

CHAPTER-IV



RESULTS OF TAXONOMIC TREATMENT

CHAPTER-IV

RESULTS OF TAXONOMIC TREATMENT

4.1 LIST OF FAMILIES IN SEQUENCE

The Monocotyledonous families are arranged according to Bentham and Hooker's (1862-1883) system of classification with slight modification incorporating splitted families as accepted internationally are given bellow:

Table 5: List of families with number of genera and species

Sl.No.	Name of Families	No. of Genus	No. of Species
1.	Hydrocharitaceae	4	4
2.	Orchidaceae	6	8
3.	Zingiberaceae	7	15
4.	Strelitziaceae	2	2
5.	Musaceae	1	9
6.	Costaceae	1	1
7.	Cannaceae	1	4
8.	Marantaceae	1	3
9.	Bromeliaceae	1	1
10.	Iridaceae	2	2
11.	Amaryllidaceae	1	2
12.	Agavaceae	3	3
13.	Hypoxidaceae	1	1
14.	Dioscoreaceae	1	8
15.	Liliaceae	3	4
16.	Asparagaceae	1	1
17.	Smilacaceae	1	1
18.	Pontederiaceae	2	3
19.	Commelinaceae	4	6

20.	Areaceae (Palmae)	9	10
21.	Pandanaceae	1	2
22.	Juncaceae	1	1
23.	Araceae	10	13
24.	Typhaceae	1	1
25.	Lemnaceae	3	4
26.	Alismataceae	1	2
27.	Najadaceae	1	1
28.	Eriocaulaceae	1	1
29.	Cyperaceae	12	37
30.	Poaceae (Gramineae)	50	78
	Total=30	133	228

4.2 KEY TO FAMILIES

1a. Ovary superior:

2a. Shrubs or trees, aerial roots present. **Pandanaceae**

2b. Herbs to undershrubs, tuberous roots present. **Araceae**

3a. Flowers unisexual, scapigerous herbs. **Eriocaulaceae**

3b. Flowers mostly bisexual, rarely unisexual, grassy herbs:

4a. Mostly solid culms, triangular with closed leaf

sheath and fruit achene. **Cyperaceae**

4b. Mostly hollow culms, cylindrical with open leaf sheath

and fruit caryopsis. **Poaceae (Graminea)**

5a. Flowers bracteates:

6a. Aquatic or marshy herbs, flowers in umbellate

or paniced whorls. **Alismataceae**

6b. Terrestrial, trees or shrubs, sometimes

climbing; flowers in panicles with

spathaceous bracts... .. **Areaceae (Palmae)**

5b. Flowers ebracteate:

7a. Fruit a capsule, leaves smooth. **Commelinaceae**

7b. Fruit an aggregate of apocarpous berry; leaves spinous.....**Bromeliaceae**

8a. Flowers in a spadix, enclosed by a spathe. **Araceae**

8b. Flowers seldom in a spadix, nor enclosed in spathes:

9a. Aquatic, erect or floating herbs. **Pontederiaceae**

9b. Terrestrial, climber herbs. **Asparagaceae**

10a. Plants are free floating minute herbs, rootless

or with capillary root. **Lemnaceae**

10b. Plants usually climbers armed with spines. **Smilacaceae**

11a. Stems round, fruit many seeded capsule. **Juncaceae**

11b. Stems underground, fruit is a capsule.. **Liliaceae**

12a. Flowers spadix like, leaves are radical..... **Typhaceae**

12b. Flower unisexual, leaves are small,

slender and profusely branched stems.... **Najadaceae**

1b. Ovary inferior:

13a. Inflorescence spadix. **Musaceae**

13b. Inflorescence not spadix:

14a. Placentation parietal. **Orchidaceae**

14b. Placentation usually axile, not parietal:

15a. Six fertile stamens.... .. **Amaryllidaceae**

15b. Only one fertile stamen, other stamens

transform into staminode. **Zingiberaceae**

16a. Seeds minute, numerous;

aquatic herbs. **Hydrocharitaceae**

16b. Seeds large, few; terrestrial herbs. **Iridaceae**

17a. Sepals free, stem short or

long tree like. **Strelitziaceae**

17b. Sepals connate into a tube;

- tuberous herb.....**Costaceae**
- 18a. Anthers 1-celled; style quite free from the anther..... **Cannaceae**
- 18b. Anthers 2-celled; style tightly held between
 anther cell... ..**Marantaceae**
- 19a. Flowers unisexual, dioecious, twinners with
 leafy stems. **Dioscoreaceae**
- 19b. Flowers bisexual, not twinners:
- 20a. Perianth segments free to the base;
 inflorescence radical... ..**Hypoxidaceae**
- 20b. Perianth segments upto the middle or more;
 inflorescence terminal.**Agavaceae**

4.3 ENUMERATION OF SPECIES OF MONOCOTYLEDONS, KEY TO GENERA AND KEY TO SPECIES OF RESPECTIVE FAMILIES WITH BOTANICAL DESCRIPTION OF SPECIES

HYDROCHARITACEAE Juss.

Gen. Pl. 67. 1789

Partially or fully submerged aquatic herb. Stoloniferous with alternate, opposite or whorled, petiolate or sessile leaves. Flowered monoecious or dioecious, enclosed in a pair of bracts or in a spathe like bifid bract. Often female flowers solitary. Peduncles long, spirally coiled. Flowers actinomorphic, epigynous, universal, bisexual (*Ottelia*). Perianth 3 or 2 tepals, free. Stamens one to many. Ovary inferior. Fruit irregularly dehiscent or pulpy or leathery. Seeds many.

Key to genera

- 1a. Leaves with a petiole... ..**Ottelia**
- 1b. Leaves without a petiole... .. **Vallisneria**
- 2a. Leaves kidney shaped..... **Hydrocharis**
- 2b. Leaves cauline, in whorls of 3-8.**Hydrilla**

Hydrilla Richard

Mem. Cl. Sci. Math. Inst. Natl. France 1811 (2): 9, 61, 1814.

A monotypic genus, cosmopolitan in distribution.

Hydrilla verticillata (L. f.) Royle, 11l. Bot. Himal. Mts. t. 376. 1839; Hook. f., FBI.5: 659. 1888; Subram., A. A. 55. 1962; Naik, BOBSI. 6: 301. 1965; Deb, FTS. 2. 343. 1983. *Serpicula verticillata* L. f., Suppl. 416. 1781. *Hydrilla angustifolia* Hassk., Pl. Jav. Rarr. 117. 1848; Rao *et* Verma, BOBSI. 12: 140. 1970.

Submerged herb. Tuberos, slender, forming large masses. Stems profusely branched, horizontal, flaccid, with fibrous roots at nodes. Leaves sessile, opposite or whorled, 3-8 in a whorl, 1.0-1.5 cm. long, linear. Flowers minute, dioecious, white. Sepals 3, ovate. Petals 3, oblong. Stamens 3. Fruits subulate. (Photo File 1.D)

Habitat: Found in undisturbed ponds.

Fls. and Frts.: Jul.-Oct.

Sonai, Udalguri; Binu. 99; July 20, 2014.

Hydrocharis L.

Sp. Pl. 2: 1036. 1753

Herbs, floating. Stems short, stoloniferous. Leaves basal, floating or submerged, rarely emerged, petiolate, stipulate; blade ovate, orbicular, entire. Flowers unisexual, monoecious. Sepals greenish white. Petals white or yellowish. Seeds ellipsoid.

Hydrocharis cellulosa Buch-Ham. ex Prain, Bengal Pl. 2: 997. 1903

Aquatic herb, floating. Stems short, stoloniferous. Floating leaves are kidney shaped, rosettes on the water surface, with the roots hanging down into the water column and touching bottom. Flowers small, white, 3-petalled. Seeds ellipsoid. (**Plate 1**)

Habitat: Found in ditches.

Fls. and Frts.: Jun.-Oct.

Sonai, Udalguri; Binu. 100; July 20, 2014.

Ottelia Pers.

Syn. Pl. 1: 400. 1805

PLATE - 1

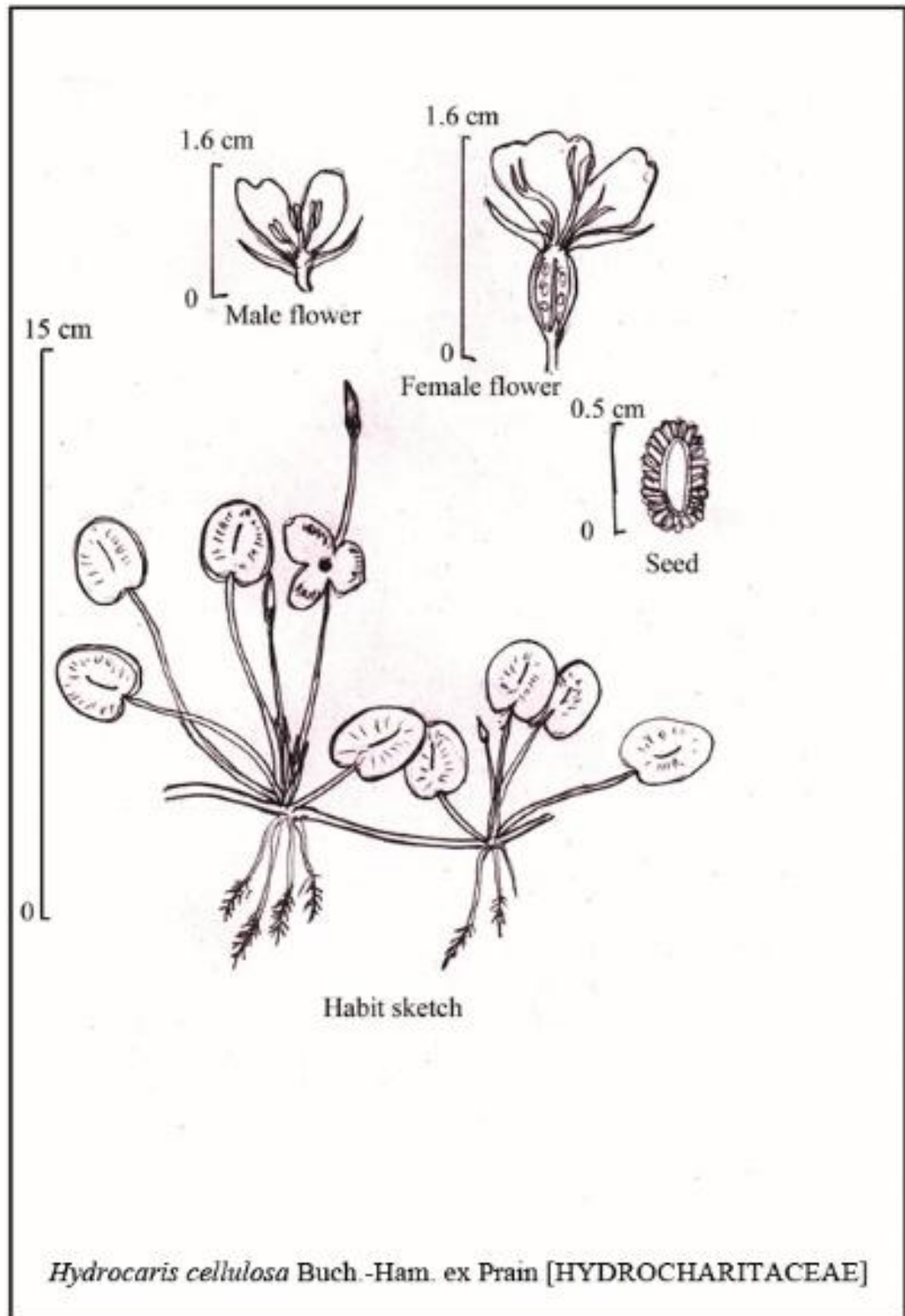
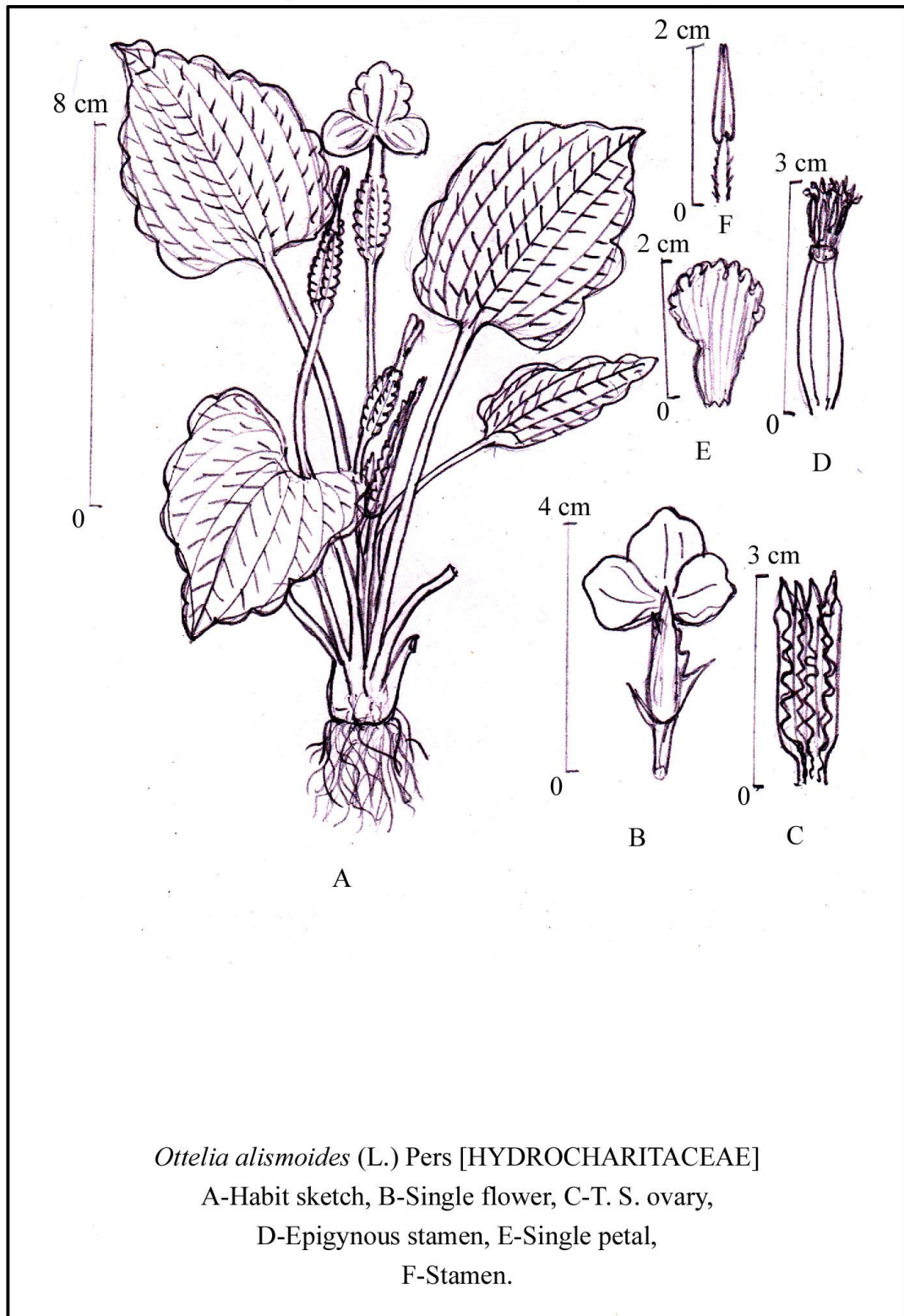


PLATE – 2



Ottelia alismoides (L.) Pers [HYDROCHARITACEAE]

A-Habit sketch, B-Single flower, C-T. S. ovary,

D-Epigynous stamen, E-Single petal,

F-Stamen.

Annual herb. Submerged or partially glabrous. Roots fibrous. Stems rhizomatous. Leaves large, oblong or cordate. Flowers solitary, bisexual, white. Fruit oblong, enclosed in the spathe, capsule fleshy. Seeds numerous.

About 21 species in tropical and sub-tropical regions; 7 species in Asia; 1 specie in India (Hook. f., 1888); 1 in Assam (Rao and Verma, 1970) and 1 in the study area.

Ottelia alismoides (L.) Pers., Synop. Pl. 1: 400. 1805; Hook. f., FBI. 5: 662. 1888; Subram, A. A. 61. 1962; Naik, BOBSI. 6: 303. 1964; Rao *et* Verma, BOBSI. 11 (3 and 4): 411 (1969) 1972; Jain *et* Hajra, BOBSI. 17: 85; Deb., FTS. 2: 344. 1985; Chowdhury, Assam's Flora 278. 2005.

Submerged herbs. 20-55 cm. in height. Roots fibrous. Leaves spirally arranged, radical, floating in water; laminae broadly lanceolate, unequal, glabrous. Spathe of two united bracts. Flowers sessile, white. Sepals 3. Petals 3. Fertile stamens. Staminodes 6. Carpls 6. Ovary 6 angular, green. Fruits oblong, enclosed in the spathe, fleshy, indehiscent. Seeds numerous, with numerous brownish hairs forming a coating. (**Plate 2**) (Photo File 1. C)

Habitat: Common in ditches and jheels.

Fls. and Frts.: Jul.-Sept.

Rowta, Udalguri; Binu. 101; August 14, 2014.

Vallisneria L.

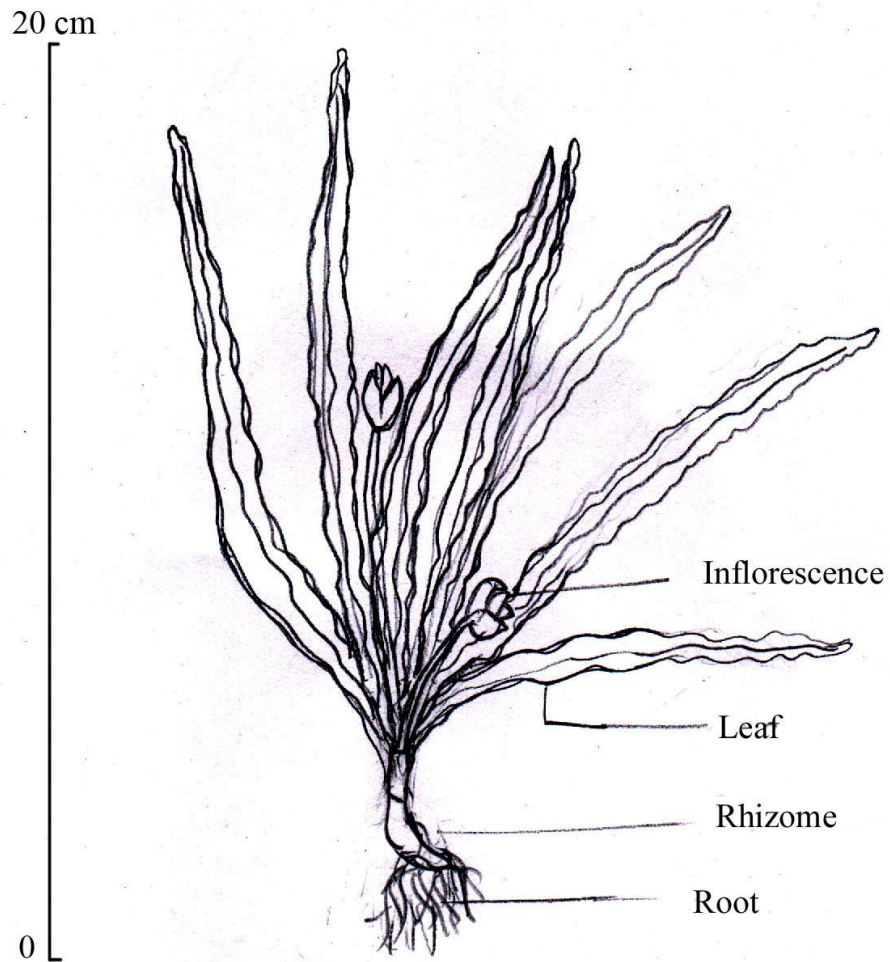
Sp. Pl. 1015. 1753; Gen. Pl. 5: 446. 1754.

Perennial herb. Submerged. Leaves sessile, linear, no midrib. Flowers unisexual. Male flowers and female flowers born separately. Fruit a cylindrical capsule.

13 species world wide; 1 species in India (Hook. f., 1888); 1 species in Assam (Rao and Verma, 1970) and 1 species in the study area.

Vallisneria spiralis L., Sp. Pl. 1015. 1753; Hook. f., FBI. 5: 660. 1888; Subram. M August. Ang. 57. 1962; Deb, Fl. Tripura 2: 345. 1983; Rao *et* Verma in Bull. Bot. Surv. Ind. 12 (1-4): 140. 1970; Cook, Aquat. W. Pl. India 221. 1996; Bora and Kumar, Fl. Div. Assam. 334. 2003. *V. spiralooides* Roxb. Fl. Ind. 3: 750, 1832.

PLATE – 3



Habit sketch

Vallisneria spiralis L. [HYDROCHARITACEAE]

Perennial herb. Submerged. Monoecious, tufted, stoloniferous. Roots unbranched. Leaves linear, narrowly strap shaped. Inflorescence axillary, spathe of two united bracts. Flowers universal. Male flowers clustered, peduncles short. Perianth 6. Stamens 2, free. Female spathes long, slender, spirally coiled scape, white. Petals 3, fringed along the margin. Fruit sub-cylindrical. (**Plate 3**) (Photo File 1. A and B)

Habitat: Found in stagnant water.

Fls. and Frts.: Jul.-Nov.

Sonai, Udalguri; Binu. 102; August 14, 2014.

ORCHIDACEAE Juss.

Gen. Pl. 64-65. 1789

Perennial herb. Epiphytic or terrestrial. Stems leafy or scapouse, sympodially or monopodially branched. Leaves thick, $\frac{1}{3}$ alternate, frequently with closed sheaths. Flowers bisexual, medianly zygomorphic, epigynous, perianth of 6 members in two whorls (3×3), generally differentiated into calyx and corolla; inner whorl butterfly like beautiful diverse colouration is known as labellum or lip. Filament is united with the gynoecium to form a column is known as gynostegium. Pollen grains are connate in waxy masses is known as pollinia. Stigmas 3 of which 2 are receptive i.e fertile and the other terminal one is sterile and is known as rostellum. Fruit capsule.

925 genera 27, 135 species world wide, most numerous in the humid tropics and sub-tropics. 6 genera and 8 species in the study area.

Key to genera

1a. Terrestrial herb. *Arundina*

1b. Epiphytic herb:

2a. Stem monopodial:

3a. Leaves terete, racemes one to few flowered. *Papilionanthe*

3b. Leaves flat, racemes many flowered:

4a. Leaves distichous, spur without callus or septum

within, usually long, conical, turned upwards,

closing the mouth of flowers. *Aerides*

4b. Leaves lorate, spur with callus within,
short, if long not turned upwards and

not closing the mouth of flowers. *Rhynchostylis*

2b. Stem sympodial:

5a. Plants pseudo bulbous, covered with overlapping

leaf sheaths, leaves with long; pollinia 2. *Cymbidium*

5b. Plants pseudo bulbous, not covered with

overlapping leaf sheaths, leaves not long,

pollinia 4 or 8. *Dendrobium*

Aerides Lour.

Lour. Fl. Coch. 525. 1790; Hook. f., FBI. 6: 43.1890.

Perennial herb. Epiphytic. Roots thick. Stems ascending, enclosed by leaf sheaths, with many nodes. Leaves distichous, slightly fleshy. Inflorescence lateral, pendulous, racemose or paniculate. Sepals and petals similar. Lip attached to end of column. Pollinia-2, waxy, attached by a semi-circular viscidium.

20 species distributed in Sri Lanka, India, Nepal, Bhutan, Myanmar, China, Thailand, Indochina and Malaysia to the Philippines and Indonesia; 15 species in India (Hook. f., 1890); 3 species in Assam (Chowdhury, 2005) and 1 species in the study area.

Aerides odorata Lour., Fl. Cochinch. 525. 1790; *A. cornutum* Roxb. Fl. Ind. 3: 472. 1832; Hook. f., FBI. 6: 47, 1890; Cooke, Fl. Pres. Bombay 3: 204. 1958 (Repr. ed.); Chowdhury, Assam's Flora 278. 2005.

Perennial herb. Epiphytic. Stout stem 10-20 cm. long. Leaves sessile, linear to oblong 10-22 × 2.5-3.4 cm., unequally 2-lobed at the apex. Inflorescence racemes lax, many flowered. Flowers white with pink spots, spur apex greenish yellow. (Photo File 2. E)

Habitat: Epiphyte in dense forest and grown as an ornamental plant.

Fls. and Frts.: Apr.-Aug,

Udalguri Nalbari; Binu. 68; April 30, 2014.

Arundina Blume

Bijdr. 401. 1825; Hook. f., FBI 5: 856. 1890.

Perennial herb. Terrestrial. Stems erect, unbranched or branched when older and leafy. Leaves linear to lanceolate, sheathing at base. Inflorescence terminal few to many flowered. Sepals and petals elliptic. Lip not spurred. Pollinia 8, in two groups, attached to sticky viscidia.

6-8 species in the world; 7 species in India (Hook. f., 1890), 1 in Assam (Chowdhury, 2005) and 1 species in the study area.

Arundina gramnifolia (D. Don) Hochr., Bull. New York Bot. Gard. 6: 270. 1910; *Arundina chinensis* Blume, Bijdr. 8: 502. 1825; *Bletia graminifolia* D. Don, Prodr. Fl. Nep. 29. 1829; *A. bambusifolia* Lindl., Gen. and Sp. Orchid. 125. 1830; Hook. f., FBI. 5: 857. 1890; Chowdhury, Assam's Flora 278. 2005.

Perennial herb. Terrestrial orchid. Stems terete and erect, very tall, upto 115 cm. long. Leaves linear to lanceolate, 15-35 × 1.0-3.0 cm, apex acuminate, glabrous. Inflorescence racemes calyx 20 cm long. Flowers pinkish purple. Bracts pale brown, lanceolate. Sepals lanceolate to oblong. Petals obovate to orbicular. Lip adnate to base of column. Rostellum 3-fid. Pollinia 8. Fruit capsule. (**Plate 4**) (Photo File 2. H)

Habitat: Grown in garden and hill areas, popularly known as “Bamboo Orchid”.

Fls. and Frts.: Through out the year.

Bhairabkunda, Udalguri; Binu. 105; March 15, 2014.

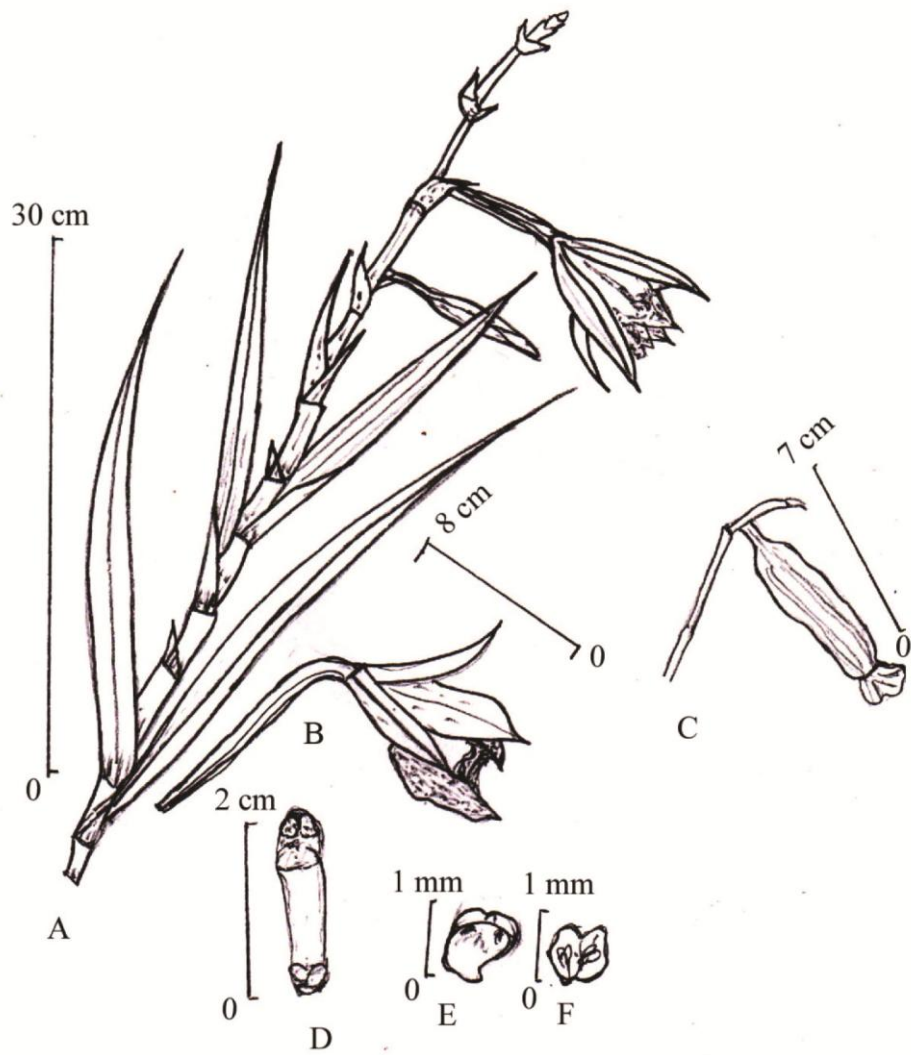
Cymbidium Swartz

Nova Acta Regiae Soc. Sci. Upsal. 6: 70. 1799; Hook. f., FRBI 5: 8. 1890.

Perennial herbs. Epiphytic, lithophytic or terrestrial. Autotrophic, usually with pseudobulbs; ellipsoid, rarely absent or stem like often enclosed in leaf bases. Leaves many, linear. Inflorescence erect pendulous, arising from base of pseudobulb. Flowers large or medium sized; lip free. Sepals and petals free. Pollinia 2 and attached to a broad viscidium.

About 55 species in tropical and sub-tropical Asia, New Guinea and Australia; 15

PLATE – 4



Arundina graminifolia (D.Don) Hochr. [ORCHIDACEAE]

A-Habit sketch, B-Flower, C-Capsule, D-Column,

E-Operculum, F-Pollinia

species in India (Hook. f., 1890); 4 species in Assam (Baishya, 1990) and 1 species in the study area.

Cymbidium aloifolium (L.) Swartz, Nova Acta Regiae Soc. Sci. Upsal. 6: 73. 1799; *Epidendrum aloifolium* L., Sp. Pl. 953. 1753; Hook. f., FBI 6: 10, 1890; *Cymbidium bicolor* Hook. f., l. c. 6: 11. 1890; *C. pendulum* (Roxb.) Sw. King and Pantl. In l. c. 188. t, 251. 1898; Chowdhury, Assam's Flora 281. 2005.

Perennial herb. Epiphytic. Stem short, pseudobulbous, usually enclosed in leaf bases. Leaves linear to oblong, obtusely 2-lobed. Racemes laxly many flowered. Flowers yellowish purple, sepals and petals pale yellow to creamy yellow, lips broad, central maroon brown stripe. Pollinia 2. (Photo File 2. A)

Habitat: Purely epiphytic but sometimes show a false terrestrial habit.

Fls. and Frts.: Mar.-May.

Udalguri town; Binu. 162; May 26, 2016.

***Dendrobium* Swartz**

Nova Acta Regiae Soc. Sci. Upsal. 6: 82, 1799; Hook. f., FBI 5: 710. 1890.

Perennial herbs. Epiphytic, lithophytic or often terrestrial. Stems erect, rhizomatous and many noded or erect or one noded or without a rhizome, new stems may arise from the base of old ones. Leaves one to many, alternate, linear, lanceolate, oblong or ovate. Inflorescence lateral, one to many flowered, usually racemose, erect or pendulous. Sepals and petals free. Column short. Pollinia 4.

About 100 species in India across to Japan, South to Malaysia and Indonesia, East to Australia, New Guinea, and the Pacific Islands; 158 species found in India (Hook. f., 1890), 22 species in Assam (Baishya, 1999) and 3 species in the study area.

Key to species

Ia. Flowers white or more or less purple. ***D. aphyllum***

Ib. Flowers golden yellow or palepink:

2a. Stems terete. ***D. fimbriatum***

2b. Stems long. ***D. moschatum***

Dendrobium aphyllum (Roxb.) C.E.C. Fischer in Gamble, Fl. Pres. Madras 1416 (991). 1928; *Limodorum aphyllum* Roxb. Pl. Corom. 1: 34. 1795; *Dendrobium cucullatum* R. Br. In Bot. Reg. 7. t, 548. 1821; *Dendrobium pierardii* Roxb. In Hook. Exot. Fl. T. 9. 1822; Hook. f., FBI 5: 735. 1890; Chowdhury, Assam's Flora 281. 2005.

Perennial herb. Epiphytic. Plants with pseudobulbs. Stems unbranched many nodes and internodes, slender, 30-80 cm long. Leaves sessile, linear to lanceolate. Inflorescence arise from nodes. Flowers pale pink. (Photo File 2. F)

Habitat: Epiphyte on tree trunks.

Fls. and Frts.: Mar.-May.

Udalguri town; Binu. 74; March 15, 2014.

Dendrobium fimbriatum Hook., Exot. Fl. L. ad. t. 71. 1823; Hook. f., FBI 5: 745. 1890; Mukherjee in BBSI 14: 96. 1972; Chowdhury, Assam's Flora 281. 2005.

Epiphytic herb. Stems erect, cylindric, unbranched with many nodes. Leaves 12-21 cm long, apex acuminate. Inflorescence racemose, arising from nodes, laxly 10-15 flowered. Flowers slightly fragrant, sepals and petals golden yellow. (Photo File 2. G)

Habitat: Epiphyte on tree trunks.

Fls. and Frts.: Apr.-Jun.

Serfang, Udalguri; Binu. 80; April 15, 2014.

Dendrobium moschatum Wall. ex D. Don, Prodr. Fl. Nepal. 34. 1825; King, et Pantl. In Ann. Roy. Bot. Gard. Calc. 8: 60. t. 84. 1898.

Perennial herb. Epiphytic. Leaves ovate to lanceolate, acute. Stems long, erect or sub-erect or leafless stems. Flowers 4-7 cm across, yellow or creamy yellow. Sepals oblong. Petals 3 cm across. Pollinia 4, oblong. Capsules oblong, fusiform, up to 7 cm long. (Photo File 2. B)

Habitat: A robust epiphyte.

Fls. and Frts.: May-Aug.

Angrajuli, Udalguri; Binu. 160; May 20, 2016.

Papilionanthe Schltr.

Orchis 9: 78. 1915

Perennial herb. Epiphytic. Monopodial. Stems erect pendulous, climbing pendulous, teretes, branching or unbranched, noded. Leaves terete, jointed and sheathing at base. Inflorescence axillary, 1 to several flowered. Perianth 6 in two whorls, the posterior median member of the inner whorl is the labellum. Petals and sepals free. Petals larger than sepals.

About 12 species distributed in China, India, South East Asia and the Malay Archipelago; 5 species found in India; 2 species in Assam (Baishya, 1999) and 1 species in the study area.

Papilionanthe teres (Roxb.) Schltr., Orchis 9: 78. 1915. (syn: *Dendrobium teres* Roxb.); *Vanda teres* (Roxb.) Lindl., Gen. Sp. Orch. Fl. Arunachal Prad. 570. 1998; Chowdhury, Assam's Flora 285. 2005; Mishra, Orch. Ind. 311. 2007.

Perennial herb. Epiphytic. Stems terete, branched, long, erect, slender, 7-11 cm. to 5.2 cm thick. Inflorescence racemose, laxly 3-5 flowered. Flowers large, showy, pink, 4.5-6.3 cm across. Lip spotted and lined with red and purplish brown. 3-lobed. Pollinia 2, sub-globose, spur with a yellow mouth. (Photo File 2. D)

Habitat: Most common epiphyte on roadside trees and in deciduous forest.

Fls. and Frts.: Apr.-May.

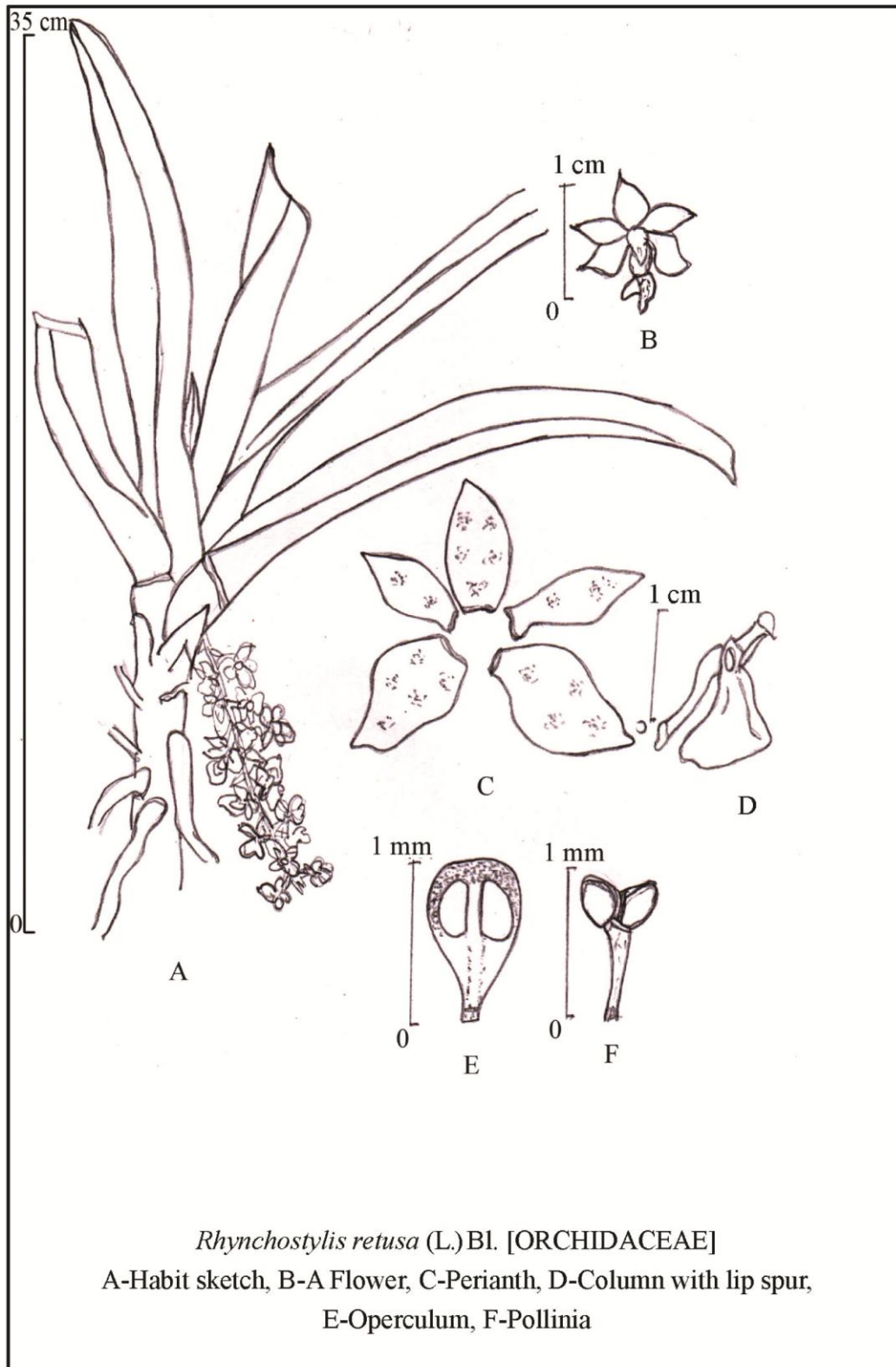
Kobirali, Udalguri; Binu. 159; April 26, 2016.

Rhynchostylis Blume.

Bijdr. 285. t. 49. 1825; Hook. f., FBI 6: 32. 1890.

Perennial herbs. Epiphytic. Monopodial. Stem stout. Leaves lorate, many flowered. Inflorescence 20-50 cm long, lateral, erect or pendulous, racemose, densely flowered. Flowers medium sized, mostly purplish white and pinkish white in colour and showy. Perianth 6 in two whorls, the posterior median member is the labellum. Sepals and petals similar and spotted. Lip adnate to column. Rostellum long and pointed.

PLATE – 5



Rhynchostylis retusa (L.) Bl. [ORCHIDACEAE]

A-Habit sketch, B-A Flower, C-Perianth, D-Column with lip spur,
E-Operculum, F-Pollinia

About 4 species distributed in Sri Lanka, Myanmar, S.E. Asia, Malaysia, Philippines and Indonesia; 1 species in India (Hook. f., 1890), Assam (Chowdhury, 2005) and 1 species in the study area.

Rhynchosyilis retusa (L.) Blume, Bijdr. 286. 1825; *Epidendrum retusum* L., Sp. Pl. 953. 1753; Hook. f., FBI 6:32. 1890; *Gastrochilus retusus* (L.) Ktze., Rev. Gen. Pl. 2:661. 1891; Cooke, Fl. Pres. Bombay 3: 202. 1958 (Repr. ed.); Chowdhury, Assam's Flora 285. 2005.

Perennial herb. Epiphytic. Stems stout, covered with leaf sheaths. Leaves distichous, lorate, sessile. Inflorescence 25-42 cm. long, pendulous, lateral, with many dense pinkish white flowers. Flowers 1.5-2.5 cm across. Sepals and petals white spotted with pink or pale purple. Lip purplish pink, spurred, apex white. (**Plate 5**) (Photo File 2. C)

Habitat: Epiphytic in dense forest and also grown as an ornamental plant.

Fls. and Frts.: Apr.-Jul.

Udalguri Nalbari Word No. 2; Binu. 81; April 20, 2015.

ZINGIBERACEAE Lindl.

Key Struct. Phys. Syst, Bot. 69. 1835.

Perennial herb. Terrestrial. Aromatic, underground rhizome. Leaves radical or cauline, distichous with an open or closed sheath at the base. Inflorescence a compact spike or open raceme or the flowers solitary. Flowers hermaphrodite, strongly zygomorphic, highly modified. Fruit a loculicidal capsule or fleshy and indehiscent. Seeds round or angular.

52 genera and more than 1300 species distributed in moist area of the tropics and subtropics; 22 genera with 163 species in India (Karthikeyan *et al*, 1989) and 7 genera and 15 species in the study area.

Key to genera

1a. Inflorescence cone like spike:

2a. Inflorescence compact with terminal plumes of barren

bract laterally and partially adnate, forming branches.*Curcuma*

- 2b. Inflorescence spikes radial, globose or oblong,
on short or long peduncles, bracts imbricate. *Amomum*
- 1b. Inflorescence panicle. *Elettaria*
- 3a. Lateral staminodes petaloid:
- 4a. Flowering stem leafy, labellum erect. *Hedychium*
- 4b. Flowering stem leafless, free from the labellum. ... *Kaempferia*
- 3b. Lateral staminodes minutes or absent:
- 5a. Inflorescence axis unbranched. *Zingiber*
- 5b. Inflorescence axis branched. *Alpinia*

Alpinia Roxb.

Asiat. Res. 11: 350. 1810; Hook. f., FBI. 6:252. 1892; Rao and Verma, Bull. Surv. India 14 (1-4): 138. 1972.

Perennial herb. Terrestrial. Erect, tall leafy stems. Leaves oblong or lanceolate, glabrous. Flowers terminal racemes or panicles. Sepals and petals 3. Stamen 1 perfect. Carpels 3, syncarpous. Fruit usually a dry or fleshy berry. Seeds globose or angular. Aril membranous.

Alpinia nigra (Gaertn.) Burt., Notes Roy. Bot. Gard. Edin. 35 (2): 213. 1977; *Zingiber nigrum* Gaertn., Fruct. Sem. Pl. 1: 35, t. 12. 1788; *Alpinia allughas* (Retz.) Roseae, Trans. Linn. Soc. Lon. 8: 346. 1807; Baker in Hook. f., FBI 6: 253. 1892; Deb, FTS. 2: 368. 1983; Chowdhury, Assam's Flora 287. 2005.

Perennial herb. Erect, 1-2 m. high, with perennial tuberous root stocks. Stems leafy. Leaves distichous, oblong to lanceolate, glabrous. Panicles erect, 10-25 cm long. Flowers shortly pedicelled, pinkish, corolla 2 cm across. Calyx tubular. Petals pink, posterior petal largest. Stamen shorter than the lip. Capsules globose, black on ripening. Seeds 4-6 in each cell. (Photo File 3. I)

Habitat: Common in marshy and wet places.

Fls. and Frts.: Jun.-Oct.

Bahinigaon, Udalguri; Binu.91; April 14, 2014.

Amomum Roxb.

Pl. Corom. 3: 75. 1820, nom. cons. *Amomum subulatum*; Fl. Ind. 1: 317. 1820; Baker in Hook. f., FBI. 6: 233. 1892; R. M. Sm., Notes R. Bot. Gard. Edinb. 42: 295-314. 1895; Rao and Verma, Bull. Bot. Surv. India 14 (1-4): 134. 1972.

Perennial herb. Rhizomatous. Stems very thin with many leaves. Inflorescence congested, terminal on a separate leafless shoot, peduncle short. Bracts closely imbricating. 1 to many flowered. Flowers yellow, orange, white or red. Calyx tubular, 3-dentate. Labellum longer than petals. Ovary trilocular. Capsule sub-globose.

About 180 species widely found in tropical Asia to tropical Australia, with majority in the Malesian region; 48 species in India (Baker in Hook. f., 1892); 5 species in Assam (Rao and Verma, 1972) and 1 species in the study area.

Amomum aromaticum Roxb., Fl. Ind. 1: 44. 1820; Baker in Hook. f., FBI 6: 241. 1892; Rao and Verma, Bull. Bot. Surv. India 14 (1-4): 135. 1972; Chowdhury, Assam's Flora 287. 2005.

Perennial herbs. Evergreen. Rhizome creeping under soil, cream colour outside, pale yellow inside, aromatic, root covered with membranous sheaths. Stem leafy, 10-20 cm high. Inflorescence globose. Flowers white. Fruit ovoid. (Photo File 3. M)

Habitat: Found in evergreen forest and as cultivated also.

Fls. and Frts.: Apr.-Jul.

Vern. name: Elachi (As., Rh. and Bd.)

Rowta R. F., Harisinga, Udalguri; Binu. 176; April 21, 2016.

Curcuma L.

Sp. Pl. 1: 2. 1753; Gen. Pl. 5: 3, 1754; Baker in Hook. f., FBI 6: 209. 1890; Rao and Verma, Bull. Bot. Surv. India 14 (1-4): 121. 1972.

Perennial herb. Pseudostem present. Inflorescence comes from rhizomebranch and without basal leaves. Bracts ovate. Inflorescence sessile, 2-7 floret. Calyx 2-3 toothed. Corolla tubular. Fruits capsules.

39 species in the world; 29 species in India (Baker in Hook. f., 1890); 5 species in Assam (Rao and Verma, 1972) and 3 species in the study area.

Key to species

1a. Leaves completely green:

2a. Rhizome pale yellow inside, have a raw mango taste.*C. amada*

2b. Rhizome bright yellow inside have a pungent taste.*C. longa*

1b. Leaves having deep purple colour at the mid rib:

3a. Rhizome yellow inside.*C. aromatica*

3b. Rhizome brown inside.*C. zedoaria*

Curcuma amada Roxb., Asiat. Res 11: 341. 1810; Fl. Ind. 1: 33. 1820, Baker in Hook. f., FBI 6: 213. 1890; Deb, Fl. Tripura 2: 372. 1983; Chowdhury, Assam's Flora 287. 2005.

Perennial herb. Rhizomatous. Rhizomes pale yellow, have a raw mango taste. Leaves oblong, 35-42 cm long, puberulous on the upper surface, glabrous beneath. Spikes 7-13 cm long, on a scape from the centre of the leafy tuft. Flowers 4.6 cm long. Corolla tubular, creamy. Lip exceeding corolla. (Photo File 3. K)

Habitat: Grows in the jungles.

Fls. and Frts.: Apr.-Oct.

Vern. name: Am Ada (As.), Thaiju Haizeng (Bd.)

Orang, Udalguri; Binu. 124; April 20, 2015.

Curcuma aromatic Salisb., Parad. 20: t. 96. 1807; Trans. Hort. Soc. 1: 285. 1812; Baker in Hook. f., FBI 6: 210. 1890; Rao and Verma, Bull. Bot. Surv. India. 14 (1-4): 122. 1972; Chowdhury, Assam's Flora 287. 2005.

Perennial herb. Rhizomatous, bluish white within. Tubers globose, aromatic. Petiole long, green; leaf blade 25-50 cm long, glabrous at adaxial and pubescent at abaxial. Inflorescence arising from rhizomes on separate shoot. Spikes cylindrical. Bracts pale green, ovate. Calyx sparsely hairy. Corolla lobes pinkish white; lateral staminodes yellow. Labellum yellow. (Photo File 3. J)

Habitat: Common as wild, grows in high areas and in humus rich soil.

Fls. and Frts.: Apr.-Jun.

Vern. name: Khathri Phul (Bd.)

Rawta R. F., Udalguri; Binu. 77; April 27, 2014.

Curcuma longa L., Sp. Pl. 2. 1753; Baker in hook. f., FBI. 6: 214. 1890; *Curcuma domestica* Val. Bull. Jard. Bot. Buitenzorg ser. 2, 27: 31. 1918 and in Rao and Verma, Bull. Bot. Surv. India 14 (1-4): 122. 1972; Chowdhury, Assam's Flora 287. 2005.

Perennial herb. Pseudostem upto 1m. Leaves petiolate, leaf blade upto 42 cm long lanceolate. Inflorescence borne at the centre of the leafy tuft. Bracts greenish white, occasionally pink tinged. Flowers yellowish white. (Photo File 3. D)

Habitat: Cultivated in high humus rich soil.

Fls. and Frts: Sept.-Nov.

Vern. name: Halodhi (As. and Bd.)

Gersong, Udalguri; Binu.155; October 20, 2015.

Curcuma zedoaria Rosc., Trans. Linn. Soc. London 8: 354. 1807; *Curcuma aromatica* Salisb. Asiat. Res. 11: 332. 1810; Baker in Hook. f. Fl. Brit. India 6: 210. 1890.

Perennial rhizomatous herb. Rhizomes are brown inside, pale yellow outside, sometimes tinged with red. Roots sometimes ending in tubers. Leaves are oblong 15-40 cm long, purple on either side of the midrib, apex acute. Peduncles 5-10 cm long. Calyx purplish white. Staminodes shorter than corolla lobe, yellow. Anther 2-celled. Ovary villoses. (**Plate 6**)

Habitat: Common in scrub jungles and in the forest.

Fls. and Frts.: May-Oct.

Barnadi Wildlife Sanctuary, Udalguri; Binu. 132; October 20, 2015.

Elettaria W. G. Maton

Trans. Linn. Soc. London 10 (1): 250, 1811; Bentham in Bentham and Hook. f., Gen. Pl. 3: 646. 1883; Baker in Hook. f., FBI 6: 251. 1892.

PLATE – 6

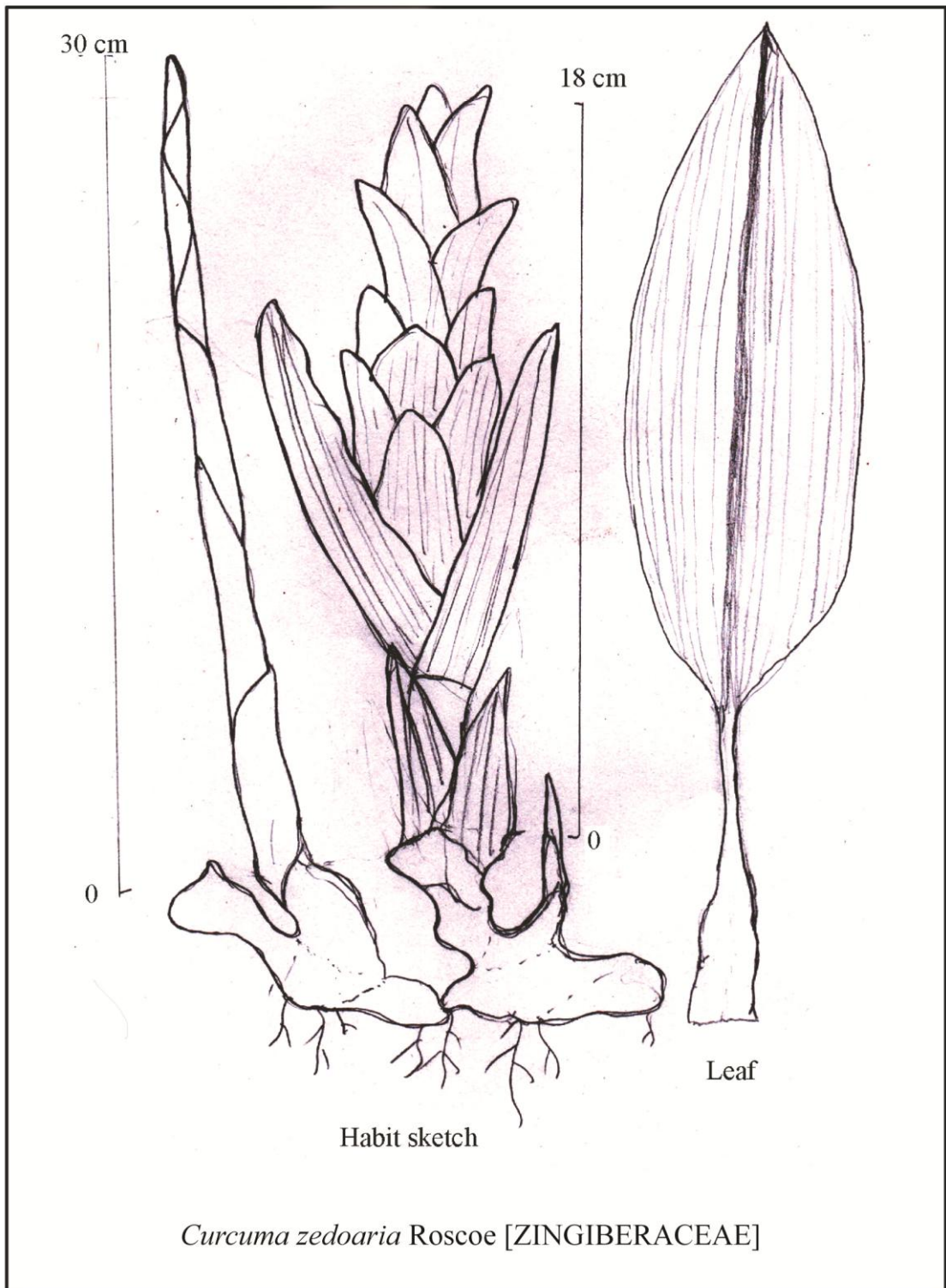
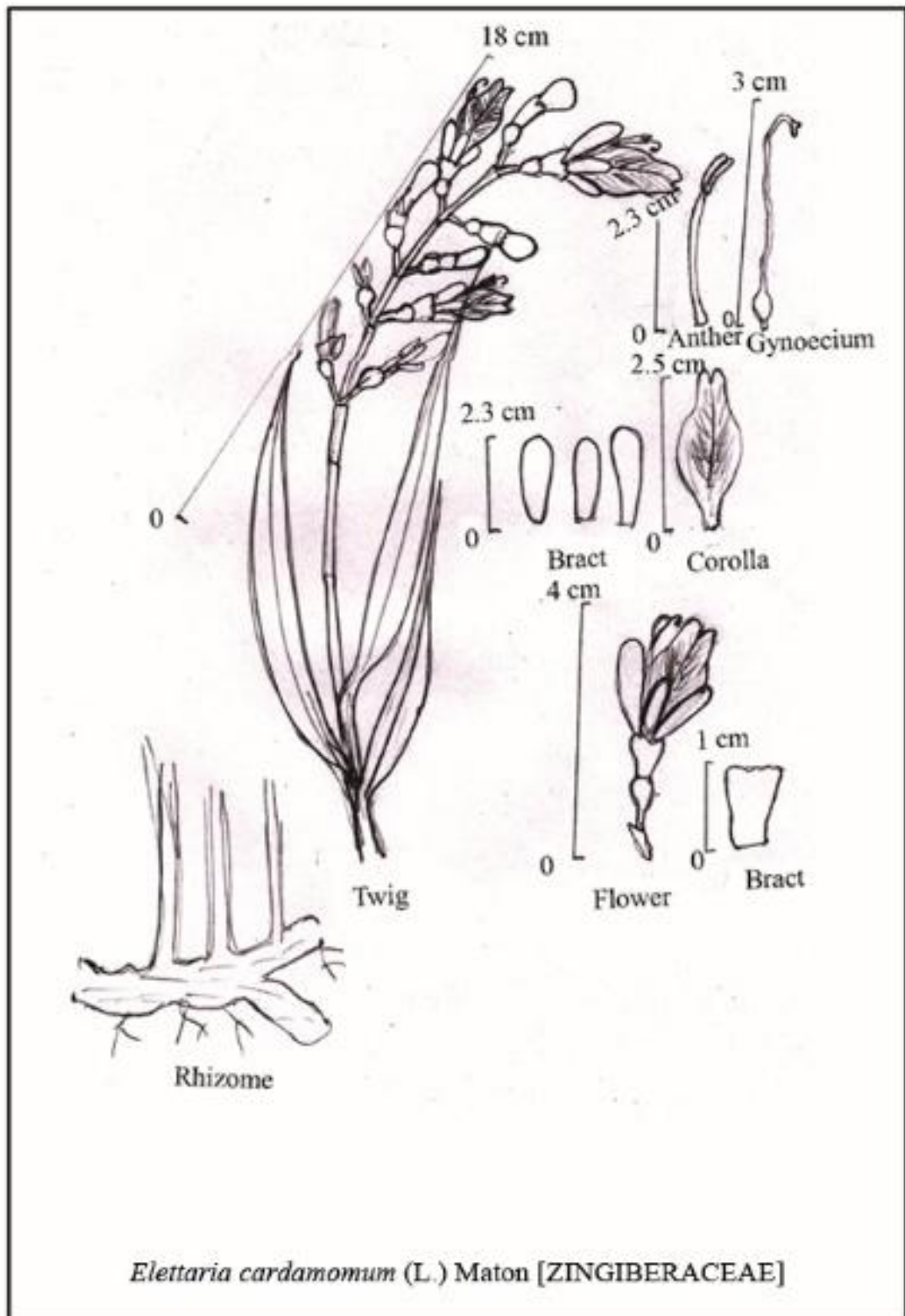


PLATE - 7



Perennial herb. 1-2 m high. Leaves linear to lanceolate, 20-50 cm. long, with a long pointed tip. Flowers white to lilac or pale violet. Spikes loose, 20-40 cm. long. Fruits angular, yellowish green pod. Seeds black.

11 species in the world; 1 species in India (Hook. f., 1892) and 1 species in the study area.

Elettaria cardamomum (L.) Maton, Trans. Linn. Soc. London 10: 254. 1811; *Alpinia cardamomum* (L.) Roxb., Asiat. Res. 11: 356. 1810; Baker in Hook. f., FBI 6: 251. 1892; Chowdhury, Assam's Flora 287. 2005.

Perennial herb. Erect, tall, upto 2 m high. Leaves sub-sessile, elliptic lanceolate, 30-35 cm long. Inflorescence a loose panicle. Fruits sub-globose. Seeds black, aromatic. **(Plate 7)** (Photo File 3. L)

Habitat: Grows in the swamp jungles.

Fls. and Frts.: Apr.-Jun.

Vern. name: Fisa Elachi (Bd.)

Harisinga, Udalguri Nalbari; Binu. 157; April 21, 2015.

Hedychium J. Koenig.

Retzius, Observ. Bot. 3: 73-74, 1783; Hook. f., FBI 6: 225. 1892; Rao and Verma. Bull. Bot. Surv. India 14 (1-4): 127. 1972.

Perennial herb. Rhizomatous, pseudostems erect, leafy. Ligule conspicuous. Leaf blade oblong or lanceolate. Inflorescence a terminal spike; densely numerous flowers. Flowers white in colour, large, showy, scented. Bracts imbricate. Calyx tubular, 3-toothed. Corolla tube long, slender, lateral staminodes petaloid. Stamen 1, filaments long. Ovary small, 3-celled, hairy, many ovuled; style long. Capsule globose or trigonous. Seeds ariolate.

About 50 species in Madagascar, Indo-Malaysia and China; 24 species in India (Baker in Hook. f., 1892); 25 species in Assam (Rao and Verma, 1972) and 3 species in the study area.

Key to species

1a. Leaf blade oblong to lanceolate:

2a. Flowers white, strongly scented. *H. coronarium*

2b. Flowers orange white, slightly scented. *H. spicatum*

1b. Leaf blade narrowly linear. *H. coccineum*

Hedychium coccineum Buch.-Ham. *ex* Smith, *Cyst.* 17: 5. 1811; Baker in Hook. f., *FBI* 6: 231. 1892; Rao and Verma, *Bull. Bot. Surv. India* 14 (1-4): 133. 1972; Kumar, *Zingiberaceae of Sikkim*: 86. 2001; Chowdhury, *Assam's Flora* 287. 2005.

Pseudostems upto 2.0 m tall. Leaves sessile. Leaf blade narrowly linear, 25-30 cm long, 3.0-4.5 cm wide, glabrous, apex caudate to acuminate. Spikes cylindrical, usually dense. Bracts oblong. Flowers red. Corolla tube longer than calyx. Labellum orbicular, apex 2-cleft. Capsule globose. (Photo File 3. A)

Habitat: Found in damp places.

Fls. and Frts.: Jun.-Oct.

Sonai, Udalguri; Binu. 157; June 21, 2016.

Hedychium coronarium J. Koenig, *Observ. Bot.* 3: 73. 1783; Baker in Hook. f., *FBI* 6: 225. 1892; Rao and Verma, *Bull. Bot. Surv. India* 14 (1-4): 128. 1972; Kumar, *Zingiberaceae of Sikkim* 47. 2001; Chowdhury, *Assam's Flora* 287. 2005.

Pseudostems upto 1 m tall. Leaves sessile. Ligule membranous. Leaf blade oblonged to lanceolate or lanceolate, 20-30 cm long, 4-5 cm wide, apex acuminate, base acute. Spikes ellipsoid. Bracts ovate. Flowers white, fragrant. Calyx 3 cm. Corolla tube 4cm long. Labellum white, apex 2. Stamen 3 cm long. Carpel 11 cm long. (**Plate 8**) (Photo File 3. E and F)

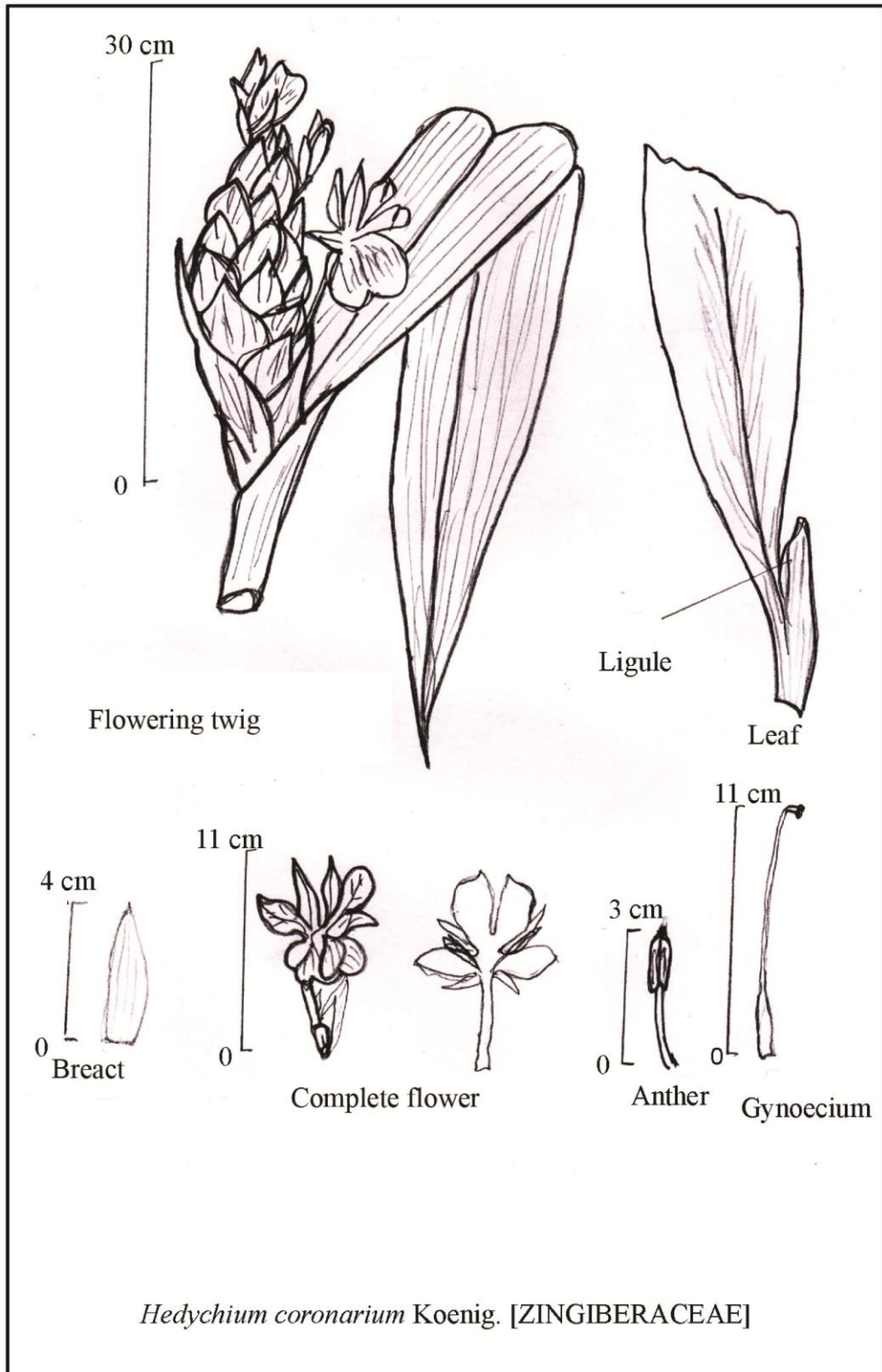
Habitat: Found in roadside waste places.

Fls. and Frts.: Aug.-Dec.

Naoherua, Udalguri; Binu. 85; July 20, 2014.

Hedychium spicatum Smith, *Cycl.* 17: *Hedychium* no. 8. 1811; Baker in Hook. f., *FBI*

PLATE – 8



6: 227. 1892; Rao and Verma, Bull. Bot. Surv. India 14 (1-4): 130. 1972; Chowdhury, Assam's Flora 287. 2005.

Perennial and pseudostems 50-90 cm high. Leaves having shortly petiolate. Leaf blade oblong or oblong to lanceolate, glabrous, apex acuminate. Spikes few to many flowered. Flowers fragrant. Calyx 3-cleft. Corolla pale yellow. Labellum yellowish. Filaments pale reddish. Capsule sub-globose.

Habitat: Found in marshy places.

Fls. and Frts.: Jun.-Nov.

Orang, Udalguri; Binu. 128; July 20, 2014.

Kaempferia L.

Sp. Pl. 1: 2. 1753; Baker in Hook. f., FBI 6: 218. 1890.

Rhizomes fleshy, tuberous. Pseudo stem short. Leaves 1 to few. Ligule small or absent. Petiole short. Leaf blade sub-orbicular to filiform. Inflorescence terminal on pseudo stems or on separate shoots arising from rhizomes, spirally few to many flowered. Calyx tubular. Corolla lobes spreading or reflexed; lateral staminodes petaloid. Labellum showy, apically 2-lobed.

About 50 species in the world; 22 species in India (Baker in Hook. f., 1890); 3 species in Assam (Rao and Verma, 1972); and 2 species in the study area.

Key to species

1a. Leaves sub-orbicular; corolla segments lanceolate;

lip white with lilac throat... .. *K. galanga*

1b. Leaves petioled, oblong; corolla segments long;

lip lilac or reddish. *K. rotunda*

Kaempferia galanga L., Sp. Pl. 1: 3. 1753; Baker in Hook. f., FBI 6: 219, 1890; Deb, Fl. Tripura. 2: 378. 1983; Rao and Verma, Bull. Bot. Surv. India 14 (1-4): 124. 1972; Chowdhury, Assam's Flora 288. 2005.

Rhizomes tuberous, pale green and fragrant. Leaves sub-sessile. Leaf blade green, glabrous on both surfaces, margin usually white, apex acute. Inflorescence terminal on

pseudostems, enclosed by leaf sheaths, few to many flowered. Bracts lanceolate. Corolla lobes white, linear. Labellum 2-cleft, lobes white with purple marking at the base. (Photo File 3. B)

Habitat: Found in marshy places.

Fls. and Frts.: Aug.-Oct.

Vern. name.: Sonfera (Bd.)

Orang, Udalguri; Binu. 129; October 20, 2015.

Kaempferia rotunda L., Sp. Pl. 1: 3. 1753; *Kaempferia longa* Jacq., Pl. Hort. Schoenbr. 3: 37. 1798; Baker in Hook. f., FBI 6: 222. 1892; Rao and Verma, Bull. Bot. Surv. India 14 (1- 4): 124. 1972; Deb, Fl. Tripura 2: 378. 1983; Chowdhury, 288. 2005.

Rhizome tuberous. Leaves 2-4, erect. Ligule triangular. Leaves petiolate. Leaf blade adaxially variegated dark and pale green on both sides of midvein, abaxially tinged with purple, lanceolate. Inflorescence on separate shoots arising from rhizomes, 4-6 flowered. Bracts purplish brown. Calyx 3-cleft. Corolla lobes white, linear; lateral staminode white. Labellum lilac.

Habitat: Found in sandy areas.

Fls. and Frts.: Apr.-Oct.

Orang, Udalguri; Binu. 130; October 20, 2015.

***Zingiber* Miller.**

Gard. Dict. Abr., ed. 4: 3. 1754, [nom. cons.]; Baker in Hook. f., FBI 6: 243. 1892.

Perennial aromatic herb. Pseudostems erect. Rhizomes yellowish within, tuberous. Leafy reed like stems, sessile. Inflorescence on a separate shoot from the rhizome. Peduncle short or long. Inflorescence with closely overlapping bracts. Each bract subtend a single flower.

About 85 in the world; 24 species in India (Baker in Hook. f., 1892); 7 species in Assam (Rao and Verma, 1972) and 6 species in the study area.

Key to species

1a. Spikes sub-cylindric, lip purple or black.*Z. officinale*

1b. Spikes ovoid, lip white or yellow:

2a. Leaves oblong, glabrous beneath, bracts orbicular, green.*Z. zerumbet*

2b. Leaves lanceolate, pubescent beneath, bracts ovate, red.....*Z. montanum*

Zingiber montanum (J. Koenig) Link. ex A. Dietr., Sp. Pl. 1: 52. 1831; *Zingiber cassumunar* Roxb., Asiat. Res. 11: 347. t. 5. 1810; Baker in Hook.f., FBI. 6: 248. 1892; Rao and Verma, bull. Bot. Surv. India 14 (1-4): 136. 1972.

Rhizomes aromatic, deep yellow inside. Stem leafy. Leaves sessile, linear to lanceolate, acuminate. Spikes ellipsoid. Peduncles 10-20 cm long. Bracts ovate. Flowers yellow. Corolla lobes lanceolate; lip bifid. Capsule globose.

Habitat: Wild but usually cultivated for medicine.

Fls. and Frts.: Sept.-Nov.

Vern. name: Hagrani Haizeng (Bd.)

Orang, Udalguri; Binu. 131; October 20, 2015.

Zingiber officinale Roscoe, Trans. Linn. Soc. London, Bot. 8: 348. 1807; *Amonum zingiber* L., Sp. Pl. 1: 1. 1753; Baker in Hook. f., FBI 6: 246. 1892; Rao and Verma, Bull. Bot. Surv. India 14 (1-4): 137. 1972; Choudhury, 288. 2005.

Rhizomes branched, light yellow inside, fleshy, strongly aromatic. Pseudostems nearly 1 m tall. Leaves sessile. Ligule membranous, 2-lobed. Leaf blade linear to lanceolate. Inflorescence arising from rhizomes, ovoid. Bracts pale green. Calyx 1 cm. Corolla yellowish green. Stamens dark purple.

Habitat: Cultivated in highly sloping areas.

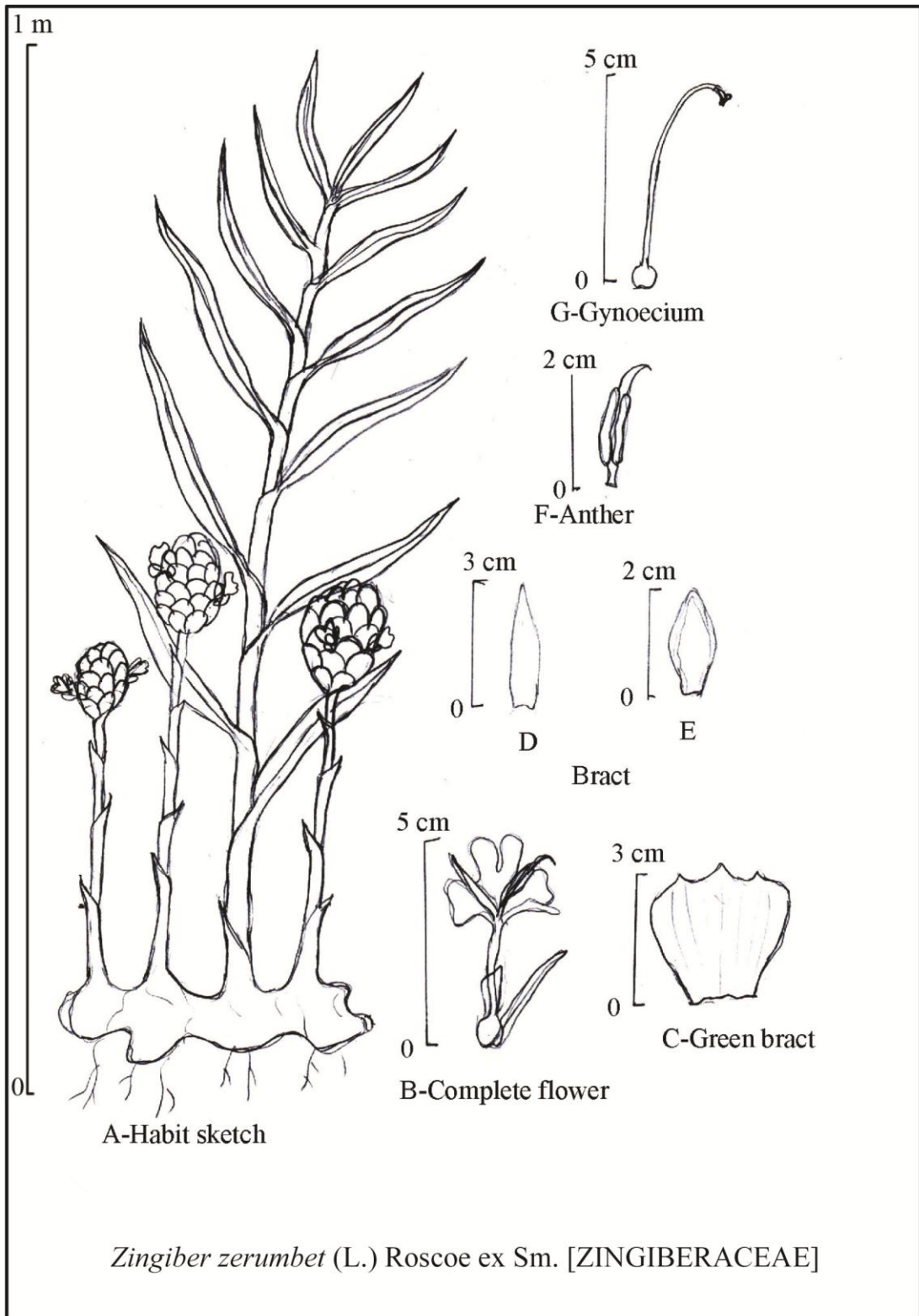
Fls. and Frts.: Oct.-Nov.

Vern.name: Haizeng (Bd), Ada (As. and Rh.)

Udalguri Nalbari; Binu. 156; October 20, 2015.

Zingiber zerumbet (L.) Roscoe ex Sm., Exot. Bot. 2: 105. 1806; *Amonum zerumbet* L., Sp. Pl. 1: 1. 1753; Baker in Hook. f., FBI 6: 247. 1892; Rao and Verma, Bull. Bot.

PLATE - 9



Surv. India 14 (1-4): 137. 1972; Kumar, Zingiberaceae of Sikkim 75. 2001; Chowdhury, Assam's Flora 288. 2005.

Rhizome tuberous, pale yellow inside. Pseudostems up to 1 m high. Leaves sessile or shortly petiolate. Leaf blade lanceolate or oblong to lanceolate, apex acuminate. Inflorescence arising from rhizomes. Peduncle 10-20 cm long. Calyx 1.5 cm. Corolla lobe pale yellow. (**Plate 9**) (Photo File 3. C)

Habitat: Wild but usually cultivated for medicine.

Fls. and Frts.: May-Oct.

Orang, Udalguri; Binu. 126; September 30, 2015.

STRELITZIACEAE Hutch.

Fam. Fl. Pl., Monocot. 2: 72. 1934.

Perennial herb with short a rhizome or with corm like aerial shoots. Leaves alternate, distichous, entire, glabrous, midrib thick. Inflorescence terminal or lateral indeterminate, erect. Flowers bisexual, zygomorphic. Stamens 5, adnate to the perianth tube. Ovary inferior. Carpels 3. Fruit a loculicidal, woody, green capsule.

2 genera, 7 species distributed in Southern Africa, Madagascar and South Africa and 2 genera with 2 species in the study area.

Key to genera

- 1a. All 6 stamens are fertile. ***Ravenala***
- 1b. All 5 stamens are fertile. ***Strelitzia***

Ravenala Adans.

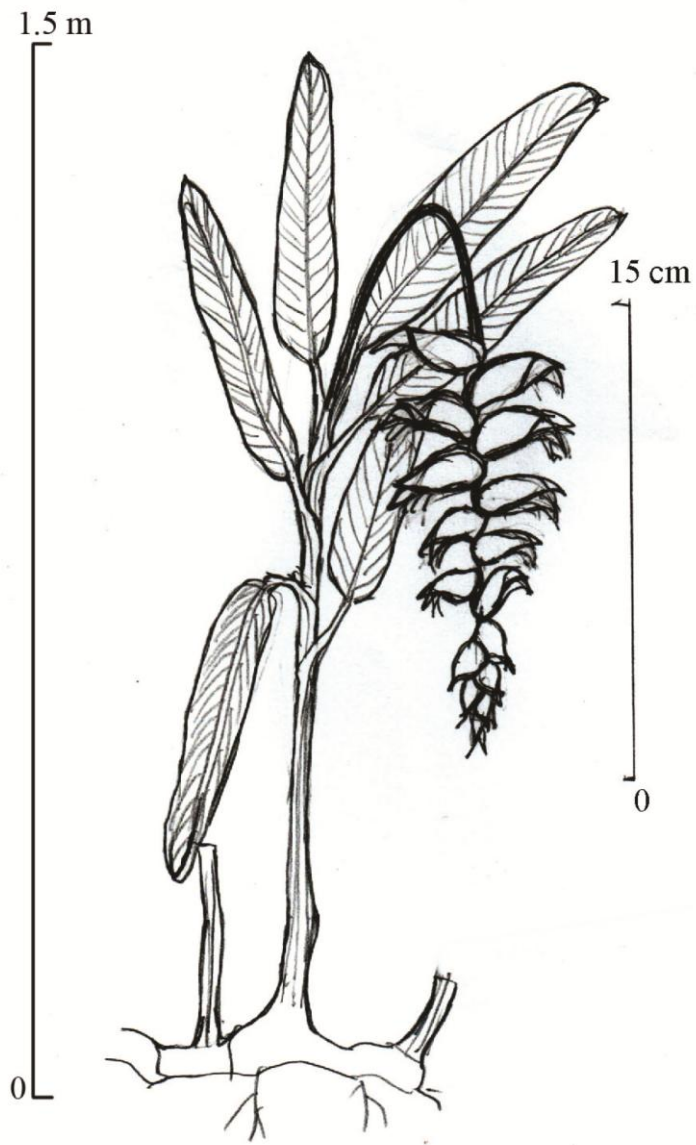
Fam. Fl. Pl. 2: 67. 1763.

A monotypic genus.

Ravenala madagascariensis Sonn., Voy. Indes Orient. 2: 223. 1782; Baker in Hook. f., FBI 6: 198. 1890; Chowdhury, Assam's Flora 288. 2005.

Perennial tree. Unbranched. 5-10 m tall. Leaf banana like distichous, petiolate, pinnately divided. Flowers white, in compact clusters, enclosed in a bract. Capsules woody. (Photo File 4. A)

PLATE – 10



Habit sketch

Strelitzia reginae Banks ex Aiton [STRELITZIACEAE]

Habitat: Found in wet places and also cultivated as an ornamental plant.

Fls. and Frts.: Sep.-Dec.

Vern. name: Dam Kal (As.)

Udalguri town; Binu. 171; April 26, 2016.

Strelitzia Aiton.

Hort. Kew. 1: 285. 1789.

Perennial herb or shrub. Plant forms a clump of long stalked leaves. Stalk 20-45 inches long. Leaves bluish grey, oblong, leathery. Flowers fan out from a boat shaped sheath at the end of the stalk, enclosed in a green, boat shaped bract edged with red. Petals pointed, 3-4 inches long.

5 species in the world and 1 species in the study area.

Strelitzia reginae Banks ex Aiton, Hort. Kew. 1: 285. 1789; Chowdhury, Assam's Flora 288. 2005.

Perennial shrub. 1 m tall. Leaves broad, petiolate, evergreen, glaucous. Flowers emerge from stiff, greenish to reddish purple, beak like spathes. Each flower has 3 large, lanceolate, yellow sepals and 3 smaller blue petals. Stamens 5, anthers linear. Ovary 3-locular. (**Plate 10**) (Photo File 4.B)

Habitat: Found in the damp places of jungle.

Fls. and Frts.: Feb.-Jun.

Vern. name: Malakal (As.)

Udalguri Nalbari; Binu. 172; June 05, 2016.

MUSACEAE Juss.

Gen. Pl. 61. 1789.

Perennial. Tree like herb, trunk formed of persistent leaf sheaths. Leaf blade very large, oblong. Inflorescence an erect or drooping spike. Flowers usually unisexual, irregular, the proximal female and distal male. Bracts sometimes brightly coloured ovate to orbicular. Stamens 5. Ovary inferior. Fruit a fleshy berry.

2 genera and 42 species distributed in Asia; 1 genus and 9 species in the study area.

Musa L.

Sp. Pl. 2: 1043. 1753; Hook. f., FBI 6: 261. 1892.

Perennial herb. Pseudostem tall, sturdy, grow from corn. Leaves petiolate, spirally arranged, up to 2 m long, 50 cm wide. Inflorescence a spike, pendulous or erect. Pistillate flowers at the top of the inflorescence. Hermaphrodite flowers in between, staminate flowers at the base. Fruit a berry.

About 50 species in the world; 8 species in India (Uma *et al*, 2001); 11 species in Assam (Chowdhury, 2005) and 9 species in the study area.

Key to species

1a. Inflorescence erect:

2a. Peduncle light green, hairless... .. *M. ornata*

2b. Peduncle red, covered in short white hairs. *M. velutina*

1b. Inflorescence erect or drooping:

3a. Leaves green tinged with blood red.... .. *M. champa*

3b. Leaves green:

4a. Pseudostem about 13 ft. high.. ... *M. assamica*

4a. Pseudostem about 20 ft. high:

5a. Bracts ovate, dark red... .. *M. paradisiaca*

5b. Bracts ovate, bright purple red.... .. *M. balbisiana*

6a. Leaves green with long stalk:

7a. Fruit whitish, large with many seeded.... *M. sapientum*

7b. Fruit greenish, small with few seeded. ... *M. chinensis*

6b. Leaves green with short stalk. *M. gigantea*

Musa assamica W. Bull, Cat. 1871: 6. 1871; *Musa sanguinea* Hook. f., Bot. Mag. 98; t. 5975. 1872; G. Mann *ex* Baker. FBI 6: 263. 1892; Chowdhury, Assam's Flora 288. 2005.

Perennial herbaceous tree. Pseudostems 13.5 ft. high. Stem green, bearing a crowded tuft of several elliptic lanceolate leaves. Leaves stalked, unequal sided at base, acute at

apex, running out into a slender tendril like point, green with a narrow purple. Inflorescence erect or dropping.

Habitat: Grows in marshland area.

Fls. and Frts.: Sept.-Jan.

Vern. name: Malbhuk (Bd.andRb.)

Udalguri town; Binu. 215; September 10, 2016.

Musa balbisiana Colla, Mem. Reale Accad. Sci. Torino 25: 384. 1820; Chowdhury, Assam's Flora 288. 2005.

Perennial, caespitose, rhizomatous. Pseudostem grow up to 20 ft., sturdy. Leaves oblong, glaucous, green above, poler green underneath, grow in clumps with a more upright habit, mid rib green or yellowish green. Inflorescence a pendulous terminal spike. Bracts ovate. Fruits bluish green heavily seeded. (Photo File 5. B)

Habitat: Found in the forested areas.

Fls. and Frts.: Nov.-Jan.

Vern. name: Athia Thalir (Bd.)

Udalguri Nalbari; Binu. 212; June 20, 2016.

Musa champa Baker, Fl. Brit. India 6: 262. 1892.

Vern. name: Senichampa (Bd., Rh. and As.)

Udalguri town; Binu. 216; September 10, 2016.

Musa chinensis Sweet., Hort. Brit. 2: 596. 1830.

Perennial. Evergreen. The trunk or pseudostem is slender with tightly packed layers of leaf sheaths emerging from compactly or partially buried corms. The inflorescence grows horizontally or obliquely from the trunk. Fruit seeded.

Habitat: Grows in marshland area.

Vern. name: Jahaji (Bd., As. and Rh.)

Udalguri town; Binu. 217; September 15, 2016.

Musa gigantea Kuntze, Revis. Gen. Pl. 2: 691. 1891.

Vern. name: Bhimkol (Bd., As. and Rh.)

Udalguri town; Binu. 218; September 15, 2016.

Musa ornata Roxb., Fl. Ind. 2: 488. 1824; Hort. *Bengalensis*, 19. 1814; Fl. Ind. 1: 666. (1820-1824); Chowdhury, Assam's Flora 288. 2005.

Perennial. Pseudostems slender. 1-3 m high. Leaf blades narrow, oblong, upto 2 m long, 30 cm wide. Truncate at apex, unequal sided at base, medium green on both sides. Inflorescence quite erect. Peduncle 2-3 cm, glabrous. Basal flowers female, upper flowers male. Bracts pale pink. Fruit bunch compact. Seeds black.

Habitat: Grows in the expose area.

Fls. and Frts.: Sept.-Jan.

Udalguri town; Binu. 228; September 15, 2016.

Musa paradisiaca var. *Sapientum* (L.) Kuntze, Revis. Gen. Pl. 2: 692. 1891; *M. cliffortiana* L., Sp. Pl. 1043. 1753 *M. sapientum* L. var. *paradisiaca* Baker in Ann. Bot. 7: 213. 1893; Hook. f., FBI 6: 262. 1892; Chowdhury, Assam's Flora 288. 2005.

Perennial. Tree like herb, up to 9 m high. Leaf sheaths tubular, forming a thick trunk. Leaf blade oblong, usually ragged in appearance, splitting between the transverse parallel veins. Inflorescence a pendulous spike. Peduncle thick. Bracts ovate, concave, dark red, fleshy. Stamens 5. Fruit oblong. (**Plate 11**)

Habitat: Found in the forest areas.

Vern. name: Kash Kol. (As.)

Fls. and Frts.: May-Aug.

Udalguri Nalbari; Binu. 219; November 20, 2016.

Musa sapientum L. Syst. Nat. ed. 102: 1303. 1759.

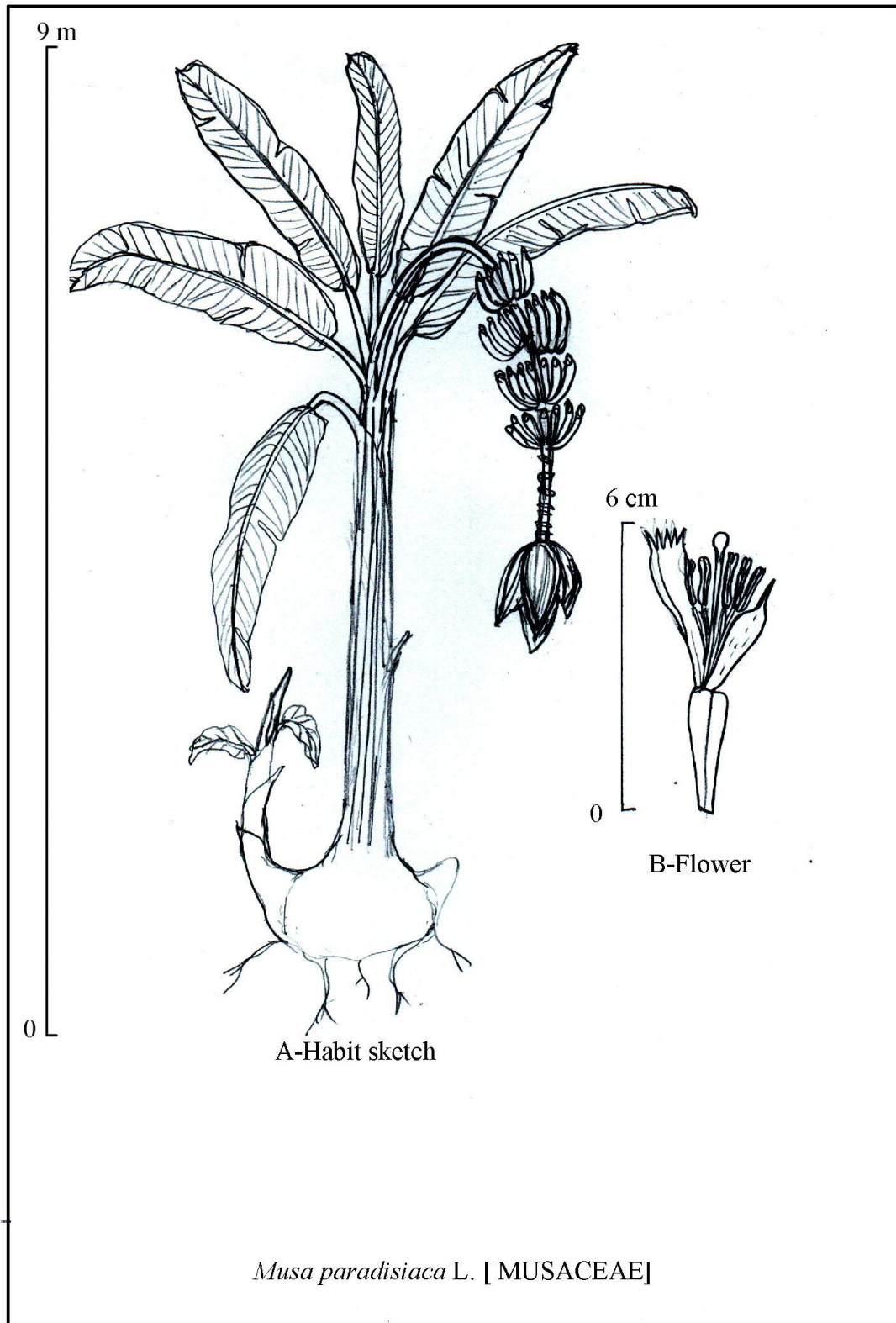
Vern. name: Monohor Kol (As. and Rh.)

Udalguri Nalbari; Binu. 220; October 11, 2016.

Musa velutina H. Wendl. & Drude, Gartenflora 24: 65. 1875; Hook. f., FBI 6: 263. 1892; Chowdhury, Assam's Flora 288. 2005.

Pseudostem 1.5 m high. Leaves pedicellate, deep green, midrib red on the under side. Inflorescence completely erect. Basal flowers hermaphrodite and upper flowers male.

PLATE - 11



Peduncle red, covered in short white hairs. Bracts pink. Fruits bright pink. Seeds many, black. (Photo File 5. A)

Habitat: Found in water logging areas of the forest areas.

Fls. and Frts.: Apr.-Nov.

Serfang, Udalguri; Binu.115; April 15, 2015.

COSTACEAE Nakai.

J. Jap. Bot. 17: 203. 1941.

Perennial herb. Terrestrial, rhizomatous. Stems simple, long, terete, spirally contorted, leafy. Leaves spirally arranged. Ligule present. Petiole short. Inflorescence a cone like spike, terminal on leafy shoots or on separate leafless shoots arising from rhizomes. Flowers bisexual. Sepals and petals tubular. Fertile stamen 1. Staminodes 5. Style 1. Ovary inferior. Fruit a capsule.

7 genera 137 species, pantropical with centre of diversity in America and only 1 genus, 1 species in the study area.

***Costus* L.**

Sp. Pl. 1: 2, 1753; Hook. f., FBI 6: 249, 1890.

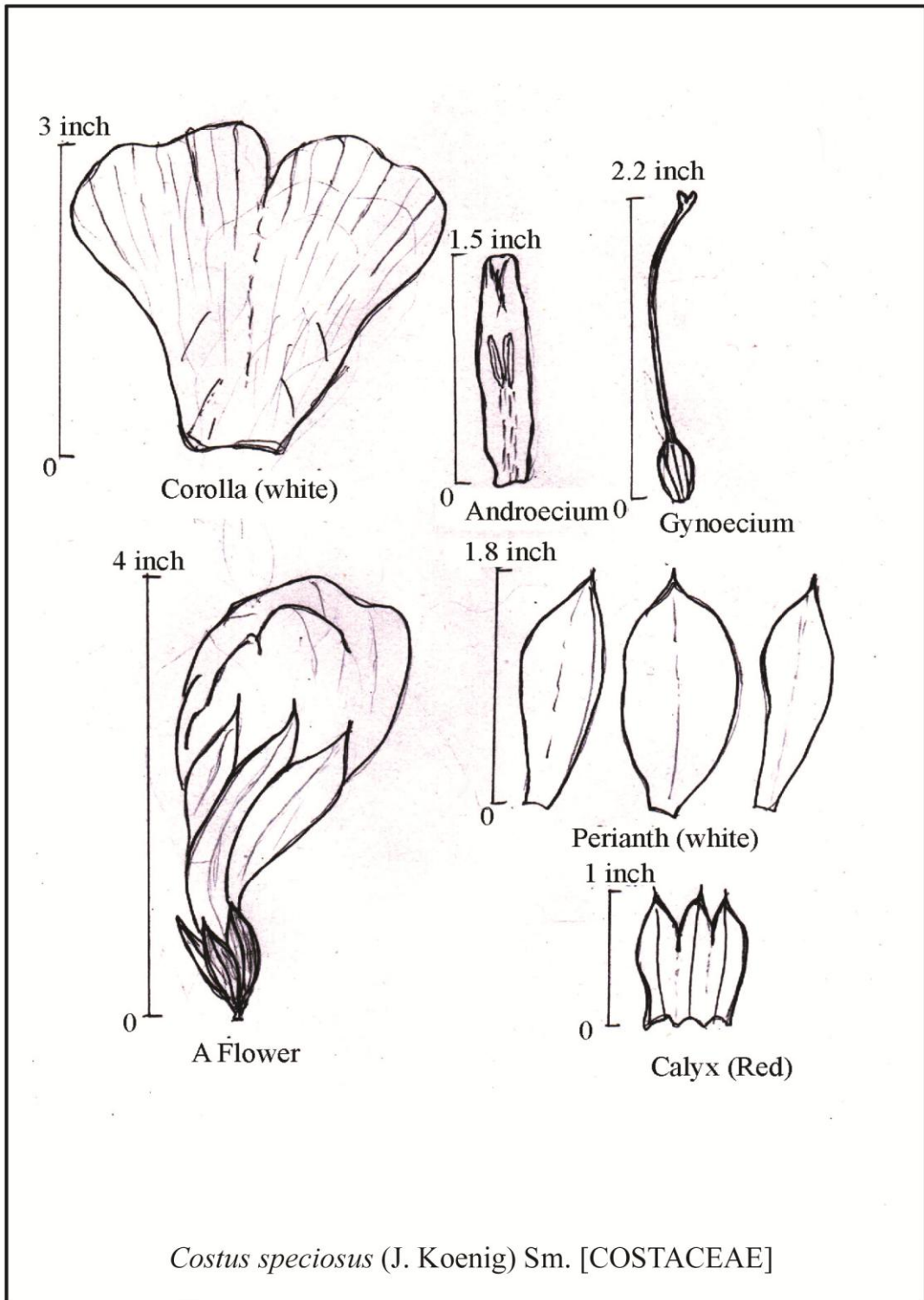
Perennial herb. Stem fleshy. Rhizome horizontal, cylindrical. Leaves spirally arranged on a true aerial stem, sessile, oblong, glabrous. Inflorescence usually condensed into sub-spherical cone like spikes either terminal or arising from rhizome petals 3. Labellum petaloid. Fruit a berry, crowned by persistent calyx.

3 species in India (Hook. f., 1892); 1 in Assam (Rao and Verma, 1972) and 1 species in the study area.

Costus speciosus (J. Koenig) Sm., Trans. Linn. Soc. London 1: 249. 1791; Baker in Hook. f., FBI 6: 249. 1892; Chowdhury, Assam's Flora 288. 2005.

Perennial herbs. Rhizomatous, usually unbranched, stem prostrate, twisted. Leaves simple, alternate, sub-sessile, margin entire. Flowers pale pink, in terminal elongated spike. Bracts petaloid, dark red. Calyx petaloid, tubular, 3-lobed. Stamens 3, 1 fertile, staminodes 2. Style filiform. Fruit capsule, globose. (**Plate 12**) (Photo File 6. A)

PLATE – 12



Habitat: Found in wet places in forest edges and also cultivated as a garden plant.

Fls. and Frts.: May-Sept.

Vern. name: Jom Lakhuti (As.), Daola Khungur (Bd.)

Nalbari Udalguri; Binu. 112; September 30, 2015.

CANNACEAE Juss.

Gen. Pl. 62: 1789

Perennial herb. Stems erect, robust. Rhizomes tuberous. Leaves alternate, spirally arranged. Inflorescence a terminal raceme or panicle. Flowers, bisexual, asymmetric. Sepals 3, green, free, persistent. Corolla 3, coloured. Staminodes and stamen in 2 whorls. Staminodes petaloid. Fertile stamen 1. Ovary inferior. Style petaloid. Fruit a capsule. Seeds many.

A monogeneric family with 55 species world wide, chiefly cultivated in various countries; 1 genus and 4 species in the study area.

Canna L.

Sp. Pl. 1: 1. 1753; Baker in Hook. f., FBI 6: 260. 1892.

Root stock rhizomatous. Leaves alternate, flat. Inflorescence a raceme or a panicle. Sepals 3. Petal 3. Flowers typically red, orange or yellow or any combination of these colours. Stamen modified to staminodes.

Key to species

1a. Showy parts of flower red, remaining erect; tube short:

2a. Flowers small, upto 7 cm. across. *C. indica*

2b. Flowers large, 10-15 cm. across. *C. chinensis*

1b. Showy parts of flower yellow, becoming reflexed:

tube long and prominent:

3a. Corolla tube more than 1 cm long; staminodes

bright yellow... .. *C. flaccida*

3b. Corolla tube less than 1 cm. long; staminodes

variegated with red and yellow. *C. speciosa*

Canna chinensis Willd., Ges. Naturf. Freunde Berlin Mag 2: 170. 1808; Hara *et al* EFPN 1: 62. 1978. *C. nepalensis* Wall. *ex* Bouche in Linnaea 8: 158. 1833. *C. indica* var. *nepalensis* (Bouche) Baker in FBI 6: 261. 1892.

Perennial, erect herb. Rhizomatous. Stems 1-2 m high, reddish. Laminae oblong to lanceolate, entire, acuminate, glabrous, lateral nerves pinnate. Racemes large, many flowered, loose. Bracts very small. Flowers much showy, deep red 10-15 cm across. Sepals 2 cm long. Corolla tube short. Petals 3-4 cm., outer staminal segments 3, bright red. Ovary 1 cm, warted capsules 2-3 cm in diameter.

Habitat: Found in wet and marshy places of the scrub jungles.

Fls. and Frts.: Apr.-Sept.

Vern. name: Khathri phul (Bd.), Parijat (Rh.).

Kahibari, Udalguri; Binu. 221; July 07, 2016.

Canna flaccida Salisb., Icon. Stirp. Rar. 3: 1791; Kanazlin in Pflanzenr. 1V. 47 (Heft 56): 49. 1912. *C. indica* var. *flava* Baker in Hook. f.; FBI. 6: 261. 1892. *Euryspytlyus flaccidus* Bouche in Linnaea 18: 485. 1844.

Perennial herb. Rhizomatous. Stems erect, 1-2 m high, with a white powdery coating over the young parts, cylindrical. Leaves large, oblong to lanceolate, entire, acuminate. Racemes narrow, multi flowered. Flowers showy, yellow. Bracts greenish. Sepals 3, greenish. Corolla tube 1.5 cm long, yellow. Stamines 6, yellow with a few red spots, entire, acute, petaloid. Ovary green, ovoid.

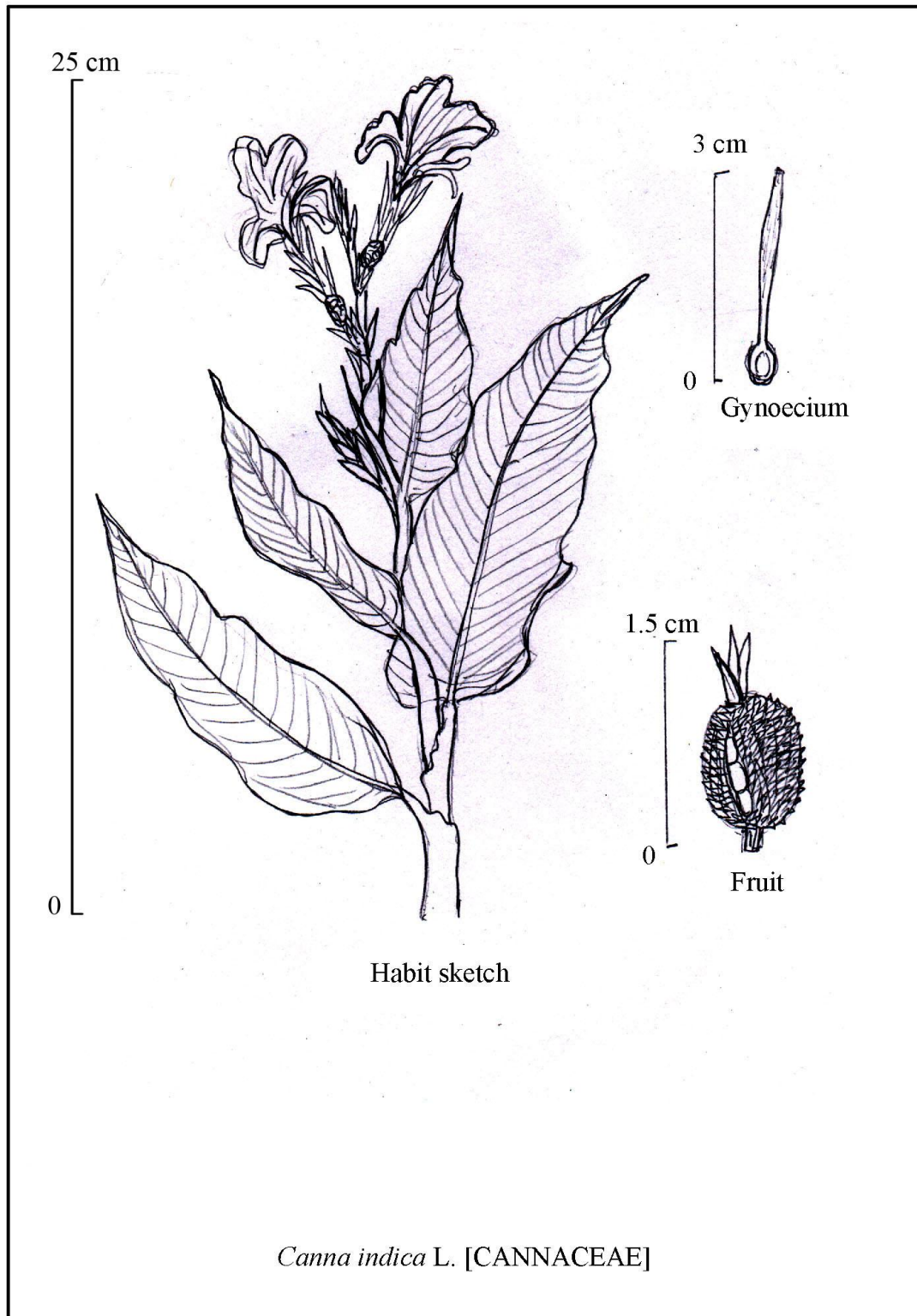
Habitat: Cultivated as ornamental plant, rarely found growing wild in wet place.

Fls. and Frts.: Mar.-Aug. Kahibari, Udalguri; Binu. 109; July 07, 2015.

Canna indica L., Sp. Pl. I. 1753; Deb, FTS. 2: 381. 1983. *Canna indica* var. *orientalis* Baker in Hook. f.; FBI. 6: 260. 1892.

Perennial herb. Rhizomatous. Stems erect, 80-130 cm. long, slender, reddish, glabrous, cylindrical. Leaves large, oblong to lanceolate to elliptic, 20-45 × 6-10 cm, apex acute, base cuneate, glabrous, pale green, entire. Inflorescence lax, few flowered.

PLATE – 13



Flowers in axillary racemes, red, sessile, narrow, 10 cm long, 7 cm across. Bracts orbicular, ovate, green. Sepals small, narrow, linear, acute. Petals 3, red. Fruits capsules, globose. Seeds black, glabrous. (**Plate 13**) (Photo File 7. A)

Habitat: Grows in wet places.

Fls. and Frts.: Feb.-Aug.

Udalguri Nalbari; Binu. 185; September 10, 2016.

Canna speciosa Hegetschw, Scitaminum 5. 1813; Hara *et al*, EFPN 1: 62. 1978; *C. indica* var. *speciosa* (Sims) Baker in FBI. 6: 261. 1892.

Perennial erect herb. Rhizomatous. Leave lamina oblong to lanceolate, entire, acuminate, glabrous. Inflorescence racemes simple, few flowered. Bracts 1.3 cm long. Flowers showy, variegated with yellow and red, 8-10 cm across. Sepals 3, greenish, 1.5 cm long, ovate with scarious margin. Petals 3, yellow, 5-5.5 cm long. Corolla tube 1 cm long, narrow. Outer staminal segments 2, bright red with a channelled yellow claw, lip large, variegated with red and yellow; ½ anther yellowish. Ovary warted, globose. Fruits capsules, globose, echinate. Seeds many.

Habitat: Grows in wet places.

Fls. and Frts.: Apr.-Sept.

Udalguri Nalbari; Binu. 222; July 07, 2016.

MARANTACEAE. Brown

Voy. Terra Austral. 2: 575. 1814.

Perennial herb. Rhizomatous. Stalks slender, reed like, branch or unbranched. Leaves in a basal cluster. Inflorescence terminal or axillary, borne on leafy shoots or leafless shoots from rhizomes. Flowers bisexual, asymmetric. Sepals 3, free. Stamines and stamen in 2 whorls. Ovary inferior. Style cylindrical. Fruit a capsule, loculicidal.

About 31 genera and 539 species growing in tropical and sub-tropical regions; 1 genus and 3 species in the study area.

***Maranta* L.**

Sp. Pl. 1: 2. 1753; Gen. Pl. 5: 2. 1754.

Perennial herb. Erect or prostrate, sometimes much branched, occasionally with tuberous swollen rhizomes. Leaves both basal or cauline or all cauline. Petiole sheathing at base. Inflorescence a dichotomous panicle or raceme. Sepals green. Corolla white. Staminodes white, occasionally tinged with purple, outer staminode 2, petaloid. Callose staminode obovate, apex petaloid. Fruit a capsule.

32 species in the world; 11 species in India; 3 species in Assam (Chowdhury, 2005); and 3 species in the study area.

Key to species

1a. Flowers white:

2a. Leaves variegated with white and green. *M. arudinacea*

2b. Leaves variegated with light green and dark green. *M. cristata*

1b. Flowers white with purple spots. *M. leuconeura*

Maranta arundinacea L., Sp. Pl. 1: 2. 1753; Chowdhury, Assam's Flora 289. 2005.

Perennial herb. 50 cm to 1 m tall. Rhizomes cylindrical, fleshy. Stems erect, apically branched, slender. Leaves petiolate. Leaf blade ovate long, variegated with white and green, apex acuminate. Basal leaves largest. Inflorescence several, leafy shoot. Each bract subtends 2 or 3 flower pairs. Sepals green. Corolla white. Staminodes white. Fruit a capsule, green. (**Plate 14**) (Photo File 8. A)

Habitat: Grows along the road side.

Fls. and Frts.: Jun.-Oct.

Vern. name: Tora Alu (As.)

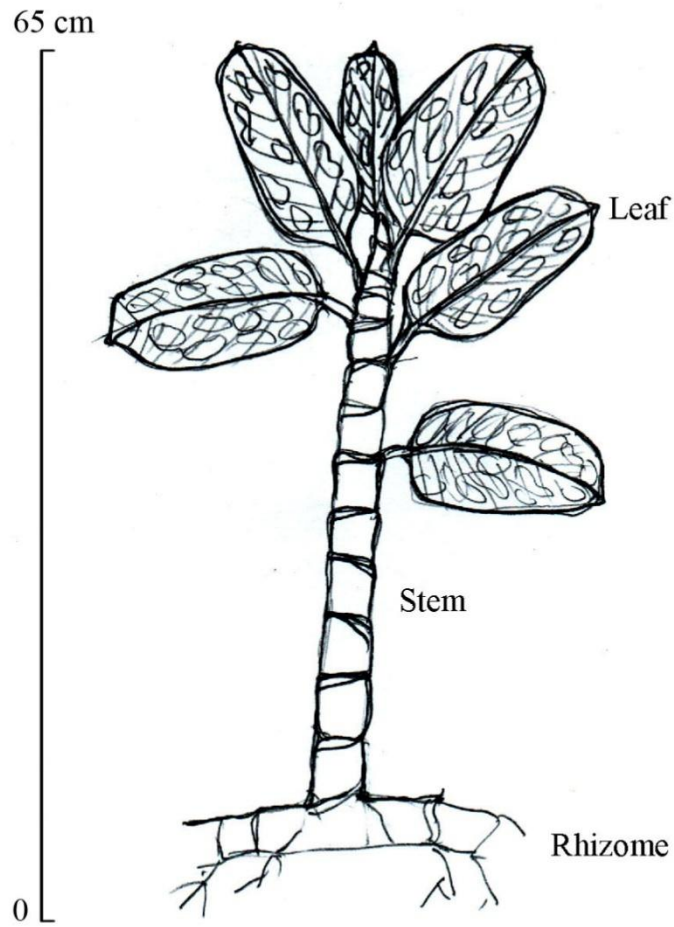
Hajong basti, Kajiamati, Udalguri; Binu. 213; October 11, 2016.

Maranta cristata Nees and Mart., Nova Acta Phys.-Med. Acad. Caes. Leop.-Crol. Nat. Cur. 11 (1): 25. 1823.

Perennial herb. Clump forming. Leaves oval, variegated with light green and dark. Flowers white, bisexual.

Habitat: Grows in marshy area.

PLATE – 14



Habit sketch

Maranta arundinacea L. [MARANTACEAE]

Fls. and Frts.: Jun-Oct.

Hazongbasti, Kajiamati, Udalguri; Binu. 225; October 11, 2016.

Maranta leuconeura E. Morren, Belgique Hort. 1874: 323-324. 1874; Chowdhury, Assam's Flora 289. 2005.

Perennial herb. Rhizomes sympodial, fleshy. Leaf blade ovate. Inflorescence several.

Habitat: Found in marshy areas.

Fls. and Frts.: Jun.-Oct.

Udalguri Nalbari; Binu. 214; October 11, 2016.

BROMELIACEAE Juss.

Gen. Pl. 49-50. 1789.

Perennial herb. Terrestrial or epiphytic. Stems very short to very elongate. Leaves spirally arranged forming water impounding rosette, margins serrate or entire. Inflorescence terminal or lateral. Bracts present. Flowers bisexual or functionally unisexual. Perianth 6. Stamens 6. Fruit capsules or berries.

50 genera, 3160 species widely distributed in the Neotropics; 1 genus and 1 species in the study area.

Ananas Mill.

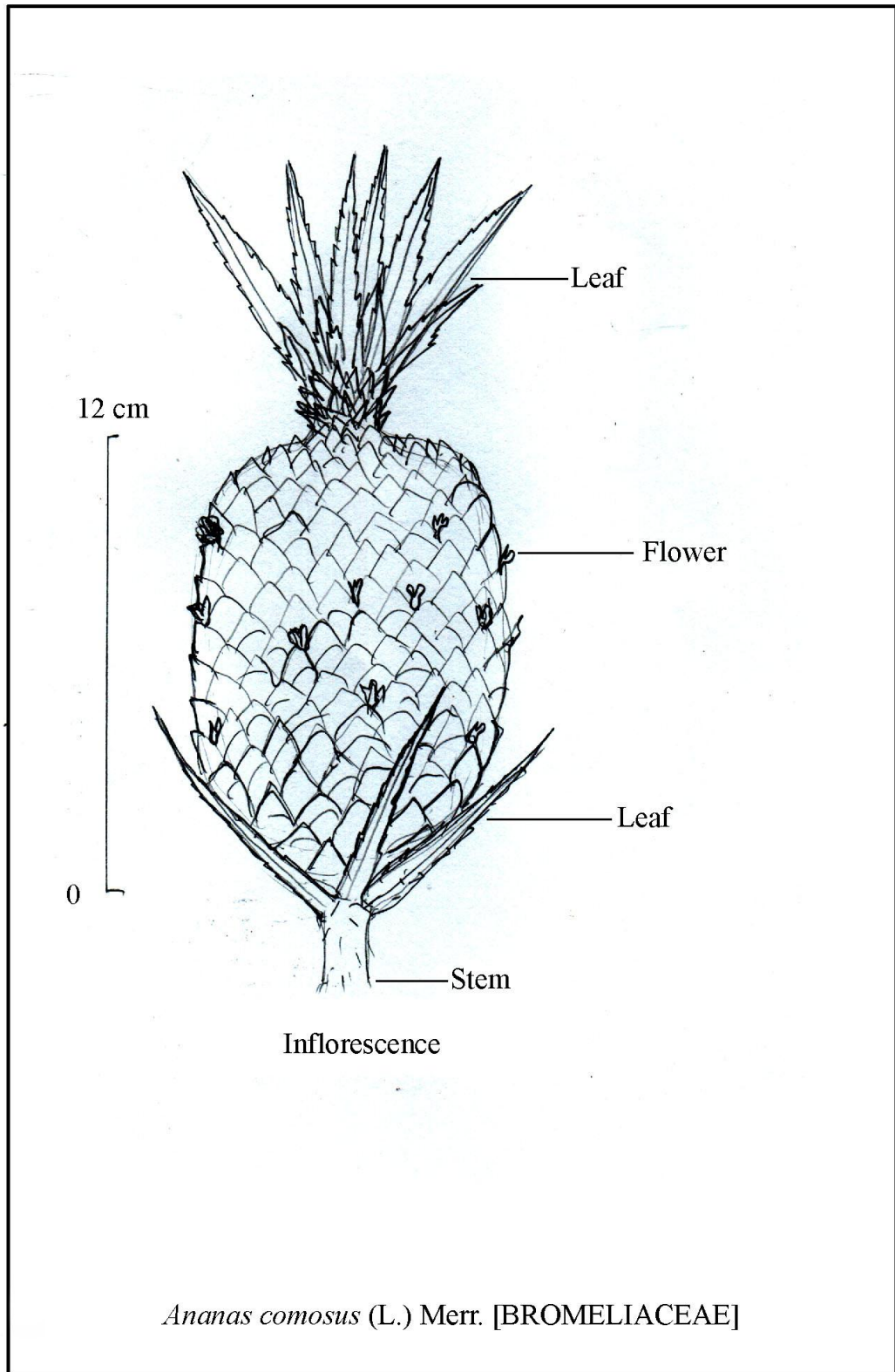
Gard. Dict. Abr. (ed. 4) no. 1754.

Perennial. Herbaceous. grow 50-70 cm tall. Stem short. Leaves long, lanceolate, sword shaped, with a serrate or thorny margin, grow in large rosettes, arising basally from a crown. Flowers trimerous, each subtended by a bract. Fruit large, fleshy.

Ananas comosus (L.) Merr., Interpr. Herb. Amboin. 133. 1917; *Bromelia comosa* L., Herb. Amb. 21. 1754; Chowdhury, Assam's Flora 289. 2005.

Perennial herb, erect. Stem short bearing a rosette of leaves. Leaves 50-80 cm long, with prickly margins and spiny tips. Inflorescences many floret, bracts inconspicuous. Flowers numerous. Sepals and petals free. Fruit globose, ovoid, become fleshy and fragrant at maturity. (**Plate 15**) (Photo File 9. A)

PLATE – 15



Ananas comosus (L.) Merr. [BROMELIACEAE]

Habitat: Cultivated for edible fruit in the high sloping land areas.

Fls. and Frts.: Mar.-Jul.

Vern. name: Raimali (Bd.), Anaros (As.)

Udalguri Nalbari; Binu.168; March 15, 2016.

IRIDACEAE Juss.

Gen. Pl. 57. 1789.

Perennial herb. Root stocks with rhizome, bulb or corm. Flowering stems simple or branched, terete. Leaves basal and distichous. Inflorescence umbellate, spikes or solitary flowers. Flowers pedicellate, actinomorphic or zygomorphic. Stamens 2 or 3. Style 1. Fruit a capsule.

65 genera, 1810 species distributed world wide; 2 genera and 2 species in study area.

Key to genera

1a. With stem and branched; flowers light orange to reddish. ***Belamcanda***

1b. Without stem; flowers white. ***Eleutherine***

***Belamcanda* Adans.**

Fam. Pl. 2: 60, 524. 1763; Hook. f., FBI. 6: 276. 1892.

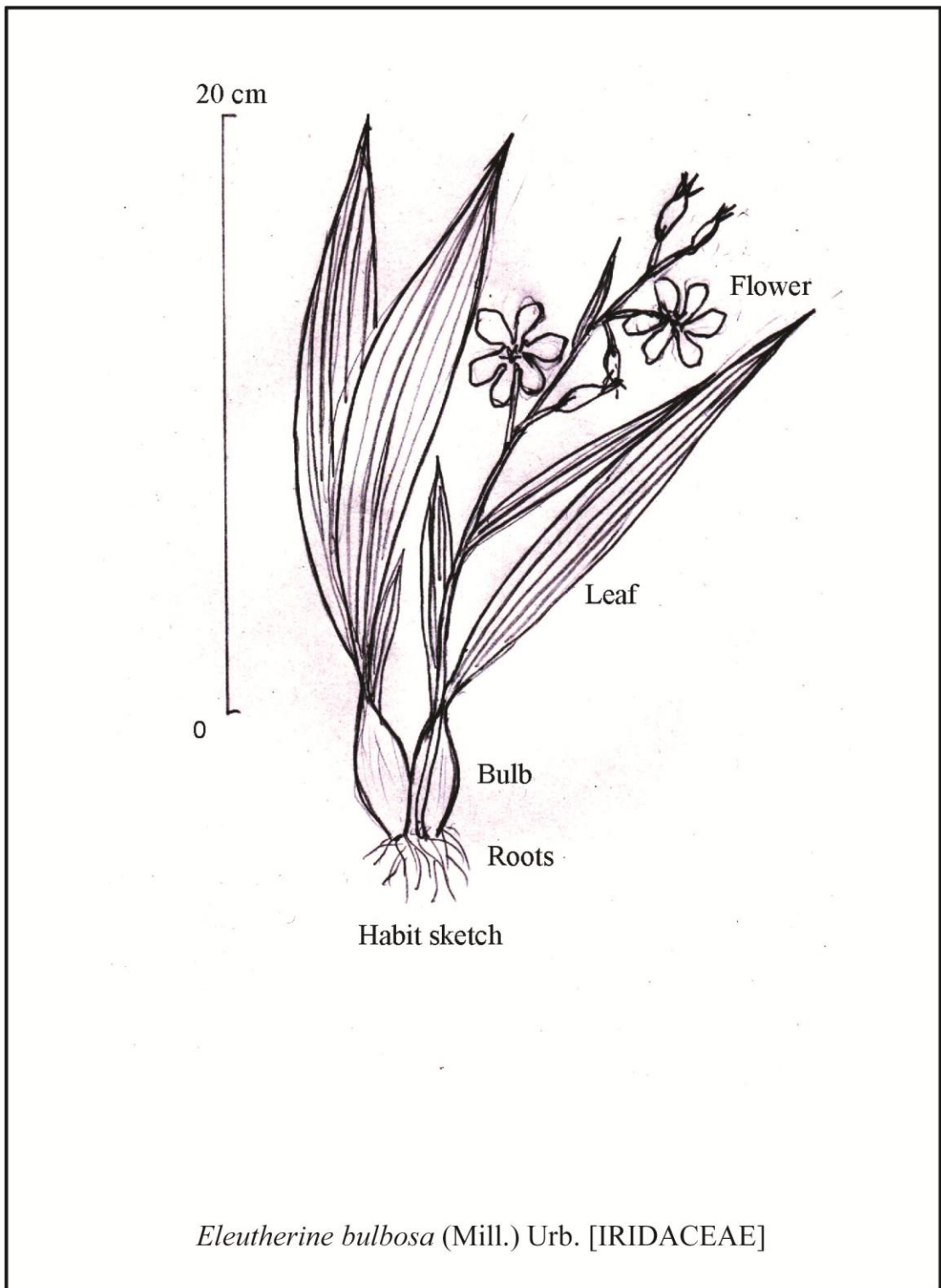
Perennial herb. Rhizomatous. Stems well developed, erect. Leaves cauline, 2 ranked, sword shaped. Inflorescence a dichotomously branched panicle. Flowers fleeting, unscented, actinomorphic. Tepals light orange to reddish with scattered spots of darker pigment. Stamens 3, diverging. Style slender. Capsule ovoid.

2 species in the world; 1 species in India (Hook. f., 1892); 1 species in Assam (Chowdhury, 2005) and 1 species in the study area.

Belamcanda chinensis (L.) DC., Liliac. 3: t. 121. 1805; *Iris domestica* (L.) Goldblatt & Mabb., Novon 15: 129. 2005; *Ixiachinensis* L., Sp. Pl. 1: 36. 1753; Hook. f., FBI. 6: 277. 1892; Chowdhury, Assam's Flora 289. 2005.

Perennial herb. Rhizomatous. Stems branched, upto 1.5 m high. Leaf blade narrowly lanceolate. Inflorescence cymose, several flowered, bracteates. Flowers light orange to

PLATE – 16



reddish with large irregularly scattered spots of darker pigment. Stamens 3. Styles 3-angled. Seeds black. (Photo File 10. A)

Habitat: Cultivated as ornamental in wet places for medicinal use.

Fls. and Frts.: Aug.-Nov.

Vern. name: Surjyakranti (As., Rh. and Bd.)

Orang, Udalguri; Binu. 114; August 08, 2015.

Eleutherine Herb. 1843

Perennial. Herbaceous. Bulbous plant. First described as a genus in 1843. It is native to Latin America and the West Indies. Leaves grass like, with a sharp central fold.

**Eleutherine balbosa* (Mill.) Urb., Repert. Spec. Nov. Regni Veg. 15: 305. 1918.

Perennial herb. Bulbs covered reddish dry scales. Leaves 20-60 cm long, 3 cm broad, cauline, pointed at the apex. Inflorescence dichotomous. Flowers white, actinomorphic, pedicilate. Petals 3×3, white. Carpels 3. Fruit a capsule. (**Plate 16**) (Photo File 10. B)

Habitat: Grows in the jungles and cultivated for medicine.

Fls. and Frts.: Apr.-Jun.

Vern. name: Sambram Gwja (Bd.)

Goraimari, Botabari, Udalguri; Binu.182; April 20, 2016.

AMARYLLIDACEAE J. St.-Hil.

Expos. Fam. Nat. 1: 134. 1805

Perennial herb with tunicated bulbs. Leaves radical, more or less linear with parallel nerves apex acuminate, base narrowed, glabrous, smooth, entire. Flowers pedicelled umbels, white, purplish, showy few, solitary, bisexual, actinomorphic. Bracts tubular and sheathing. Perianth 6 lobed, long to short stipes. Stamens 6. Carpels 3. Ovary inferior. Fruita berry or capsule.

About 90 genera and 1200 species in temperate regions, rarely in the tropics; I genera and 2 species in the study area.

Crinum L.

Sp. Pl. 1: 291-292. 1753; Hook. f., FBI 6: 280. 1892.

Perennial herb with large tunicated bulbs. Pseudo stems sheathing with old leaves. Leaves long, basal and sheathing at the base. Inflorescence umbellate. Perianth tube long. Stamens curved, ascending or angled downwards. Fruits sub-globose.

About 180 species in warm temperate and tropical parts of both eastern and western hemispheres especially on sea coasts; 12 species in India (Hook. f., 1892); 4 species in Assam (Chowdhury, 2005); and 2 species in the study area.

Key to species

1a. Perianth lobes linear; seeds small round. *C. asiaticum*

1b. Perianth lobes lanceolate; seeds large not round. *C. defixum*

Crinum asiaticum L., Sp. Pl. 1: 292. 1753; *Crinum toxicarium* Roxb., Fl. Ind. 2: 134. 1832; Hook. f., FBI 6: 280. 1892; Chowdhury, Assam's Flora 289. 2005.

Perennial herb. Bulbous fleshy, white with fibrous roots. Leaves strap like with 1m long and 10 cm wide, emerge from huge bulbs, tapering to apex. Flowers white, hermaphrodite. Stamens long, filamentous purple. Anthers yellow. Fruit a capsule, green. Seeds small, round. (**Plate 17**) (Photo File 11. A)

Habitat: Found in the jungles.

Fls. and Frts.: Apr.-Aug.

Vern. name: Bon-Nohoru (As., Rh.), Hagrani Sambram (Bd.)

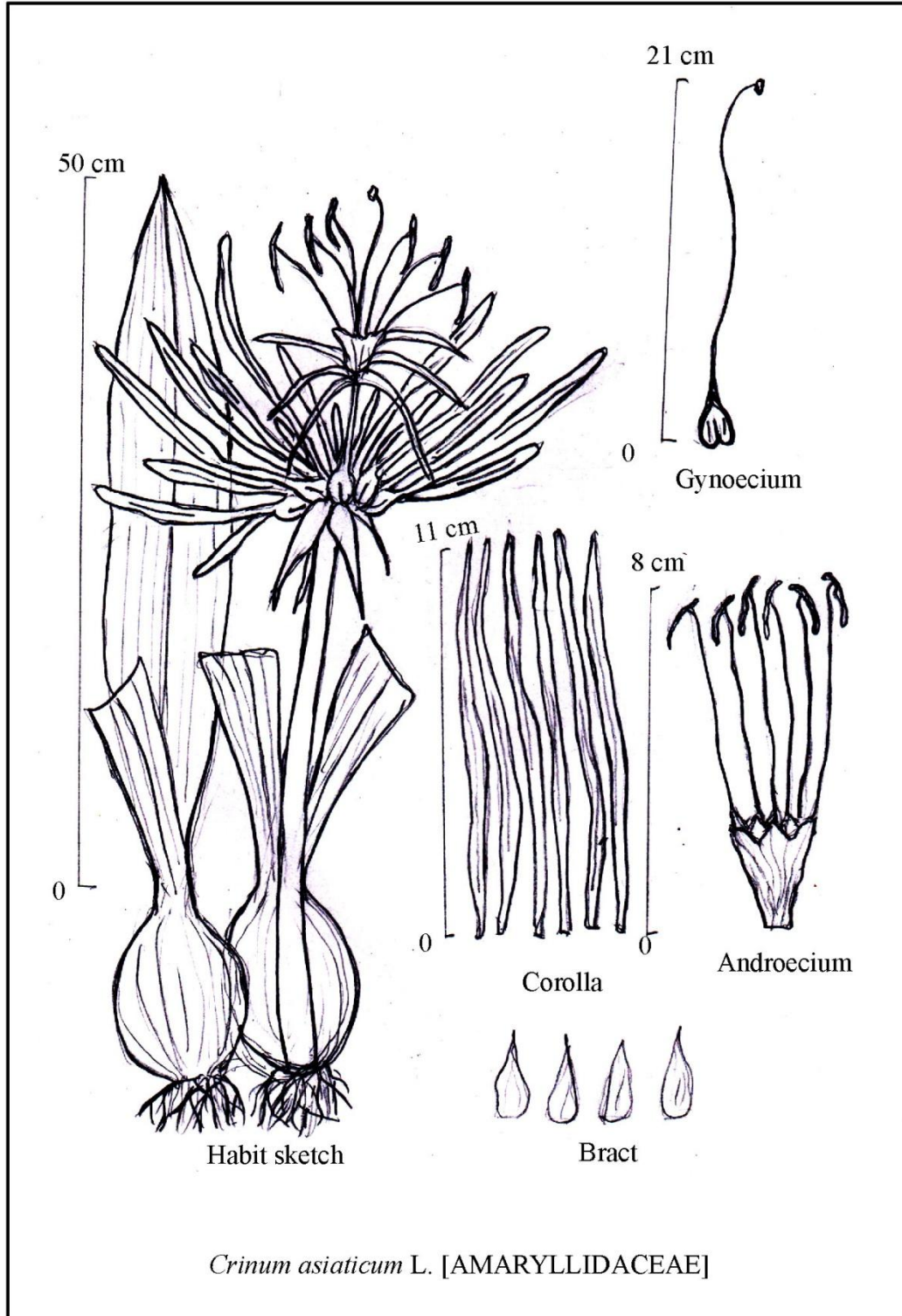
Kajiamati, Udalguri; Binu. 108; June 07, 2015.

Crinum defixum Ker-Gawl., Quart. J. Sci. Art. 3: 105. 1817; Hook. f., FBI 6: 28.1892.

Perennial herb. Erect with tunicate bulbs. Stems cylindrical, spongy. Leaves radical, simple, cauline with 50-100 cm long and 10-12 cm wide. Inflorescence umbels multi-flowered. Flowers white. Perianth lobes 6 white. Stamens 6. Carpels 3. Seeds large, round. (Photo File 11. B)

Habitat: Generally wild and grows in marshy places.

PLATE - 17



Fls. and Frts.: Apr.-Aug.

Vern. name: Khanari (Bd.)

Udalguri Nalbari; Binu.29; July 07, 2014.

AGAVACEAE Dumort.

Anal. Fam. Pl. 57, 58. 1829

Perennial, with thick trunks, or stemless and leaves in a basal rosette. Leaves arranged spirally, sheathing at base, the apex sometimes spine. Inflorescence raceme or panicle. Flowers bisexual, regular. Perianth 6 and united below in a tube. Stamens 6. Ovary superior or inferior. Fruit a capsule or berry.

18 genera found primarily in arid, semi-tropical, sub-tropical and tropical regions. 3 genera and 3 species in the study area.

Key to genera

1a. Ovary inferior:

2a. Flowers actinomorphic.*Agave*

2b. Flowers zygomorphic.*Polianthes*

1b. Ovary superior.*Sansevieria*

***Agave* L.**

Sp. Pl. 1: 323 - 324. 1753; Karthikeyan *et al*, Fl. Ind. 4: 1. 1989.

Perennial plant, rosette forming. Short trunk. Leaves in a spiral rosette, glabrous, margin spinous, apex pointed. Inflorescence raceme or panicle. Flowers bisexual, regular. Perianth 6, Stamens 6. Ovary inferior. Fruit a loculicidal capsule.

200 species found in warmer regions; 8 species in India (Karthikeyan *et al*, 1989); 3 species in Assam (Chowdhury, 2005) and 1 species in the study area.

***Agave Americana* L.**, Sp. Pl. 1: 323. 1753; Hook. f., FBI 6: 277. 1892; Karthikeyan *et al*, Fl. Ind. 4: 1. 1989; Chowdhury, Assam's Flora. 290. 2005.

Perennial. Plant with sucker. Stem absent. Leaves in a basal rosette, lanceolate, fleshy, curved or reflexed, with spiny margin, tip pointed. Inflorescence paniculate. Flowers pale yellow. Stamens 6. Stigmas 6. Fruit a large oblong capsule.

Habitat: Grows in dry areas.

Fls. and Frts.: Aug.-Nov.

Vern. name: Degar bifang (Bd.)

Udalguri town; Binu. 204; October 02, 2016.

Polianthes L.

Sp. Pl. 1: 316. 1753.

Perennial herb. Rhizome bulbous. Leaves in a rosette, succulent, grass like, entire. Inflorescence raceme or spike with bracteates scape. Flowers bisexual perianth 6, united below in a long funnellform tube. Stamens 6. Ovary inferior. Fruit a capsule. Seeds numerous.

17 species world wide; 1 species in Assam (Chowdhury, 2005) and 1 species in the study area.

Polianthes tuberosa L., Sp. Pl. 1: 316. 1753; Randhowa and Mukhopadhyay. Floriculture in India 623. 1986; Chowdhury, Assam's Flora 290. 2005.

Perennial herb. Plant arising from thick, erect rhizome. Leaves progressively smaller from base of rosette upwards to stem leaves, linear to lanceolate, acuminate. Inflorescence a raceme. Flowers in 1-bracteates pairs, fragrant.

Habitat: Grows in marshy land places.

Fls. and Frts.: Jun.-Oct.

Vern. name: Rajanigandha (Bd. and Rh.)

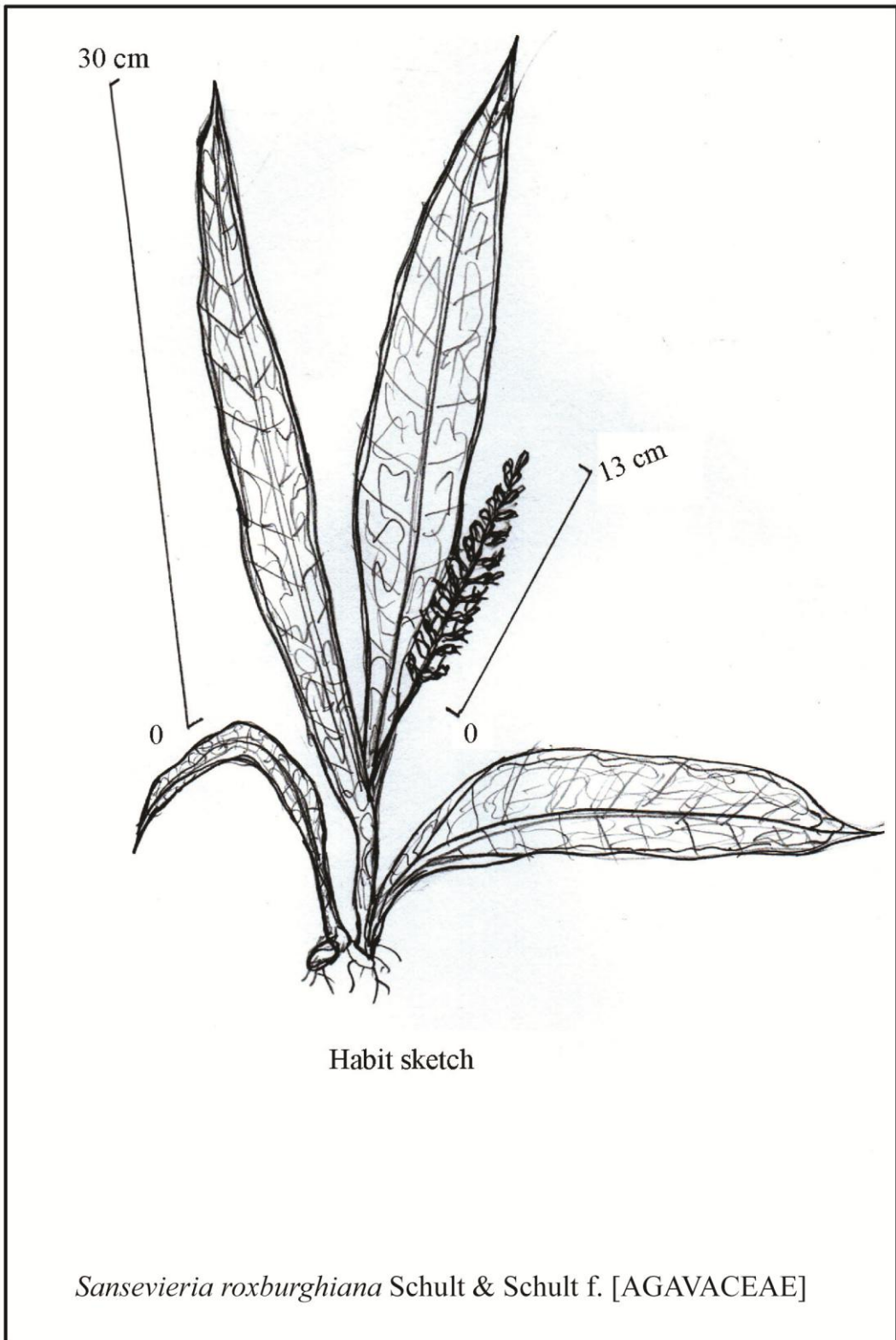
Udalguri town; Binu. 205; October 20, 2016.

Sansevieria Thunb.

Prodr. Pl. Cap. I: (XII), 65. 1794; Hook. f., FBI 6: 270, 1892.

Perennial herb with thick rhizome. Leaves in a basal rosette or in a distichous fan at top short stem, erect, succulent, sessile or narrowed in a short petiole, flat, semi-cylindrical or cylindrical. Inflorescence a many flowered spike, raceme or panicle. Flowers bisexual, regular. Perianth segments 6, Stamens 6. Ovary superior. Fruit 1-3 seeded berry.

PLATE-18



70 species world wide; 2 species in India (Hook. f., 1892); 4 species in Assam (Chowdhury, 2005) and 1 species in the study area.

Sansevieria roxburghiana Schult. & Schult. f., Linn. Syst. Veg. 7: 357. 1829; Hook. f., FBI 6: 271. 1892; Chowdhury, Assam's Flora 290. 2005.

Perennial herb. Stem rhizomatous, creeping. Leaves basal, in 5-9 tuft, fleshy, glossy, apex acute, margin green, with violet tinge, in long raceme. Fruit a berry, globose. **(Plate 18)**. (Photo File 12. A)

Habitat: Found in the scrub jungles.

Fls. and Frts.: Feb.-Jun.

Vern. name: Sarpa gash (Rh.)

Khawrang khuti, Udalguri; Binu. 206; March 20, 2016.

HYPOXIDACEAE R. Brown

Flinders, Voy. Terra Austral. 2: 576. 1814.

Perennial herb. Stem almost invisible, modified into corm or rhizome. Leaves grass like or like petelnut seedling. Inflorescence raremose. Flowers borne on leafless shoots. Flowers bisexual, actinomorphic, trimerous, radially symmetrical. Perianth segments 6. Stamens 6. Ovary inferior. Fruit a capsule or a berry.

8 genera and 220 species world wide. 1 genus and 1 species in the study area.

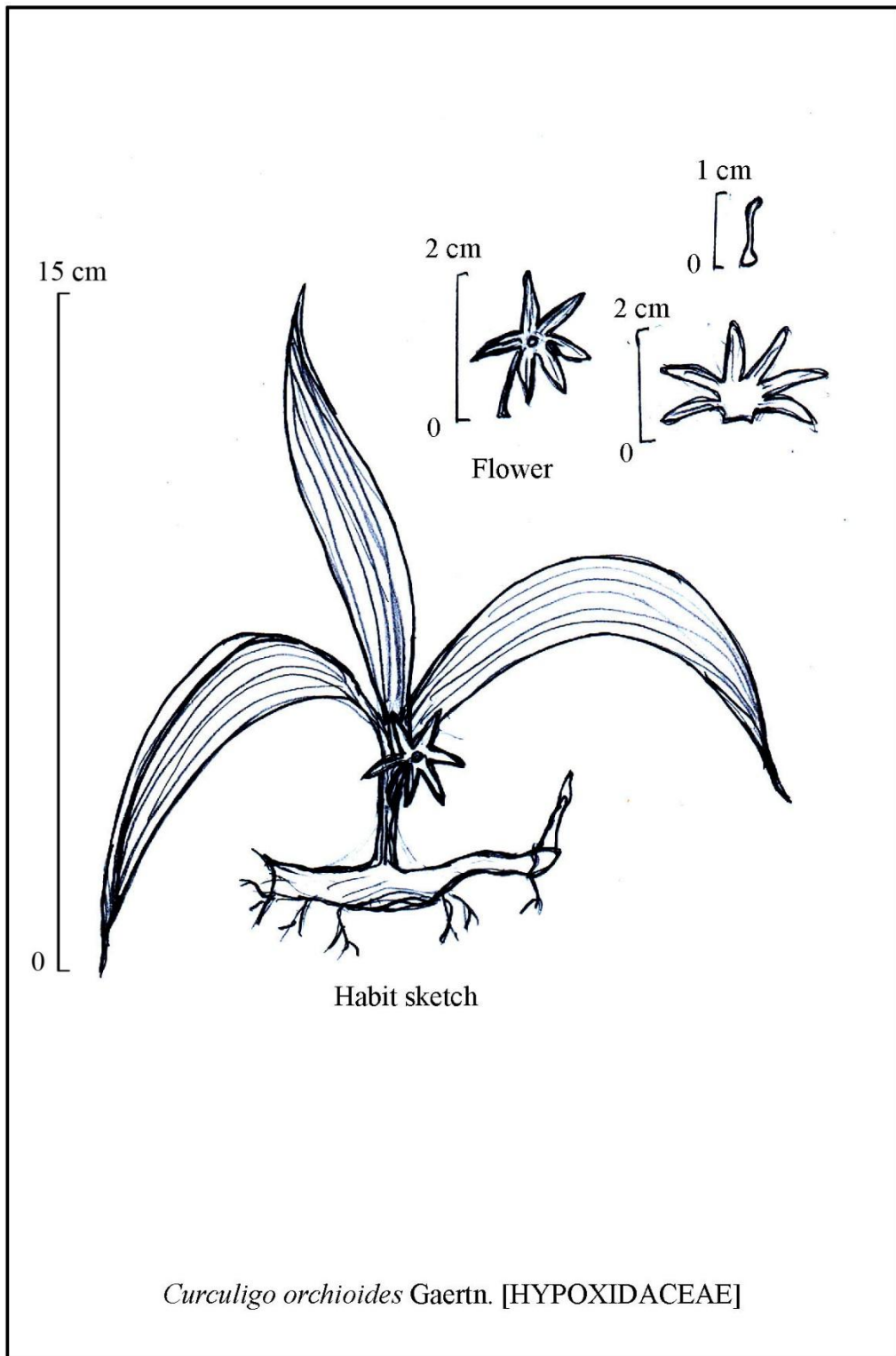
Curculigo Gaertn.

Fruct. i. 63, t. 16. 1788; Hook. f., FBI 6: 278. 1892.

Perennial herb. Stem rhizomatous, oblong, vertical. Leaves basal, cauline, alternate, 10-20 × 1.5-3.0 cm, sub-sessile, leaf blade entire, flat or folded, linear or lanceolate, apex acuminate, base cuneate, glabrous, membranous, base sheathing. Inflorescence in racemes or spikes or in heads. Flowers hermaphrodite. Perianth of 6 in two whorls. Stamens 6. Carpels 3. Fruit a capsule.

10 species in the Southern Hemisphere tropics; 6 species in India (Hook. f., 1892); 2 species in Assam (Chowdhury, 2005) and 1 species in the study area.

PLATE – 19



Curculigo orchioides Gaertn., Fruct. Sem. Pl. 1: 63. 1788; *C. brevifolia* (Dryand.) Ait., Hort. Kew. Ed. 2, 2: 253. 1811; Hook. f., FBI 6: 279. 1892; Chowdhury, Assam's Flora 290. 2005.

Perennial herb. Leaves sessile or petiolate, linear or linear to lanceolate. Inflorescence raceme. Flowers distichous, hidden by the leaf sheaths, the lowest bisexual, all the rest male, yellow. Fruit a capsule, 1-4 seeded. (**Plate 19**) (Photo File 13. A)

Habitat: Grows in the jungles.

Fls. and Frts.: Mar.-Oct.

Vern. name: Hagrani Goi (Bd.); Bon-tamuli (Rb.)

Purani Goraibari, Udalguri; Binu. 180; June 15, 2016.

DIOSCOREACEAE R. Brown

Prodr. Fl. Nov. Holl. 294, 1810.

Perennial, herbaceous or woody, slender, climber, tall, dioecious. Stem rhizomatous. Leaves alternate, petiolate, exstipulate, simple or compound. Inflorescence racemes or panicles. Flowers unisexual, actinomorphic bracteates, inconspicuous in axillary spikes. Perianth 6, Stems 6. Ovary inferior. Fruit a berry or 3-winged capsule. Seeds compressed or winged.

5 genera, 750 species distributed over tropical and warmed temperate regions of the world. 1 genus and 8 species in the study area.

Diosorea L.

Sp. Pl. 2: 1032-1034. 1753; Hook. f., FBI 6: 288. 1892; Rao and Verma, Bull. Bot. Surv. India 15 (3-4): 191. 1973.

Perennial herb, climber, twining, root stock rhizomatous or tuberous. Leaves alternate or opposite, petiolate, simple or compound. Flowers unisexual, arranged spirally in axillary. Staminate and pistillate flowers on different plants. Fruit a capsule.

600 species world wide; 25 species in India (Hook. f., 1892); 23 species in Assam (Rao and Verma, 1973) and 8 species in the study area.

Key to species

1a. Leaves compound:

2a. Stamens 6... .. *D. pentaphylla*

2b. Stamens 3. *D. hispida*

1b. Leaves simple:

3a. Stems prickly, puberulous to villous. *D. esculenta*

3b. Stems unarmed, glabrous. *D. puber*

4a. Leaves long petioled with blades

heart shaped. *D. bulbifera*

4b. Leaves elliptic. *D. glabra*

5a. Stems terete, faintly winged. *D. hamiltoni*

5b. Stems 4-angled, prominently winged. *D. alata*

Dioscorea alata L., Sp. Pl. 2: 1033. 1753; Hook. f., FBI 6: 296. 1892; Rao and Verma, Bull. Bot. Surv. India 15 (3-4): 201. 1973; Chowdhury, Assam's Flora 290. 2005

Perennial. Twining herbaceous vine, tubers solitary, polymorphic. Stems 4-angled. Bulbils numerous. Leaves opposite, long petioled, blades heart shaped. Flowers small, male and female arising from leaf axils of separate plants. Fruit a 3-parted capsule. (Photo File 14 C)

Habitat: Grows in the high areas.

Fls. and Frts.: Oct.-Dec.

Vern. name: Kath aloo (Rh.), White yam (Eng.)

Sonai, Udalguri; Binu. 207; October 29, 2016.

Dioscorea bulbifera L., Sp. Pl. 2: 1033. 1753; Hook. f., FBI 6: 296. 1892; Rao and Verma, Bull. Bot. Surv. India 15 (3-4): 201. 1973; Chowdhury, Assam's Flora 291. 2005.

Perennial. Twining herbaceous vine. Under ground tubers absent. Stems glabrous twining clock-wise bearing numerous bulbils. Leaves long petioled, ovate, more or

less deeply cordate at base and alternate. Flowers small, male and female arising on leaf axils on separate plants in panicles or spikes. Fruit a capsule. (Photo File 14 B)

Habitat: Grows in the hilly areas.

Fls. and Frts.: Jun.-Nov.

Vern. name: Air yam (Eng.)

Garo-basti, Bhutan border, Udalguri; Binu. 208; October 29, 2016.

Dioscorea esculenta (Lour.) Burkill, Gard. Bull. Straits. Settlem. 1: 396. 1917; Sp. Pl. 1033. 1753; Chowdhury, Assam's Flora 291. 2005.

Perennial. Twining herbaceous vine. Tubers many, lobed or cylindrical. Stems prickly at base. Leaves alternate, ovate, base cordate, apex acuminate, hairy beneath. Leaf petioles hairy or prickly. Male flowering axes solitary, hairy, many flowered, stemens 6. Female flowering axes also solitary, hairy, many flowered, bract hairy. Capsules reflexed.

Habitat: Cultivated for edible tubers in the high area.

Fls. and Frts.: Oct.-Jan.

Vern. name: Tha-onthai (Bd)

Naoherua and Sonai, Udalguri; Binu. 116; September 08, 2015.

Dioscorea glabra Roxb., Fl. Ind. 3: 1832; Hook. f., Fl. Brit. India 6: 294. 1892; Rao and Verma, Bull. Bot. Surv. India 15 (3-4) n: 199. 1973; Chowdhury, Assam's Flora 291. 2005.

Perennial. Twining herbaceous vine. Tuber solitary, cylindrical, fleshy white. Stems terete or obscurely ridged. Leaves elliptic, base rounded, apex acuminate. Male flowering axes very long, upto 1m long on leafless branches, sometimes axillary, 15-30 flowered. Bracts minute. Stamens 6. Female flowering axes solitary or paired, shorter than males, flowers upto 50. Capsules retuse, winged. (**Plate 20**)

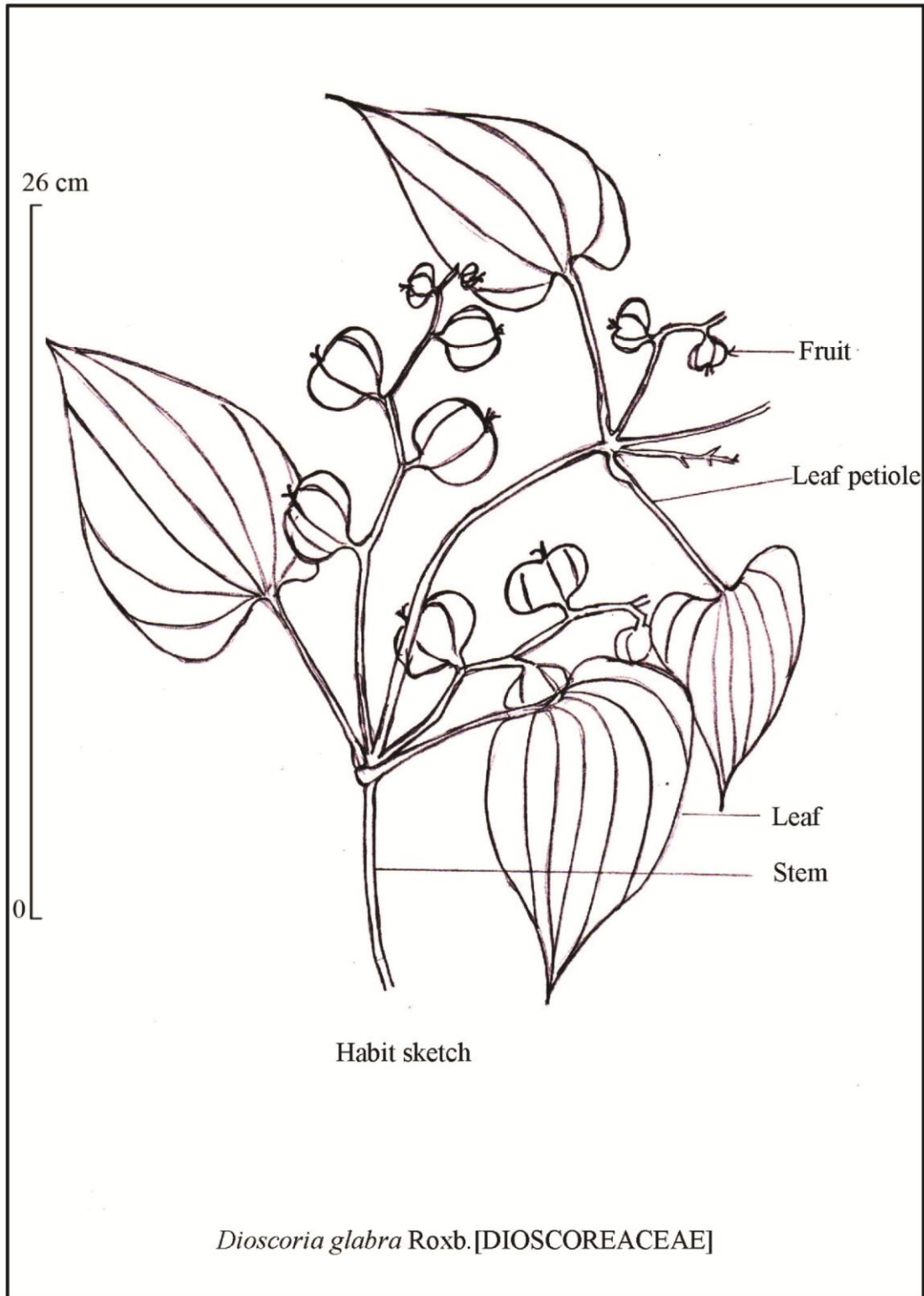
Habitat: Grows in the scrub jungles.

Fls. and Frts.: Sept.-Jan.

Vern. name: Hagrani Tha (Bd.)

PLATE – 20

p



Bhutan border. Garobasti, Udalguri; Binu. 206; September 08, 2015.

Dioscorea hamiltonii L., Hook. f. Fl. Brit. India 6: 295. 1892; Rao and Verma, Bull. Bot. Surv. India 15 (3-4): 200. 1973. Chowdhury, Assam's Flora 291.2005.

Perennial. Twining herbaceous vine. Tubers slender, stalked, laterally spreading, fleshy white. Stems rigid. Leaves alternate or opposite in the upper portions, lanceolate. Male flowering axes on 10-50 cm long, leafless branches simple or branched, bracts brown dotted, stamens 6. Female flowering axes solitary or many together, angled, 20-30 flowered. Capsules brown. Seeds winged all around.

Habitat: Wild climbing on other plants in the forest area.

Fls. and Frts.: Jul.-Oct.

Vern. name: Hagrani Tha (Bd.)

Bhutan border, Khawrangkhuti, Udalguri; Binu. 210; September 08, 2015.

Dioscorea hispida Dennst., Schluss. Hort. Malab. 33. 1818; Hook. f., FBI 6: 289. 1892; Chowdhury, Assam's Flora 291. 2005.

Perennial herbaceous. Tuberous liana. Stems climbing twining to left. Leaves compound 3-5 foliate, leaflets ovate, acute. Bulbils at the axils of leaves. Male flowers in paniculate spikes, dense, oblong, cylindric. Perianth 6, glabrous. Stamens 6. Female flowers solitary. Ovary 3-celled. Capsules reflexes, rounded at the at the base.

Habitat: Grows in the forest.

Fls. and Frts.: Jan.-Oct.

Bhairabkhunda, Udalguri; Binu. 122; October 29, 2016.

Dioscorea pentaphylla L., Sp. Pl. 2: 1032. 1753; Hook. f. L, FBI 6: 289. 1892; Rao and Verma, Bull. Bot. Surv. India 15 (3-4): 193. 1973; Chowdhury, Assam's Flora 291. 2005.

Perennial herbaceous, tubers irregular. Stem twining to left, prickly. Leaves alternate, palmately 5-foliolate, petiole 5-10 cm long. Male flowers dense, oblong, paniculate spikes, perianth 6, stamens 6 and all are fertile. Female flowers same as males, styles 3. Capsules 3-winged with shining. Seeds flat, winged all round. (Photo File 14. A)

Habitat: Grows in scrub jungles.

Fls. and Frts.: Aug.-Oct.

Vern. name: Gangaba bilai tha (Bd.)

Kalajhar, Udalguri; Binu. 209; October 29, 2016.

Dioscorea puber Blume, Enum. Rao and Verma, Bull. Bot. Surv. India 15 (3-4); 199. 1973; Chowdhury, Assam's Flora 291. 2005.

Perennial. Climber. Herbaceous. Stems twining to the left, terete, glabrous. Leaves opposite, ovate, strongly 5-7 nerved, softly hairy beneath, petioles 4-5 cm long. Male flowers in dense paniculate spikes. Perianth 6 and all are fertile. Female flowers in slender racemes. Stigma 3-lobed. Capsules elongated at base, truncate at base, 3-winged with shining. Seeds winged.

Habitat: Grows in the forest.

Fls. and Frts.: Jul.-Dec.

Vern. name: Hagrani Tha (Bd.)

Garobasti of Bhutan border, Udalguri; Binu. 211; October 29, 2016.

LILIACEAE Juss.

Gen. Pl. 48. 1789

Perennial herb with rhizomes, corms, bulbs. Leaves alternate or less often opposite or whorled. Flowers bisexual, actinomorphic, pedicelled. Perianth of two whorls. Tepals 3 in each whorl, obovate. Stamens 6 and fertile. Carpels 3. Ovary superior, trigonous. Fruit a capsule or berry, globose, smooth.

280 genera and 4000 world wide, especially in temperate and sub-tropical regions. 3 genera and 4 species in the study area.

Key to genera

1a. Bulbs scaly or tunicated. *Allium*

1b. Bulbs absent:

2a. Leaves succulent. *Aloe*

2b. Leaves not succulent. *Gloriosa*

Allium L.

Syst. Ed. 1. 1735; Sp. Pl. 2: 294. 1753; Gen. Pl. ed. 5. 1754; Hook. f., FBI 6: 337. 1892.

Perennial herb, bulbs, solitary or clustered. Leaves sheathing, sessile. Inflorescence a terminal umbel. Flowers bisexual. Perianth segments free or united, filaments usually connate at base, style simple, stigmas 3-cleft. Capsule loculicidal.

660 species in Asia, Africa and central and South America; 27 species in India (Hook. f., 1892); 3 species in Assam (Chowdhury, 2005) and 2 species in the study area.

Key to species

1a. Leavers cylindrical, bulb scally and reddish brown.*A. cepa*

1b. Leaves flat, bulbs tunicates and white.*A. sativum*

Allium cepa L., Sp. Pl. 1: 300. 1753; Hook. f., FBI 6: 337. 1892; Chowdhury, Assam's Flora 292. 2005.

Perennial herb. Leaves cylindric or fistular. Bulbs clothed with red or reddish pink membranous seales. Leaves fistular, Scapes elongated during flowering, 20-60 cm long. Flowers clustered, umbellate head. Flowers white with mind green line in tepals. Perianth 6. Stamens 6. Ovary 3-celled. Stigmas 3-lobed. Fruit capsule, small loculicidal. Seeds compressed, black. (**Plate 21**) (Photo File 15. C)

Habitat: Cultivated in winter season.

Fls. and Frts.: Feb.-Apr.

Vern. name: Sambram Gwja (Bd.), Piyaj (Rh.)

Udalguri Nalbari; Binu. 169; March 15, 2016.

Allium sativum L., Sp. Pl. 1: 296. 1753; Hook. f., FBI 6: 337. 1892; Chowdhury, Assam's Flora 292. 2005.

Perennial herb. Erect. Bulbs tunicated, clothed with white membranous scales. Leaves flat, linear, heads bearing both flowers and bulbils, fleshy. Inflorescence umbels, sub-globose.

PLATE – 21

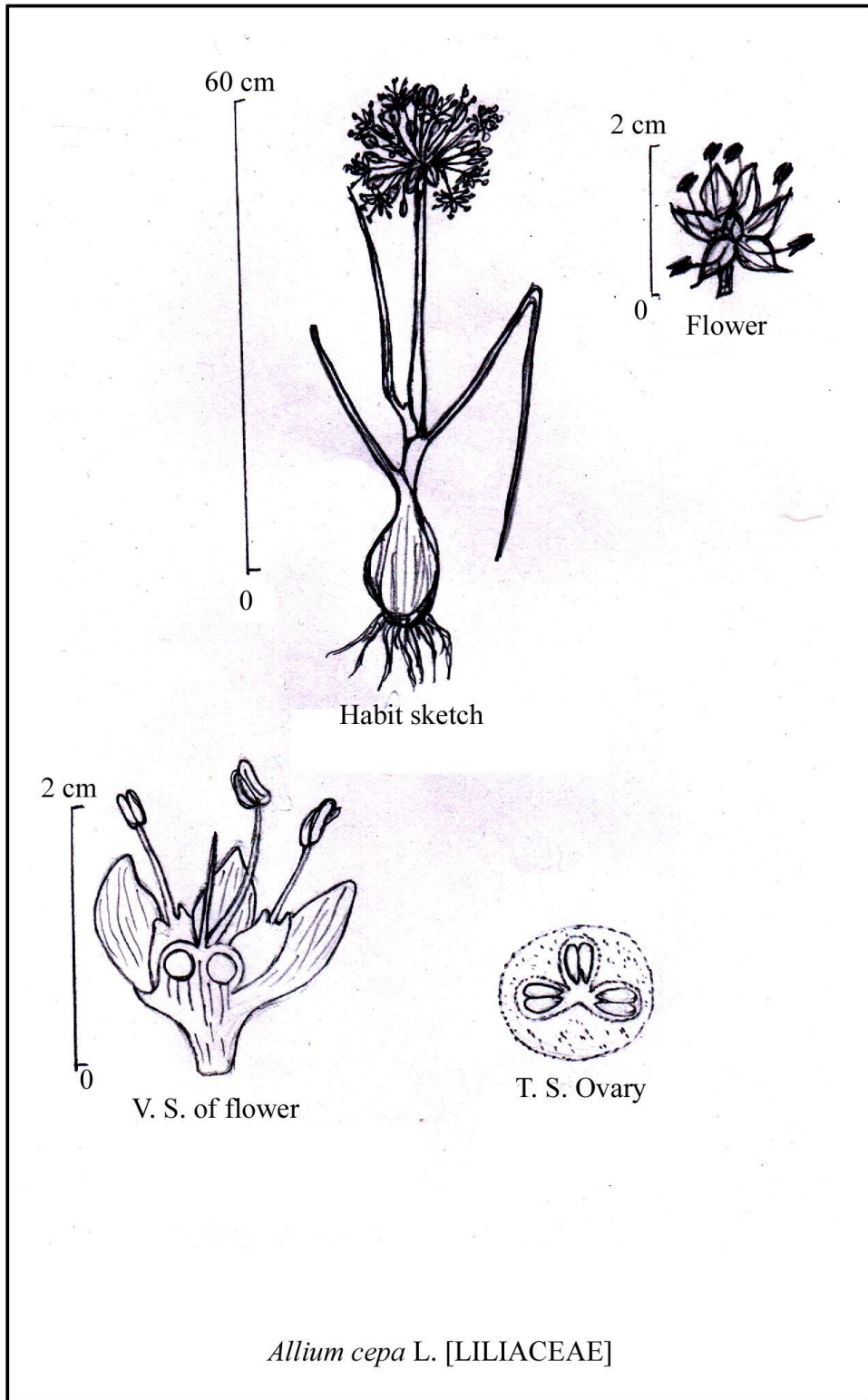
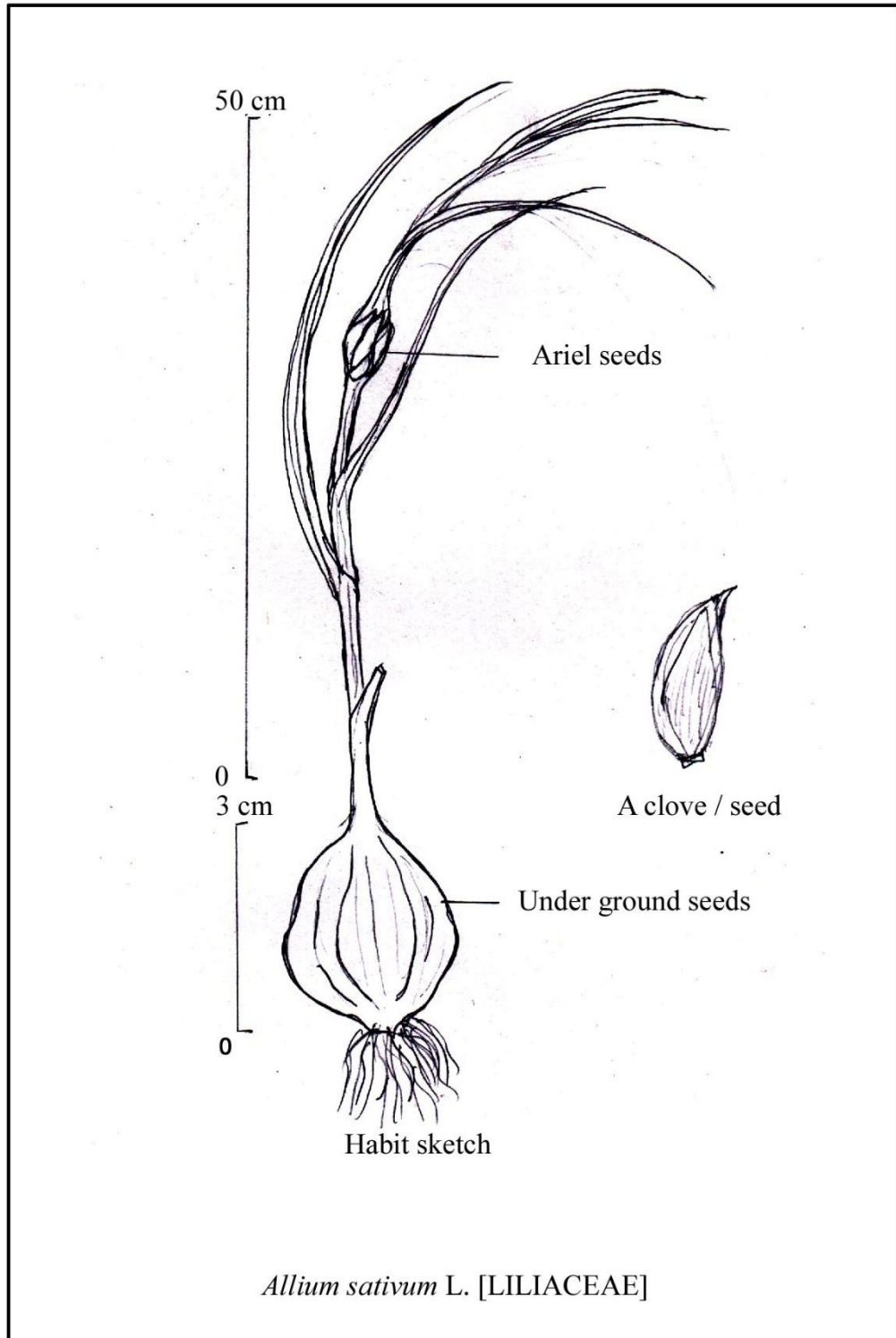


PLATE – 22



Flowers greenish white. Fruit seedless. (**Plate 22**) (Photo File 15. A)

Habitat: Grows in winter season.

Fls. and Frts.: Oct.-Mar.

Vern. name: Sambram Gufur (Bd.), Nuhuru (Rh.)

Udalguri Nalbari; Binu. 170; March 15, 2016.

Aloe L.

Sp. Pl. 1: 319-323. 1753; Gen. Pl. 5: 150. 1754.

Perennial. Plant succulent. Stems erect, ascending. Leaves crowded, succulent, distichous, blade margins spiny toothed. Inflorescence axillary or terminal, racemose, dense, bracteates. Perianth red to yellow. Stamens 3 or 6. Style slender.

About 300 species in the world; 1 species in Assam (Chowdhury, 2005) and 1 species in the study area.

Aloe vera (L.) Burm. f., Fl. Ind. 83. 1768; Hook. f., FBI 6: 264. 1892; Chowdhury, Assam's Flora 291. 2005.

Perennial herb. Succulent, stemless, dense clumps. Leaves sub-basal, erect, pale green, fleshy, margin dentate, apex pointed. Inflorescence a raceme, numerous flowered. Flowers 3 cm long, bisexual. Perianth lobe 6, pale yellow mottled with red. Stamens 6. Ovary superior, trilocular. Fruit capsule or berry. (Photo File 15. B)

Habitat: Cultivated for medicinal uses and as an ornamental plant.

Fls. and Frts.: Dec.-May.

Tangla town, Udalguri; Binu. 103; November 08, 2014.

Gloriosa L.

Syst. Ed. i. 1753; Sp. Pl. 305. 1753; Hook. f., FBI 6: 358. 1892.

Perennial herb. Scandent. Rhizomatous. Stem leafy. Leaves spirally arranged, upper one with cirrhose tips. Flowers solitary, large, borne on long spreading pedicels, actinomorphic, hermaphrodite. Perianth 6 and free. Stamens 6, hypogynous. Fruit a capsule.

Gloriosa superba L., Sp. Pl. 305. 1753; *G. simplex* D. Don, Prod. Fl. Nep. 51. 1825; Hook. f., FBI 6: 358. 1892; Chowdhury, Assam's Flora 292. 2005.

Perennial. Climber. Rhizome prostrate. Leaves with long coiled tip. Flowers pedicelled, showy. Perianth 6-partite. Stamens 6. Carpels 3, Capsules 3-5 cm long.

Habitat: Cultivated and usually wild.

Fls. and Frts.: Aug.-Oct.

Dimakusi, Udalguri; Binu. 194; October 10, 2016.

ASPARAGACEAE Juss.

Gen. Pl. 40. 1789.

Perennial. Erect or climbing herbs or undershrubs. Rhizome stout, creeping. Leaves minute, like scale, bearing a tuft of linear or acicular cladodes in the axils. Flowers bisexual, rarely unisexual, in raceme or panicles. Perianth 6-partite. Stamens 6. Ovary 3-celled. Stigma 3-fid, recurved. Seeds 2-6, testa black, fragile.

Asparagus L.

Sp. Pl. 1: 313. 1753; Gen. Pl. 147. 1754; Hook. f., FBI 6: 314. 1892.

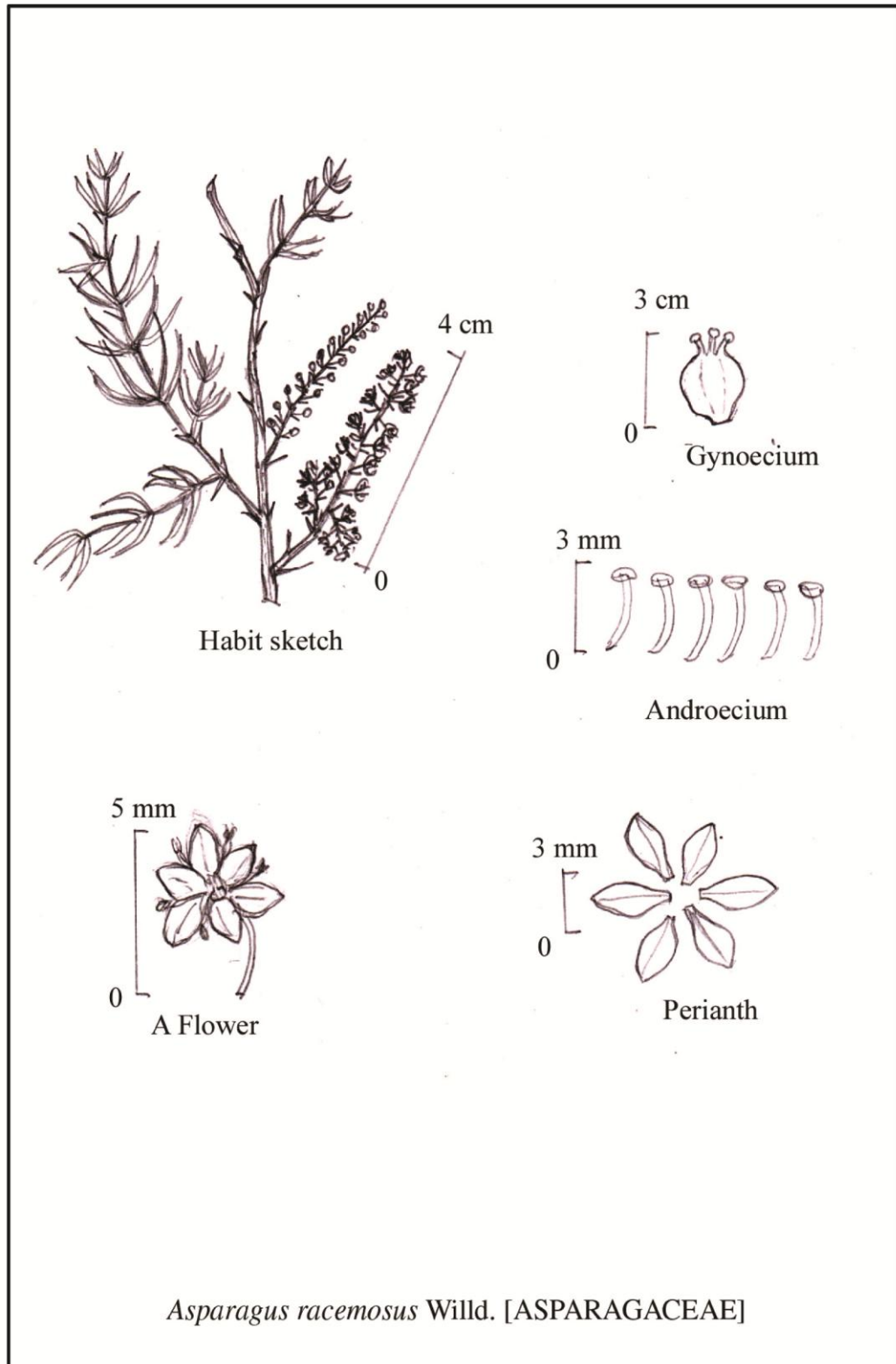
Perennial herb. Stems erect or twining, branched. Leaves needle like cladodes in the axils of scale leaves, spurred at base, spurs sometimes extending spines. Inflorescence axillary or terminal solitary or cluster of flowers. Tepals 6 pedicel articulated. Perianth sub-globose. Stamens 6. Fruit a berry.

About 370 species in the world; 17 species in India (Hook. f., 1892); 2 species in Assam (Chowdhury, 2005) and 1 species in the study area.

Asparagus racemosus Willd., Sp. Pl. 2: 152. 1799; Hook. f., FBI 6: 316. 1892; Chowdhury, Assam's Flora 291. 2005

Perennial herb, erect, climber. Root stock stout. Stems scandent, terete. Branches triquetrous, arising in the axils of spines. Leaves needle like cladodes, linear leaf spur spinous, spine sharp. Inflorescence axillary, many flowered raceme or panicle. Flowers whitish purple, bisexual. Fruit a globose berry. Seed 1-6. (**Plate 23**) (Photo File 16. A)

PLATE – 23



Habitat: Climbing and grows in dry area.

Fls. and Frts: Nov.-Feb.

Vern. name: Satmul (Bd. and Rh.)

Udalguri Nalbari; Binu.104; November 08, 2014.

SMILACACEAE Vent.

Tabl. Regn. Veg. 2: 146. 1799.

Perennial with vines, herbs or shrubs. Rhizomatous. Stem erect or climbing, usually prickly, sometimes unarmed. Leaves alternate or opposite. Inflorescence umbellate. Flowers unisexual, staminate or pistillate on different plants. Tepals 6, distinct. Stamens 2-3 whorled. Pistillate flowers bearing staminodes. Pistil 3-4 carpellate.

Smilax L.

Sp. Pl. 2: 1028. 1753; Gen. Pl. 5: 455. 1754; Hook. f., FBI 6: 302. 1892.

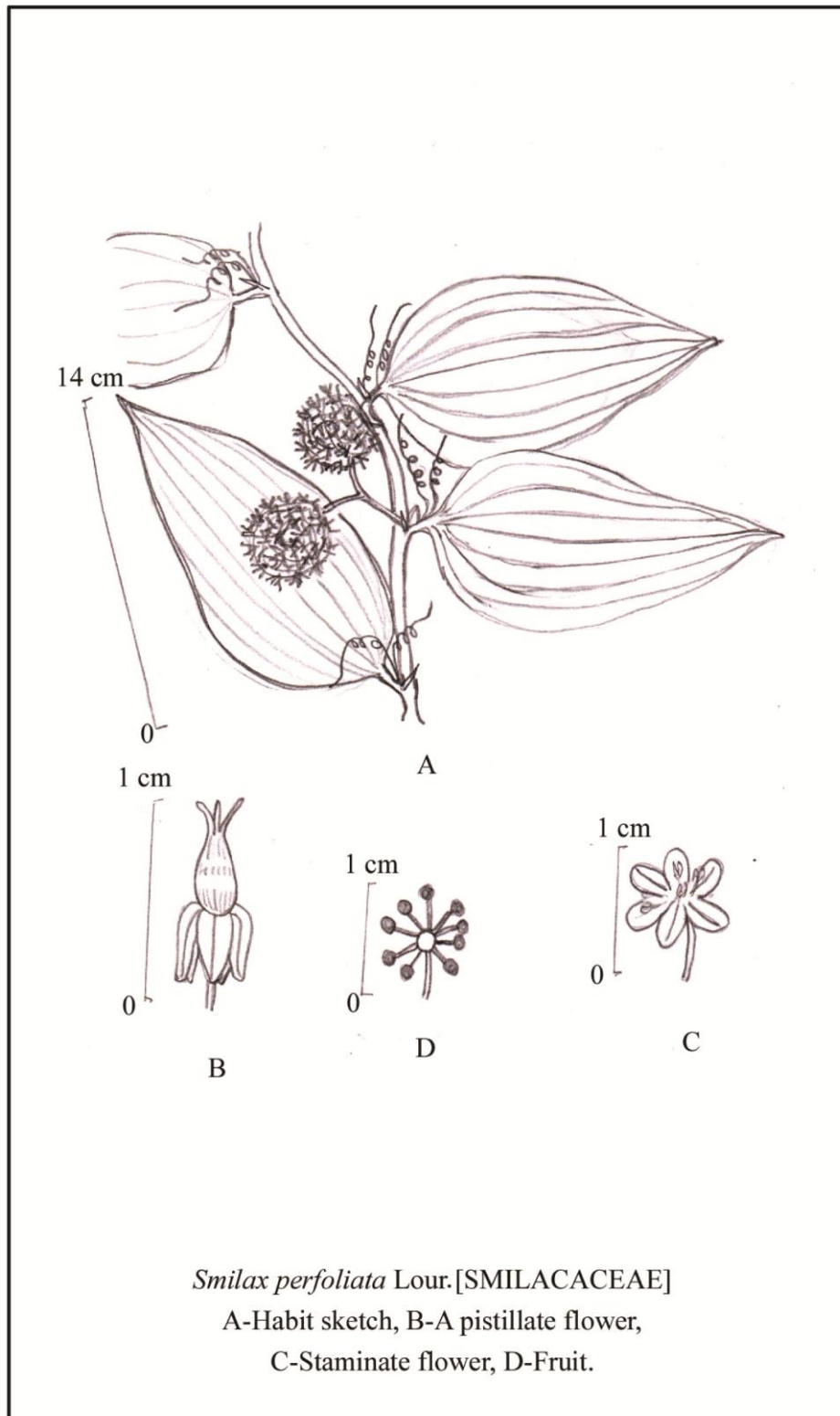
Perennial with vines, herbs or shrubs, scandent. Rhizomes tuberous or stoloniferous, woody. Branchlets angular. Stem erect, sprawling or more often climbing, armed or unarmed with prickles. Leaves evergreen, alternate, 10-20 × 2-15 cm, ovate, oblong, orbicular, elliptic or lanceolate, apex acuminate. Stipules present. Tendrils often present. Blade linear, ovate or sometimes reduced to scales in herbaceous species. Inflorescence umbellate. Flowers unisexual. Fruits a berry and black.

About 300 species worldwide in the tropics and subtropics, with extensions into temperate areas; 33 species in India (Hook. f., 1892); 15 species in Assam (Baishya, 1999) and 1 species in the study area.

Smilax perfoliata Lour., Fl. Coch. 622. 1790; Koyama in Quart. Journ. Calm. Mas. 10: 16. 1957; Fl. Taiw. 5: 155. 1979)

Perennial climber. Stems terete, armed with stout, short prickles. Leaves broad, ovate to lanceolate, apex acute to acuminate. Abaxial angle ovate, clasping round the stem, with tendrils at the notch or on the side. Umbels axillary. Stamens 6. Pistillate flowers similar to that of males. Stigmas minute, with 3 filiform staminodes. Seeds 1-2 series.
(Plate 24) (Photo File 17. A)

PLATE – 24



Smilax perfoliata Lour. [SMILACACEAE]

A-Habit sketch, B-A pistillate flower,

C-Staminate flower, D-Fruit.

Habitat: Found in the jungle.

Fls. and Frts.: Apr.-Oct.

Serfang field, Udalguri; Binu. 167; April 26, 2016.

PONTEDERIACEAE Kunth

Nov. Gen. Sp. Pl. 1: 265. 1815.

Perennial or annual herb. Aquatic, rooted in mud or free floating. Stems two types: vegetative and flowering. Vegetative stems indeterminate and flowering stem determinate. Leaves two types: sessile and petiolate. Sessile leaves submerged or rarely emerged, forming basal rosette. Petiolate leaves floating or emerged, blade cordate. Inflorescence paniculate. Flowering sessile, trimerous, tepals yellow, blue or white. Stamens 3 or 6, adnate to perianth. Pistil 3-locular. Fruit a capsule.

7 genera and 30 species occurring in the marshes and fresh water pools of the tropical and subtropical countries of the world.

Key to genera

Ia. Petioles swollen, flowers sessile and zygomorphic. *Eichhornia*

Ib. Petioles not swollen, flowers pedicellate and actinomorphic.... .. *Monochoria*

Eichhornia Kunth

En. 4: 129. 1843; Rao and Verma, Bull. Bot. Surv. India 16 (1-4): 3. 1974.

Perennial herb. Aquatic, rooted on muds or floating. Leaves floating or submerged. Petioles swollen, spongy. Leaf blade ovate to circular, linear in some submerged forms. Perianth funnel shaped. Capsule fusiform.

7 species in America, 1 naturalized in tropical and elsewhere; 1 species in Assam (Rao and Verma, 1974) and 1 species in the study area.

Eichhornia crassipes (Mart.) Solms, A. de Candole & C. de Candole, Monogr. Phan. 4: 527. 1883; *Pontederia crassipes* Mart. Nov. Gen. Sp. Pl. 1: 9. 1823; Rao and Verma, Bull. Bot. Surv. Ind. 16 (1-4): 3. 1974; Chowdhury, Assam's Flora 292. 2005.

Perennial herb, free floating. Stem short and leafy. Roots long and fibrous. Leaves basal. Leaf blade circular to ovate, thick, light green. Petiole inflated. Inflorescence

axillary. Flowers very showy, pale violet, trimorphic, heterostyled. Capsule ovoid. (Photo File 18. A)

Habitat: Found in the ponds.

Fls. and Frts.: Jul.-Nov.

Vern. name: Khwslifana (Bd.), Pani meteka (Rh.)

Kajiamati, Udalguri; Binu. 84; September 07, 2014.

Monochoria C. Presl

Reliq. Haenk. 1 : 27. 1827; Hook. f., FBI 6: 362. 1892; Rao and Verma, Bull. Bot. Surv. India 16 (1-4): 1.1974.

Perennial or annual herb. Rooting in mud. Vegetative stems submerged with elongate internodes. Flowering stems emerged or sub-emerged. Sessile leaves form a basal rosette. Petiolate leaves floating. Leaf blade cordate to hastate, apex acute to acuminate. Inflorescence umbellate or paniculate, upto 20-flowered. Flowers blue or white. Fruit capsular, ovoid.

8 species in the world; 2 species in India (Hook. f., 1892); 2 species in Assam (Rao and Verma, 1974) and 2 species in the study area.

Monochoria hastata (L.) Solms, A. de Candole & C. De Candole, Monogr. Phan. 4: 523. 1883; *Pontederia hastata* L., Sp. Pl. 288. 1753; *Monochoria hastaefolia* K. B. Presl, Rel. Haenk. 1: 128. 1827; Hook. f., FBI 6: m 362. 1892; Rao and Verma, Bull. Bot. Surv. India 16 (1- 4): 1. 1974; Chowdhury, Assam's Flora 292. 2005.

Perennial herb. Leaf blade triangular, base sagittate to hastate, apex acute to acuminate. Inflorescence umbellate, upto 20 flowered. Flowers bluish violet long pedicelled. Perianth 6, actinomorphic. Capsules elliptic. (**Plate 25**) (Photo File 18. B)

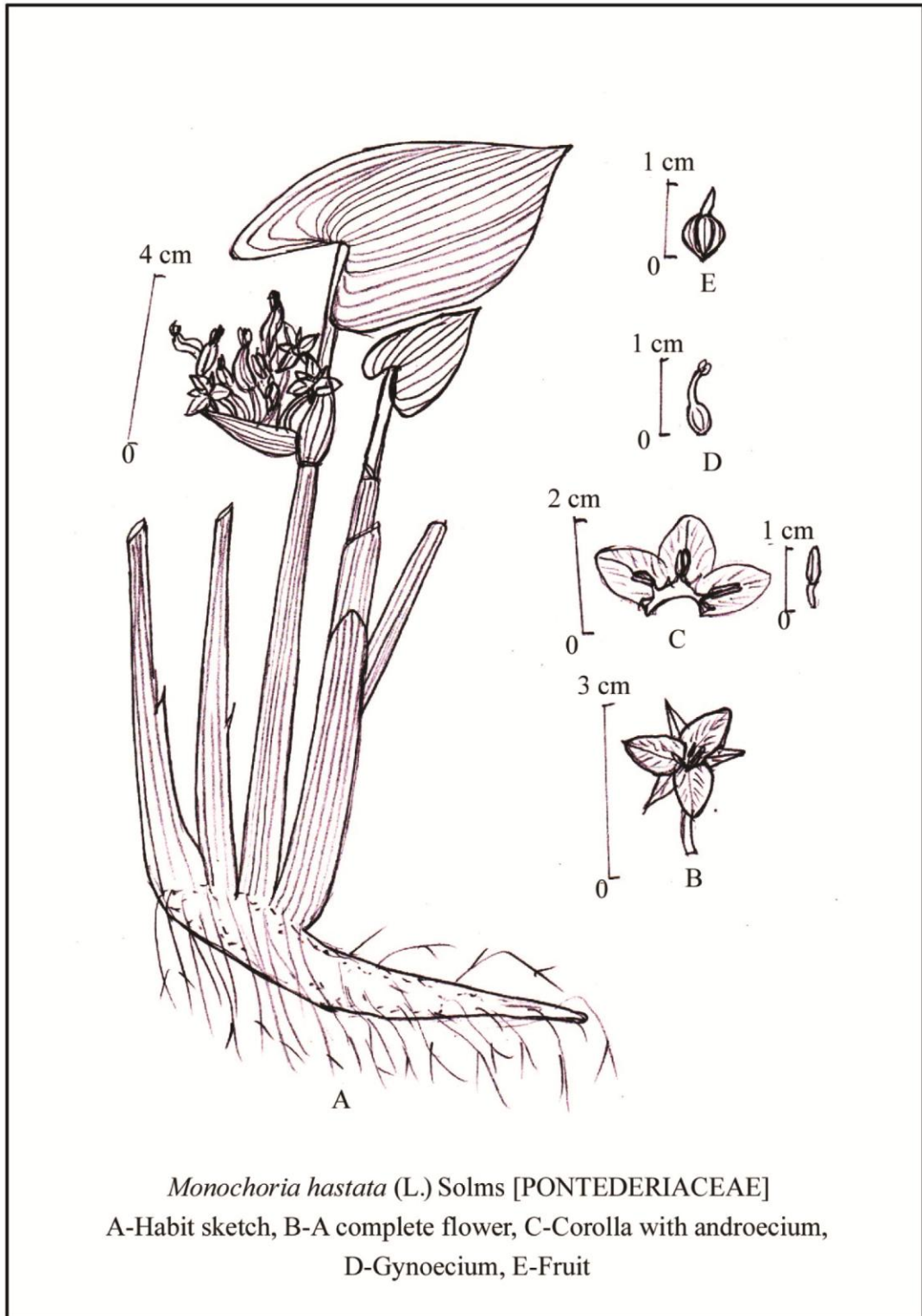
Habitat: Grows in wasteland, ditches and pools.

Fls. and Frts.: Jan.-Dec.

Vern. name: Ajwnai (Bd.).

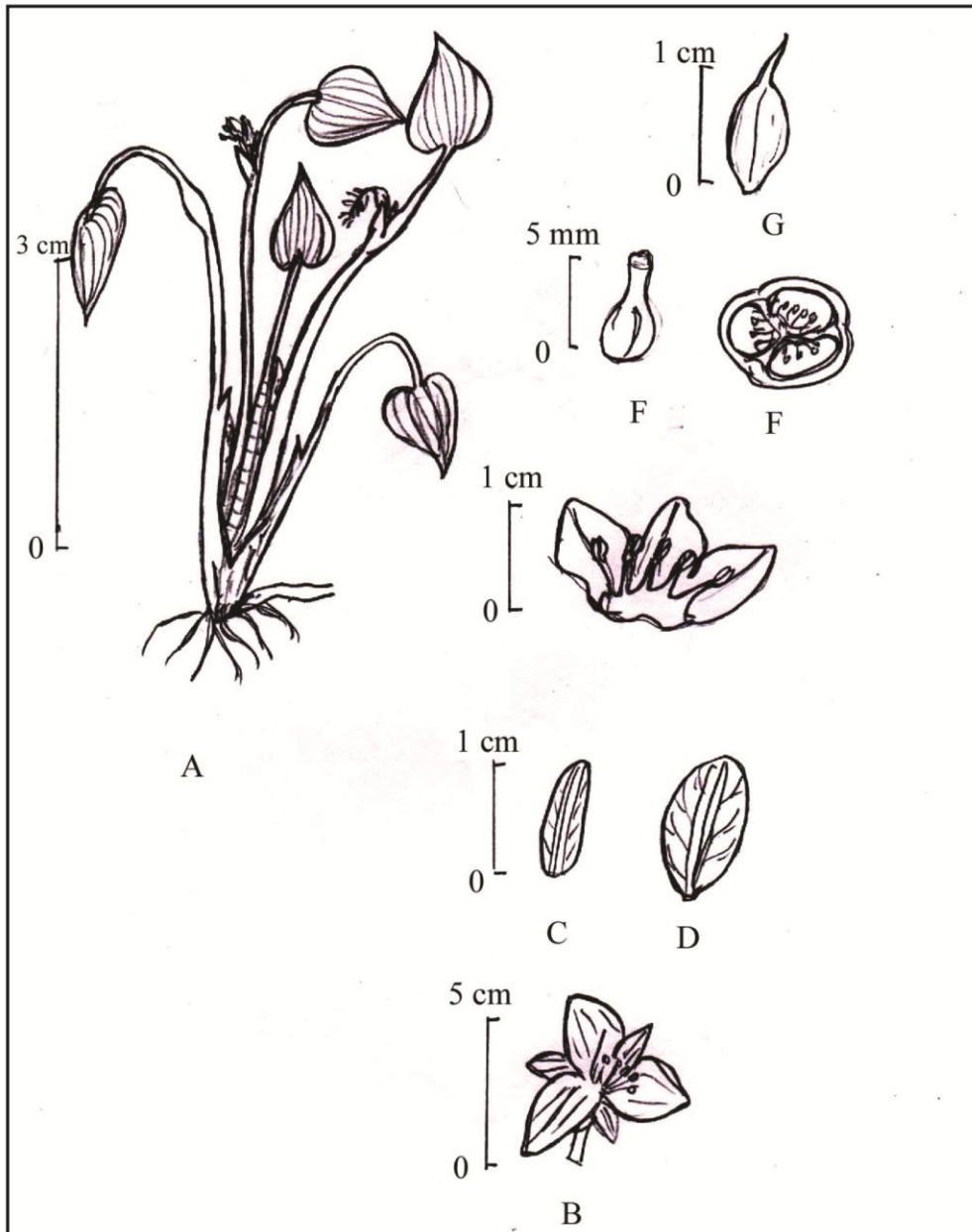
Golondi river bank, Udalguri; Binu. 30; February 27, 2014.

PLATE – 25



Monochoria hastata (L.) Solms [PONTEDERIACEAE]
A-Habit sketch, B-A complete flower, C-Corolla with androecium,
D-Gynoecium, E-Fruit

PLATE – 26



Monochoria vaginalis (Burm. f.) C. Presl. ex Kunth
 [PONTEDERIACEAE]
 A-Habit sketh, B-A complete flower, C&D-Bract,
 E-Corolla with androecium, F-Gynoecium, G-Fruit

Monochoria vaginalis (Burm. f.) C. Presl. *ex* Kunth, Enum. Pl. 4: 134. 1843; Hook. f. Fl. Brit, India 6: 363. 1892; Subram. Aq. Ang. 69, t. 43. 1962; Hara Fl. East. Himal. 402. 1966; Babu Herb. Fl. Dehra Dun 523. 1977. *Pontederia vaginalis* Burm. F. Fl. Ind. 80. 1768; Chowdhury, Assam's Flora, 292. 2005.

Perennial herb. Roots tufted. Stems short 5 cm long. Leaves ovate, acute. Petiole slender and spongy. Flowers bisexual, pinkish yellow. Perianth 6. Stamens 6. Capsule elliptic. Seeds rounded, minute. **(Plate 26)**

Habitat: Grows commonly in paddy fields as weeds and also in shallow ponds.

Fls. and Frts.: May.-Dec.

Gersong, Udalguri; Binu.125; July 07, 2015.

COMMELINACEAE. Brown

Hist. Nat. Pl. 8: 177. 1804

Perennial or annual herb. Erect or creeping. Leaves basal or cauline alternate. Leaf sheaths enclosed. Leaf blade simple. Inflorescence terminal or axillary. Flowers bisexual or same plants. Sepals 3. Petals 3. Stamens 6, all fertile or some staminode. Ovary superior. Style 1, usually slender. Fruit a loculicidal capsule.

40 genera, 630 species distributed in pantropical and pantemperate regions and 4 genera, 6 species in the study area.

Key to genera

Ia. Flowers embraced by large spathaceous bracts:

2a. Stamens 6. *Cyanotis*

2b. Stamens 3. *Commelina*

Ib. Spathaceous bracts absent:

3a. Fertile stamens 6. *Floscopa*

3b. Fertile stamens 3. *Murdania*

Commelina L.

Sp. Pl. 1: 40-42. 1753; Hook. f., FBI 6: 368. 1892; Rao and Verma, Bull. Bot. Surv. India 16 (1- 4): 8. 1974.

Perennial or annual herb. Stems suberect or creeping. Leaves alternate or spirally arranged. Leaf blade sessile or petiolate. Inflorescence terminal, enclosed in spathes. Bracteoles absent. Flowers blue, bisexual and staminate. Pedicels well developed. Stamens 3. Staminodes 3. Capsule oblong, globose or ellipsoid.

About 170 species distributed in tropical and subtropical regions; 20 species in India (Hook. f., 1892) and 8 species in Assam (Rao and Verma 1974) and 3 species in the study area.

Key to species

1a. Leaves obviously petiolate, leaf blade ovate. *C. benghalensis*

1b. Leaves sessile, leaf blade lanceolate:

2a. Stems decumbent, capsules 2-valved.. *C. longifolia*

2b. Stems generally diffuse, capsules 3-valved. *C. paludosa*

Commelina benghalensis L., Sp. Pl. 41. 1753; Hook. f., FBI 6: 370. 1892; *Commelina canescens* Vahl, Enum. Pl. 2: 173. 1805; Rao and Verma, Bull. Bot. Surv. India 16 (1-4): 11. 1974; Chowdhury, Assam's Flora 293. 2005.

Perennial herb. Stems slender, creeping or erect, pubescent, rooting below, many branched and glabrous. Leaves ovate, 4-5 × 2.0-2.5 cm, apex acute, base rounded. Leaf sheaths with reddish hairy and with oblique mouth. Inflorescence cymes short peduncled, 1-3 flowered. Flowers zygomorphic, bisexual, petals 3, upper 2 petals blue, lower petal white. Capsule trigonous. Seeds rectangular, smooth, brown to black. **(Plate 27)** (Photo File 19. F)

Habitat: Grows common in shady and open areas especially in low ditches.

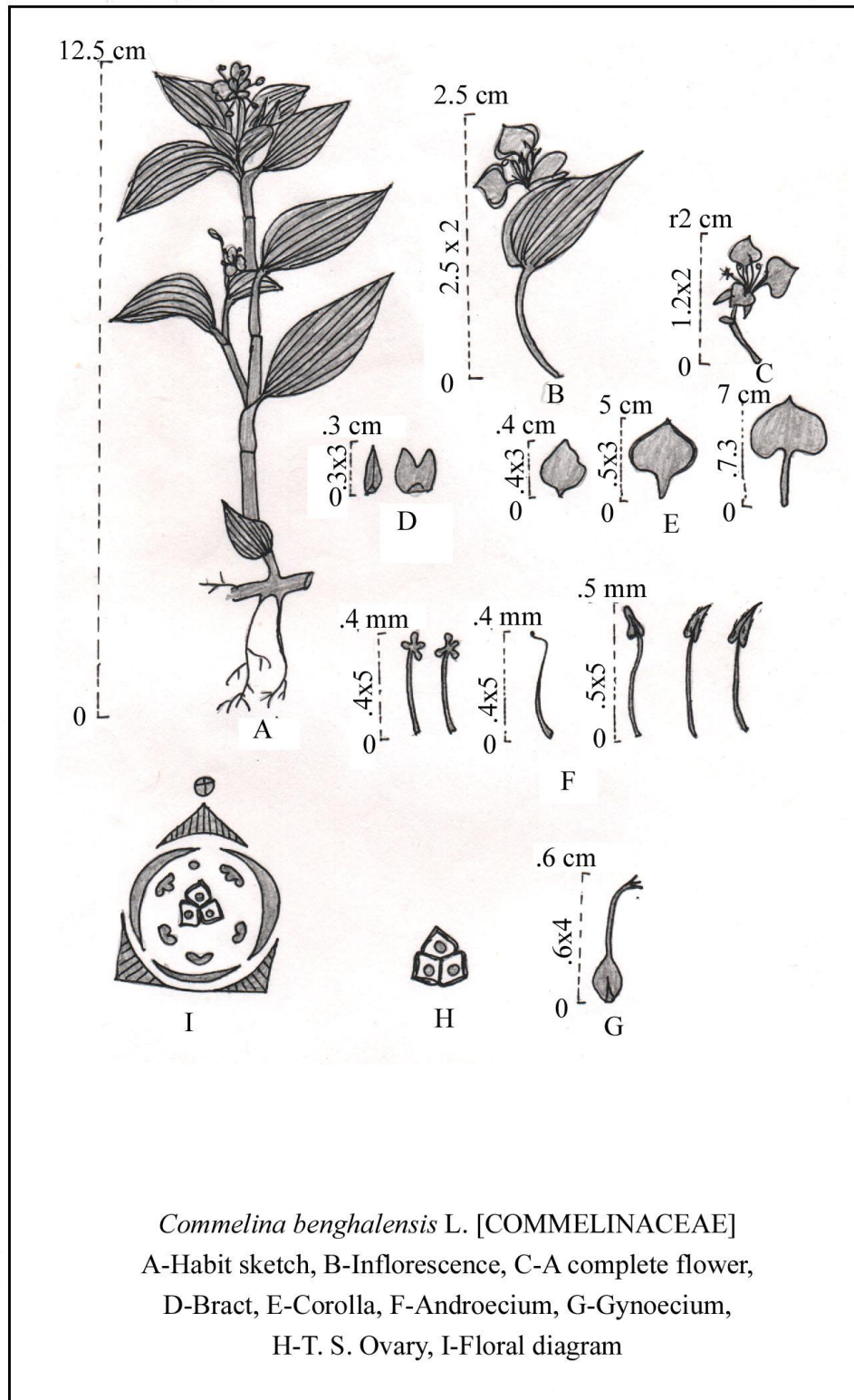
Fls. and Frts.: Apr.-Nov.

Vern. name: Kona Simolu (Rb.)

Through out Udalguri district; Binu. 31; April 09, 2014.

Commelina longifolia Lam., Tabl. Encyl. 1: 129. 1791; *C. salicifolia* Roxb., Fl. Ind. 1: 176. 1820; Rao and Verma, Bull. Bot. Surv. India 16(1-4): 11. 1974; Chowdhury, Assam's Flora 293. 2005.

PLATE – 27



Commelina benghalensis L. [COMMELINACEAE]
 A-Habit sketch, B-Inflorescence, C-A complete flower,
 D-Bract, E-Corolla, F-Androecium, G-Gynoecium,
 H-T. S. Ovary, I-Floral diagram

Annual herb, slender. Stem decumbent. Leaves alternate, sessile, acuminate at apex. Spathes solitary, cordate at base. Flowers blue. Sepals and petals ovate. Fruit capsules, 2- valved. Seeds smooth.

Habitat: Grows in moist places.

Fls. and Frts.: Jun.-Oct.

Throughout Udalguri district; Binu. 37; July 20, 2016.

Commelina paludosa Blume, Enum. Pl. Jav. 1: 2. 1827; Hook. f., FBI 6: 372. 1892; *C. oblique* Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 45. 1825, non Vahl 1806 non illegit.; Rao and Verma, Bull. Bot. Surv. India 16 (1-4): 11. 1974; Chowdhury, Assam's Flora 293. 2005.

Perennial herb. Stems diffuse, erect. Leaves sessile. Leaf lamina lanceolate to ovate 5-6 cm long, spathes 2-3 cm long, folded, 1-2 cm broad, obliquely funnel shaped. Petals blue. Fruits capsule, ovoid, globose, valved-3. Seeds brown. (Photo File 19. B)

Habitat: Grows in moist places.

Fls. and Frts.: Oct.-Dec.

Vern. name: Hangsw Gadeb. (Bd.)

Udalguri Nalbari; Binu. 111; October 02, 2015.

Cyanotis D. Don.

Prodr. Fl. Nepal 45. 1825; Hook. f., FBI 6: 384. 1892; Rao and Verma, Bull. Bot. Surv. India 16 (1-4): 18. 1974.

Annual or perennial herb. Evergreen. Stems cylindrical. Leaves alternate, spiral or distichous. Leaf blade entire. Inflorescence terminal or axillary. Flowers regular, hermaphrodite. Perianth with distinct calyx and corolla. Calyx 3. Corolla 3. Androecium 6, filaments densely hairy. Gynoecium 3, syncarpous, superior. Fruit a capsule.

About 100 species world wide; 16 species in India (Hook. f., 1892); 3 species in Assam (Rao and Verma, 1974) and 1 species in the study area.

Cyanotis cristata (L.) D. Don, Prodr. Fl. Nepal. 46. 1825; *C. cristata* L. Sp. Pl. 1: 42. 1753; Hook. f., FBI 6: 385. 1892; Rao and Verma, Bull. Bot. Surv. India 16 (1-4): 18. 1974; Chowdhury, Assam's Flora 293. 2005.

Annual prostrate herb. Branches ascending, erect. Leaves ovate to oblong, sessile, 5-11 × 1-2 cm. Inflorescence axillary. Flowers blue in terminal clusters subtended by folded spathes. Capsule 3-4 mm long, obtuse, membranous, usually 6 seeded. Seeds 2 mm long. (Photo File 19. E)

Habitat: Found in wet places near hills.

Fls. and Frts.: Sept.-Dec.

Sonai, Udalguri; Binu. 177; September 15, 2016.

Floscopa Lour.

Fl. Cochinch. 1: 189, 192. 1790; Rao and Verma, Bull. Bot. Surv. India 16 (1-4): 20. 1974.

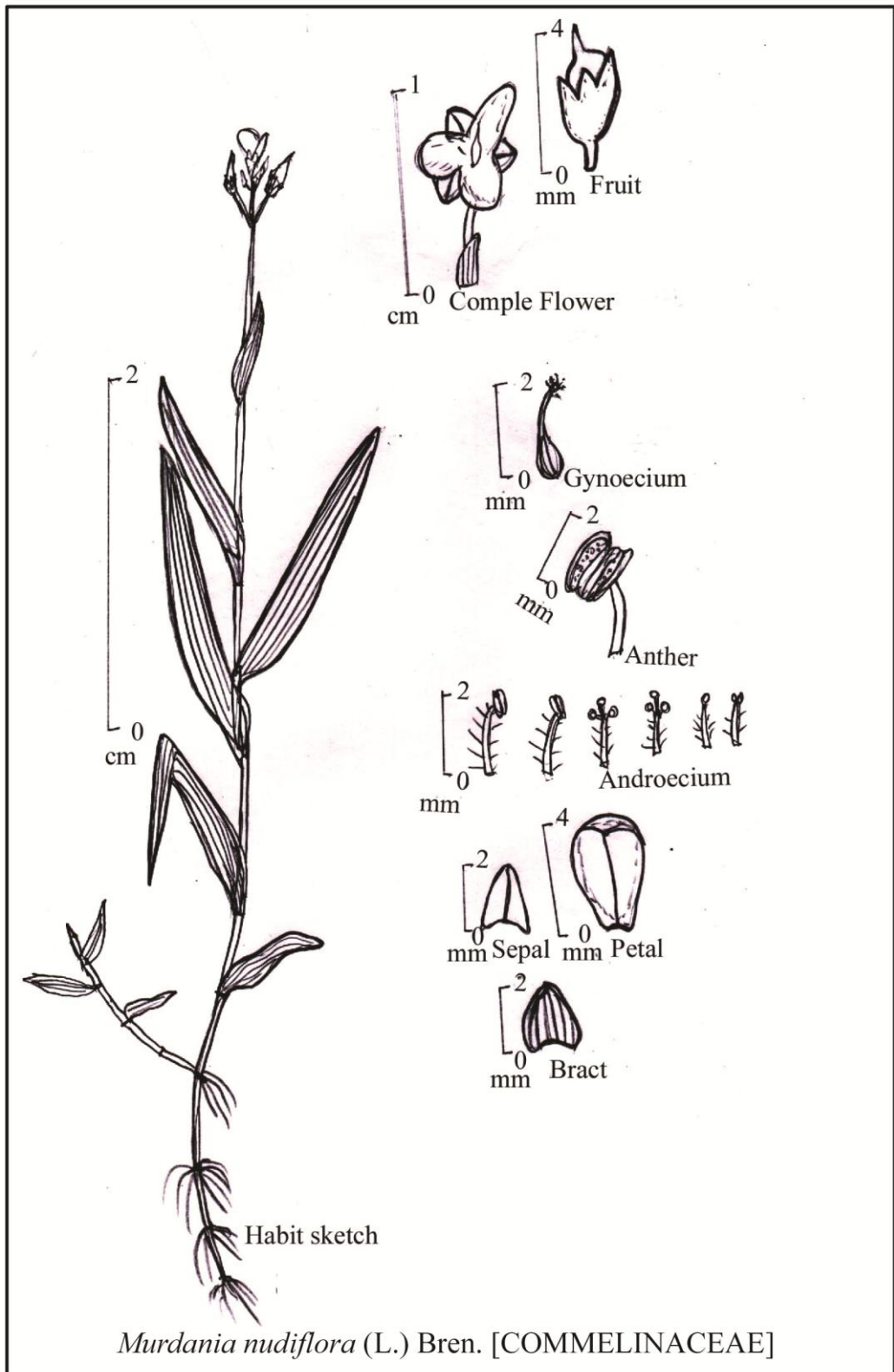
Perennial herb. Stems erect, rhizomatous. Leaves alternate. Inflorescence solitary 6 or several, terminal or axillary in axils of apical leaves. Flowers actinomorphic. Sepals free, leathery. Petals blue or purple, free. Fertile stamens 3 or 6. Filaments glabrous. Fruit a capsule.

About 20 species distributed in the tropical regions; 1 species in India (Hook. f., 1892); 1 in Assam (Rao and Verma, 1974) and 1 species in the study area.

Floscopa scandens Lour., Fl. Cochinch. 193. 1790; *Aneilema hispida* D. Don, Prodr. Fl. Nepal. 45. 1825; Hook. f., FBI 6: 390. 1892; Rao and Verma, Bull. Bot. Surv. India 16 (1-4) 20. 1974; Chowdhury, Assam's Flora 293. 2005.

Perennial herb with trailing, fleshy, erect stem. Leaf lamina linear to lanceolate. Flowers pinkish to purplish in large hairy panicle. Stamens 6, filaments 3.0-5.5 mm long. Anthers yellow. Ovary stipitate. Capsules ovoid, compressed. Seeds gray blue. (Photo File 19. C)

Habitat: Grows in wet places.



Fls. and Frts.: Aug.-Dec.

Phitor-Sonai, Udalguri; Binu. 110; November 20, 2015.

Murdania Royle.

I 11. Bot. Himal. Mts. 1: 403, Pl. 95, f. 3. 1839; Rao and Verma, Bull. Bot. Surv. India 16 (1-4): 13. 1974.

Perennial herb. Rhizomes present or absent. Stems creeping or ascending. Leaves alternate and linear. Inflorescence a panicle, sometimes shortened into heads, sometimes reduced to solitary flowers. Flowers actinomorphic. Sepals free. Petals free, blue, pink, purple or white. Fertile stamens 3. Ovary 3-loculed.

About 50 species distributed in tropical and sub-tropical regions; 12 species distributed in tropical and subtropical regions; 12 species in Assam (Rao and Verma, 1974) and 1 species in the study area.

Murdania nudiflora (L.) Bren., in Kew Bull. 7. 189. 1952; *Commelina nudiflora* L., Mant. 177. 1767 (non Sp. Pl. 41. 1753); *Aneilema nudiflorum* (L.) R. Brown, Prodr. 271. 1810; Hook. f., FBI 6: 378. 1892; Rao and Verma, Bull. Bot. Surv. India 16 (1-4): 15. 1974; Chowdhury, Assam's Flora 293. 2005.

An annual herbs with linear leaves. Stems erect, creeping. Flowers bisexual, slightly bilaterally symmetric, purplish pink. Sepals upto 3 mm long. Petals purple, 3 mm long. Fertile stamens 2.0-2.5 mm long, staminodes 4. Pistil 4 mm long. Seeds 2 per locule. **(Plate 28)** (Photo File 19. A)

Habitat: Grows in moist localities.

Fls. and Frts.: Aug.-Dec.

Udalguri Nalbari; Binu. 178; August 15, 2016.

ARECACEAE Schultz Sch.

Nat. Syst. Pflanzenr. 317. 1832.

Trees, shrubs like plants or climbers, either monoecious, dioecious or with bisexual flowers. Stems simple or rarely branched, sometimes absent, arising from long rhizomes, often ringed by leaf scars, the surface smooth nor armed with spines. Leaves

spirally arranged, sometimes forming a crown shaft. Petiole usually present, sometimes armed. Leaf blades pinnate, palmate. Inflorescence spicate or paniculate. Flowers borne singly or in triades of one female and two male flowers or in a line of one female and several males along the rachillate. Fruit a dry or fleshy drupe.

Genera 1914 and species 2500 in world wide and 9 genera, 10 species in the study area.

Key to genera

- 1a. Leaves simple, flabelliform, fan like or orbicular:
 - 2a. Flowers monoecious, scattered, small; fruit small:
 - 3a. Carpels triangular; spadix sparingly branched or simple.*Licuala*
 - 3b. Carpels globose, spadix loosely panicked.*Livistonia*
 - 2b. Flowers dioecious; males small, sunk in cavities of thickened, catkin like branches; females large; fruit large.*Borassus*
- 1b. Leaves pinnate:
 - 4a. Fruits clothed with closely adpressed imbricating scales; stem climbing, rarely erect, armed; leaf rachis or spadix or sheath produced as an armed flagellum.. ..*Calamus*
 - 4b. Fruit not clothed with scales; stem erect, unarmed; flagellum not produced:
 - 5a. Leaves 2-pinnate; leaflets obliquely cuneate, apical margin caudate; monoecious..... ..*Caryota*
 - 5b. Leaves 1-pinnate; leaflets linear, oblong, margin entire; mono or dioecious:
 - 6a. Lowest leaflets modified into spines; dioecious..*Phoenix*
 - 6b. Lowest leaflets non spinous; monoecious:
 - 7a. Stem sympodial; stem and leaf golden yellow.*Chrysalidocarpus*

7b. Stem monopodial; stem and leaf green:

8a. Drupe 3-5 cm across; stem ca 15 cm
across; leaflets apically praemorse,
leaf sheath tubular. *Areca*

8b. Drupes vary; stem ca 40 cm
across; leaflets apically acuminate,
leaf sheaths absent. *Cocos*

Areca L.

Sp. Pl. 2: 1189. 1753; Becc. & Hook. f., FBI 6: 405. 1892.

Perennial. Monoecious, solitary or clumping. Trunk slender, unarmed, topped by a crown shaft formed of leaf bases. Leaves pinnate. Inflorescence below the crown shaft many branched or spicate, with flowers in triads or with male flowers in distichous pairs in distal parts and the triads in proximal part. Fruit with a tanning, ovoid or globose drupe.

About 48 species, from Sri Lanka and N. E. India through S. E. Asia to as far east as New Guinea and the Solomon Islands; 4 species in India (Becc. and Hook. f., 1892); 3 species in Assam (Chowdhury, 2005) and 1 species in the study area

Areca catechu L., Sp. Pl. 1189. 1753; Becc. & Hook. f., FBI 6: 405. 1892; Chowdhury, Assam's Flora. 294. 2005.

Perennial tree. Trunk solitary, with green crown shaft of few leaves. Leaves arched. Pinnae irregularly toothed at apex, narrowly lanceolate. Inflorescence a panicle. Female flowers few, at the base of rachilla. Male flowers in upper part of rachillae in distichous pairs. Stamens 6. Fruit ovoid, yellow or orange. (**Plate 29**)

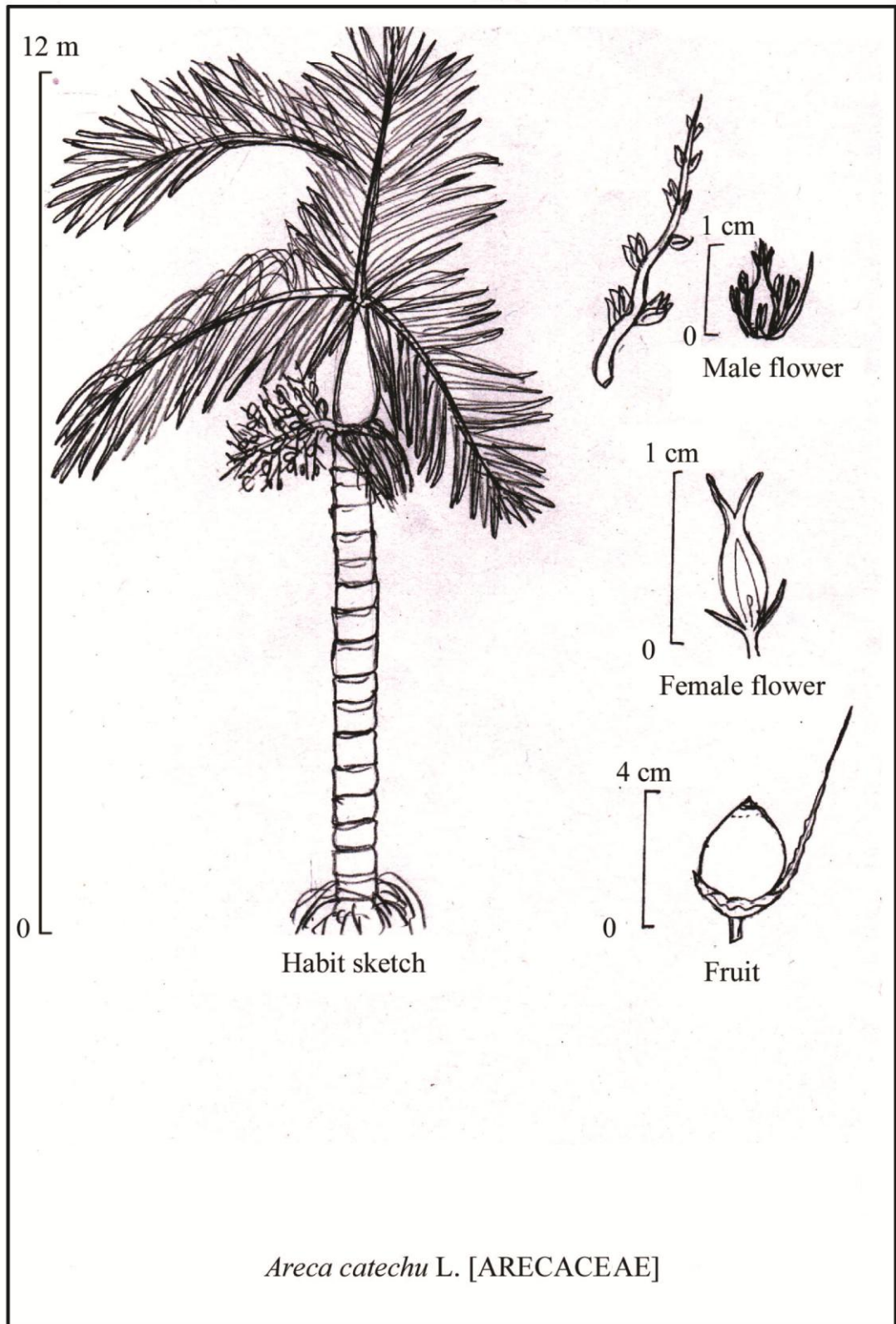
Habitat: Widely cultivated in dry area.

Fls. and Frts.: Throughout the year.

Vern. name: Goy (Bd.) and Tamul (Rh. and As.)

Udalguri Nalbari; Binu. 195; December 02, 2016.

PLATE – 29



***Borassus* L.**

Sp. Pl. 2: 1187. 1753; Becc. & Hook. f., FBI 6: 481. 1893.

Perennial plant. Dioecious, solitary. Trunks rigid, unarmed. Leaves costa palmate, pleated, greyish green or bluish, in a dense crown. Petiole elongate, armed with saw teeth. Inflorescence axillary, branched, sheathed in persistent bracts. Male flowers clustered in catkin like spikes. Stamens 6. Female flowers solitary, much larger than male flowers, with lobe daring of staminodes. Fruit large, berry like.

A genus with 7 species distributed in Tropical Africa, Madagascar, Indo-China, Ceylon, Malaya, India and New Guinea; 1 species in India (Becc. and Hook. f., 1893);

1 species in Assam (Chowdhury, 2005); and 1 species in the study area.

***Borassus flabelliformis* L.**, Sp. Pl. 1187. 1753; Becc. & Hook. f., FBI 6: 482. 1893; Chowdhury, Assam's Flora 294. 2005.

Perennial. Stems tall, erect. Leaves fan shaped, up to 1.0-1.5 m long, with many ribs or plaits, these segments bifid at the apex. Petiolar teeth jagged. Fruit orange in colour. Seeds with a very hard wall.

Habitat: Grows in high areas.

Fls. and Frts.: Feb.-Apr.

Vern. name: Tal (As., Bd. and Rh.)

Udalguri town; Binu. 196; September 02, 2016.

***Calamus* L.**

Sp. Pl. 1: 325. 1753; Becc. & Hook. f., FBI 6: 436. 1892.

Perennial shrub, dioecious and scandent. Stems clustered or less often solitary, mostly slender and climbing. Leaves pinnate, spiny. Inflorescence usually elongate, branched to 3 orders. Male inflorescence more branched than female inflorescence. Male flowers borne along opposites sides of rachillae. Female flowers borne in pairs with a sterile male flower. Fruits variously shaped and coloured, 1-seeded.

About 385 species distributed from W. Africa, India and Sri Lanka through South and South East Asia to Australia and the Pacific islands; 72 species in India (Becc. and Hook. f., 1892); 12 species and 2 varieties in Assam (Baishya, 1999) and 2 species in the study area.

Key to species

1a. Fruits broadly ovoid. *C. flagellum*

1b. Fruits sub-globose. *C. tenuis*

Calamus flagellum Griff. ex Mart., Hist. Nat. Palm. 3: 333. 1853; Hook. f., FBI 6: 439. 1892; Hajra and Jain, Bot. Kaz. Man. 253. 1978; Chowdhury *et al*, Assam's Flora 294. 2005.

Sub-scanded shrub. Stems 3 cm across. Leaves 2-3 m long. Leaflets sub-opposite, linear to lanceolate, largest 65-70 cm long. Ochrea small, 2-lobed, caduceus. Petiole 30-40 cm, spiny. Spathes tubular. Spadix 3 m long, produced into a long, clawed flagellum. Male flowers 1 cm long. Calyx divided to middle. Female flowers conical, 7 mm long. Calyx 3-toothed. Fruits broadly ovoid, 3 cm long; scales in 12 series with dark intra-marginal lines. (Photo File 20. A)

Habitat: Grows in the forest areas.

Fls. and Frts.: Mar.-Dec.

Vern. name: Raidwng (Bd.)

Rawta R. F., Udalguri; Binu. 107; September 02, 2016.

Calamus tenuis Roxb., Fl. Ind. 3: 780. 1832; Becc. & Hook. f., FBI 6: 46; Chowdhury, Assam's Flora 294. 2005.

Perennial, climber. Growing in clumps. Stems large, slender, scandent. Leaves glabrous, pinnate, leaflets 20-30 on each side, equidistant, alternate, linear to lanceolate, acuminate, gradually becoming smaller upward. Leaf petiole short, stout and pale. Bracts tubular spiny. Inflorescence very long, decompounds. Flowers minute. Fruit sub-globose. (Photo File 20. B)

Habitat: Grows wild in the roadside at wasteland .

Fls. and Frts.: Jun.-Aug.

Vern. name: Jati bet. (As.)

Udalguri town; Binu. 197; September 02, 2016.

Caryota L.

Sp. Pl. 2: 1189. 1753; Becc. & Hook. f., FBI 6: 422. 1892.

Perennial. Monoecious plants. Plant solitary with multiple trunks, unarmed. Trunks often with persistent petiole bases. Leaves bipinnate, the pinnae irregularly toothed, oblique at apex. Bract keeled, with fibrous margin. Inflorescence axillary. Fruit globose, unedible drupe.

13 species found in Asia and South Pacific; 3 species in India (Becc. and Hook. f., 1892); 2 species in Assam (Chowdhury, 2005); 1 species in the study area.

Caryota urens L., Sp. Pl. 1189. 1753; Becc. & Hook. f., FBI 6: 422. 1892; Chowdhury, Assam's Flora 294. 2005.

Perennial tree. Stems unarmed, solitary, unbranched, conspicuously ringed with narrow leaf scars. Leaves bipinnate, induplicate with a terminal leaflet. Leaflets numerous, obliquely wedge shaped, upper margin irregularly toothed. Inflorescence axillary, solitary, pendulous. Flowers bisexual, with 3 sepals and 3 petals. Stamens 3. Ovary superior. Fruit globose.

Habitat: Grows in high places.

Fls. and Frts.: Apr.-May.

Vern. name: Chao-Tamul (Rh.) and Chao (Bd.)

Udalguri Sapkhaiti; Binu. 198; September 02, 2016.

Chrysalidocarpus H. Wendl.

Bot. Zeitung (Berlin) 36: 171. 1878.

Perennial. Small tree. Stems erect, unarmed, with annual petiolar scars, flagellum not produced. Leaves 1-pinnate. leaflets linear, oblong, margin entire, often leaflets and petioles become golden yellow in colour. Flowers monocious, shortly pedicillate

Chrysalidocarpus lutescens H. Wendl., Bot. Zeitung (Berlin) 36: 171. 1878; Chowdhury *et al.*, Assam's Flora 294. 2005.

Cultivated commonly as ornamental plant in garden and home-stead.

Habitat: Grows in exposed areas.

Fls. and Frts.: Throughout the year.

Vern. name: Golden palm. (Eng.)

Udalguri town; Binu. 199; September 10, 2016.

Cocos L.

Sp. Pl. 2: 1188. 1753; Becc. & Hook. f., FBI 6: 482. 1892.

Perennial. Plants monoecious, solitary, unarmed. Stem with adventitious at base, without apical crown shaft; leaves in a crown, pinnate, with numerous, regularly arranged leaflets. Petiole base forming a fibrous sheath. Inflorescence among the leaves, of once 149 branched, simple panicles. Male flowers with stamens 6 and a pistillode. Female flowers much larger than the male, globose. Fruit a 1-seeded drupe.

30 species world wide, 1 species in India (Becc. and Hook. f., 1892); 1 in Assam (Chowdhury, 2005) and 1 species in the study area.

Cocos nucifera L., Sp. Pl. 1188. 1753; Becc. & Hook. f., FBI 6: 482. 1892; Chowdhury, Assam's Flora 295. 2005.

Perennial tree. Stems stout. Leaf blade up to 3 m long. Leaflets linear to lanceolate, yellowish green. Inflorescence up to 1 m long, consists of male and female axillary flowers. Male flowers numerous. Female flowers fewer. Fruit ellipsoid to obovoid, often with 3 blunt angles, green.

Habitat: Grows in exposed and dry areas.

Fls. and Frts.: Throughout the year.

Vern. name: Narikol (As. and Bd.)

Udalguri Nalbari; Binu. 200; September 10, 2016.

Licuala Wurm

Verh. Batav. Gen. Kuns. 2: 473. 1780; Becc. & Hook. f., FBI 6: 430. 1892.

Small to medium sized palm. Monoecious or rarely dioecious. Trunk solitary or clumping. Leaves 5-25, palmate. Petioles spiny along margins. Leaf blades circular in outline, split to base into several multi folded wedge shaped segments. Apices of segments truncate. Inflorescence borne among leaves. Flowers bisexual with 6 stamens and 3 carpels. Fruit ovoid globose.

149 species world wide; 14 species in India (Becc. and Hook. f., 1892) and 1 species in the studyarea.

Licuala peltata Roxb. ex Buch.-Ham., Mem. Wern. Nat. Hist. Soc. 5: 313. 1826; Becc. & Hook. f., FBI 6: 430. 1892; Chowdhury, Assam's Flora 295. 2005.

Perennial shrub. Plant solitary, rarely caespitose, monoecious, with stems which may reach up to 6 m. Stem covered from base by petioles. Leaves intense green, orbicular, 1-1.5 m long, usually divided up to the base in several cuneiform segments, apex truncated. Petioles armed with curved thorns. Inflorescence are compound spikes, pendulous, carry greenish white hermaphrodite flowers. Fruits globular. (Photo File 20 C and D)

Habitat: Grows in the forest area.

Fls. and Frts.: Nov-May.

Vern. name: Khofri Bilai (Bd.)

Gersong, Udalguri; Binu. 201; October 15, 2016.

Livistona R. Brown

Prodr. 267. 1810.

Perennials tree. Stems solitary, stout with persistent leaf bases. Leaves palmate or costapalmate, forming a dense crown. Petioles spiny on margins. Inflorescence borne among leaves. Flowers bisexual with 6 stamens and 3 carpels. Fruit globose to ellipsoid.

33 species distributed from N. E. Africa and India to Australia, New Guinea, the Pacific Islands, Philippines, China, Japan; 4 species in India (Becc. and Hook. f., 1892); 2 in Assam (Chowdhury, 2005); 1 species in the study area.

Livistona jenkinsiana Griff., Calcutta J. Nat. Hist. 5: 334. 1845; Becc. & Hook. f., FBI 6: 435. 1892; Chowdhury, Assam's Flora 295. 2005.

Perennial tree. Trunk solitary, up to 11 m tall, about 30 cm in diameter. Leaves palmate, recurved spines along margins. Leaf blades circular in outline, divided into several segments, adaxially green, abaxially greyish green, apical lobes pendulous. Flowers solitary or borne in clusters of 2-6, sessile. Fruit globose to reniform.

Habitat: Grows in exposed and dry areas.

Fls. and Frts.: Jun.-Sep.

Vern. name: Tokou (As. and Bd.)

Udalguri town; Binu. 202; October 15, 2016.

Phoenix L.

Sp. Pl. 2: 1188. 1753; Becc. & Hook. f., FBI 6: 424. 1892.

Perennial tree. Dioecious. Trunk solitary, clumping or prostrate. Leaves pinnate. Petioles short or absent. Male and female flowers on separate plants. Lower parts inconspicuous, yellowish brown.

14 species distributed in the Old World; 8 species in India (Becc. and Hook. f., 1892); 3 species in Assam (Chowdhury, 2005) and 1 species in the study area.

Phoenix dactylifera L., Sp. Pl. 2: 1188. 1753; Becc. & Hook. f., FBI 6: 424. 1892.

Perennial tree. Trunk up to 24 m tall, covered with the remains of sheaths from fallen leaves. Leaves pinnate, clustered together forming a loose crown shaft, upper leaves ascending, basal leaves recurving, the segments linear, sharp pointed. Flowers unisexual, clustered in axillary spadices. Fruits oblong berries.

Habitat: Grows in exposed and dry areas.

Fls. and Frts.: Mar.-Jul.

Vern. name: Khejur (Bd.)

Udalguri town; Binu.203; October 15, 2016.

PANDANACEAE R. Brown

Prodr. Fl. Nov. Holl. 340. 1810.

Perennial tree, shrub or woody lianas, evergreen, dioecious. Stem simple, ringed with annular leaf scars. Aerial roots present or absent. Leaves simple, numerous, spirally arranged at apex, sessile, linear to lanceolate, leathery. Male inflorescence axillary and terminal. Perianth absent. Male flowers sessile. Stamens numerous. Female inflorescence terminal, solitary or in spikes, racemes or capitula. Pistils free. Fruit a berry or a drupe.

3 genera with about 800 species occur in the tropics, a few are temperate

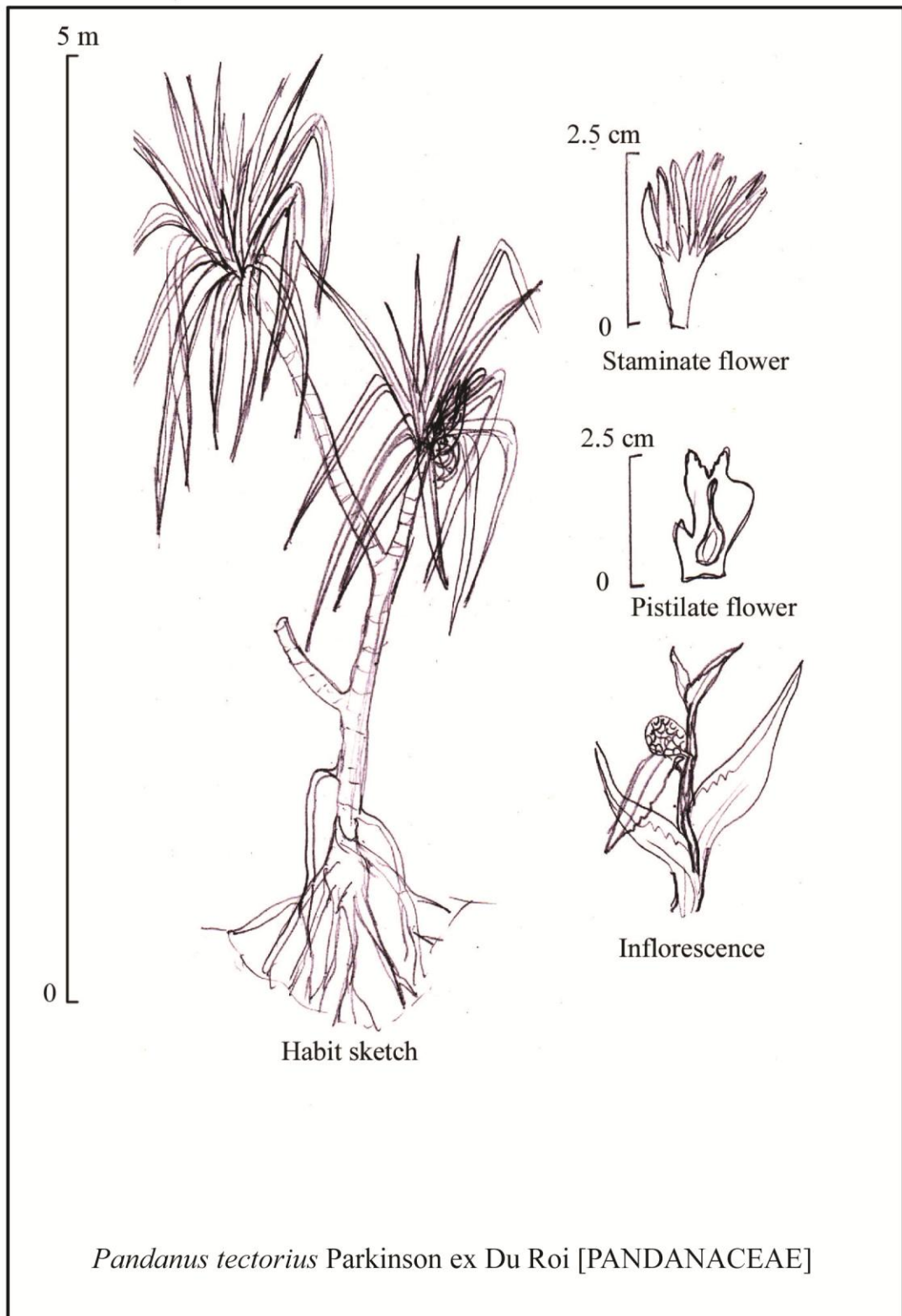
Pandanus Hook. f.

Benth. & Hook. f. Gen. Pl. 3: 949. 1883.

Perennial tree, shrub or herb, evergreen, dioecious. Stems simple or branched, erect or prostrate with prop roots and aerial roots. Leaves simple, terminal, sessile densely arranged in spirals, linear, often spinous serrate on margin. Inflorescence of large bracteate heads or spadices. Perianth absent. Flowers not individually distinguishable. Fruit a hard drupe.

About 600 species in the tropics; 7 species in India (Hook. f., 1893); 5 in Assam (Chowdhury, 2005) and 2 species in the study area.

PLATE – 30



Key to species

1a. Leaves green. *P. odorifer*

1b. Leaves variegated, yellowish green. *P. tectorius*

Pandanus odorifer (Forssk.) Kuntze, Gen. Pl. 2: 737. 1891 (*Keura odorifera* Fossk.);
Pandanus odoratissimus Roxb., Hook. f., FBI 6: 485. 1893.

Perennial shrub. 4-5 m tall with multiple branches. Trunk greyish brown, ringed by leaf scars with basal prop roots. Leaves spiraled in 3 rows, up to 2m long and 6 cm broad, linear to uniform, apex gradually narrowed, the margins and dorsal midrib armed with white prickles, glaucous beneath. Female inflorescence terminal. Male inflorescence of several spikes. (Photo File 21. A)

Habitat: Grows in dry areas.

Fls. and Frts.: Feb.-Apr.

Vern. name: Keteki (As. and Rh.), Screwpine (Eng.)

Udalguri town; Binu.225; September 08, 2015.

Pandanus tectorius Parkinson ex Du Roi, Naturforscher (Halle) 4: 250. 1774.

Perennial shrub. Stems bent. Leaves uniform, caudate, acuminate, variegated green and cream yellow striped, margin spinose, spines pointing forward. Inflorescence axillary. Male flowers a cylindrical spike of numerous flowers. Female flowers: carpels in groups of 4-10. (**Plate 30**) (Photo File 21. B)

Habitat: Grows along roadside.

Fls. and Frts.: Mar.-Jun.

Vern. name: Keteki (As.)

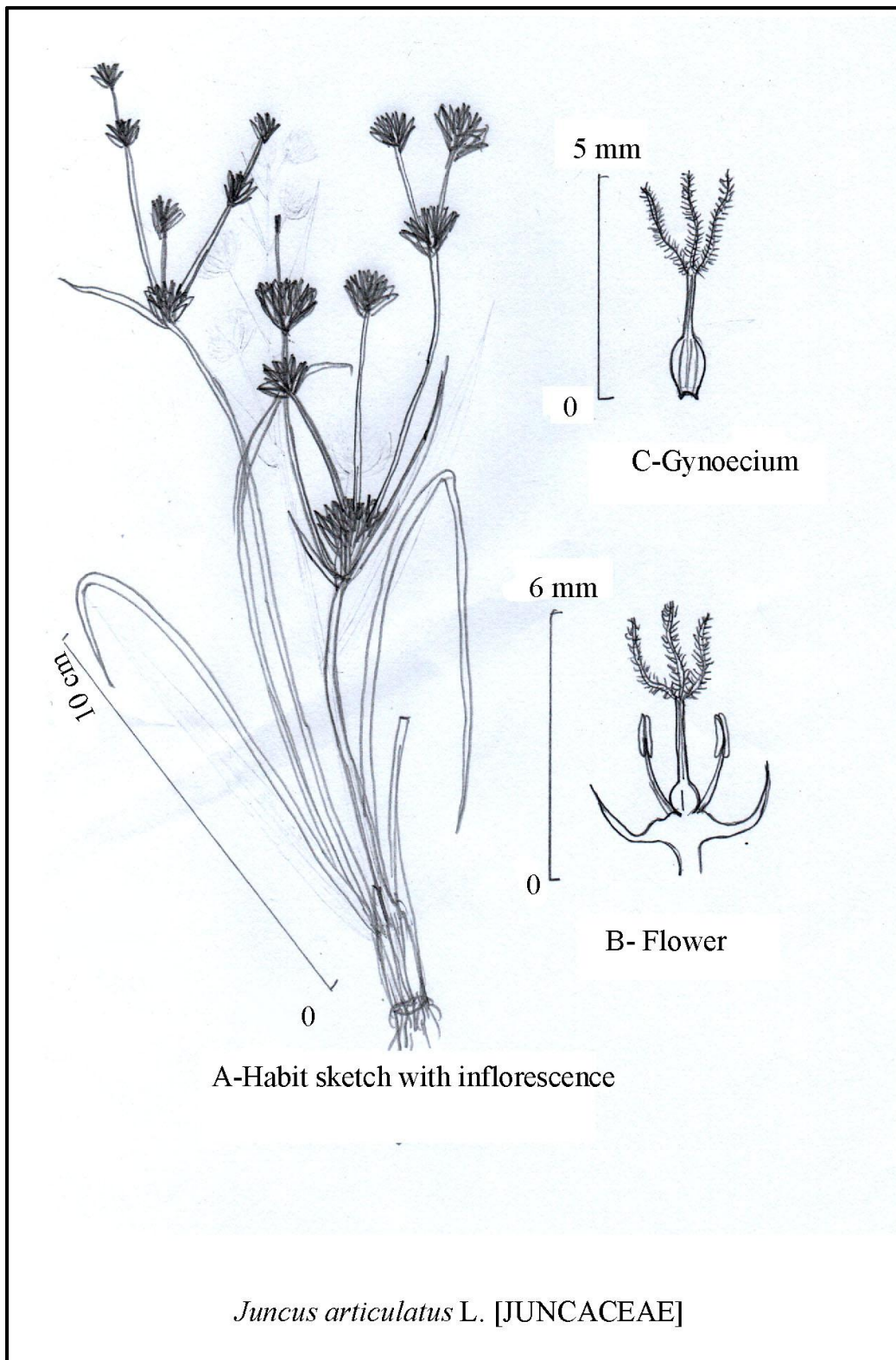
Kobirali, Udalguri; Binu. 127; September 08, 2015.

JUNCACEAE Juss.

Gen. Pl. 43. 1789.

Perennial, rhizomatous. Stem round or flat. Leaves basal, alternate, tristichous, tufts,

PLATE – 31



Leaf sheaths closed. Inflorescence of head like luster or single flowers variously arranged. Flowers bisexual, radially symmetric. Tepals 6. Sepals 3, petals 3. Stamens 3 or 6. Pistil one. Ovary superior. Capsule many seeded.

7 genera distributed in tropical mountains and temperate regions.

***Juncus* L.**

Sp. Pl. 325. 1753; Hook. f., FBI 6: 392. 1892; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 3. 1976.

Perennial, rarely annual herb. Rhizomatous, usually tufted. Leaves either all radical or both radical or few cauline, flat to cylindrical. Inflorescence terminal. Flowers clustered, few or solitary. Perianth segments 6. Stamens 3 or 6. Fruit a capsule.

347 species world wide; 26 species in India (Hook. f., 1892); 10 species Assam (Rao and Verma, 1976) and 1 species in the study area.

***Juncus articulatus* L.**, Sp. Pl. 1: 327. 1753; Hook. f., FBI 6: 395. 1892; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 5. 1976; Chowdhury, Assam's Flora. 294. 2005.

Perennial herb. Tufted stems with erect to decumbent. Leaves flat, basal, cauline, linear to filiform. Inflorescence with compound cymes of heads, bracteates. Flowers sessile. Perianth segments ovate to lanceolate. Stamens 3. Carpels 3. Capsule many seeded. (**Plate 31**) (Photo File 22. A)

Habitat: Common in forest based swamp areas.

Fls. and Frts.: Jan.-Dec.

Serfang, Udalguri; Binu. 06; February 27, 2014.

ARACEAE Juss.

Gen. Pl. 23. 1789.

Plants terrestrial or epiphytic, rarely aquatic. Stems often with thickened rhizomes or corms, climbing and with alternate leaves. Leaves usually with a sheathing or winged

petiole. Leaf blades with striate or reticulate veins, simple, lobed or pinnatifid, occasionally perforated. Inflorescence a terminal or lateral, pedunculate, often stipitate spike (spadix) of flowers, subtended by a spathe. Flowers bisexual or unisexual, when unisexual arranged on the spadix with a female zone at base and a male zone above, the zone sometimes separated by zone of sterile filaments. Perianth of 4 or 6. Stamens 1-6, free or connate. Ovary superior. Fruit a berry.

115 genera 1500 species growing in warmer countries of the world with only a few in the temperate regions and 10 genera, 13 species in the study area.

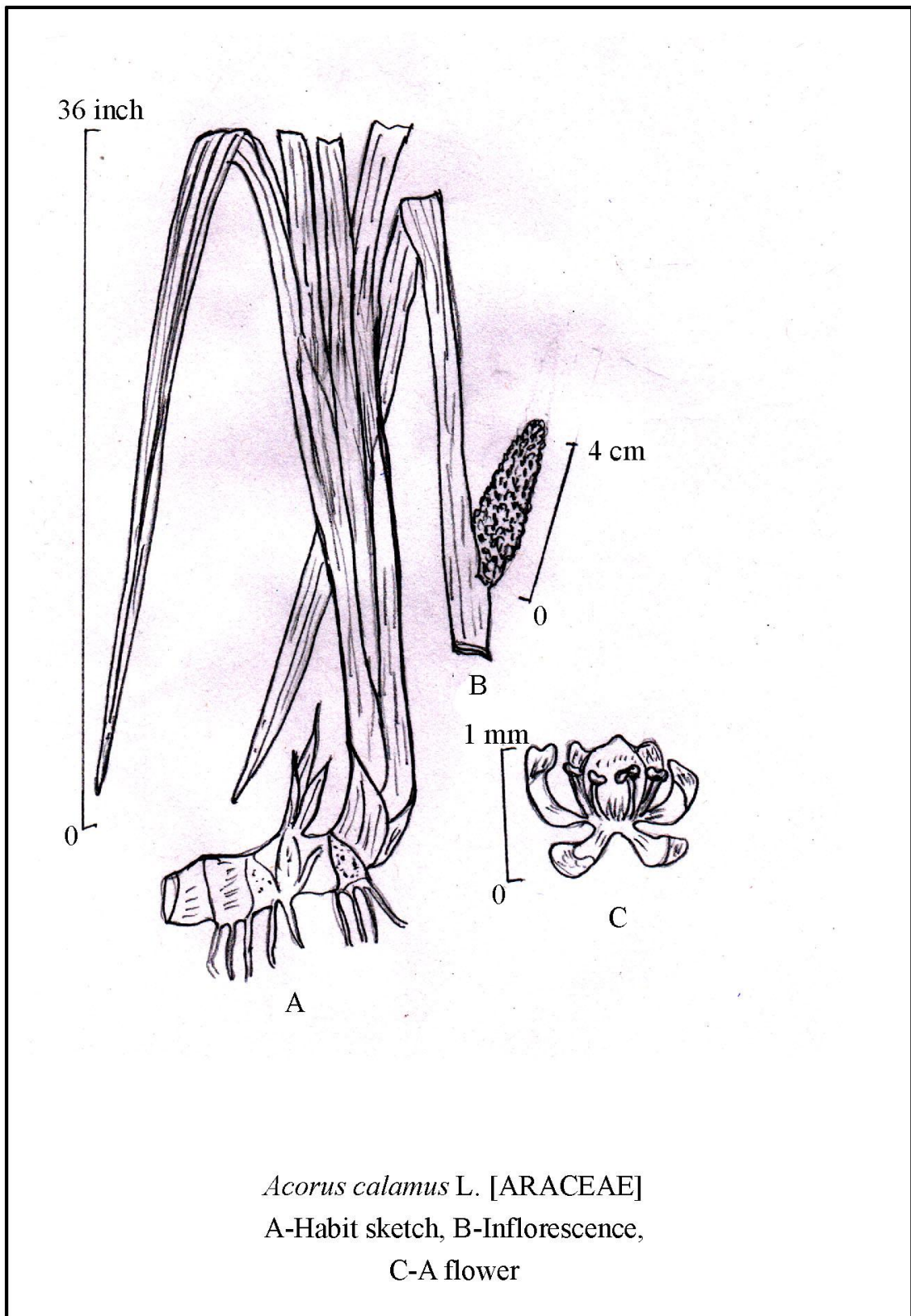
Key to genera

- 1a. Aquatic floating, leaves pubescent and rosette. *Pistia*
- 1b. Terrestrial, climbing herbs, glabrous and not rosette. *Monstera*
 - 2a. Stem spinous, leaves lobed, ovary solitary. *Lasia*
 - 2b. Stem smooth, leaves entire, ovules many. *Acorus*
 - 3a. Leaves entire, 3-5 lobed; flowers appear with leaves;
 - Staminate and pistillate zones contiguous... .. *Typhonium*
 - 3b. Leaves 3-partite, segments pinnatisect; flowers appear
 - before leaves; staminate and pistillate
 - zones contiguous. *Amorphophallus*
 - 4a. Leaves variegated.. *Caladium*
 - 4b. Leaves not variegated:
 - 5a. Leaves peltate; spadix with a barren appendage:
 - 6a. Ovules few, basal; seeds subglobose... .. *Alocasia*
 - 6b. Ovules many, parietal; seeds oblong. *Colocasia*
 - 5b. Leaves not peltate; spadix without an appendage.. *Homalomena*

Acorus L.

Sp. Pl. 1: 324. 1753; Gen. Pl. 5: 151. 1754; Hook. f., FBI 6: 555. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 34. 1976.

PLATE – 32



Acorus calamus L. [ARACEAE]
A-Habit sketch, B-Inflorescence,
C-A flower

Perennial herb. Grass like. Leaves bright green. Sheathing base 2-facial. Distal part of leaf 1-facial, flattened in median rather than transverse plane, veins prominent. Inflorescence solitary. Flowers in a close spadix.

2 species in the world; 2 in India (Hook. f., 1893); 2 in Assam (Rao and Verma, 1976) and 1 species in the study area.

Acorus calamus L., Sp. Pl. 1: 324. 1753; Hook. f., FBI 6: 555. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 34. 1976; Chowdhury, Assam's Flora 295. 2005.

Perennial herb. Rhizome cylindrical. Leaves bright green, erect, sword shaped, single mid vein prominently raised above leaf surface, other veins barely or not raised. Spadix cylindrical, with greenish yellow flowers. Spathe absent. (**Plate 32**) (Photo File 23. A)

Habitat: Grow along roadside ditches.

Fls. and Frts.: Jun.-Aug.

Vern. name: Bosh (Bd., Rh. and As.)

Kahibari, Udalguri; Binu. 08; September 07, 2014.

Alocasia (Schott) G. Don.

Melet. Bot. 18. 1832; Hook. f., FBI 6: 528. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 27. 1976.

Perennial herbaceous. Stems sometimes stoloniferous and bulbiferous, latex bearing. Leaf blade entire to pinnatisect, long petioled, large heart shaped, prominently veined and sometimes variegated. Glauous boat shaped spathe. Spadix shorter than spathe. Berries red.

About 80 species in the world; 13 species in India (Hook. f., 1893); 6 in Assam (Rao and Verma, 1976) and 4 species in the study area.

Key to species

1a. Plants massive, atleast 1 m tall:

2a. Sinus between posterior leaves peltate. *A. odora*

2b. Sinus between posterior leaves naked. *A. indica*

1b. Plants not massive, if taller than 1 m:

3a. Veins prominent. *A. acuminata*

3b. Veins not so prominent. *A. cucullata*

Alocasia acuminata Schott., Bonplandia 7: 28. 1859; Gard. Bull. Singa. 51: 12. 1999.

Perennial herb. Leaves ovate, elliptic, peltate, upper surface bright lime green with contrasting black zones around the veins, lower leaf surface pale green. Petiole lime green. Spathe white with a tint of pale lime. Spadix yellowish white.

Habitat: Grows in high areas.

Fls. and Frts.: Jun.-Sep.

Udalguri Nalbari; Binu. 191; September 02, 2016.

Alocasia cucullata (Lour.) G. Don, Sweet, Hort. Brit., ed. 3. 631. 1839; *Arum cucullatum* Lour., Fl. Cochinch. 2: 536. 1790; Hook. f., FBI 6: 525. 1893; Rao and Verma, Bull. Bot. Surv. India 18(1-4): 27. 1976; Chowdhury, Assam's Flora 295. 2005.

Perennial herb. Plants up to 1.5 m tall, clumping. Stems erect. Leaf blade broadly ovate to cordate, thick veins prominent on the underside, tip curly. Spathe green.

Habitat: Grows in high areas.

Fls. and Frts.: Jun.-Sep.

Vern. name: Ba-Mwkhang Thaso (Bd.)

Kundarbil, Udalguri; Binu. 192; September 02, 2016.

Alocasia indica (Lour.) Schott, Oesterr. Bot. Wochenbl. 4: 410. 1854; Hook. f., FBI 6: 525. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 28. 1976.

Perennial herb. Evergreen. Stem erect, latex slightly milky. Leaves large, glossy, up to 1 m long, held stiffly upwards, with prominent veining on the under side of the leaf. Spathe yellowish green. Spadix shorter than spathe, whitish. (Photo File 23. B)

Habitat: Grows along the roadside ditches.

Fls. and Frts.: May-Sep.

Vern. name: Man Kochu (As.), Thaso-manai (Bd.)

Panari, Udalguri; Binu. 106; September 14, 2015.

Alocasia odora (Roxb.) K. Koch, Index Seminum Hort. Berol. 1854 (App.) 5: 1854; Hook. f., FBI 6: 526. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 28. 1976; Chowdhury, Assam's Flora 295. 2005.

Perennial herb. Massive, with slightly milky latex. Stem erect. Leaves stiff, leaf blade peltate, cordate to sagittate or cordate to ovate, tips rounded. Spathe pale green. Spadix shorter than spathe. Fruit globose, red.

Habitat: Grows in humus soil.

Fls. and Frts.: Sep.-Feb.

Vern. name: Dudh kochu. (Bd.)

Gersong, Udalguri; Binu. 193; September 16, 2016.

Amorphophallus Blume. *ex* Decne.

Nouv. Ann. Mus. Hist. Nat. 3: 366. 1834; Hook. f., FBI 6: 513. 1893.

Terrestrial herb. Tuberous. Stem tuberous. Leaf usually 1, subtended by basal cataphylls. Leaf blade decompose, 3-partite. Spathe brownish purple.

197 species in the world; 14 species in India (Hook. f., 1893); 2 in Assam (Rao and Verma, 1976) and 1 species in the study area.

Amorphophallus bulbifera (Roxb.) Blume, Rumph. 1: 148. 1835; *Arum bulbiferum* Roxb. Fl. Ind. 3: 510. 1832; Hook. f., FBI 6: 515. 1893; Blatt. In J. Bombay Nat. Hist. Soc. 35: 27. 1931; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 22. 1976; Chowdhury, Assam's Flora 2005.

Perennial herb. Tubers are globose, suppressed and subterranean. Leaf sessile with a long petiole, segments are 3 partition. Inflorescence sessile on the ground. Spathe reddish pink.

Habitat: Grows in swamp areas of the jungles.

Fls. and Frts.: May-Aug.

Vern. name: Ol-kochu. (Bd.)

Bhutan border, Amgasi garobasti, Udalguri; Binu. 93; November 25, 2016.

***Caladium* Vent.**

Mag. Encycl. 4: 463. 1801.

Perennial herb. Tuberous. Petiole green, 15-20 cm long. Leaf blade heart shaped or arrow head shaped and variously spotted with pink, red, gray or white; peduncles solitary. Spathe usually green, hooded. Spadix included in the spathe, the dense flowers arranged in 3 zones, with female flowers at base, sterile male flowers in the constricted middle, and male flowers of 3-5 stamens each in the upper part. Flowers unisexual. Perianth absent. Fruit berry.

8 species in the world and 1 species in the study area.

Caladium bicolor (Ait. ex Dryand.) Vent., Descr. Pl. Nouv. t. 30. 1801; *Arum bicolor* Ait. ex Dryand. Hort. Kew 3: 316. 1789; Bailey, Man. Cult. Pl. 188. 1949; Chowdhury, Assam's Flora 296. 2005.

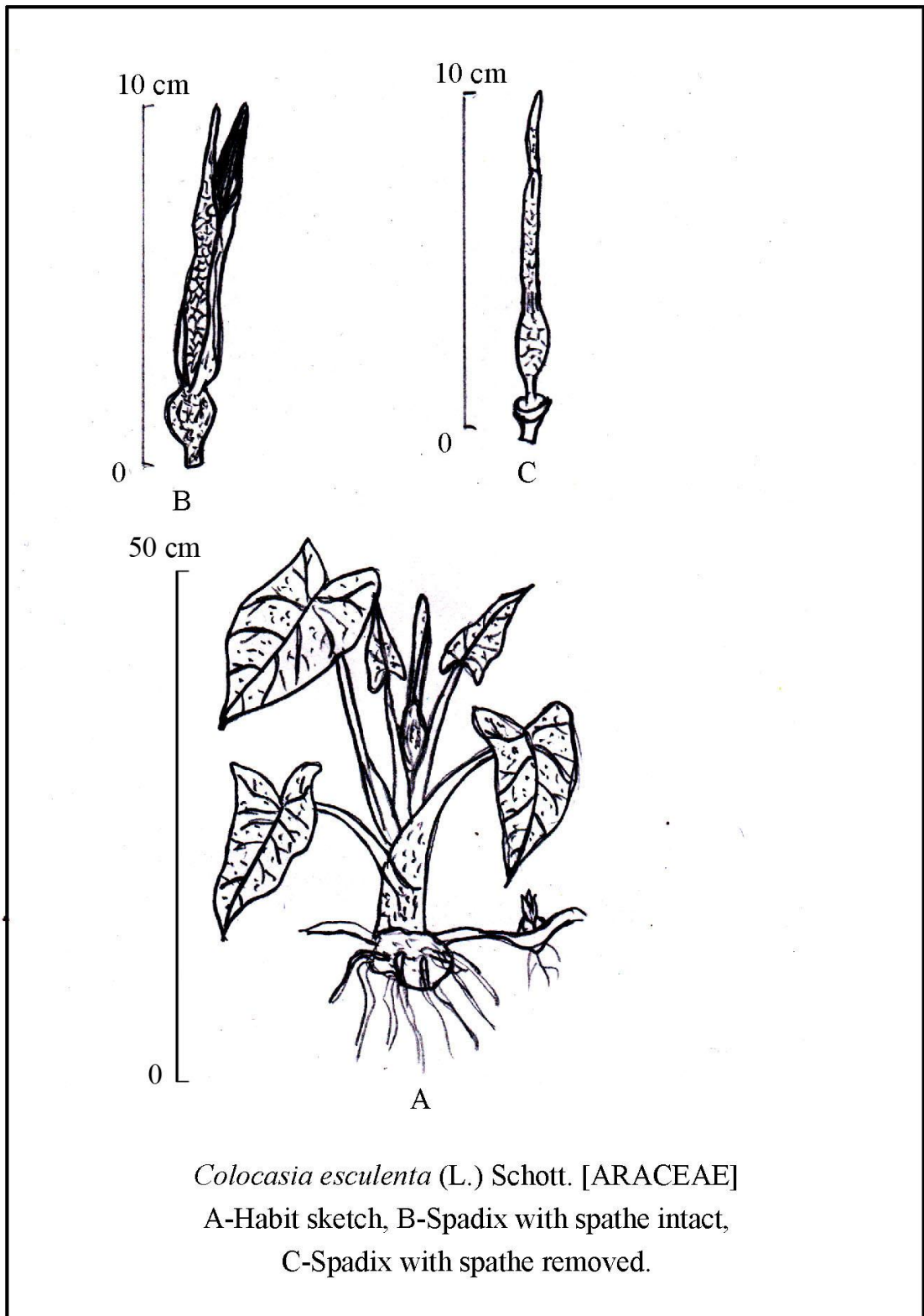
Perennial herb. Rhizome globose. Leaves sagittate to ovate or ovate to triangular, acuminate and mucronate at apex, upper surface has spots of white, pink, red, purple or yellow. Peduncle slender. Spathe coriaceous, whitish green. Petiole slender, elongated. Spadix greamy.

Habitat: Grows along the road side.

Fls. and Frts.: May-Sep.

Udalguri Nalbari; Binu. 97; May 14, 2014.

***Colocasia* Link.**



Colocasia esculenta (L.) Schott. [ARACEAE]
A-Habit sketch, B-Spadix with spathe intact,
C-Spadix with spathe removed.

Diss. Bot. 77. 1795; Hook. f., FBI 6: 523. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 26. 1976.

Perennial herb. Corms underground, tuberous. Petioles thick, succulent. Leaves peltate, cordate to sagittate. Spathe with a short green ellipsoid basal tube and much longer yellow to orange apex. Inflorescence pedunculated. Spathe erect, constricted. Spadix shorter than spathe. Flowers unisexual.

About 8 species in the tropical Asia; 6 in India (Hook. f., 1893); 3 species in Assam (Rao and Verma, 1976) and 1 species in the study area.

Colocasia esculenta (L.) Schott in Schott & Endl. Meletem. Bot. 1: 18. 1832; *Arum esculentum* L., Sp. Pl. 965. 1753; Hook. f., FBI 6: 523. 1983; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 26. 1976; Chowdhury, Assam's Flora 296. 2005.

Perennial herb. Root stock tuberous. Leaves peltate to ovate, cordate at base. Inflorescence on a fleshy stalk shorter than leaf petioles, enveloped by a long yellow bract. Spathe pale yellow. Spadix much shorter than the spathe. Flowers tiny, with female flowers below and male flowers above. Fruit a small berry. (**Plate 33**) (Photo File 23.F)

Habitat: Grows along streams and ponds.

Fls. and Frts.: Jun.-Nov.

Vern. name: Thaso-gwswm (Bd.)

Udalguri Kahibari; Binu. 181; June 07, 2016.

Homalomena Schott.

Melet. Bot. 20. 1832; Hook. f., FBI 6: 531. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 29. 1976.

Perennial herb. Evergreen. Aromatic. Stem creeping, erect or ascending. Leaves long petioled. Leaf blade elliptic, deltoid or sagittate, base usually cordate, apex acuminate, numerous, primary veins diverge from midrib. Inflorescence usually several together.

Spathe persistent, often constricted. Spadix elongate.

About 110 species in the world; 22 species in India (Hook. f., 1893); 2 species in Assam (Rao and Verma, 1976) and 1 species in the study area.

Homalomena aromatica (Spreng.) Schott, Schott & Endlicher, Melet. Bot. 20. 1832; *Zantedeschia aromatica* Spreng. Syst. Veg. 3: 765. 1826; Hook. f., FBI 6: 532. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 30. 1976; Chowdhury, Assam's Flora 296. 2005.

Perennial herb with creeping aromatic rhizome. Leaves radical with sheathing bases, long petioled, sagittate to cordate, apex acuminate. Spathe greenish to yellowish, 10 cm long. (Photo File 23. C)

Habitat: Grows in waste places.

Fls. and Frts.: May-Nov.

Vern. name: Thaso-thukhru (Bd.)

Bathabari, Udalguri; Binu. 121; May 25, 2016.

Lasia Lour.

Fl. Cochinch. 1: 64, 81. 1790; Hook. f., FBI 6: 550. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 32. 1976.

Perennial herb. Evergreen, armoured. Stem long creeping, stoloniferous with terminal part erect or ascending, with armed internodes. Leaves crowded at shoot apex. Petiole long. Leaf blade sagittate to hastate, simple divided, prickly abaxially on larger veins. Inflorescence solitary. Spathe constricted above spadix. Spadix sessile, cylindrical.

3 species in Indo-Malaysia; 1 species in India (Hook. f., 1893); 1 species in Assam (Rao and Verma, 1976); and 1 species in the study area.

Lasia spinosa (L.) Thwaites, Enum. Pl. Zeyl. 336. 1864; *Dracontium spinosum* L., Sp. Pl. 2: 967. 1753; Hook. f., FBI 6: 550. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 32. 1976; Chowdhury, Assam's Flora 296. 2005.

Perennial herb. Stem creeping and stoloniferous, erect or ascending, internodes with stout prickles. Petiole laxly prickly. Leaf blade sagittate or pinnatifid, apex acuminate, thorny along the veins. Peduncle thorny. Spathe spirally twisted above spadix. Spadix greenish yellow. (Photo File 23. D)

Habitat: Common in swamp places.

Fls. and Frts.: Jun.-Sep.

Vern. name: Chengmora (As.), Sibru or Sembra (Bd.)

Kajiamati, Udalguri; Binu. 98; September 14, 2014.

Monstera Adans.

Fam. Pl. 2: 470. 1763.

Epiphytic vines. Evergreen. Climbs by means of aerial roots. Leaves alternate, petiolate, leathery, dark green, very large, ovate. Leaf blades deeply incised and perforated. Spadix enclosed in a yellow concave spathe. Flowers bisexual. Perianth absent. Spathe boat shaped. Spadix densely flowered. Fruit a cluster of white berries.

60 species in the world; 2 species in Assam (Chowdhury, 2005) and 1 species in the study area.

Monstera deliciosa Liebm., Vidensk. Meddel. Dansk Naturhist. Foren. Kjobenhavn 1849: 19. 1849; Chowdhury, Assam's Flora 296. 2005.

Perennial shrub. Climber and climbing by aerial roots. Leaves pinnatisect and often perforated, glossy deep green, alternate. Spadix surrounded by a white spathe.

Habitat: Cultivated as well as wild forest.

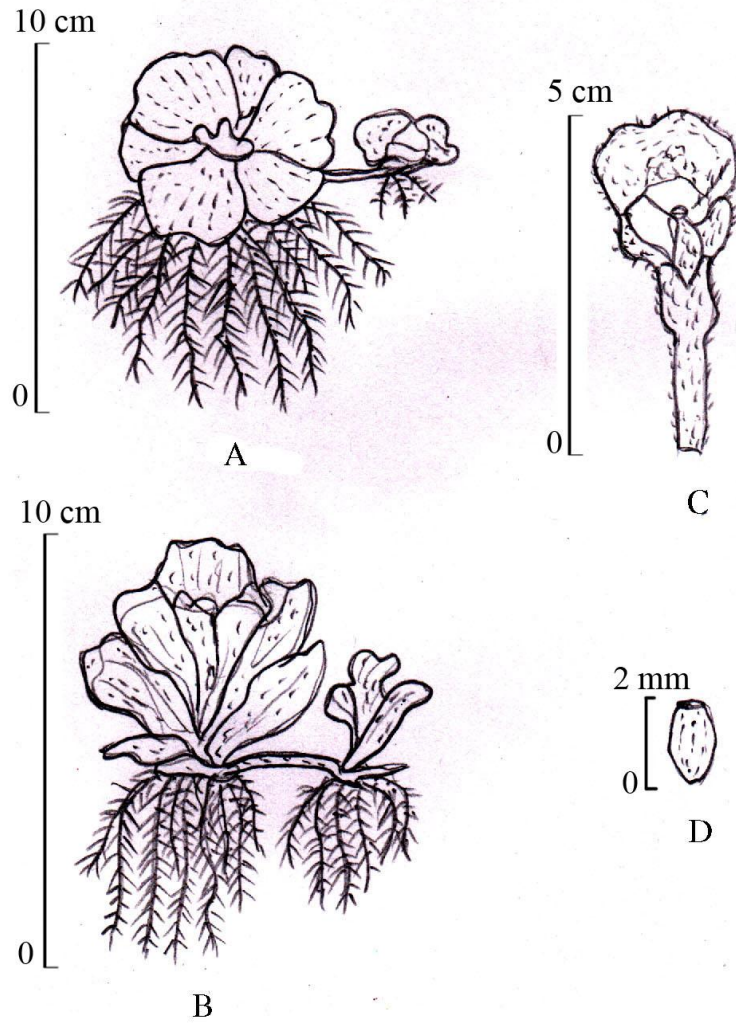
Varn. name: Manlagra Thaso (Bd.)

Gerensi, Udalguri; Binu. 190; September 20, 2016.

Pistia L.

Sp. Pl. 2: 963. 1753; Gen. Pl. 5: 411. 1754; Hook. f., FBI 6: 496. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 32. 1976.

PLATE – 34



Pistia stratiotes L. [ARACEAE]

A-Habit sketch, B-Formation of offset, C-Spadix, D-Seed.

A monotypic genus distributed in tropical and subtropical regions.

Pistia stratiotes L., Sp. Pl. 2: 963. 1753; Hook. f., FBI 6: 497. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 12. 1976; Chowdhury, Assam's Flora 296. 2005.

Perennial. Submerged herb. Aquatic, floating. Stemless, stoloniferous. Leaves sessile, tufted, oblong, veins prominent, light green to grayish green, spongy, pubescent, wavy margins. Inflorescence solitary, 5 cm long; peduncle very short, pubescent. Spathe white to pale green. Spadix shorter than spathe, pale green. Lower greenish. Berries small, ovoid. (**Plate 34**) (Photo File 23. E)

Habitat: Grows profusely in ponds.

Fls. and Frts.: Jan.-Nov.

Vern. name: Bor puni (As.)

Maoriabasti, Udalguri; Binu. 22; July 07, 2014.

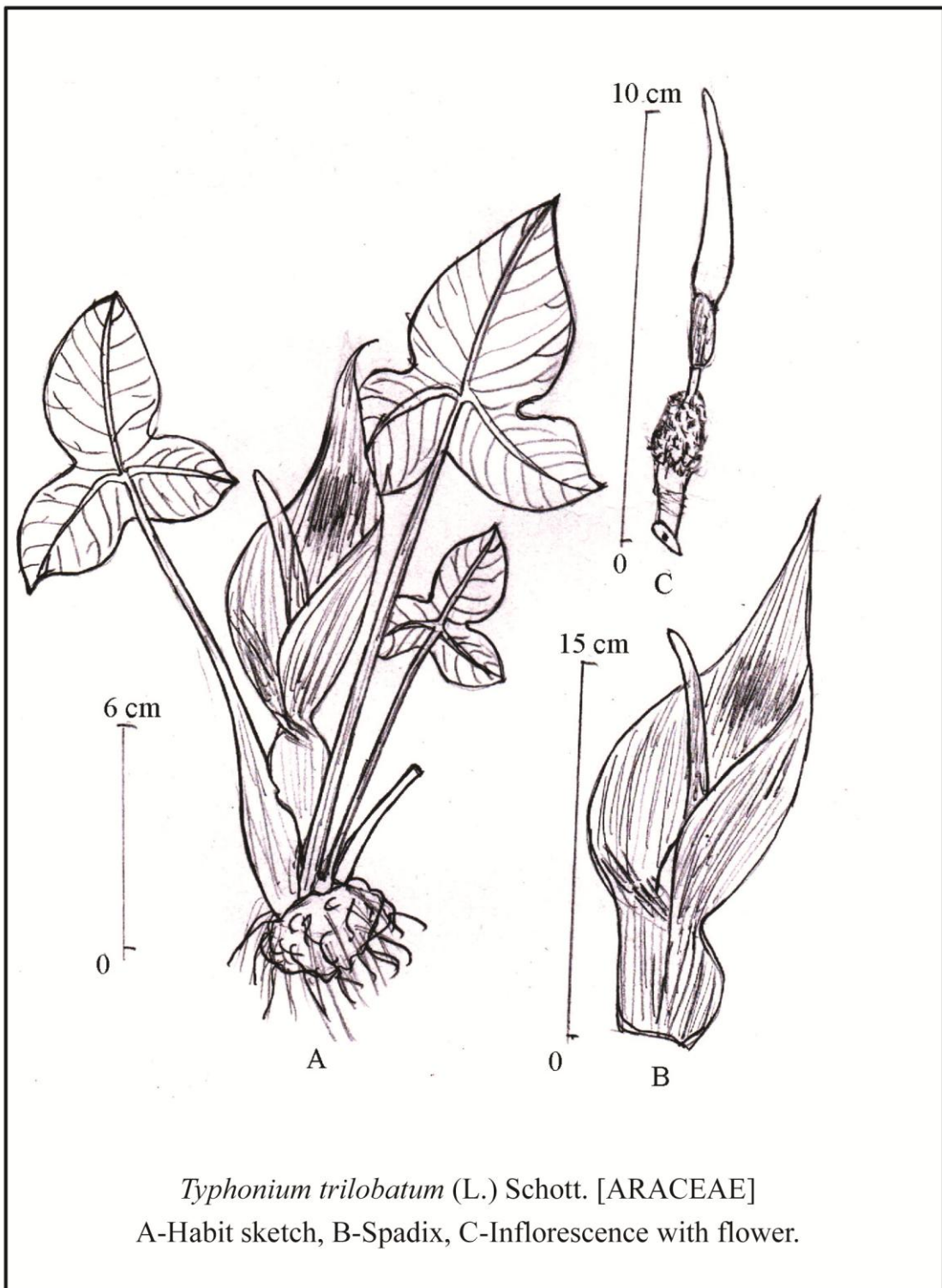
Typhonium Schott

Wiener Z. Kunst 3: 732. 1829; Hook. f., FBI 6: 509. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 19. 1976.

Perennial herb. Often with thickened rhizomatous or tuberous stems. Leaves few to several, long petioled. Leaf blade sagittate, basal, hastate or trilobed. Petiole with vaginate sheath at base. Inflorescence monoecious, solitary. Peduncle shorter than petiole. Spathe greenish on the outer surface. Flowers unisexual, without perianth. Fruit a berry.

About 50 species in the tropical regions in India and S. E. Asia; 10 in India (Hook. f., 1893); 3 in Assam (Rao and Verma, 1976); 1 species in the study area.

Typhonium trilobatum (L.) Schott, Wiener Z. Kunst. 3: 72. 1829; *Arum trilobatum* L. Sp. Pl. 965. 1753; Hook. f., FBI 6: 509. 1893; Blatt. in J. Bombay Nat. Hist. Soc. 35: 22. 1931; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 19. 1976; Chowdhury, Assam's Flora 296. 2005.



Typhonium trilobatum (L.) Schott. [ARACEAE]
A-Habit sketch, B-Spadix, C-Inflorescence with flower.

Perennial herb, stoloniferous. Tubers sub-globose. Leaves 5-20 × 5-15 cm, cordate to ovate in outline, usually deeply 3-lobed, segments all acuminate, front segment ovate, apex acute, base cuneate, glabrous, entire. Petiole 20-25 cm long, green or variously flushed with purple. Spathe green. Spadix exerted, shorter than spathe. Flowers pinkish red. Fruits berries. (**Plate 35**) (Photo File 23. G)

Habitat: Common in waste land.

Fls. and Frts.: May-jul.

Vern. name: Bolamuli (Bd.)

Udalguri Nalbari; Binu. 174; May 07, 2016.

TYPHACEAE Juss.

Gen. Pl. 25. 1789.

Perennial herb. Aquatic or palustrine with creeping rhizomes, leaves linear, erect, sheathing below. Nerves parallel. Flowers small or minute, monoecious or dioecious, densely crowded in globose or cylindrical, bracteate spikes, of which the upper are males. Bracteoles 0. Perianth of membranous green scales or slender hairs. Male flower: stamens 1-7; filaments free or connate; anthers basifixed. Female flowers: ovary superior. 1-2 locular; styles free, persistent. Fruit small, membranous or drupaceous.

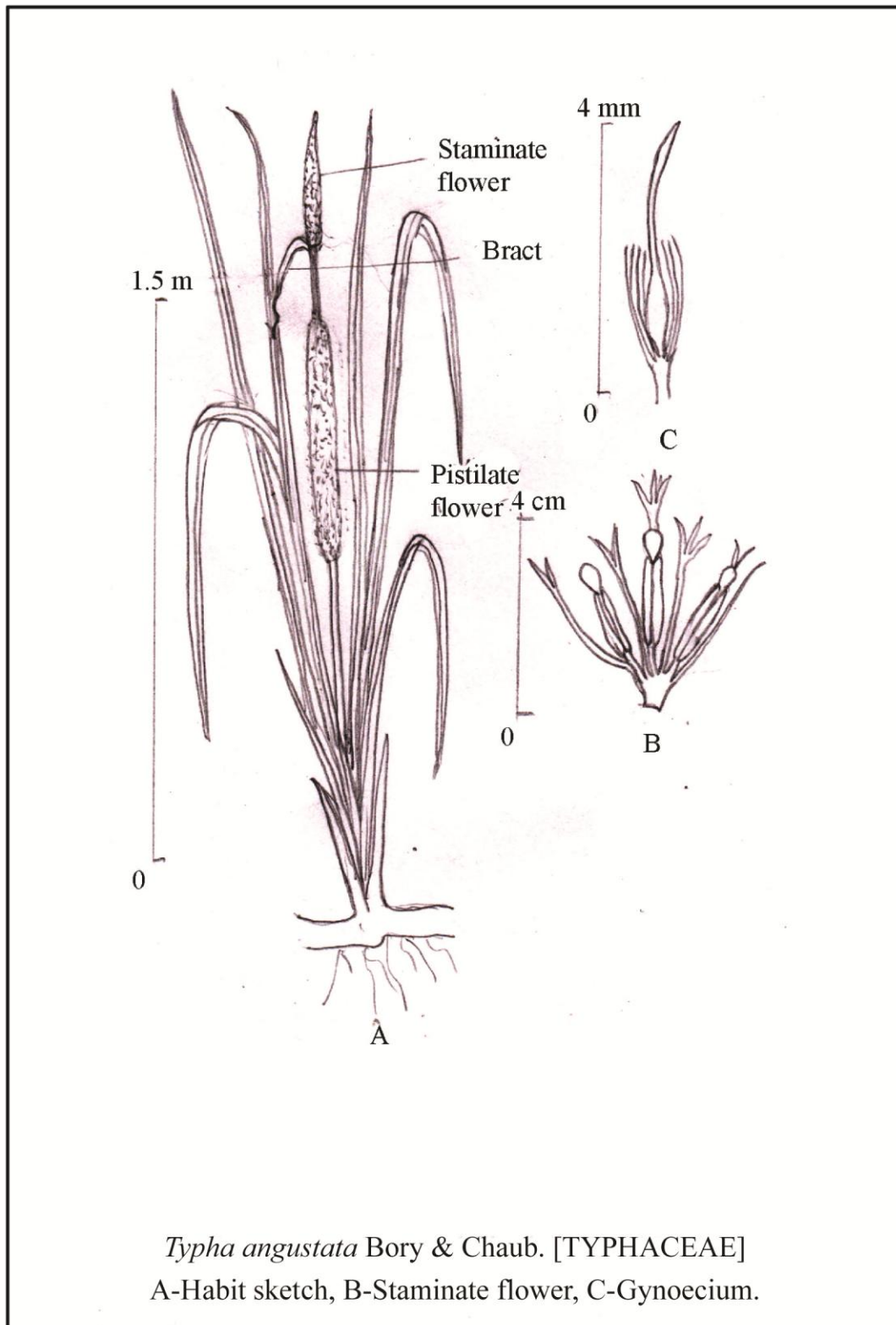
In India about 2 genera and 6 species; 1 genus and 1 species in the study area.

Typha L.

Sp. Pl. 2. 971. 1753; Gen. Pl. ed. 5: 418. 1754

Perennial herb, grass. Stem stout, erect, march herbs. Rhizomes creeping. Leaves 80-130 × 0.5-1.0 cm, abaxially carinate, erect, linear, spongy, radical. Flowers small, numerous, in very dense, cylindrical spikes, often intermixed with hairs. Perianth of capillary hairs, or in the male flowers obsolete. Stamens 1 or more. Ovary often reduced to a hair with clavate tip, long stalked, narrowed into a capillary style, with a clavate or filiform stigma. Fruit very minute achene.

PLATE – 36



Typha angustata Bory & Chaub. [TYPHACEAE]
A-Habit sketch, B-Staminate flower, C-Gynoecium.

Typha angustata Bory & Chaub., *Typha domingensis* Pers. Nouv. Fl. Pelop. 4. 1838; Exp. Moree, Bot. 2 (1): 338. 1832; Hook. f. FBI. 6: 489. 1893. *Typha angustifolia* Sibth. and Sm., Fl. Graec. Prodr. 2: 226. 1815 (not. Linn.).

Perennial herb. Stout herb, 1-4 m high. Leaves 50-125 cm long. Tall, 2-3 cm. herbs. Rhizomes robust up to 1.5 cm. in diameter. Scale leaves nearly surrounding the nodes. Photosynthetic leaves 13 × 5-9 mm, abaxially convex, adaxially flat, with a single row of gas chambers, cortex with spongy aerenchyma. Sheath usually decurrent. Inflorescence 8-20 × 1.5-2.5 cm, light brown, male inflorescence up to 34 cm. long. Perianth hairy. Stamens in groups of 2. Filaments usually simple forked. Pistiloid a club shaped. Fruits 1.0-1.5 mm long. **(Plate 36)** (Photo File 24. A)

Habitat: Grows in marshy places.

Fls. and Frts: Jun-Sep.

Vern. name: Ala Hagra (Bd).

Kahibari, Udalguri; Binu. 90; July 29, 2014.

LEMNACEAE Mart.

Tekhno-Bot. Slovar 362. 1820.

Mostly perennial herb. Aquatic, floating or submersed, reduced to small bodies called fronds corresponding partly to leaf and partly to stem. Distinct stems absent. Fronds not differentiated into petiole and blade. Inflorescence usually solitary. Flowers bisexual. Sepals absent. Petals absent. Stamens 1-2. Stigma funnel shaped. Fruit follicles.

4 genera, 37 species world wide and 3 genera, 4 species in the study area.

Key to genera

1a. Roots absent; plants minute. *Wolffia*

1b. Roots present; fronds flat:

2a. Fronds with 2 or more roots. *Spirodela*

2b. Fronds bearing a single root. *Lemna*

Lemna L.

Sp. Pl. 2: 970. 1753; Hook. f., FBI 6: 556. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 35. 1976.

Aquatic herb. Free floating, minute, not exceeding 5 mm in length, flattened or with inflated ventral side, oval to oblong in outline, pale green or dark green. Dorsal surface with row of papules along midline.

9 species in tropical and temperate regions, mostly cosmopolitan; 6 species in India (Hook. f., 1893); 2 in Assam (Rao and Verma, 1976) and 1 species in the study area.

Lemna perpusilla Torrey, Fl. New York 2: 245. 1843; *L. minor sensu* Hook. f., FBI 6: 556. 1893 *p.p. non* L. 1753; Chowdhury, Assam's Flora 297. 2005.

Aquatic herb. Thalloid. Fronds entire. Dorsal surface with prominent apical papule near apex and nodal papule at basal end. 2 prominent wing like lateral appendages on their basal root sheaths. Spathe open. Staminate flowers 2. Pistillate flower 1. (**Plate 37**) (Photo File 25. A)

Habitat: Found in ponds and tanks.

Fls. and Frts.: May-Jan.

Vern. name: Maju puni (Rh.)

Sonai, Udalguri; Binu. 187; October 27, 2016.

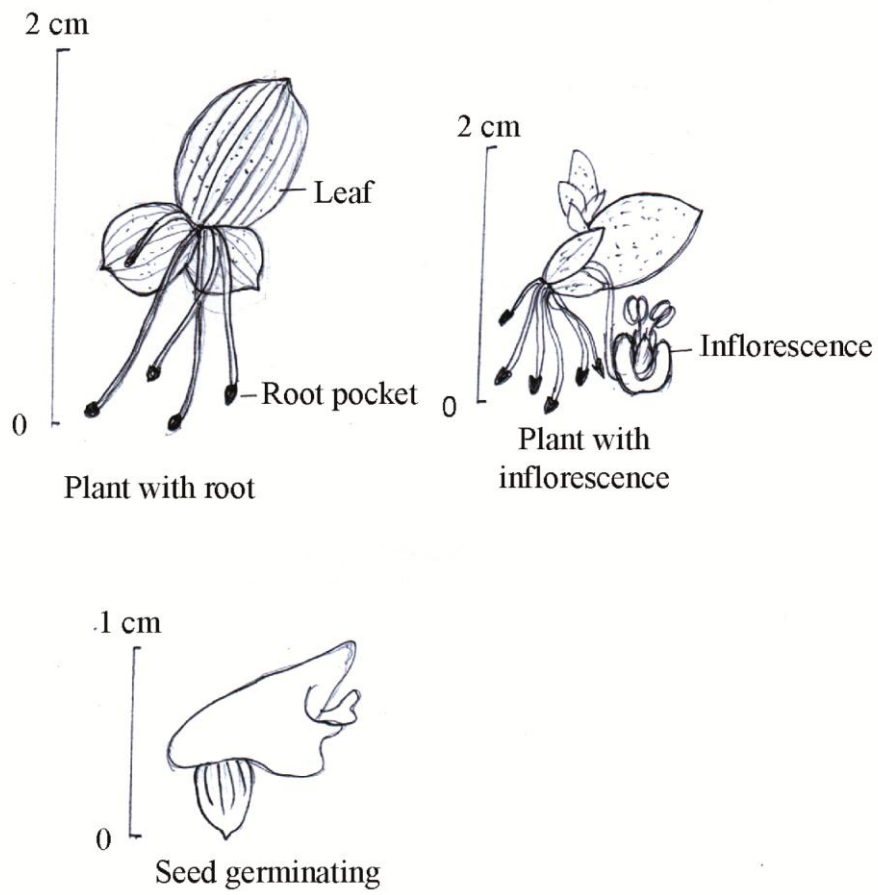
Spirodela Schleid.

Linnaea 13: 391. 1839; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 35. 1976.

Aquatic herb. Plant body flattend, oval to orbicular in outline with 3-12 veins, dark lustrous green above and reddish purple beneath. Floating solitary or in clusters of 2-5. Dorsal surface often with row of papules along midline. Flowers bisexual produced within membranous spathe. Pistil 1. Stamens 2. Anthers bilocular.

2 species; world wide; the other restricted to Central and South America.

PLATE – 37



Lemna purpusilla Torrey [LEMNACEAE]

Spirodela polyrrhiza (L.) Schleid., Linn. 13: 392. 1839; *Lemna polyrrhiza* L. Sp. Pl. 970. 1753; Hook. f., FBI 6: 557. 1893; *L. maxima* Blatt. and Hallb. in J. Indian Bot. 2: 49. 1921; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 35. 1976; Chowdhury, Assam's Flora 297. 2005.

Aquatic herb. Fronds solitary or 2-5 together, round or obovate with reddish purple margin. Stipes hyaline. Flowers minute, within membranous sac like spathe inside budding pouches.

Habitat: Floated in tanks.

Fls. and Frts.: Sep.-Apr.

Vern. name: Soru pani (Rh. and As.)

Golmagaon, Udalguri; Binu. 189; October 30, 2016.

***Wolffia* Schleid.**

Beitr. Bot. 1: 233. 1844; Hook. f., FBI 6: 557. 1893.

Aquatic herb. Plant bodies minute, rootless, float in still water in the form of thick, green, granular masses, generally globoid to ovoid to ellipsoid or cylindrical, 0.4-1.3 mm long and 0.2-1.0 mm wide. Dark green dorsal surface. Flowers bisexual. Pistil 1 and stamen 1. Ovary unilocular.

7 species cosmopolitan in distribution; 2 species in India (Hook. f., 1893) and 1 species in the study area.

Wolffia arrhiza (L.) Horkel ex Wimm., Fl. Schles. 3: 140. 1857; Hook. f., FBI 6: 557. 1893; Chowdhury, Assam's Flora 297. 2005.

Aquatic herb. Plant body ovoid to nearly spherical with distinctly flattened, dark green dorsal surface floating with only central portion of dorsal surface above water. Without brown pigment cells. Floral cavity not enclosed by a spathe.

Habitat: Grows in tanks and ponds.

Fls. and Frts.: Jun.-Oct.

Golmagaon, Udalguri; Binu. 186; October 30, 2016.

ALISMATACEAE Vent.

Tabl. Regn. Veg. 2: 157. 1799.

Annual, mostly perennial herb. Aquatic. Leaves form a sheath for the stem. Leaves simple, smooth, arrow shaped and oval or lance shaped. Only main veins parallel. Flowers unisexual or bisexual. Petals 3. Sepals 3. Stamens 3-6 to numerous. Ovary superior. Fruit a dry seed.

17 genera 111 species, distributed in the tropical and sub-tropical regions and 1 genus, 2 species in the study area.

Sagittaria L.

Sp. Pl. 2: 993. 1753; Hook. f., FBI 6: 561. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 37. 1976.

Perennial herb. Submersed, floating leaved, rhizomatous. Leaves sessile or petiolate. Inflorescence racemes, panicles, rarely umbels, erect, emersed or floating. Flowers monoecious, borne near the summit of the scapes in whorls of threes. Perianth segments 6. Stamens numerous. Fruits without longitudinal ribs, compressed.

30 species found in the Western Hemisphere: Europe and Asia; 2 species in India (Hook. f., 1893) 2 species in Assam (Rao and Verma, 1976) and 2 species in the study area.

Key to species

1a. Flowers white, lower flowers bisexual, upper one male.***S. guayanensis***

1b. Flowers white, flowers unisexual, born on the same plant.***S. Sagittifolia***

Sagittaria guayanensis Kunth sub sp. *lappula* (D. Don) Bogin, Mem. New York Bot. Gard. 9: 192. 1955; Subram., A. A. 87. 1962; Rao *et* Verma, BOBSI. 18: 39. 1976; Deb, FTS. 2: 346. 1983. *S. lappula* D. Don, Prodr. Fl. Nep. 22. 1825. *S. guayanensis* Hook. f., FBI. 6: 561. 1893.

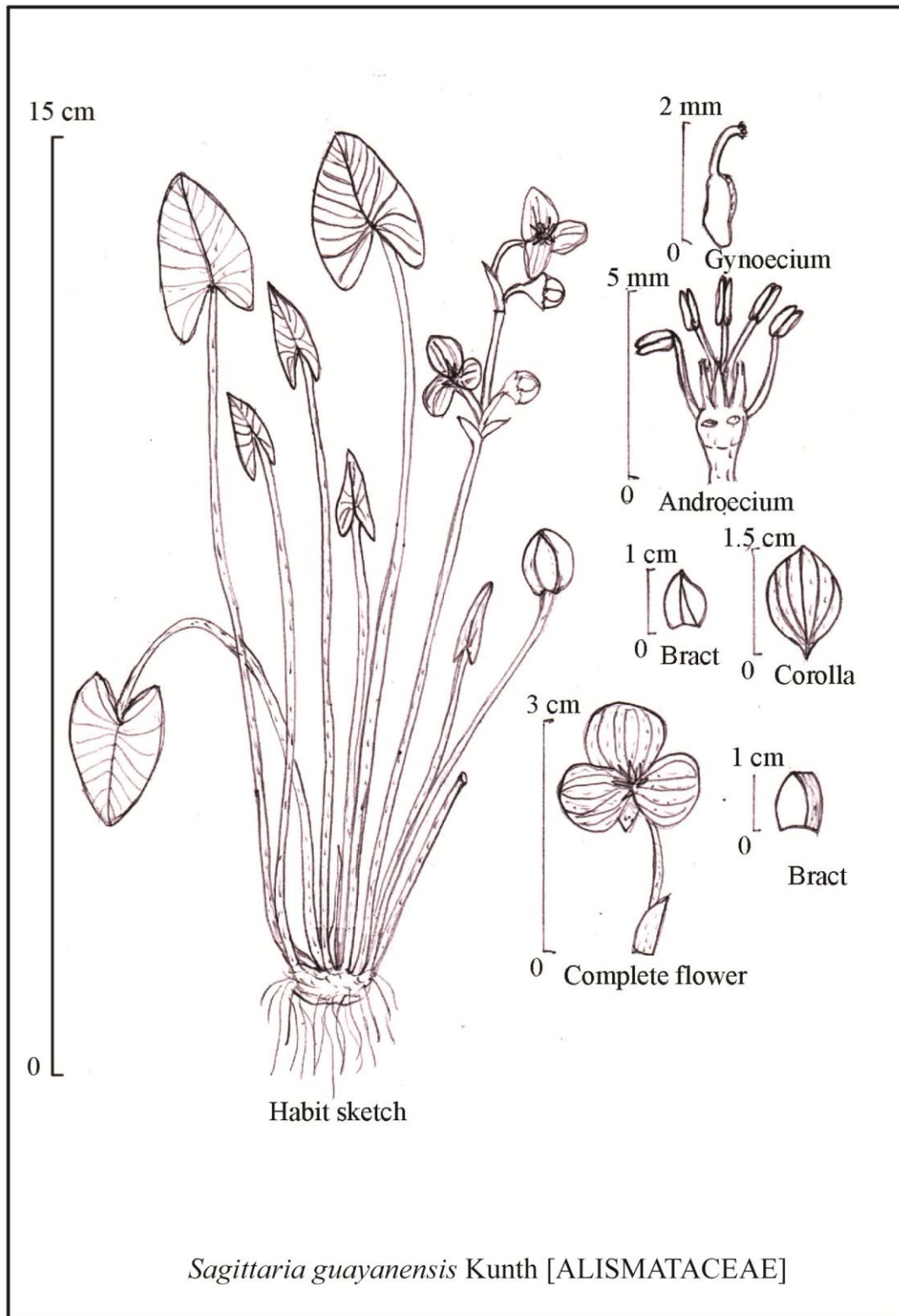
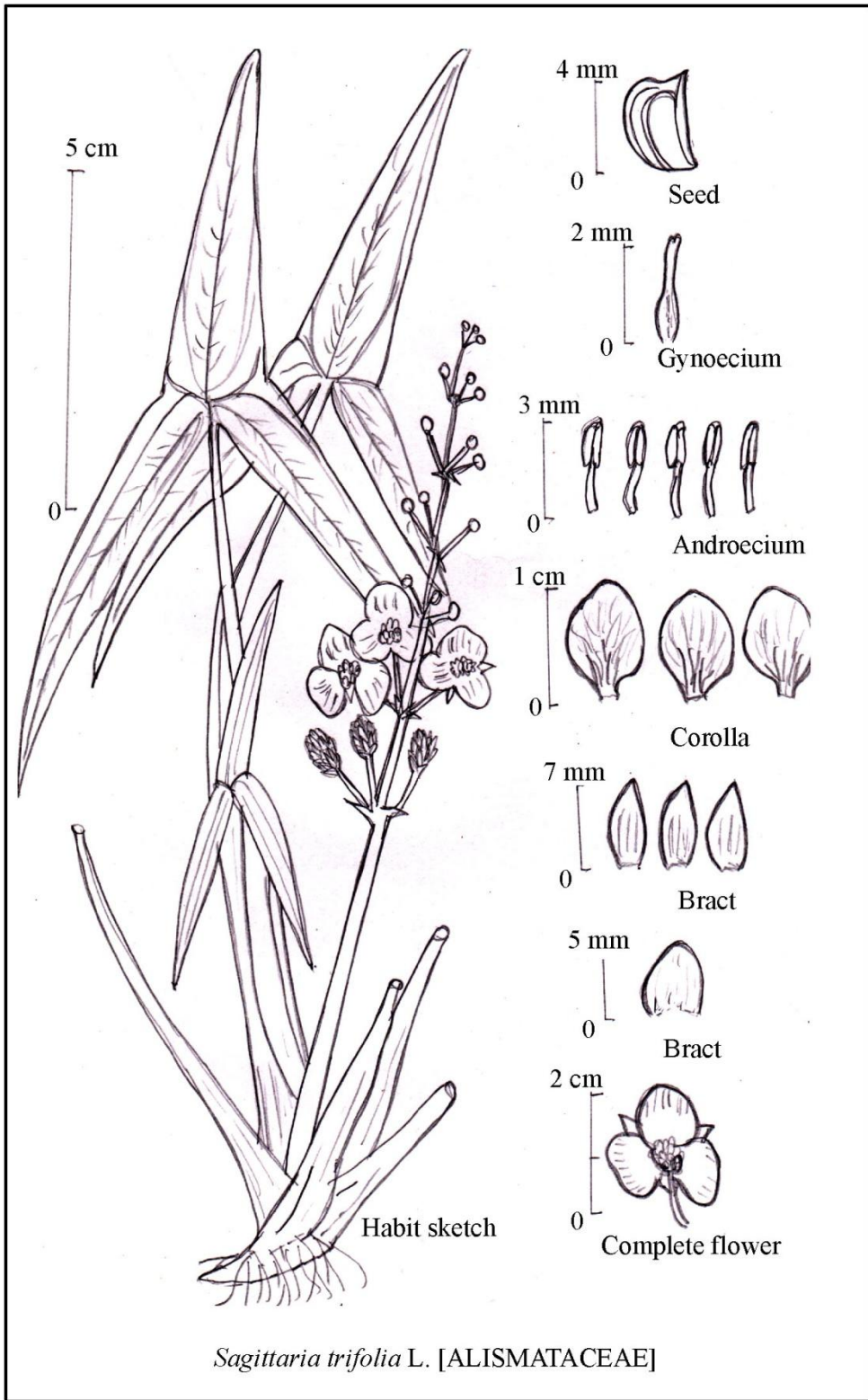


PLATE – 39



Annual herb. Aquatic. Stems rhizomatous. Leaves radical, long petioled. Laminae broadly ovate, deeply cordate at the base, obtuse or round at the apex. Petioles cylindrical, spongy, hairy, 20-60 cm long. Racemes few flowered. Flowers white, corolla 1.8 cm across, lower flowers bisexual, upper one's male. Bracts, ovate, glabrous, greenish. Sepals 3, free, green. Petals 3, free, white. Stigma papillose. Achenes flat, surrounded by a broad toothed wing. (**Plate 38**) (Photo File 26. A)

Habitat: Common in paddy fields, marshes, drains and tanks.

Fls. and Frts.: May-Oct.

Udalguri College road; Binu. 95; September 14, 2014.

Sagittaria trifolia L., Sp. Pl. 2: 993. 1753; Hook. f., FBI 6: 561. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 39. 1976; Chowdhury, Assam's Flora 297. 2005.

Perennial herb. Aquatic. Leaves arrow head, emergent, some leaves, narrow, linear. Submerged. Submerged leaves ribbon shaped. Blade 10-20 cm long. Petiole long. Flowers borne on a spike, unisexual, borne on the same plant. Petals 3, white. Sepals 3. Stamens numerous. (**Plate 39**)

Habitat: Grows in moist locality.

Fls. and Frts.: Jul.-Sep.

Kajiamati, Udalguri; Binu. 96; September 07, 2014.

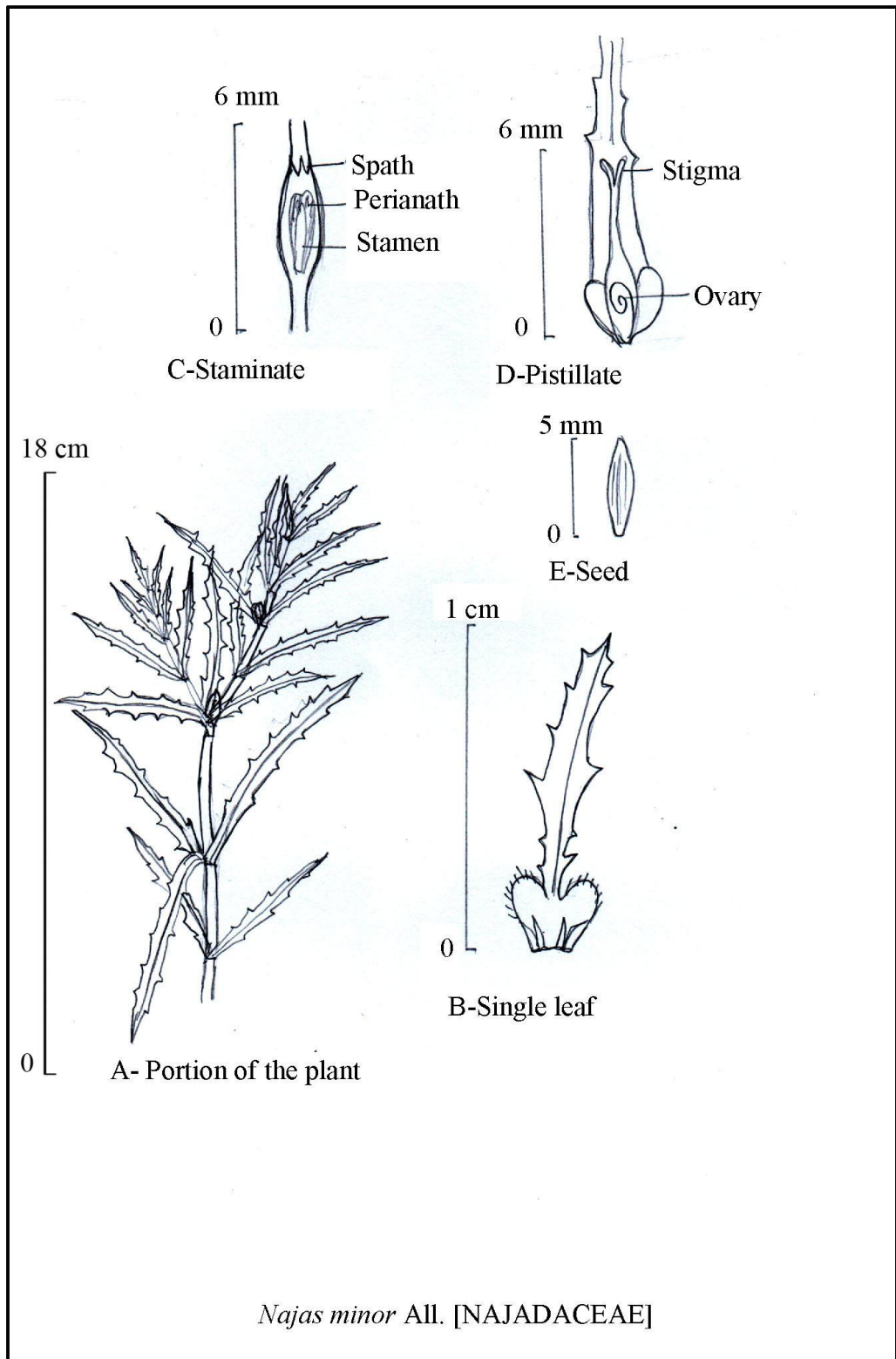
NAJADACEAE Juss.

Annual or perennial herb. Aquatic, without conspicuous aggregations of leaves. Leaves opposite to whorled or alternate, simple, lamina entire, linear. Flowers unisexual, monoecious or dioecious, solitary, axillary. Perianth of tepals. Stamens 1 with sessile anthers. Gynoecium 1 carpelled. Pistil 1 celled. Fruit non fleshy, an achene. Seeds with starch.

Najas L.

Sp. Pl. 2: 1015. 1753.

PLATE – 40



Annual herb. Very small, submerged in fresh or brackish water. Stem slender, much branched, rooting at base and lowermost nodes. Leaves sessile, linear, small, sheathing at base, margin spinulose toothed. Plants monoecious or dioecious; flowers minute, unisexual, solitary. Male flowers spatulate, stamen 1. Female flowers sessile. Fruit an elliptic to oblong achene. Seeds without endosperm.

About 40 species cosmopolitan; 11 species (one endemic) in China and 1 species in the study area.

Najas minor All., Auct. synopsis. meth stirp. horti. reg. Taurine 3. 1773; Hook. f., Fl. Brit. Ind. 6: 569. 1894; Prain, Beng. Plants 2: 847. 1903; Deb, Fl. Trip. 2: 350.1983.

Aquatic herb. Plants monoecious. Stems 5-25 cm. tall, 0.5-1 mm in diameter. Leaves recurved, 1.0-3.0 cm long. Leaf sheaths 1.5 mm long. Auricles truncate to rounded, with more than 10 teeth on upper and outer sides of leaf margin. Flowers yellowish green. Male flowers 0.5-1 mm long. Female flowers ca 2 mm long. Style 1 mm long. Fruit linear to ellipsoid. (**Plate 40**) (Photo File 27. A)

Habitat: Common in stagnant water.

Fls. and Frts.: Aug.-Nov.

Angragaon, Udalguri; Binu. 113; September 14, 2014.

ERIOCAULACEAE Martinov

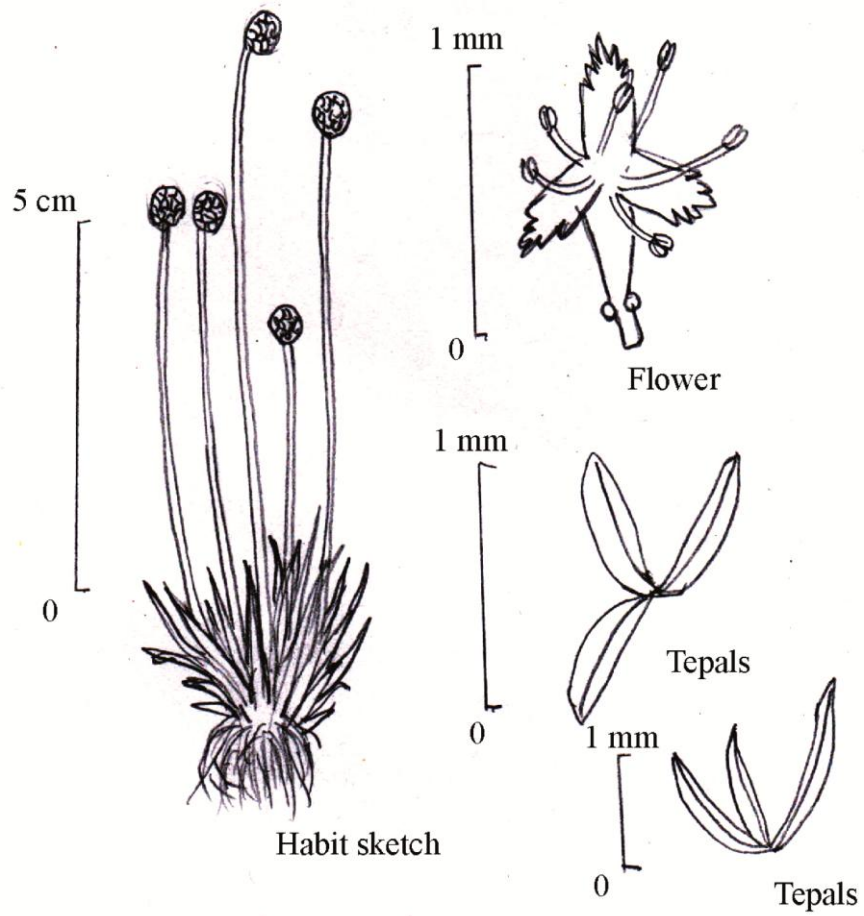
Tekhno. Bot. Slovar. 237. 1820.

Annual or perennial herb, caespitose or solitary. Root stocks rhizomes or stems thickened, short to variously elongate, erect or prostrate. Leaves many ranked in rosettes, grass like. Leaf blade linear to linear to triangular. Inflorescence terminal or axillary. Flowers unisexual, staminate or pistillate on same plants. Stamens 2-4, 2-3 carpellate. Ovary superior. Fruit a capsule, loculicidal.

13 genera and about 1150 species distributed chiefly in the tropical and subtropical regions of the globe, a few extending into the temperate regions.

Eriocaulon L.

PLATE – 41



Eriocaulon achiton Korn. [ERIOCAULACEAE]

Sp. Pl. 1: 87. 1753; Gen. Pl. ed. 5; 38. 1754; Hook. f., FBI 6: 571. 1893; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 43. 1976.

Annual or perennial herb. Stems short. Leaves many ranked in flat or high spiral. Leaf blade ligulate, basally pale, distally green, base noticeably lacunate. Inflorescence in heads. Flowers bracteates. Male flowers with outer tepals inserted at base of floral axis, inner tepals inserted above on floral axis. Stamens usually twice the number of inner tepals. Anthers black. Stigmas 2 or 3.

Total species 400, distributed mostly in tropical and sub-tropical regions; 43 species in India (Hook. f., 1893); 15 species in Assam (Rao and Verma, 1976) and 1 species in the study area.

Eriocaulon achiton Korn., Linnae 27: 630. 1856; Hook. f. FBI 6: 584. 1893; F; Rao and Verma, Bull. Bot. Surv. India 18 (1-4): 48. 1976.

Annual herb. Rootstock absent. Leaves linear, acute, 2-3 cm long. Inflorescence capitate; head ovoid. Male flowers: tepals 3, anthers globose. Female flowers: tepals absent. Style 3-fid. (**Plate 41**) (Photo File 28. A)

Habitat: Grows in shady area and in river bank.

Fls. and Frts.: Apr.-Dec.

Serfang, Udalguri; Binu. 69; April 27, 2014.

CYPERACEAE Juss.

Gen. Pl. 26. 1789.

Annual or perennial herb. Rhizomatous or not. Stems trigonous, occasionally terete, usually solid. Leaves basal. Ligule often present. Leaf blade linear, grass like. Involucral bracts 1-several. Inflorescence paniculate or capitate. Spikelets with one to many glumes. Flowers bisexual or unisexual. Perianth absent or reduced to bristles. Stamens 1-3. Stigmas 2 or 3. Fruit a hard nutlet.

About 80 genera and 4000 species distributed throughout the world in wet and marshy situations and 12 genera, 38 species in the study area.

Key to genera

1a. Perianth present. *Eriophorum*

1b. Perianth absent:

2a. Inflorescence pseudolateral, with solitary erect bract. *Scirpus*

2b. Inflorescence terminal, with one to several foliaceous bracts:

3a. Flowers unisexual, nuts enclosed within a utricle.. *Carex*

3b. Flowers bisexual or unisexual, nuts not

enclosed within an utricle:

4a. Inflorescence paniculate or spicate; flowers all

unisexual; nuts borne on a hypogynous disc. *Scleria*

4b. Inflorescence paniculate; anthelate, capitate,

or reduced to a solitary spikelet; nuts not

borne on a hypogynous disc:

5a. Perianth of only scales or of scales alternating with bristles:

6a. Inflorescence capitate. *Lipocarpha*

6b. Inflorescence capitate:

7a. Perianth scales oblanceolate:

7b. Perianth scales subquadrate... .. *Fuirena*

5b. Perianth of only bristles:

8a. Leaves all reduced to bladeless sheaths... .. *Eleocharis*

8b. Leaves at least some with well developed blades:

9a. Nuts beaked by the persistent

stylebase. *Rhynchospora*

9b. Nuts not beaked by the style base:

10a. Style base persisting on the nut

like a beak or a button. *Balbastylis*

10b. Style base not persisting on the nut:

11a. Inflorescence a decoposed or

reduced to a few spikeletes. *Fimbristylis*

11b. Inflorescence umbellate or capitate:

12a. Spikelets globose or sub-globose... *Kyllinga*

12b. Spikelets linear, compressed... .. *Cyperus*

Balbastylis Kunth.

Enum. Pl. 2: 205. 1837.

Annual herb. Culms slender, capillary. Leaves capillary, hairy or glabrous. Spikelets umbellate or reduced to a single spikelet. Spikelets many flowered, cylindric or cuneate, keeled. Glumes imbricate, spirally arranged on the rachilla. Stamens 1-3. Anthers 2-celled, not crosted. Styles slender. Style base not dilated and deciduous leaves, peculiar button like, at the apex of the nut. Stigmas 3-fid. Nut trigonous.

Balbastylis barbata (Rottb.) C. B. Clarke, Hook. f., Fl. Brit. India 6: 651. 1893.

Annual herb, tufted. Roots fibrous, capillary. Stems 5-10 cm high, subterete, glarous. Leaves capillary, glabrous. Bracts 2-3, leaf like, as long as the globose heads. Spikelets many, 4-5 m long. Glumes 1 mm long, ovate, 3-nerved. Filaments very short. Styles 3-fid. Nuts oblong.

Habitat: Common along the banks of rivers and streams.

Fls. and Frts.: May-Dec.

Golondi river bank, Udalguri; Binu. 88; June 08, 2014.

Carex L.

Sp. Pl. 2: 972. 1753; Clarke in Hook. f., FBI 6: 699. 1894; Rao and Verma, Cyperaceae of N. E. India 62. 1982.

Perennial herb. Stem trigonous, erect. Leaves linear, lower sometimes reduced to sheaths. Inflorescence of simple or paniced spikes. Spikes 1 to numerous, sessile or pedicelled. Hypogynous bristles absent. Male spikelets many flowered. Stamens 3. Female spikelets consisting of single pistil. Style 1. Stigmas 2-3. Achene plano-convex or trigonous.

Species about 2000, distributed throughout the world; 142 species in India (Clarke in Hook. f., 1894); 49 species in N. E. India (Rao and Verma, 1982); 10 species in Assam (Baishya, 1999) and 2 species in the study area.

Key to species

1a. Leaves shorter than or equaling stem; utricles brownish green. ...*C. finitima*

1b. Leaves longer than stem; utricles pale brownish white

with brown spots and short line.*C. cruciata*

Carex cruciate Wahlenb., Kongl. Vetensk. Acad. Nya Handl. 24: 149. 1803; *Carex benghalensis* Roxb., Fl. Ind. 3: 572. 1832; Rao and Verma, Cyperaceae of N. E. India 73. 1982; Deb, Fl. Tri. 2: 469. 1983; Chowdhury, Assam's Flora 298. 2005.

Perennia herb, erect. Stem 35-80 cm high, 1.5 mm in diameter, trigonous. Leaves linear to lanceolate, longer than stem, 50-60 × 1.0-1.5 cm long, apex acuminate, narrow at the base, glabrous, entire. Leaf sheath brown. Inflorescence a compound panicle with 10-45 cm long. Rachis hispid. Bracts longer than inflorescence. Spikes numerous, 5-6 mm long. Glumes ovate. Stigmas 3. Achene or nut trigonous, brown. (Photo File 29. C)

Habitat: Grows along hillsides.

Fls. and Frts.: May-Oct..

Border of Arunachal Pradesh, Sikaridanga, Udalguri; Binu. 117; October 20, 2015.

Carex finitima Boott, III. Gen. Carex 1: 44. 1858; *C. finitima* Boott var. *attenuata* Clarke in Hook. f., FBI 6: 736. 1894; Rao and Verma, Cyperaceae of N. E. India 80. 1982.

Perennial herb. Stems tufted, 45 cm high, trigonous. Leaves shorter than or equaling stem. Leaf blade 4 mm wide. Involucral bracts longer than inflorescence. Spikes linear. Glumes ovate, apex acute.

Habitat: Grows along the roadside.

Fls. and Frts.: June-Oct.

Mazbat, Naoherua. Udalguri; Binu. 229; October 20, 2015.

Cyperus L.

Sp. Pl. 1: 44. 1753; Gen. Pl. ed. 5: 26. 1754; Clarke in Hook. f., FBI 6: 597. 1893; Rao and Verma, Cyperaceae of N. E. India 2. 1982.

Annual or perennial herb. Stems trigonous, leafy at basal part. Ligule absent. Involucral bracts leaf like. Inflorescence a terminal, simple or compound anthela. Spikelets few to many in spikes, digitate clusters or a capitulum at apex. Glumes distichous, the lowest 2 empty remaining glumes each with a bisexual flower. Perianth bristles or scales absent. Stamens 1-3. Style 3-fid, rarely undivided or 2-fid. Stigmas slender. Achene often trigonous or plano-convex.

Species about 600, distributed in tropics and temperate regions; 61 species in India (Clarke in Hook. f., 1893); 35 species in Assam (Baishya, 1999) and 17 species in the study area.

Key to species

- 1a. Stems mostly decumbent; spikelets oblong; nuts
obovate to sub-orbicular. *C. sulsinux*
- 1b. Stems always erect; spikelets linear to lanceolate;
nuts with a median... .. *C. sanguinolentus*
 - 2a. Spikelets numerous, very densely arranged;
glumes spirally imbricate. *C. michelianus*
 - 2b. Spikelets spreading; glumes rounded:
 - 3a. Leaves very narrow; glumes with recurved awn at

- the apex; nutlet obovoid to oblong....*C. cuspidatu*
- 3b. Leaves flat; glumes membranous;
nutlet obovoid or ellipsoid:
- 4a. Perennials or rarely annuals; culms with
few leaves or with bladeless sheaths only; stamens (1-) 3;
nutlet less than ½ as long subtending glume:
- 5a. Bracts lower exceeding the anthela; nuts
oblong to ellipsoid; spikelets digitate.*C. silletensis*
- 5b. Bracts all shorter than the anthela; nuts broadly
obovoid or subglobose; spikelets shortly spicate..*C. tenuispica*
- 4b. Annuals without stolons; culms usually leafy; stamens
1 or 2 (or 3); nutlet ½ or more as long as subtending glume:
- 6a. Rachilla not winged or only with very narrow
white hyaline margins; style short:
- 7a. Perennials, with long stolons; spikelets slig turgid;
glumes abaxially not keeled or rarely keeled.*C. pilosus*
- 7b. Annuals, without rhizomes or stolons; spikelets
compressed; glumes abaxially keeled:
- 8a. Rachis of spikes short; spikelets densely arranged,
subcapitate; glumes densely imbricate; nutlet half
as long as subtending glume.*C. compressus*
- 8b. Rachis of spikes long; spikelets laxly arranged;
glumes laxly imbricate; nutlet nearly as long
as subtending glume.*C. iria*
- 6b. Rachilla winged; style usually long or medium, rarely short:
- 9a. Spikes cylindric, with numerous spikelets:

- 10a. Spikelets linear, terete or subterete;
 rachilla broadly winged, wings
 lanceolate and deciduous. *C. digitatus*
- 10b. Spikelets narrowly oblong to ovoid,
 compressed; rachilla narrowly winged,
 wings linear and persistent. *C. imbricatus*
- 11a. Spikelets 1-3 (or 4)-flowered;
 glumes tightly included around nutlet:
- 12a. Inflorescence a compound
 anthela; stamens 1. *C. pumilus*
- 12b. Inflorescence a simple
 anthela; stamens 3. *C. cyperinus*
- 11b. Spikelets 4-10-flowered; glumes
 not tightly included around nutlet... .. *C. compactus*
- 9b. Spikes broadly ovoid, turbinate,
 ellipsoid, oblong, orbicular, or rarely
 cylindric, with up to 10 spikelets:
- 13a. Rhizomes short or surculose, without
 stolons or tubers; glumes laxly spreading:
- 14a. Spikelets laxly arranged; glumes
 dark blood red.... .. *C. distans*
- 14b. Spikelets arranged in a dense
 cluster glumes reddish or
 yellowish brown.... .. *C. albostratus*
- 13b. Rhizomes creeping or with
 stolons and tubers; glumes densely

imbricate.... ..*C. rotuntus*

Cyperus albostriatus Schrad., Anal. Fl. Cap. 1: 7. 1832.

Perennial with short thick rhizome, tufted. Culms trigonous, smooth, 40-120 cm tall. Leaves reduced to long sheaths, covered the bases of the stems. Inflorescence a cluster; flattened flowers spikelets arranged in a dense cluster. Flower spikelets 3-9 mm long, 1.5-3.0 mm wide, initially light green in colour, but turn reddish brown after mature. Nuts yellowish brown, oval, trigonous. (Photo File 29. L)

Habitat: Uncommon weed of damp sites found near Arunachal Pradesh hills slope.

Fls. and Frs.: Throughout the year.

Arunachal border, Sikaridanga, Udalguri; Binu. 24; March 20, 2015.

Cyperus compactus Retz., Observ. Bot. 5: 10. 1789; Clarke in Hook. f., FBI 6: 624. 1893; Rao and Verma, Cyperaceae of N. E. India 21. 1982; Chowdhury, Assam's Flora 299. 2005.

Perennial herb. Stems 73 cm high. Leaves basal. Leaf blade 9 mm wide. Inflorescence a compound. Spikes with many spikelets congested into a globose spike. Spikelets many. Glumes oblong. Stamens 3. Stigmas 3. (**Plate 42**) (Photo File 29. D)

Habitat: Grows in roadside ditches.

Fls. and Frs.: Apr.-Dec.

Serfang, Udalguri; Binu. 86; May 18, 2014.

Cyperus compressus L., Sp. Pl. 1: 46. 1753; Clarke in Hook. f., FBI 6: 605. 1896; Rao and Verma, Cyperaceae of N. E. Ind. 15. 1982; Chowdhury, Assam's Flora 299. 2005.

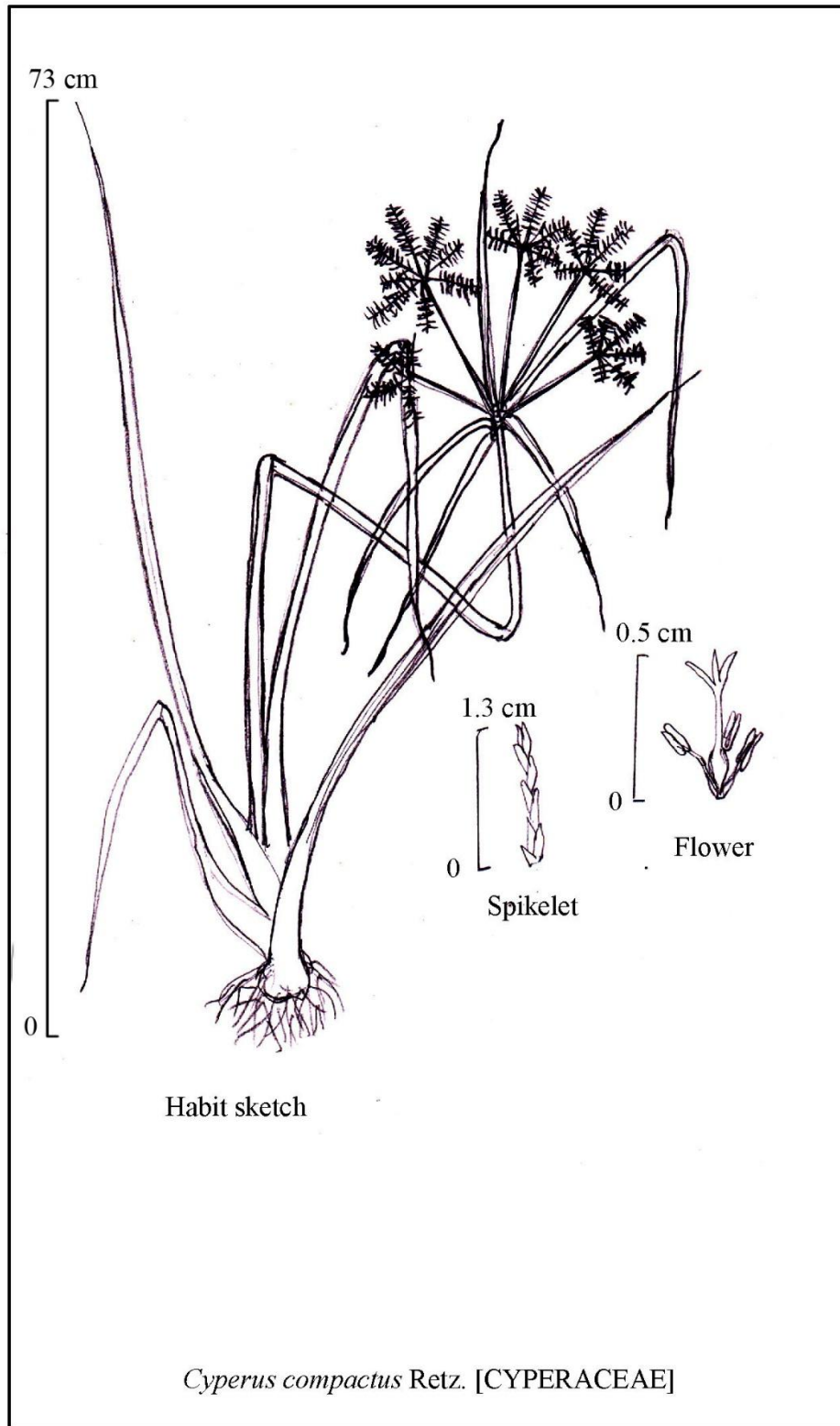
Annual herb. Stems 30 cm high. Leaf blade obtuse. Inflorescence a simple umbel. Spikelets 4-9, 20-50 flowered. Glumes 3 mm long. Stamens 3. Style short.

Habitat: Found along the roadside.

Fls. and Frts.: May-Dec.

Gersong, Udalguri; Binu. 224; May 18, 2016.

PLATE – 42



Cyperus caspidatus Kunth, Nov. Gen. Sp. 1: 204. 1815; Clarke in Hook. f. Fl. Brit. Ind. 6: 598. 1893; Babu. Herb. Fl. Dehra Dun 555. 1977.

Annual or perennial tufted herb. Culms 5-20 cm high, trigonous. Leaves radical, setaceous. Bracts leaf like. Spikelets congested or digitate, straw or pale green, recurved arista at the apex of the glumes. Spikelets 4-6 mm. Glumes 1mm long, keels hyaline, arista as long as or shorter than the glumes. Bristles strap shaped. Stamens 1. Anthers very short. Styles short, 3-fid, unequal. Nuts 5mm long, ovoid, trigonous.

Habitat: Common in paddy fields and along road sides, usually on sandy soils also.

Fls. and Frs.: Aug.-Jan.

Bandarguri, Udalguri; Binu. 118; October 20, 2015.

Cyperus cyperinus (Retz.) Suringar, *Cyperus* Mal. Arch.154. 1898; *Kyllinga cyperina* Retzius, Observ. Bot. 6: 21. 1791; *Mariscus cyperinus* var. *benghalensis* Clarke in Hook. f., FBI 6: 621. 1893; Rao and Verma, Cyperaceae of N. E. India 20. 1982; Chowdhury, Assam's Flora 299. 2005.

Perennial herb. Stems scattered, 15-50 cm tall, base many leaved. Leaf blade 5-7 mm wide. Involucral bracts 6-10 mm. Inflorescence a simple anthela. Spikes oblong. Spikelets 2-4 flowered. Stamens 3. Stigmas 3.

Habitat: Along the road side ditches.

Fls. and Frts.: Apr.-Oct.

Gersong, Udalguri; Binu. 119; October 20, 2015.

Cyperus digitatus Roxb., Fl. Ind. 1: 209. 1820; Clarke in Hook. f., FBI 6: 618. 1893; Rao and Verma, Cyperaceae of N. E. India 20. 1982; Chowdhury, Assam's Flora 299. 2005.

Perennial herb. Stems trigonous, 50-65 cm tall. Leaves 40-60 cm in length, 5-12 mm wide. Inflorescence a compound anthela. Spikelet linear, 10-40 flowered. Glumes straw coloured, imbricate. Stamens 3. Style long. Stigmas 3. (Photo File 29. I)

Habitat: Common in swamps and paddy fields.

Fls. and Frts.: Apr.-Dec.

Serfang, Udalguri; Binu. 61; April 19, 2014.

Cyperus distans L. f., Suppl. Pl. 103. 1782; Clarke in Hook. f., FBI 6: 607. 1896; Rao and Verma, Cyperaceae of N. E. India 16. 1982; Chowdhury, Assam's Flora 299. 2005.

Perennial herb. Stems solitary, trigonous, 75 cm long. Leaves as long as the culm. Inflorescence a compound umbel. Spikelets 20 mm long, 10-20 flowered. Stamens 3. Achene trigonous.

Habitat: Common in streams and in moist ditches.

Fls. and Frts.: Aug.-Dec.

Udalguri Nalbari; Binu. 120; September 03, 2014.

Cyperus flavidus Retz., Observ. Bot. 5: 13. 1788; Clarke in Hook. f., FBI 6: 600. 1893; *C. strictus* Roxb. Fl. Ind.1: 203. 1820; Cooke, Fl. Pres. Bombay 2: 857. 1908; Rao and Verma, Cyperaceae of N. E. India 10. 1982.

Perennials herb. Stems up to 30 cm high, 3-angled, with few leaves basally. Leaves 20 cm long, 2 mm wid. Involucral bracts longer than inflorescence. Inflorescence a simple anthela. Spikelets linear, 2 cm long, 1.5 cm broad. Spike linear. Glume 1.5 mm long. Stamen 2. Stigmas 2. (Photo File 29. N)

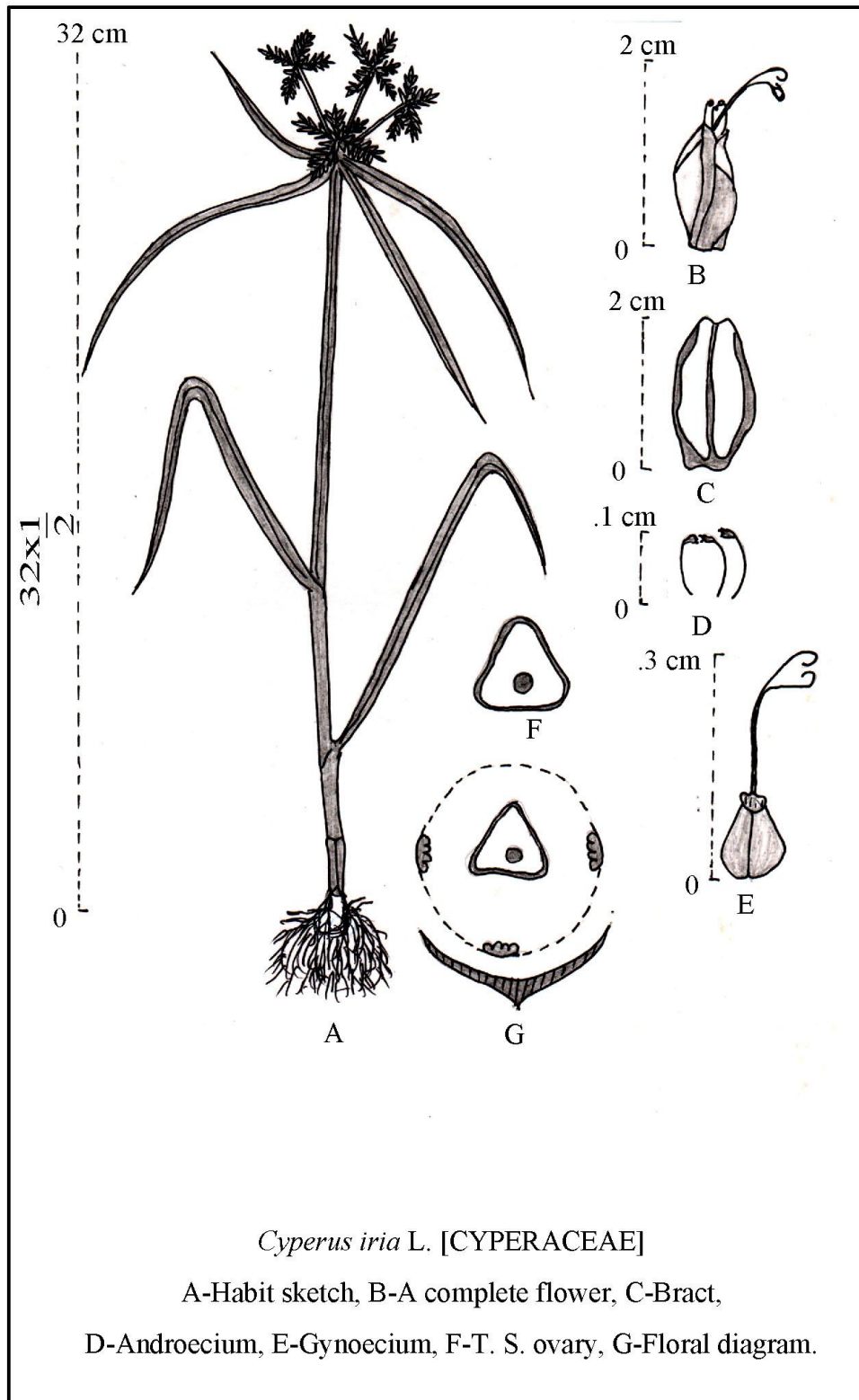
Habitat: Common along the roadside.

Fls. and Frts.: Jun.-Nov.

Goraimari, Udalguri; Binu. 87; June 08, 2014.

Cyperus imbricatus Retz., Observ. Bot 5: 12. 1788; *Cyperus radiatus* Vahl, Clarke in Hook. f., FBI 6: 617. 1893; Chowdhury, Assam's Flora 299. 2005.

Perennials herb. Stems, triangle, 7-14 cm long, 3-angled. Leaves basal. Inflorescence a compound anthela. Spikes densely arranged. Spikelets 10-25 flowered. Glumes ovate.



Cyperus iria L. [CYPERACEAE]

A-Habit sketch, B-A complete flower, C-Bract,
D-Androecium, E-Gynoeceium, F-T. S. ovary, G-Floral diagram.

Stamens 2. Style long. Stigmas 3. (Photo File 29. U)

Habitat: Grows along the roadside ditches.

Fls. and Frts.: Apr.-Oct.

Serfang, Udalguri; Binu. 78; April 27, 2014.

Cyperus iria L., Sp. Pl. 45. 1753; Clarke in Hook. f., FBI 6: 606. 1893; Rao and Verma, Cyperaceae of N. E. India 15. 1982; Chowdhury, Assam's Flora 299. 2005.

Annual herb. Stems 60 cm high, trigonous. Leaves 3 mm wide, acuminate. Inflorescence a compound umbel. Spikelets 5-20 flowered. Glumes 1.2 mm long. Stamens 2. Style short. (**Plate 43**) (Photo File 29. U)

Habitat: Grows along the roadside.

Fls. and Frts.: Apr.-Dec.

Udalguri Nalbari; Binu. 42; April 05, 2014.

Cyperus michelianus L., Egypte, Hist. Nat. 3: 50. 1813; *Scirpus michelianus* L., Sp. Pl. 52. 1753; *Isolepis micheliana* Roem. et Schult., Syst. 2: 114. 1817; Chowdhury, Assam's Flora, 299. 2005.

Annual herb. Small tufted, erect, 8-10 cm tall, with conspicuous leafy bracts. Leaves linear, flat or canaliculated. Inflorescence a dense head. Spikes several, about 10-18 mm long, strongly flattened, greenish white. Glumes distichous. Stamens 1-2. Stigmas 2 or 3. Nut oblong, pale brown. (Photo File 29. O)

Habitat: Found in marshy areas.

Fls. and Frts.: Feb.-Apr.

Vern. name: Semsakhora Hagra (Bd.).

Serfang, Udalguri; Binu. 123; March 20, 2015.

Cyperus pilosus Vahl, Enum. Pl. 2: 354. 1805; Clarke in Hook. f., FBI 6: 609. 1893; Rao and Verma, Cyperaceae of N. E. India 17. 1982; Chowdhury, Assam's Flora 300. 2005.

Perennial herb. Stems 30-75 cm high, trigonous. Leaves 60 cm long, 8 mm wide. Inflorescence a compound umbel. Spikelets linear, 5 mm long, 10-20 flowered. Glumes 1.5 mm long. Stamens 3. (Photo File 29. V)

Habitat: Common in marshy places.

Fls. and Frts.: Apr.-Nov.

Serfang, Udalguri; Binu. 26; April 19, 2014.

Cyperus pumilus L., Cent. Pl. 2: 6. 1756; Nees, *ex* Clarke in Hook. f., FBI 6: 591.

1893; Rao and Verma, Cyperaceae of N. E. India 9. 1982.

Annual herb. Stem 25 cm tall, trigonous. Leaves 18 cm long, 2 mm broad. Inflorescence a compound anthela. Spikelet 3 mm long, 8-20 flowered. Glume 1.5 mm long, 1 mm broad. Stamen 1. Style 0.5 mm long, bifid.

Habitat: Found along the roadsides.

Fls. and Frts.: Jan.-Nov.

Serfang, Udalguri; Binu. 60; April 19, 2014.

Cyperus rotundus L., Sp. Pl. 45. 1753; Clarke in Hook. f., FBI 6: 614. 1896; Rao and Verma, Cyperaceae of N. E. India 19. 1982; Chowdhury, Assam's Flora 300. 2005.

Perennial herb. Stems 30-50 cm high, trigonous. Leaves equaling culm, acuminate. Inflorescence a compound umbel. Spikelets spreading, linear, many flowered. Glumes 2.5 mm long. Stamens 3. Stigmas 3. (**Plate 44**) (Photo File 29. Y)

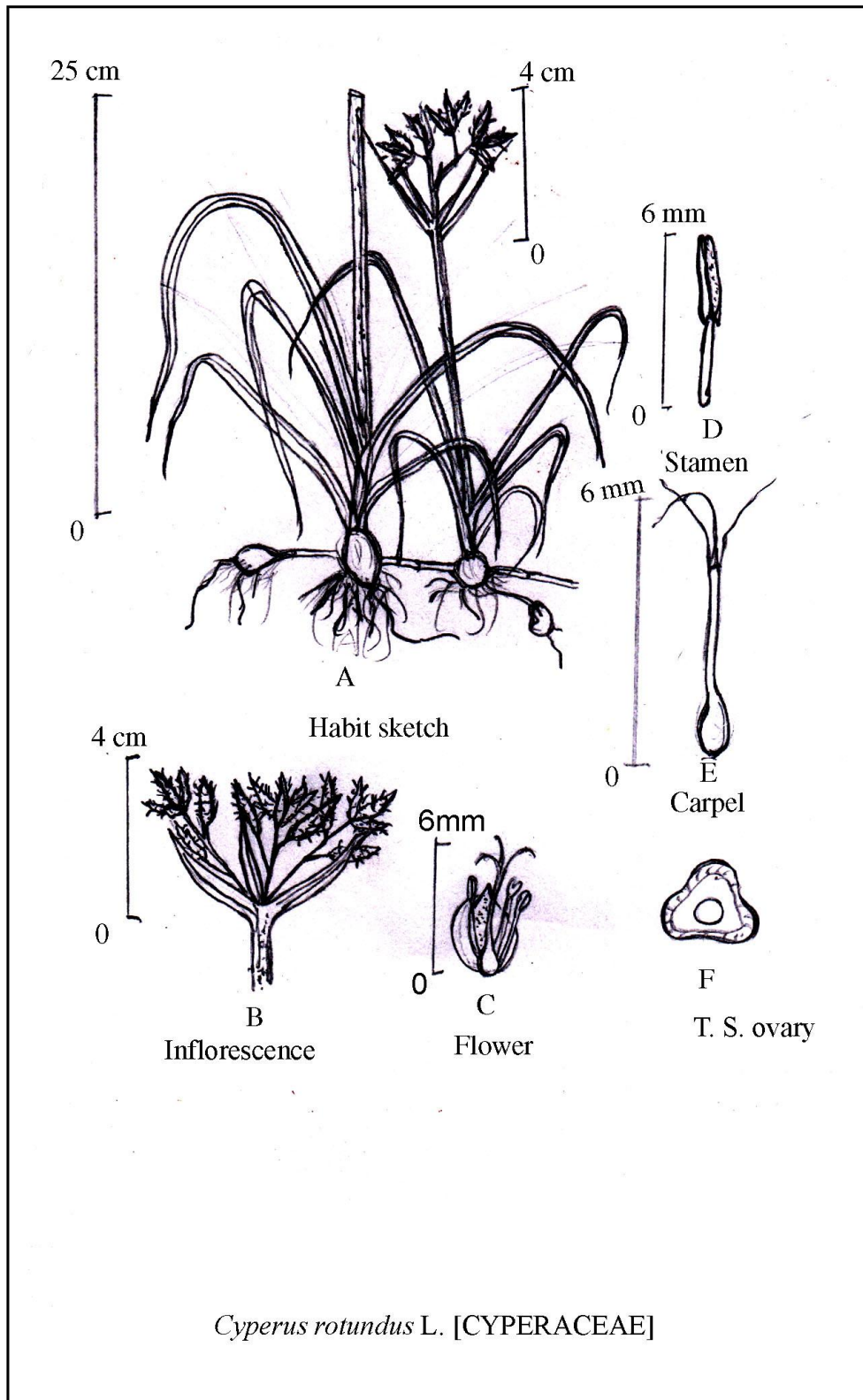
Habitat: Grows along the roadsides.

Fls. and Frts.: Feb.-Nov.

Vern. name: Khaya Hagra. (Bd.).

Serfang, Udalguri; Binu. 05; February 27, 2014.

Cyperus sanguinolentus Vahl, Enum. Pl. Obs. 2: 351. 1805; Rao and Verma, Cyperaceae of N. E. India 9. 1982; Chowdhury, Assam's Flora 300. 2005.



Annual herb. Stems 28 cm high, trigonous, with several leaves basally. Leaves 20 cm long, 2 mm broad. Inflorescence a simple anthela. Spikelet ovoid, 20-flowered. Glumes ovate. Stamens 2. Stigmas 2.

Habitat: Found along the roadside of wasteland.

Fls. and Frts.: Feb.-Dec.

Sonai, Udalguri; Binu. 12; February 27, 2014.

Cyperus silletensis Nees, Contr. Bot. India 79. 1834; C. B. Clarke in Hook. f., Fl. Brit. India 6: 600. 1893.

Annuals herb. Tufted, 1.5-3.0 dm high. Stems slender, trigonous, 1-2 mm thick. Leaves 4-6, 1.5-4.0 mm broad. Anthela compound, dense or some what open; brcts 4-5 foliaceous, spreading. Spikelets in cluster of 5-15, lanceolate. Rachilla reddish brown, wingless. Glumes short, ovate to lanceolate, greenish stramineous or sometimes reddish, keeled. Stamen solitary. Styles tritit. Nuts trigonous, apiculate, brownish. (Photo File 29. W)

Habitat: Grows along streams.

Fls. and Frts.: Oct.-Apr.

Serfang, Udalguri; Binu. 73; April 27, 2014.

Cyperus sulcinux (C. B. Clarke) C. B. Clarke, in Hook. Fl. Brit. India 6: 593. 1893; J. Linn. Soc., Bot. 21: 56. 1884.

Annual herb. Roots fibrous. Culms tufted, 5.0-43 cm tall, slender, 3-angled, smooth, with a few leaves basally. Leaves shorter than culm; sheath purplish brown. Leaf blade 0.5-2.0 mm wide, usually folded, apical margin scabrous. Involucral bracts 3-5. Inflorescence simple, 6 cm, slender. Spikelets spreading, linear, compressed, 8-20 flowered. Glumes straw coloured to brownish yellow. Stamen 1. Anther oblong. Stigmas 2. Nutlet blackish brown, oblong.

Habitat: Found on mountaint slopes.

Fls. and Frts.: Jan.-Apr.

Sikaridanga, Udalguri; Binu. 27; February 27, 2014.

Cyperus tenuispica Steud., Syn. Pl. Glumac. 2: 11. 1854; *C. flavidus* C. B. Clarke, J. Linn. Soc., Bot. 20: 287. 1883; Clarke in Hook. f., FBI 6: 600. 1893; Rao and Verma, Cyperaceae of N. E. India 13. 1982; Chowdhury, Assam's Flora 300. 2005.

Annual herb. Stems 10-20 cm high, trigonous. Leaves bladeless. Inflorescence a compound dumbel. Spikelets in clusters of 5-20. Glume 0.9 mm long. Stamen 1. Stigmas 3.

Habitat: Found in roadside of waste land.

Fls. and Frts.: Jul.-Nov.

Udalguri, Nalbari; Binu. 89; June 08, 2014.

Eleocharis R. Brown

Prodr. 224. 1810; Clarke in Hook. f., FBI 6: 625. 1893; Rao and Verma, Cyperaceae of N. E. India 22. 1982.

Annual or perennial herb. Stem tufted, angular. Leaves reduced to sheaths. Inflorescence a terminal spikelet. Glumes spirally arranged, imbricate. Hypogynous bristles present. Stamens 1-3. Style 2-3-fid. Achene trigonous or biconvex.

Species about 150, cosmopolitan; 16 species in India (Clarke in Hook. f., 1893); 8 in N. E. India (Rao and Verma, 1982) and 1 species in the study area.

Eleocharis congesta D. Don, Prodr. Fl. Nepal. 41. 1821; Clarke in Hook. f., FBI 6: 630. 1893; Rao and Verma, Cyperaceae of N. E. India 26. 1982; Chowdhury, Assam's Flora 300. 2005.

Annual. Stems tufted, angular. Leaves reduced to sheaths. Spikelet oblong, 8 cm long, 3 mm wide. Glumes imbricate, 1.5 mm wide. Perianth bristles present. Stamens 2. Stigmas 3. (Photo File 29. F) (Photo File 29 F)

Habitat: Found in swamps and paddy fields.

Fls. and Frs.: Jan.-Nov.

Udalguri Nalbari; Binu. 11; February 27, 2014.

***Fimbristylis* Vahl**

Enum. Pl. 2: 285. 1806; Clarke in Hook f., FBI 6: 630. 1893; Rao and Verma, Cyperaceae of N. E. India 26. 1982.

Annual or perennial herb. Stems sometimes solitary, tufted, 3-5 angled. Leaves basal, sometimes reduced to sheaths. Inflorescence terminal, umbellate, capitate or reduced to one spikelet. Spikelet solitary or clustered, many flowered. Glumes several. Stamens 1-3. Style 2-3-fid. Achene trigonous.

Species about 300 in the tropics and subtropics; 58 species found in India (Clarke in Hook. f., 1893); 40 in N. E. India (Rao and Verma, 1982); 11 species in Assam (Baishya, 1999) and 6 species in the study area.

Key to species:

1a. Styles 2-fid. ***F. dichotoma***

1b. Styles 3-fid. ***F. complanata***

2a. Spikelets many globose:

3a. Inflorescence decompound, spikelets usually

many, 1-2 mm long. ***F. miliacea***

3b. Inflorescence a simple umbel of few spikelets;

2-5 m long.... .. ***F. litoralis***

2b. Spikelets solitary, cylindric, triangle:

4a. Culms tufted, 2-15 cm high, spikelets minute,

2-3 mm long.... .. ***F. aestivalis***

4b. Culms solitary, 20-40 cm high,

spikelets acute, 2-4 mm long. ***F. diphylla***

Fimbristylis aestivalis (Retz.) Vahl, Enum. 2: 288. 1805; *Scirpus aestivalis* Retz. Observ. Bot. 4: 12. 1786; Clarke in Hook. f., FBI 6: 637. 1893; Rao and Verma, Cyperaceae of N. E. India 32. 1982; Chowdhury, Assam's Flora 301. 2005.

Annual herb. Stems 5.0-22 cm high, 3-angled, with few leaves at base. Leaves shorter than culm, 1 mm wide. Inflorescence a terminal compound umbel. Spikelets 2 mm long, solitary, ovoid. Glumes 1.5 mm long. Stamen 1. Styles 2-fid.

Habitat: A common weed found in the paddy fields.

Fls. and Frts.: Nov.-May.

Udalguri Nalbari; Binu. 26; February 27, 2014.

Fimbristylis complanata (Retz.) Linn., Hort. Berol. 1: 292. 1827; *Scirpus complanatus* Retz., Observ. Bot. 5: 14. 1789; Clarke, Hook. f., FBI 6: 646. 1893; Rao and Verma, Cyperaceae of N. E. Ind. 37. 1982; Chowdhury, Assam's Flora 301. 2005.

Perennial herb. Stem 40 cm high, 2 mm wide. Leaves half of culm length, 4 mm wide. Inflorescence a globose anthelodium. Spikes many. Glumes 2 mm long, acute. Stamens 3. Stigmas 3.

Habitat: Found in swampy wasteland.

Fls. and Frts.: Feb.-Sep.

Serfang, Udalguri; Binu. 65; April 19, 2014.

Fimbristylis dichotoma (L.) Vahl, Enum. 2: 287. 1805; *Scirpus dichotomus* L., Sp. Pl. 1: 50. 1753. *S. diphyllus* Retz., Obs. Bot. 5: 15. 1789; *Fimbristylis diphylla* (Retz.) Vahl, Enum. 2: 289. 1805; Clarke in Hook. f., FBI 6: 636. 1893; Rao and Verma, Cyperaceae of N. E. India 31-32. 1982; Chowdhury, Assam's Flora 301. 2005.

Perennial herb. Culms 30-42 cm high, trigonous. Leaves 25 cm long. Inflorescence a terminal compound umbel. Glumes ovate, 2.5 mm long. Stamens 1-3. Styles 2-fid.

Habitat: Found widespread in dry to swampy places.

Fls. and Frts.: Mar.-Dec.

Serfang, Udalguri; Binu. 66; April 19, 2014.

Fimbristylis diphylla (Retz.) Vahl., Enum. Pl. 2: 287. 1805; Cl. In Hook. f., Fl. Brit. Ind. 6: 636. 1893; Chowdhury, Assam's Flora 301.2005.

Annual herb. Grass like. Culms solitary, 22-45 cm high, striate, hairy below the umbel. Leaves upper one, very hairy, margin scabrid, apex obtuse, sheaths close, glabrous below. Ligule a ring of cilia. Bracts leaf like. Umbels with few spikelets, central spikelets sessile cylindrical, acute, fusiform, 4-6mm long. Basal glumes empty, very hairy with spinous tubercle based hairs, 2.0-2.5 mm long, broader at base, strongly 1-nerved. Other glumes glabrous 3 mm long. Acute, strongly 1-nerved. Stamens 1. Anthers longer than filaments. Styles 2-fid, hairy. Nuts ovoid, 2 mm long. (Photo File 29. P)

Habitat: Common in marshes and paddy fields.

Fls. and Frts.: Apr.-Dec.

Serfang, Udalguri; Binu. 63; April 19, 2014.

Fimbristylis littoralis Gaudich., Voy. Uranie 413. 1829; Blake in J. Arn. Arbor. 35: 217. 1954. *F. miliacea* sensu Vahl, Enum. 2: 285. 1805 (*Scirpus miliacus* L.); Clarke in Hook. f., Fl. Brit. Ind. 6: 644. 1893; Rao and Verma, Cyperaceae of N. E. India 36. 1982; Chowdhury, Assam's Flora 301. 2005.

Annual herb. Culms up to 40 cm long, quadrangular. Leaves shorter than culm, tapering to a fine point. Inflorescence compound umbel. Spikelets globose. Glumes 1.2 mm long, ovate. Stamens 1-3.

Habitat: Common along roadside ditches and paddy fields.

Fls. and Frts.: Mar.-Sep.

Serfang, Udalguri; Binu. 57; April 19, 2014.

Fimbristylis miliacea (L.) Vahl, Enum. Pl. Obs. 2: 267. 1805; Clarke in Hook. f., Fl. Brit. Ind. 6: 644. 1893.

Perennial herb. Culms tufted, 10-40 cm high, terete. Leaves variable, longer or very much shorter than the culms or sometimes reduced to sheaths. Apex rounded. Umbels decomposed. Spikelets many to few, globose, 1-2 mm long, many flowered. Glumes cymbiform, brown, lanceolate, apex rounded, about 0.5 mm long, with a median green

nerve. Stamens 3, very short. Anthers cylindrical. Styles 3-lobed, base swollen. Nuts trigonous.

Habitat: Common in paddy field and in marches.

Fls. and Frts.: Feb.-Dec.

Serfang, Udalguri; Binu. 07; February 27, 2014.

***Fuirena* Rottb.**

Descr. Icon. Rar. Pl. 70. 1773; Clarke in Hook. f., FBI 6: 665. 1893; Rao and Verma, Cyperaceae of N. E. India 47. 1982.

Annual or perennial herb. Stems leafy. Leaves linear to lanceolate. Inflorescence corymbose or sub-capitate, terminal or axillary. Spikelets many flowered. Glumes spirally arranged. Stamens 2-3. Stigmas 3. Achene trigonous, ovoid or obovoid.

Species about 40, in tropical and sub-tropical regions; 6 species in India (Clarke in Hook. f., 1893); 2 in N. E. India (Rao and Verma, 1982) and 1 species in the study area.

***Fuirena umbellata* Rottb.**, Descr. Icon. Rar. Pl. 70, t. 19, f. 3. 1773; Clarke in Hook. f., FBI 6: 666. 1893; Rao and Verma, Cyperaceae of N. E. India 48. 1982; Chowdhury, Assam's Flora 301. 2005.

Perennial. Rhizome creeping, woody. Culms 25-40 cm high. Leaves linear to lanceolate, acuminate. Spikelets in a simple or compound, axillary and terminal pedunculate, greenish or brownish. Stamens 3. Stigmas 3. (Photo File 29. A)

Habitat: Grows in swampy area.

Fls. and Frts.: Jan.-Dec.

Serfang, Udalguri; Binu. 55; April 19, 2014.

***Kyllinga* Rottb.**

Descr. Icon. Rar. Pl. 12. 1773; Clarke in Hook. f., FBI 6: 587. 1893.

Perennial herb. Stems trigonous, leafy at base only, terminated by a sessile spike. Leaves linear. Spikelets sessile, numerous, laterally compressed. Glumes distichous. Perianth absent. Stamens 1-3. Ovary sub-orbicular. Stigmas 2. Achene oblong or ellipsoid.

Species about 60, distributed in tropics and sub-tropics; 6 species occur in India (Clarke in Hook. f., 1893) and 2 species in the study area

Key to species

1a. Stem cespitose or not; spikelet greenish. *K. brevifolius*

1b. Stem densely cespitose; spikelets whitish. ... *K. odorata*

Kyllinga brevifolius Rottb., Descr. Icon. Rar. Pl. 13. 1773; *Cyperus brevifolius* (Rottb.) Hassk., Cat. Hort. Bog. 24: 1844; Clarke in Hook. f., FBI 6: 588. 1893; Rao and Verma, Cyperaceae of N. E. India 6. 1982; Chowdhury, Assam's Flora 298. 2005.

Perennial herb. Rhizome creeping. Stems 35 cm high. Leaves 26 cm long, shorter than stems, 4 mm wide. Spikes solitary ovoid, greenish, 5 mm in diameter. Spikelets 2 mm long. Lemma 3.5 mm long. Palea 3 mm long. Stamens 3, 4 mm long. Carpel bifid, 4 mm long. (**Plate 45**) (Photo File 29. J)

Habitat: Very common in waste land.

Fls. and Frts.: Mar.-Nov.

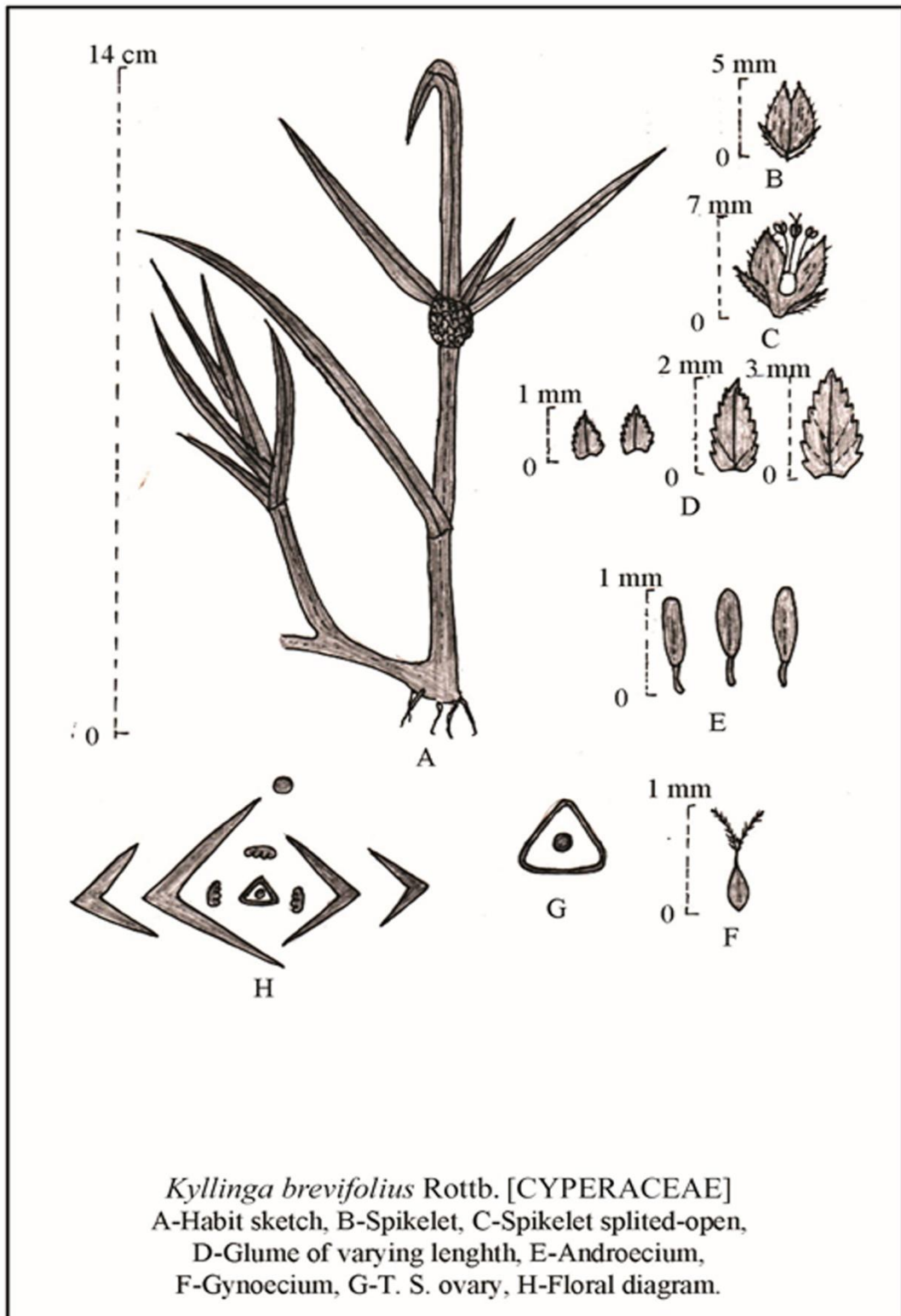
Gersong, Udalguri; Binu. 40; April 05, 2014.

Kyllinga odorata Vahl, Enum. Pl. 2: 382. 1805; *Kyllinga cylindrica* Nees, Clarke in Hook. f., FBI 6: 588. 1893; Rao and Verma, Cyperaceae of N. E. India 6. 1982.

Perennial herb. Densely caspitose. Stems smooth. Leaves flat to slightly folded, shorter than stem, up to 20 cm long, 2 mm wide. Spikes whitish, ovoid. Spikelets ovate. Stamens 2. Style 1 mm long.

Habitat: Found along the roadside.

Fls. and Frts.: Jan.-Aug.



Kyllinga brevifolius Rottb. [CYPERACEAE]
 A-Habit sketch, B-Spikelet, C-Spikelet splitted-open,
 D-Glume of varying length, E-Androecium,
 F-Gynoeceum, G-T. S. ovary, H-Floral diagram.

Gersong, Udalguri; Binu.230; April 05, 2014.

Lipocarpha R. Brown

J. H. Turkey, Narr. Exped Zaire 459. 1818; Clarke in Hook. f., FBI 6: 667. 1893; Rao and Verma, Cyperaceae of N. E. India 48. 1982.

Annual or perennial herb. Rhizome absent or short. Stems tufted, trigonous, leafy only at base. Leaves narrow, ligule absent. Spikelets 1-20 in a single terminal head. Glumes present or absent. Hypogynous bristles replaced by two hyaline scales. Stamens 1-3. Stigmas 2-3. Achene bi-convex or trigonous.

Species about 15, distributed in America, Africa and Asia; 3 in India (Clarke in Hook. f., 1893); 2 species in N. E. India (Rao and Verma, 1982) and 1 species in the study area.

Lipocarpha chinensis (Osbeck) J. Kern, Blumea, Suppl. 4: 167. 1958; *Scirpus chinensis* Osbeck, Dagb. Ostind. Resa 220. 1757; *Hyphaelytrum argenteum* Vahl, Enum. Pl. 2: 283. 1805; *Lipocarpha argentea* (Vahl) R. Br. In Turkey, Narr. Exp. Congo. 459. 1818; Clarke in Hook. f., FBI 6: 667. 1893; Rao and Verma, Cyperaceae of N. E. India 48. 1982; Chowdhury, Assam's Flora 301. 2005.

Annual or perennial herb. Rhizome obscure. Stems tufted, 30-35 cm high, trigonous. Leaves shorter than stem, 2 mm wide. Spikelets 3-4, 5 mm long, whitish. Glumes 2.5 mm long. Stamens 2. Styles 3-fid. (Photo File 29. T)

Habitat: Common weed of paddy field.

Fls. and Frts.: Apr.-Dec.

Khomabari, Udalguri; Binu. 71; April 27, 2014.

Mariscus (Gaertn.) C. B. Clarke

Perennial, rarely annual herb. Stolon present or absent. Leaves mostly radical. Involucral bracts leaf like. Inflorescence an umbellate panicle with long or short rays. Spikes cylindrical. Rachilla disarticulating above the two lowest empty glumes. Stamens 3. Styles short, 3-fid. Nuts trigonous.

Meriscus cyperinus (Retz.) Suringer, *Cyperus* Mai. Arch. 154. 1898; Enum. Pl. 2: 377. 1806; Clarke in Hook. f. Fl. Brit. Ind. 6: 621. 1893.

Stolon short or absent. Roots fibrous, tufted, brown. Culms 20-30 cm high, trigonous. Leaves shorter than culms, tapering towards the apex. Bracts leaf like. Spikes sessile, 1-2cm long, truncate. Spikelets 6 mm long, terete, acute, 2-3 flowered. Glumes ovate to lanceolate, 4 mm long, keel membranous, apex rounded. Stamens 1-3, filaments short. Styles short, stout. 3-fid, coiled. Nuts linear, trigonous. (Photo File 29. E)

Habitat: Grows in moist shady places.

Fls. and Frts.: Mar.-Oct.

Sonai, Udalguri; Binu. 58; April 19, 2014.

***Rhynchospora* Vahl.**

Enum. Pl. 2: 229. 1805; Clarke in Hook. f., FBI 6: 590. 1893; Rao and Verma, *Cyperaceae of N. E. India* 49. 1982.

Perennial herb. Tufted. Rhizomes present or absent. Stems simple, leafy throughout or at base only. Inflorescence capitate, corymbose or paniculate. Spikelets terete. Glumes spirally arranged. Stamens 1-3. Style undivided or bifid. Stigmas 2 or 3. Achene obovoid.

Species about 200 in the warmer regions of the world; 11 species in India (Clarke in Hook. f., 1893); 5 in N. E. India (Rao and Verma, 1982) and 2 species in the study area.

Key to species

1a. Culms stout, 30-50 cm high, leaves broad;

inflorescence corymbose. ***R. corymbosa***

1b. Culms slender, 10-30 cm high, leaves basal;

inflorescence globose. ***R. rubra***

Rhynchospora corymbosa (Linn.) Britton, Trans. New York Acad. Sci. 11: 84. 1892;
Scirpus corymbosa L., Cent. Pl. 2: 7. 1756.

Perennial herb. Culms obtusely trigonous, robust. Leaves as long as culms, serrate. Panicle 4-5 cm across, brown. Lower glumes short, mucronate. Other glumes 5mm long, acute. Bristles 6, longer than nuts, brown. Stamens 6. Filaments as long as glumes. Style conic, persistent. Nuts cylindrical, glabrous, truncate with conic style base.

Habitat: Common in marshes and in paddy field.

Fls. and Frts.: Apr.-Dec.

Sonari, Udalguri; Binu. 59; April 19, 2014.

Rhynchospora rubra (Lour.) Makino, Bot. Mag. (Tokyo) 17: 180. 1903; *Schoenus rubra* Lour., Fl. Cochinch. 1: 41. 1790; *Rhynchospora wallichiana* Kunth, Clarke in Hook. f., FBI 6: 668. 1893; Rao and Verma, Cyperaceae of N. E. India 50. 1982; Chowdhury, Assam's Flora 302. 2005.

Perennial herb. Culms trigonous, nodeless, 10-30 cm high. Leaves basal, shorter than stem, 2 mm wide. Inflorescence globose, dense. Spikelets compressed. Glumes brown. Styles 2-fid. Stamens 3, anthers 2 mm long.

Habitat: Grows in paddy field.

Fls. and Frts.: Apr.-Aug.

Bandarguri, Udalguri; Binu. 56; April 19, 2014.

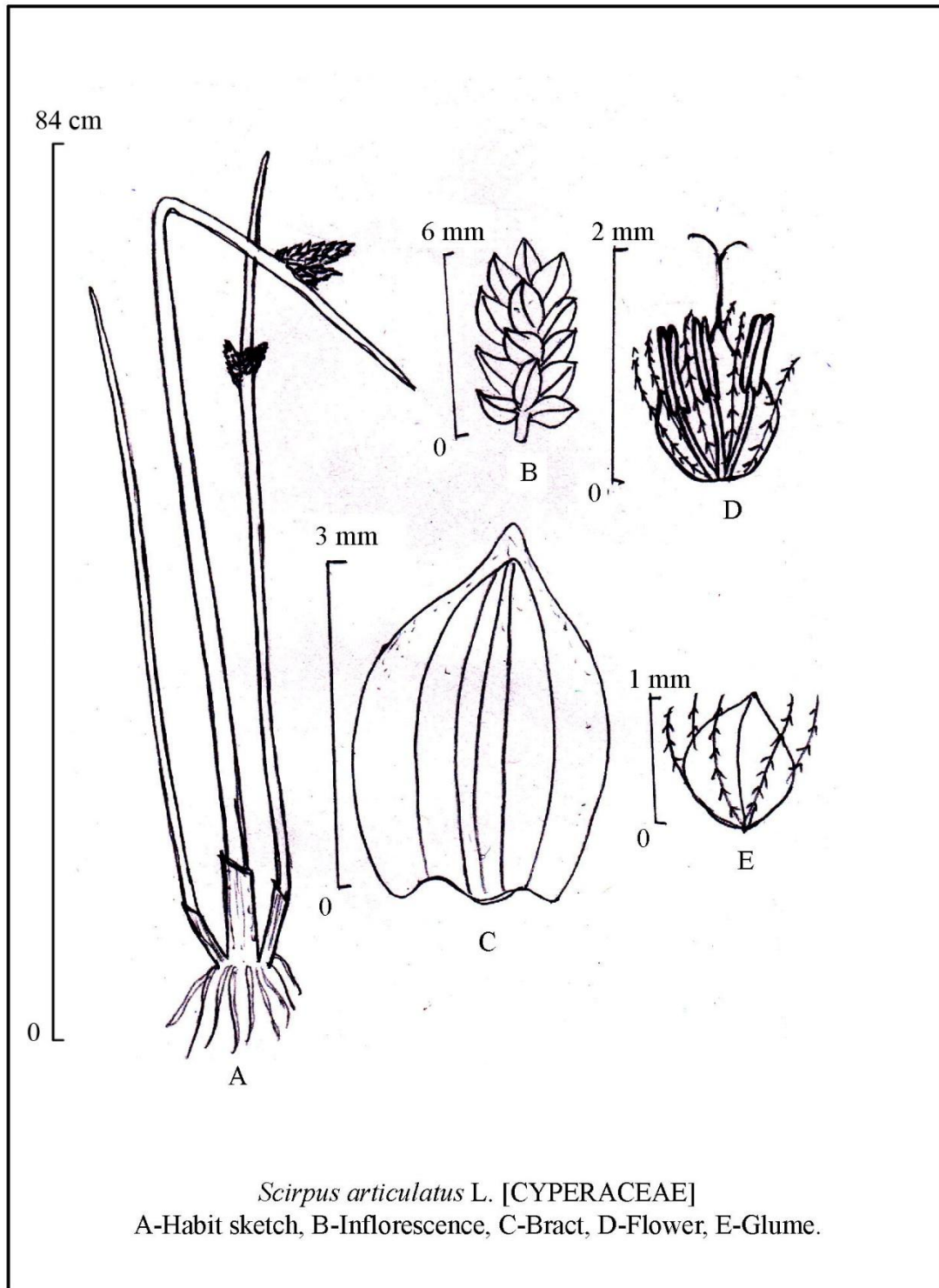
***Scirpus* L.**

Sp. Pl. 1: 47. 1753

Usually aquatic herb. Culms terete or trigonous. Inflorescence compound panicles or reduced to solitary spikelets. Spikelets ovoid, many flowered. Glumes spirally imbricate. Hypogynous bristles 2-7 or 0. Stamens 1-3. Anthers linear, oblong. Ovary ovoid. Styles slender 2-3 fid. Nuts obovoid, trigonous or plano-convex.

Species 26, distributed in tropics, temperate regions and 1 species in the study area.

PLATE - 46



Scirpus articulatus L. [CYPERACEAE]
A-Habit sketch, B-Inflorescence, C-Bract, D-Flower, E-Glume.

Scirpus articulatus L., Sp. Pl. 1: 47. 1753; Rao and Verma, Cyperaceae of N. E. India 43. 1982; *Schoenoplectus articulatus* (L.) Palla, Bot. Jahrb. Syst. 10: 299. 1888; Clarke in Hook. f., FBI 6: 656. 1893; Chowdhury, Assam's Flora 302. 2005.

Annual herb. Stems 50-84 cm tall, terete. Leaves reduced to sheaths. Inflorescence of many sessile spikelets, capitate. Spikelets ovoid, 7 mm long. Glumes ovate, 5 mm long. Stamens 3. Stigmas 3. Nut 3-sided. (**Plate 46**) (Photo File 29. B)

Habitat: Grows in marshy wasteland.

Fls. and Frts.: Feb.-Nov.

Golondi river bank, Udalguri; Binu. 09; February 27, 2014.

Scleria P. J. Bergius

Kongl. Vetensk. Acad. Handl. Stockholm 26: 142. 1765; Clarke in Hook. f., FBI 6: 685. 1893; Rao and Verma, Cyperaceae of N. E. India 55. 1982.

Annual or perennial herb. Erect leafy herbs. Culms triquetrous. Leaves sheathing at base. Inflorescence a terminal or axillary panicle or reduced to spikes. Flowers unisexual rarely bisexual. Spikelets clustered or solitary, bisexual or unisexual. Glumes numerous, imbricate. Stamens 1-3. Hypogynous bristles absent. Stigmas 3. Nut globose or ovoid, often white and shining.

Species about 200, found in all tropical and sub-tropical regions; 29 species occur in India (Clarke in Hook. f., 1893); 14 in N. E. India (Rao and Verma, 1982); 7 in Assam (Baishya, 1999) and 1 species in the study area.

Scleria terrestris (L.) Fassett, Rhodora 26: 159. 1924; *Zizania terrestris* L., Sp. Pl. 2: 991. 1753; Rao and Verma, Cyperaceae of N. E. India 60. 1982; Chowdhury, Assam's Flora 302. 2005.

Perennial herb. Rhizomes woody. Stems up to 1 m tall, 4 mm wide, trigonous. Leaf sheaths papery. Inflorescence a panicle. Spikelets entirely unisexual. Female spikelets grow at base of branch. Stigmas 3. Anthers linear. Nutlet white, spherical. (Photo File 29. G and H)

Habitat: Common in wastelands of marshy areas.

Fls. and Frts.: Apr.-Oct.

Serfang, Udalguri; Binu. 70; April 27, 2014.

POACEAE (R. Brown) Barnhart

Bull. Torrey Club. 22: 7. 1895.

Annual or perennial herb. Rarely shrubs or trees. Stems erect, hollow in the internodes, nodes solid. Leaves solitary at the nodes, alternate, consisting of a sheath, ligule and blade. Blades narrow. Inflorescence a spikelet arranged in a panicle, spikes or racemes. Spikelet consists of two bracts at the base called glumes, followed by one or more florets. Floret surrounded by two bracts, one external: the lemma and one internal: the palea. Flowers bisexual, sometimes unisexual, inconspicuous. Perianth represented by 2 or 3 minute hyaline or fleshy scales called lodicules. Stamens 1-6. Styles 2. Fruit a caryopsis.

777 genera, 11461 species throughout the world ; 50 genera and 78 species in the study area.

Key to genera

1a. Shrubs or trees or arborescent:

2a. Culms armed. *Bambusa*

2b. Culms unarmed:

3a. Inflorescence indeterminate:

4a. Lodicules 2. *Microstegium*

4b. Lodicules absent. *Dendrocalamus*

3b. Inflorescence determinate. *Narenga*

1b. Herbs or undershrubs:

5a. Spikelets flowers 2, falling entire at maturity, usually
the upper floret hermaphrodite and the lower male
and the latter often reduced to the lemma or rarely

the lemma entirely absent, all alike or more often different
in size, shape and structure frequently dorsally compressed:

6a. Male and female spikelets in separate

Inflorescence, in different parts of the same
inflorescence and of different appearance:

7a. Male and female spikelets in

same inflorescence. *Coix*

7b. Male and female spikelets in

separate inflorescence:

8a. Styles basally fused. *Polytoca*

8b. Styles fused nearly to tip. *Zea*

6b. Spikelets all hermaphrodite or

closely mixed with male or barren:

9a. Spikelets usually solitary, rarely paired, more
or less similar; glumes membranous, lower glume
usually smaller or suppressed; lower lemma
resembling upper glume usually awnless:

10a. Rachis flattened. *Paspalum*

10b. Rachis angular or terete:

11a. Inflorescence a raceme:

12a. Racemes digitately arranged:

13a. Glumes and lemmas with laterally
compressed and thickened apices;
margins of lemma narrowly inrolled:

14a. Lemmas not striate. *Axonopus*

14b. Lemmas striate. *Acroceras*

- 13b. Glumes and lemmas not so; margins
of lemma flat, hyaline:
- 15a. Ligule usually of a fringe of hairs.*Pseudostachyma*
- 15b. Ligule usually an unfringed membrane... ..*Digitaria*
- 16a. Leaves ovate to ovate lanceolate..... ..*Oplismenus*
- 16b. Leaves linear to lanceolate:
- 17a. Ligule present.*Urochloa*
- 17b. Ligule absent or vestigial.*Echinochloa*
- 11b. Inflorescence paniculate:
- 18a. Panicle contracted:
- 19a. Spikelets not subtended by bristles.....*Hymenachne*
- 19b. Spikelets subtended by involucre bristles:
- 20a. Lemmas having the margins inrolled
against the palea.*Setaria*
- 20b. Lemmas having the margins lying flat
on the palea.*Pennisetum*
- 18b. Panicles effuse:
- 21a. Glumes shorter than the
adjacent lemmas.*Cyrtococcum*
- 21b. Glumes longer than the
adjacent lemmas.*Panicum*
- 9b. Spikelets paired but one sessile and the other pedicelled,
each pair similar or dissimilar, rarely solitary and all alike;
glumes equaling the length of spikelets, hyaline and membranous,
rigid and firmer than lemmas; upper lemma usually awned:
- 22a. Joints and pedicel fused together:

- 23a. Sessile spikelets globose. *Hackelochloa*
- 23b. Sessile spikelet not as above:
 - 24a. The longer spikelets hermaphrodite.... .. *Hemarthria*
 - 24b. The longer spikelets male only or sterile. *Capillidium*
- 22b. Joints and pedicels not fused:
 - 25a. Inflorescence a simple raceme:
 - 26a. Racemes without spathe:
 - 27a. Lodicules present... .. *Ischaemum*
 - 27b. Lodicules absent. *Centotheca*
 - 26b. Raceme with spathe:
 - 28a. Lemma awnless. *Cymbopogon*
 - 28b. Lemma awned:
 - 29a. Lower glume 5-9 nerve.... .. *Heteropogon*
 - 30a. Leaf blades narrow... .. *Themeda*
 - 30b. Leaf blades broad. *Apluda*
 - 25b. Inflorescence a panicle:
 - 31a. Panicle glabrous or pubescent:
 - 32a. Pedicelled spikelet with
 - translucent groove at ped:
 - 32b. Pedicelled spikelet not such:
 - 33a. Spikelets in threes... *Chrysopogon*
 - 33b. Spikelets in pairs. *Vetiveria*
 - 31b. Panicle plumose:
 - 34a. Spikelets all pedicelled.. *Imperata*
 - 34b. Spikelets one sessile and other pedicelled:
 - 35a. Spikelets awned:

- 36a. Lower lemma 1-nerved. *Dimeria*
- 36b. Lower lemma 2-nerved
 - or nerveless. *Poa*
- 35b. Spikelets unawned. *Saccharum*
- 5b. Spikelets flowers 1 to many, breaking up at maturity
 - of persistent glumes or falling entire, not with
 - the lower floret male or barren and the upper
 - hermaphrodite, usually more or less laterally compressed
 - or terete or 2-flowered and falling entire, the glumes
 - and the lemmas all membranous and with a globose
 - wrinkled seed which splits the palea when mature:
- 37a. Inflorescence a raceme:
 - 38a. Raceme terminal, solitary:
 - 39a. Glumes subulate.... *Cynosurus*
 - 39b. Glumes not subulate... *Triticum*
 - 38b. Racemes digitate:
 - 40a. Spikelets awnless. *Cynodon*
 - 40b. Spikelets awned:
 - 41. Rachis and branches of the inflorescence
 - not terminating in a spikelet,
 - sharp point. *Dactyloctenium*
 - 41b. Rachis and branches of the inflorescence
 - terminating in a spikelet, not in a
 - sharp point. *Eleusine*
- 37b. Inflorescence a panicle:
 - 42a. Leaves 30-80 cm long, 10-80 cm

broad; panicle never stiff:

43a. Spikelets several flowered, lowest floret male or

abortive, others hermaphrodite, ligules hairy:

44a. Rachilla long, hairy; lemma entire. *Phragmites*

44b. Rachilla glabrous; lemma bifid, pillose

at the back. *Arundo*

43b. Spikelets 2-flowered, lower abortive, upper

fertile, ligules truncate. *Thysanolaena*

42b. Leaves 20 cm long, 8 mm broad; panicle stiff:

45a. Ligule 15-45 mm long. *Oryza*

45b. Ligule less than 10 mm long or absent:

46a. Spikelets many flowered. *Eragrostis*

46b. Spikelets 1-2 flowered:

47a. Spikelets 2-flowered:

48a. Glumes unequal. *Arundinella*

48b. Glumes equal:

49a. Lemma unawned..... *Isachne*

49b. Lemma awned. .. *Alopecurus*

47b. Spikelets 1-flowered:

50a. Glumes reduced to a

membranous rim; lemma

ciliate keeled. *Leersia*

50b. Glumes well-developed;

lemma not keeled. *Sporobolus*

Acroceras Stapf

Prain, Fl. Trop. Afr. 9: 621. 1920; Bor, FA 5: 198. 1940; Mitra, Fl. Pl. of Eastern India

1: 195. 1958; Bor, Grasses of India 275. 1960; Shukla, GNEI 305. 1996.

Annual or perennial herb. Culms creeping. Leaf blades linear to lanceolate. Ligule ciliated membrane or absent. Panicle of distant, spiciform or raceme like branches, bearing spikelets from the base. Spikelets paired or solitary upwards. Glumes equal. The lower usually short. Lower floret sterile and the upper hermaphrodite. Lemma laterally compressed. Stamens 3.

15-19 species in the world; 3 species in India; species in N. E. India (Shukla, 1996); 3 in Assam (Bor, 1940) and 1 species in the study area.

Acroceras munroanum (Balansa) Henrard, Blumea 3: 445. 1940; *Panicum latifolium* L., Sp. Pl. (ed. 1): 58. 1753; *P. munroanum* Balansa in Morot, J. de Bot. 4: 140. 1890; Hook. f., FBI 7: 39. 1896 *pro parte*; *A. crassiapiculatum* sensu Bor, FA 5: 200. 1940; Bor, Grasses of India 275. 1960; Mitra, Fl. Pl. of Eastern India 1: 196. 1958; Shukla, GNEI 306. 1996; Chowdhury, Assam's Flora 303. 2005.

Perennial herb. Culm slender. 11-24 cm tall. Leaf blades 1.0-3.3 cm long, 0.3 cm broad. Panicle consists of spike or raceme like branches. Spikelets ovate to lanceolate. Lower florets sterile and the upper hermaphrodite. (Photo File 30. f)

Habitat: Grows along the roadside.

Fls. and Frts.: May-Apr.

Udalguri Nalbari; Binu. 41; April 05, 2014.

Alopecurus L.

Sp. Pl. 1: 60. 1753 and Gen. Pl. 5: 30. 1754; Hook. f., FBI 7: 237. 1897; Bor, FA 5: 150. 1940; Mitra, Fl. Pl. of Eastern India 1: 1958; Bor, Grasses of India 392. 1960; Shukla, GNEI 42. 1996.

Annual or perennial herb. Culms ascending, spreading. Leaf blades linear. Ligule membranous. Inflorescence dense, up to 10 cm long, 1.1 cm broad. Spikelets laterally compressed. Rachilla not produced. Glumes equal and strongly keeled. Lemma slightly longer than the glumes and awned.

50 species in the world; 6 species in India (Hook. f., 1897); 4 species in N. E. India (Shukla, 1996); 2 species in Assam (Bor, 1940) and 1 species in the study area.

Alopecurus aequalis Sobol., Fl. Petrop. 16. 1799; Bor, Grasses of India 392. 1960; Shukla, GNEI 42. 1996; Chowdhury, Assam's Flora 303. 2005.

Annuals herb. Culms 35 cm tall. Leaf sheaths loosely arranged. Leaf blades glaucous, 7-11 cm long, 0.2 cm broad. Ligule membranous. Panicle dense, up to 8 cm long. Spikelets laterally compressed, 2 mm long. Glumes equal, 1-nerved, keeled. Upper glume hairy on the margins. Lemma 2.5 mm long with awned. Anthers 1 mm long. Style solitary. Stigmas 2.

Habitat: Found in shallow water.

Fls. and Frts.: Mar.-Jun.

Udalguri Nalbari; Binu. 34; March 09, 2014.

Apluda L.

Sp. Pl. (ed. 1): 82. 1753 and Gen. Pl. (ed. 5): 35. 1754; Hook. f., FBI 7: 150. 1897; Bor, FA 5: 430. 1940; Bor, Grasses of India 93. 1960; Mitra, Fl. Pl. of Eastern India 1: 206. 1958; Shukla, GNEI 60. 1996.

Annual or perennial herb. Inflorescence spreading. Racemes one noded. Spikelets 3-groups of heteromorphous: one sessile hermaphrodite, one pedicelled male and a pedicel tipped with a rudimentary floret enclosed within a peduncled, boat shaped spathe.

1 species distributed S. Arabia and Mauritius through India to S. E. Asia and Australia; 1 species in India (Hook. f., 1897); 1 species in N. E. India (Shukla, 1996); 2 species recorded in Assam (Bor, 1940) and 1 species in the study area.

Apluda mutica L., Sp. Pl. (ed. 1): 82. 1753; Bor, FA 5: 432. 1940; Mitra, Fl. Pl. of Eastern India 206. 1958; Bor, Grasses of India 93. 1960; Deb in Bull. Bot. Surv. India 3: 131. 1961; Hook. f., FBI 7: 150. 1897; Bor, FA 5: 432. 1940; Shukla, GNEI 60. 1996; Chowdhury, Assam's Flora 303. 2005.

Annual or perennial herb. Culms decumbent, up to 2.5 m tall. Leaf blade linear, acuminate, 10-28 cm long. Ligule membranous. Panicle leafy, spreading. Spikelets unawned in triplets, enclosed within a spathe, one sessile, 2-pedicelled. Sessile spikelet hermaphrodite. Lemma entire and unawned or bifid and awned. Stamens 3. Pedicelled spikelet 2-flowered, male. (Photo File 30. v)

Habitat: Grows on high area.

Fls. and Frts.: Jul.-Mar.

Gersong, Udalguri; Binu. 137; October 21, 2015.

Arundinella Raddi.

Agrost. Bras. 36. t. 1. 1823; Hook. f., FBI 7: 68. 1897; Bor, FA 5: 178. 1940 and Grasses of India 417. 1960; Mitra, Fl. Pl. of Eastern India 1: 181. 1958; Shukla, GNEI 150. 1996.

Annual or perennial herb or shrub. Culms simple reed. Leaf blades lanceolate. Panicle loose. Spikelets ovate, paired and unequally pedicellate or sessile, 2-flowered. Glumes unequal and persistent. Lower glumes short acute and upper glumes acuminate. Lower floret sterile and upper floret hermaphrodite. Stamens 3. Styles 2.

About 47 species in tropical and subtropical regions, mainly in Asia; 23 species in India (Hook. f., 1897); 9 species in N. E. India (Shukla, 1996); 9 species in Assam (Bor, 1940) and 2 species in the study area.

Key to species

1a. Upper lemma with 2 setae,

on each side of the awn. *A. khasiana*

1b. Upper lemma with a single awn

or without awn; seta absent. *A. bengalensis*

Arundinella bengalensis (Spreng.) Druce, Rep. Bot. Soc. Exch. Club Brit. Isles 1916: 605. 1917; Bor, FA 5: 185. 1940; *Panicum bengalensis* Spreng., Syst. Veg. 1: 311. 1825; Hook. f., FBI 7: 75. 1897; Bor, FA 5: 185. 1940; Mitra, Fl. Pl. of Eastern India

1: 182. 1958; Deb in Bull. Bot. Surv. India 3: 131. 1961; Shukla, GNEI 151. 1996; Chowdhury, Assam's Flora 303. 2005.

Perennial herb. Culms erect, 1.5 m tall. Leaf sheaths glabrous to villous. Leaf blades up to 30 cm long, flat, lanceolate, acuminate. Panicle erect, up to 30 cm long. Spikelets crowded. Glumes hispidulous: lower glume ovate, acute, 3-nerved and upper glume lanceolate, acuminate, 5-nerved. Lower floret male and upper floret hermaphrodite. Anthers 1.5 mm long.

Habitat: Grows along the roadside.

Fls. and Frts.: Jul.-Apr.

Vern. name: Hasib Bifang (Bd.)

Kahibari, Udalguri; Binu. 54; April 19, 2014.

Arundinella khasiana Nees *ex* Steud., Syn. Pl. Glum 1: 115. 1854; Hook. f. Fl. Brit. India 7: 71. 1896; Bor in Fl. Assam 5: 181. 1940 *et* Grass. Burm. Ceyl. Ind. Pak. 422. 1960.

Tufted plant. Culms robust 1-2 m high, glabrous, ribbed. Leaves 10-40 × 0.2-1.5 cm, hairy, margin rough, apex acute. Ligules reduced to a hairy ring. Panicles the uniform, branches sub-verticillate; rachis villous. Spikelets 6-8 mm long, 1-flowered. Lower glumes lanceolate, 5-nerved, acute with long tubercle based hairs; upper glumes similar to the lower onea. Lemmas hyaline, 2-keeled, with geniculate awn. Palea hyaline, nerveless. Stamens 3. Stigmas feathery. (Photo File 30. s)

Habitat: Common in marshes throughout the study area.

Fls. and Frts.: Sep.-Dec.

Vern. name: Nwlw singsri (Bd.)

Bogoribari, Udalguri; Binu, 147; September 03, 2014.

Arundo L.

Sp. Pl. (ed. 1): 81. 1. 1753; *et* Gen. Pl. (ed. 5): 35. 1754; Hook. f., FBI 7: 302. 1897; Bor, FA 5: 88. 1940; Mitra, Fl. Pl. of Eastern India 1: 157. 1958; Bor, Grasses of India

413. 1960; Shukla, GNEI 147. 1996.

Perennial shrub. Culms robust, upto 4.0 m tall with creeping rhizomes. Leaf blades linear, 20-30 cm long, 2-5 cm broad, tapering to a very fine point. Inflorescence a large, terminal and panicle.

12 species in the tropical and temperate regions (Clayton and Renvoize, 1986); 1 species in India (Hook. f., 1897); 1 species and 2 varieties in N. E. India (Shukla, 1996); 1 species in Assam (Bor, 1940) and 1 species in the study area.

Arundo donax L., Sp. Pl. 1: 81. 1753; Hook. f., FBI 7: 302. 1897; Bor, FA 5: 89. 1940; Mitra, Fl. Pl. of Eastern India 1: 157. 1958; Shukla, GNEI 147. 1996; Chowdhury, Assam's Flora 303. 2005.

Perennial shrub. Culms rhizomatous, upto 3 m tall, simple. Leaf blades lanceolate, 12-25 cm long, 2-4 cm broad, tapering to a fine point. Inflorescence a terminal panicle. Spikelets long, 2-7-flowered, laterally compressed. Glumes equal, 3-5-nerved, keeled. Lemmas 0.6 cm long. Palea about half the length of the lemma.

Habitat: Common in wasteland.

Fls. and Frts.: Throughout the year.

Vern. name: Nwlw Hagra (Bd.)

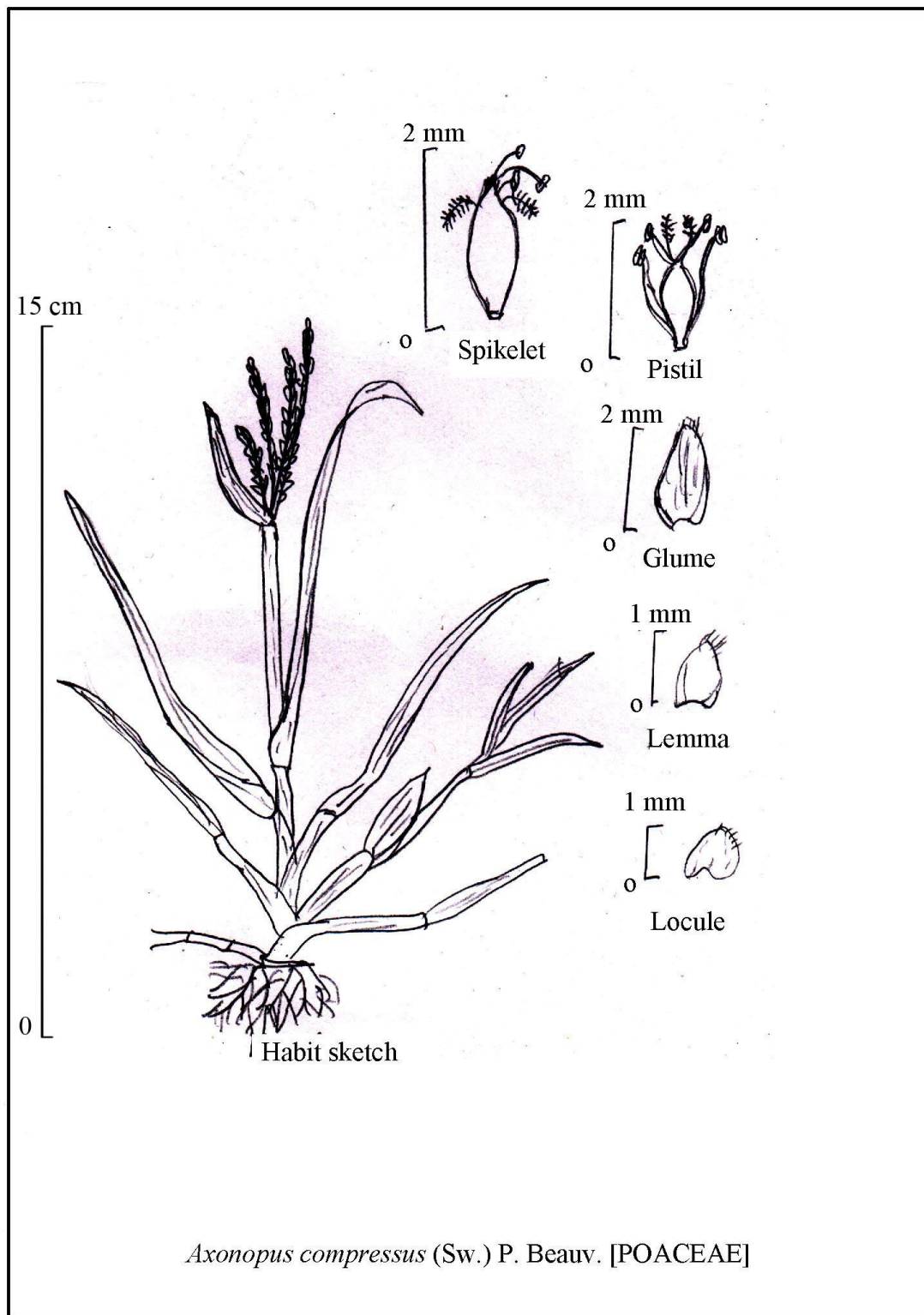
Sonai, Udalguri; Binu. 147; September 03, 2014.

Axonopus P. Beauv.

Ess. Agrost. 12: 154. 1812; Hook. f., FBI 7: 63. 1897; Bor, FA 5: 268. 1940; Mitra, Fl. Pl. of Eastern India 1: 202. 1958; Bor, Grasses of India 277. 1960; Shukla, GNEI 309. 1996.

Perennial herb. Culms stoloniferous. Leaf sheaths, compressed, keeled. Leaf blades linear. Ligule a narrow membrane. Inflorescence spike like racemes, digitate. Spikelets flattened axis. Lower glume absents and upper as long as the spikelet. Lower floret sterile and upper floret hermaphrodite.

PLATE - 47



35 species in the world; 2 species in India (Hook. f., 1897); 2 species in N. E. India (Shukla, 1996); 1 species in Assam (Bor, 1940) and 1 species in the study area.

Axonopus compressus (Sw.) P. Beauv., Ess. Agrost. 12, 154. 1812; Bor, FA 5: 270. 1940; Bor, Grasses of India 278. 1960; Mitra, Fl. Pl. of Eastern India 1: 202. 1958; Shukla, GNEI 310. 1996; Chowdhury, Assam's Flora 303. 2005.

Perennial. Herbaceous grass. Culms slender tufted, ascending and compressed. Often with a slender drooping peduncle. Racemes 2-3, sub-digitate, 3-5 cm long. Spikelets 2.4 mm long, straight or flexuous spikes. (**Plate 47**)

Habitat: Grows openly on play ground.

Fls. and Frts.: Apr.-Nov.

Vern. name: Dabsahagra (Bd.)

Udalguri H. S. School; Binu. 43; April 05, 2014.

Bambusa Schreber.

Gen. Pl. (ed. 8) 1: 236. 1789 (*nom. cons.*); *et* in Hook. f., FBI 7: 386. 1897; Bor, FA 5: 26. 1940; Shukla, GNEI 176. 1996; Seethalakshmi and Kumar, Bamboos of India 31. 1998.

Perennial shrub or tree, evergreen. Erect, arborescent or shrubby or rarely climbing, sometimes thorny. Culms mostly medium sized, seldom large, form a thick rhizome. Culm sheaths usually broad, often auricled. Leaves small to moderate sized, rarely large, linear, acuminate. Inflorescence generally a large leafless compound panicle bearing spikelets in heads, sometimes leafy panicles or paniculate spikes. Spikelets with one or many fertile flowers, usually supported by 1-3 empty glumes with an imperfect floret at the base or apex. Flowering glumes or lemmas ovate or lanceolate, many veined. Paleas 2-keeled, lodicules 3, membranous. Stamens 6, filaments free. Ovary oblong or obovat. Stigma 1-3.

15 species in India and 12 in N. E. India (Bahadur, 1979); 22 species in India and 17 species in N. E. India (Biswas, 1988); 25 species in India and 19 species and 1 var. in

N. E. India (Shukla, 1996); 26 in India and 16 in N. E. India (Seethalakshmi and Kumar, 1998); 11 in Assam (Bor, 1940) and 7 species and 1 variety in study area.

Key to species

1a. Culms recurved spines on the nodes. *B. arundinacea*

1b. Culms without spines:

2a. Culm sheaths with small auricles. *B. pallida*

2b. Culm sheaths with large auricles:

3a. Anthers obtuse. *B. tulda*

3b. Anthers apiculate. *B. nutans*

4a. Spikelets flattened. *B. vulgaris*

4b. Spikelets cylindrical:

5a. Spikelets in thick heads. *B. balcooa*

5b. Spikelets in detached heads. *B. assamica*

Bambusa arundinacea (Retz.) Willd., Sp. Pl. 2: 245. 1799; *Arundo bambos* L., Sp. Pl. 81. 1753; *Bambos arundinacea* Retz., Obs. Bot. 5: 24. 1789; Munro in Trans. Linn. Soc. 26 (1): 103. 1868; *et* in Hook. f., FBI 7: 395. 1897; *Bambusa bambos* (L.) Voss, Besch. Pflanzen deutsche Gaerten 2: 584. 1896; Bor, FA 5: 34. 1940; Shukla, GNEI 178. 1996; Barooah & Borthakur, Diver. and Distr. of Bamboos in Assam 35. 2003; Chowdhury, Assam's Flora 303. 2005.

Deciduous tree. Densely tufted. Thorny. Culms bright green, shining, variable in length reaching up to 30 m high and 18 cm in diameter. Lower branches spreading with 2-3 recurved spines on the nodes. Nodes slightly swollen. Internodes variable in length. Culm sheaths 30 cm long and 18-35 cm broad at base. Leaves linear to lanceolate, apex acute, rounded at base into a short, often swollen petiole like base. Inflorescence a large panicle. Spikelets lanceolate, acute, sessile, consisting of 3-7 flowers, the lower ones hermaphrodite, the upper male only. Palea 2-keeled. Lodicule 3. Stamens drooping. Ovary elliptic.

Habitat: Grows in high area.

Vern. name: Su-gwnang Owa. (Bd.)

Udalguri Nalbari; Binu. 149; November 20, 2015.

Bambusa assamica Barooah & Borthakur in Indian J. For. 24 (4): 503. t. 1. 2001;
Barooah & Borthakur, Diver. and Distr. of Bamboos in Assam 41. 2003.

Perennial shrub, evergreen. Tufted or loosely clumped. Culms erect 6-7.5 m high, 2 cm in diameter. Nodes prominently thickened. Internodes 15-40 cm long. Culm sheaths 8-12 cm long, 5-12 cm broad at base. Ligule 1 mm high, narrow. Auricles 2, rounded. Leaves oblong lanceolate, auricles 2, long, rounded. Ligule short.

Habitat: Found in high area.

Flowers not seen.

Vern. name: Fisa-bijuli Owa (Bd.)

Goraimari, Udalguri; Binu. 24; March 23, 2016.

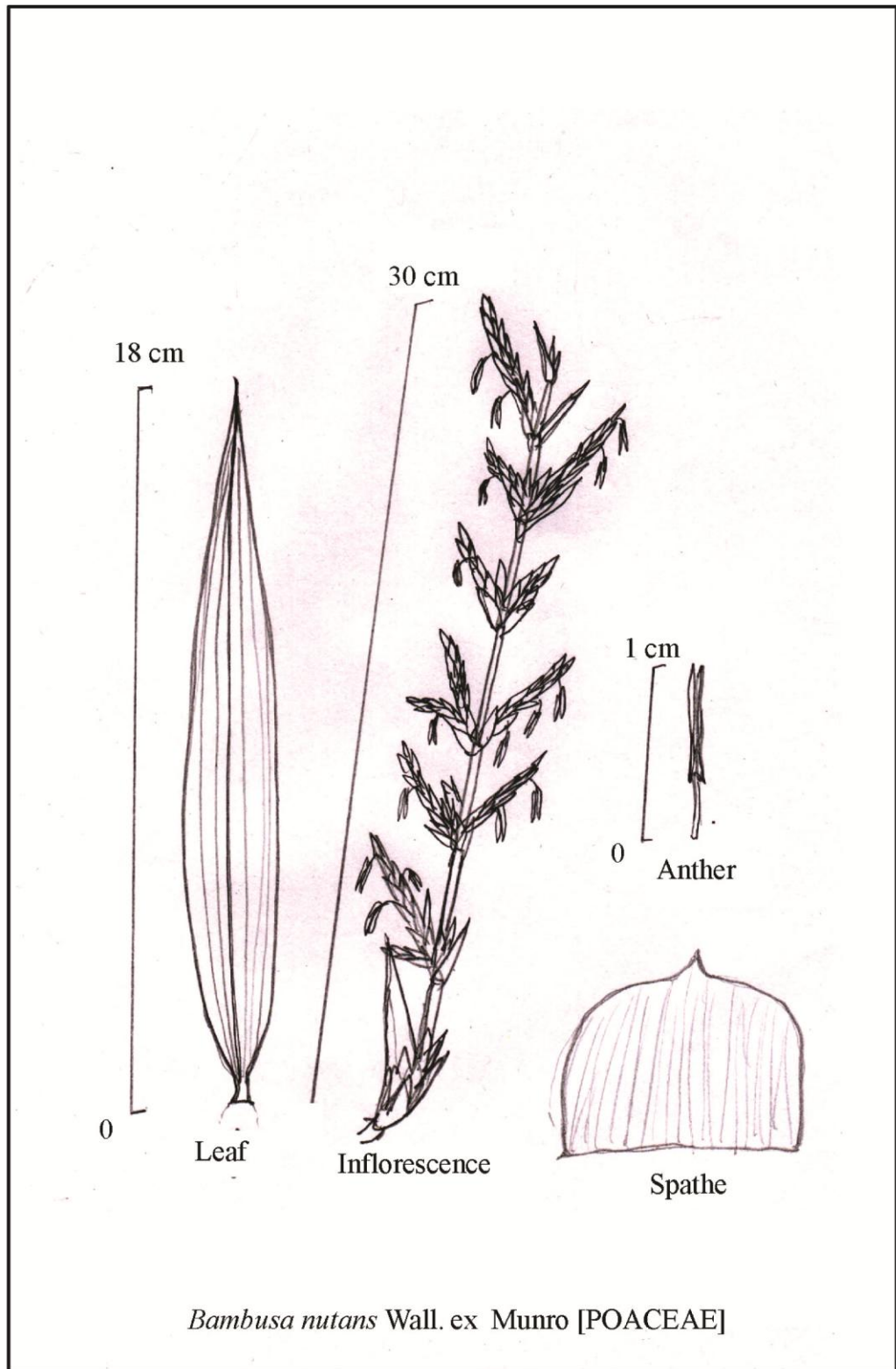
Bambusa balcooa Roxb., Hort. Beng. 25. 1814; *et* Fl. Ind. 2: 196, 1832;
Dendrocalamus balcooa (Roxb.) Voigt., Hort. Suburb. Cal. 718. 1845; Munro in
Trans. Linn. Soc. 26 (1): *et* in Hook. f., FBI 7: 39. 1897; Bor, FA 5: 33. 1940; Shukla,
GNEI 179. 1996; Barooah & Borthakur, Diver. and Distr. of Bamboos in Assam 45.
2003; Chowdhury, Assam's Flora 303. 2005.

Evergreen tree. Tall and stout. Culms 10-30 m in height and 8-16 cm in diameter, green when young and dull grayish green on maturity. Culm sheaths are of two kinds, of the lower nodes shorter and broader, dark hairs on outer surface, inner surface glabrous. Leaves lanceolate. Inflorescence a large compound panicle with bracteates heads of spikelets. Spikelets ovoid. Empty glumes ovate to acute, many nerved. Flowering glumes larger than empty glumes. Palea as long as flowering glume. Lodicules 3. Stamens exserted. Ovary ovoid. (Photo File 30. T)

Habitat: Found in high area.

Vern. name: Bholuka Bah (As.), Bholuka Owa (Bd.)

PLATE – 48



Udalguri, Santipur; Binu. 161; March 23, 2016.

Bambusa nutans Wall. *ex* Munro, Trans Linn. Soc. 26: 92. 1868; Gamble in Hook. f., Fl. Brit. Ind. 7: 387. 1896; Bor, Fl. Assam 5: 28, 1940; Deb. Fl. Tri. 2: 495. 1940; Shukla, Grass N. E. Ind. 183. 1996.

Perennial evergreen tree. Tall. Culms 5-10 cm in diameter, smooth. Nodes with white ring. Internodes 35-50 cm long. Culm sheaths 10-20 cm long, covered with hairs. Blades broad with hairs. Ligules short. Leaves linear to lanceolate, 15-35cm long, 2-4 cm wide, apex pointed, base attenuated, hairy, entire. Petioles 1-2 cm long. Panicles leafless with clusters of fertile spikelets. Spikelets few flowered, verticillate. Glumes 2-3. Lemmas membranous. Palea flattened, 2-keeled. Lodicules 3, fimbriate. Stamens 6, apiculate. Stigmas 2-3. Caryopsis oblong. **(Plate 48)** (Photo File 30. S)

Habitat: Found in high area.

Fls. and Frts.: Feb.-Apr.

Vern. name: Jhati Bah (Rh.)

Santipur, Udalguri; Binu. 163; April 26, 2016.

Bambusa pallida Munro, Trans. Linn. Soc. 26 (1): 97. 1868; *et* in Hook. f., FBI 7: 89. 1897; Bor, FA 5: 30. 1940; Shukla, GNEI 185. 1996; Barooah & Borthakur, Diver. and Distr. of Bamboos in Assam 66. 2003; Chowdhury, Assam's Flora 304. 2005.

Evergreen tree, very tall. Thickly growing. Culms 12-20 m high, 5-7 cm in diameter, olive green, young shoots covered with white powder. Nodes not very prominent. Internodes 45-65 cm long. Culm sheaths 18-20 cm long, 20-25 cm broad. Imperfect blades long. Auricles small, ligule narrow. Leaves linear. Leaf sheaths glabrous. (Photo File 30. V)

Habitat: Found in high area.

Flowers not seen.

Vern. name: Bijuli Owa (Bd.)

Santipur, Udalguri; Binu. 164; March 23, 2016.

Bambusa tulda Roxb., Beng. 25. 1814; Gamble in Ann. Roy. Bot. Gard. Cal. 7: 30. t. 29. 1896; *et in* Hook. f., FBI 7: 387. 1897; Bor, FA 5: 27. 1940; Shukla, GNEI: 188. 1996; Seethalakshmi and Kumar, Bamboos of India 79. t. 22. 1998; Barooah & Borthakur, Diver. and Distr. of Bamboos in Assam 74. 2003; Chowdhury, Assam's Flora 304. 2005.

Evergreen tree, tall. Culms 10-25 m high, 5-10 cm in diameter, almost unbranched below; nodes not swollen. Internodes 35-65 cm long, branches many from nearly nodes. Culm sheaths inner surface smooth, outer surface with black hairs. Auricles 2, unequal. Leaves linear to lanceolate, 15-30 cm long, 2-4 cm broad. Inflorescence a large radical leafless panicle. Spikelets 2.0-6.0 cm long, 5 mm broad, sessile. Empty glumes acute, many nerved. Flowering glumes many nerved, glabrous. Palea boat-shaped, 2-keeled. Lodicules 3, 2.5 mm long. Stamens long exerted, anthers 7.5 mm. Ovary obovate oblong. Caryopsis 8 mm long. (Photo File 30. W)

Habitat: Found in high area.

Fls. and Frts.: Mar.-Apr.

Vern. name: Jati Bah (Rh. and As.)

Santipur, Udalguri; Binu. 163; March 23, 2016.

Bambusa vulgaris Schrad. *ex* Wendl., Collect. Pl. 2: 26. t. 47. 1810; Munro in Trans. Linn. Soc. 26 (1): 1868; *et in* Hook. f., FBI 7: 391. 1897; Bor, FA 5: 34. 1940; Shukla, GNEI 190. 1996; Seethalakshmi and Kumar, Bamboos of India 83. t. 23. 1998; Barooah and Borthakur, Diver. and Distr. of Bamboos in Assam 74. 2003.

Perennial evergreen tree. Moderate sized. Loosely clumped. Culms erect, 10-20 m high. Bright green or striped yellow, shining, nodes prominent. Culm sheaths 15-25 cm long, 20-35 cm broad. Leaves narrowly or broadly lanceolate, 15-32 cm long, 2-4 cm broad, glabrous on both sides. Leaf sheaths striate, hairy.

Bambusa vulgaris var. ***vittata*** A. and C. Riviere, Les Bambous 191. 1898; *Bambusa striata* Lodd. *ex* Lindl., Penny Cyclop. 3: 357. 1835; Munro in Trans. Linn. Soc. 26 (1): 121. 1868; *Bambusa vulgaris* var. *striata* (Lodd. *ex* Lindl.) Gamble in Ann. Roy.

Bot. Gard. Cal. 7: 44. 1896; *et* in Kew Bull. 21: 268. 1967; Shukla, GNEI 190. 1996; Seethalakshmi and Kumar, Bamboos of India 74. t. 20. 1998; *B. vulgaris* cv. *Striata* Pandey and Banerjee in J. Econ Taxon. Bot. 25 (3): 546. 2001; Barooah and Borthakur, Diver. and Distr. of Bamboos in Assam 85. 2003; Chowdhury, Assam's Flora 304. 2005.

Evergreen tree. Loosely clumped. Culms 10-15 m high, 12 cm in diameter, glabrous, yellow with light green stripes, shining. Nodes slightly swollen. Internodes 10-35 cm long. Culm sheaths 10-18 cm long, 15-25 cm broad at base, greenish yellow when young. Ligule 5-8 mm broad, dentate. Imperfect blades triangular, acute. Leaves 15-32 cm long, 2-3.8 mm broad, linear to oblong or oblong to lanceolate. (Photo File 30. U)

Habitat: Cultivated.

Flowers not seen.

Vern. name: Halodhia Bah (As. and Rh.), Gwmw Owa (Bd.)

Bornogaon, Udalguri; Binu. 166; April 26, 2016.

Capillipedium Stapf

Fl. Trop. Afr. 9: 169. 1917.

Annual or perennial grass. Culms simple or copiously branched. Leaves linear, with a conspicuous white midrib. Panicles delicate, profusely branched. Branches and pedicels longitudinally furrowed. Spikelets 2-nut, deciduous, one sessile, awned and the other pedicelled, awnless, in 1-2 jointed racemes, disarticulating horizontally; sessile spikelets apparently 1-flowered, dorsally compressed, callus shortly bearded. Glumes equal, lower lemma hyaline, awnless, upper lemma terminating in a slender awn. Palea absent. Lodicules 2. Stamens 3, stigma laterally exerted, much longer than style. Caryopsis ellipsoid.

Capillipedium parviflorum (R. Br.) Stapf, Fl. Trop. Afr. 9: 169. 1917; Bor in Fl. Assam 5: 362. 1940; Grass, Burm. Ceyl. Ind. Pak. 112. 1960.

Perennial. Culms tufted, upto 1m high, simple or branched, glabrous. Leaves linear, tapering to a fine point, glabrous, scabrid on the margin. Leaf sheaths loose, many nerved. Ligule of short tufted hairs. Panicles 8-30 cm long, primary branches 5-6 from the lowest nodes, glabrous, hairy only at the junction. Racemes reduced to one sessile spikelets, and 2-3 pedicelled spikelets. Lemmas linear, hyaline, awn 1.5-2 cm long. Pedicelled spikelets usually males: stamens 3, anthers elongated. Styles 2. Stigmas plumose.

Habitat: common in both open and in dense forests.

Fls. and Frts.: Aug.-Apr.

Bhairabkunda, Udalguri; Binu. 145; November 20, 2015.

***Centotheca* Desv.**

Centotheca lappacea (L.) Desv., Nouv. Bull. Sci. Soc. Philom. 2: 189. 1810; *et* in Jour. Bot. 1: 70. 1813; Hook. f., Fl. Brit. India 7: 332.1896; Bor in Fl. Assam. 5: 59. 1940 *et* Grass. Burm. Ceyl. Ind. Pak. 457. 1960.

Perennial. Culms geniculate, 30-90 cm high, glabrous. Leaves ovate to lanceolate, acuminate, narrowed at the base, margin undulate. Lingules truncate, membranous. Panicles spreading 5-20 cm long, branches numerous spreading. Pedicels capillary, unequal, scaberulous. Spikelets oblong to lanceolate, 3-4 mm long, 3-5 nerved. Upper glumes similar to lower glumes; lemmas oblong, 5-6 nerved. Palea hyaline, smaller than the lemmas. Stamens 3. Styles 2, short. Stigmas feathery. (Photo File 30. g)

Habitat : Common in shady places in bamboo forests and in fallows.

Fls. and Frts.: Aug.-Dec.

Bhairabkunda, Udalguri; Binu, 152; November 20, 2015.

***Chrysopogon* Trin.**

Andropogon L. sub genus *Chrysopogon* of Hook. f., FBI 7: 187. 1897; Bor, FA 5: 356. 1940; Bor, Grasses of India 196. 1960; Shukla, GNEI 69. 1996.

Perennial herb. Panicle lax, branches usually whorled, generally solitary or paired. Spikelets at the tip of the branches, in 3-groups: one is sessile, awned and the two are pedicelled, unawned, 2-flowered. The lower flower sterile and the upper hermaphrodite, sessile. Spikelet male or sterile with pedicelled. Glumes sub-equal: the lower glume coriaceous and the upper boat shaped. Upper lemma entire or 2-toothed, awned. Stamens 3.

25-30 species in the world, 15 in India; 3 in N. E. India (Shukla, 1996); 4 species in Assam (Kanjalil and Bor, 1940) and 1 species in the study area.

Chrysopogon aciculatus (Retz.) Trin., Fund. Agrost. 188. 1820; *Andropogon aciculatus* Retz., Obs. Bot. 5: 22. 1789; Hook. f., FBI 7: 188. 1897; Fischer in Rec. Bot. Surv. India 12 (2): 151. 1938; Bor, FA 5: 357. 1940; Mitra, Fl. Pl. of Eastern India 1: 221. 1958; Bor, Grasses of India 115. 1960; Deb in Bull. Bot. Surv. India 3: 132. 1961; Shukla, GNEI 70. 1996; Chowdhury, Assam's Flora 304. 2005.

Perennial herb. Culms rhizomatous, ascending from a creeping base, 20-60 cm tall. Panicle erect, narrow oblong or linear to oblong, 2.5-10.0 cm long. Branches 4-5 node, slender, 1.0-1.5 cm long. Spikelets often purplish to greenish. Sessile spikelets 2-4 mm long. Lower floret sterile and the upper hermaphrodite. Pedicelled spikelets 5-6 mm long, male. (**Plate49**)

Habitat: Grows amidst grasses.

Fls. and Frts.: Feb.-Oct.

Vern. name: Bon guti (As. and Rh.), Samthai (Bd.)

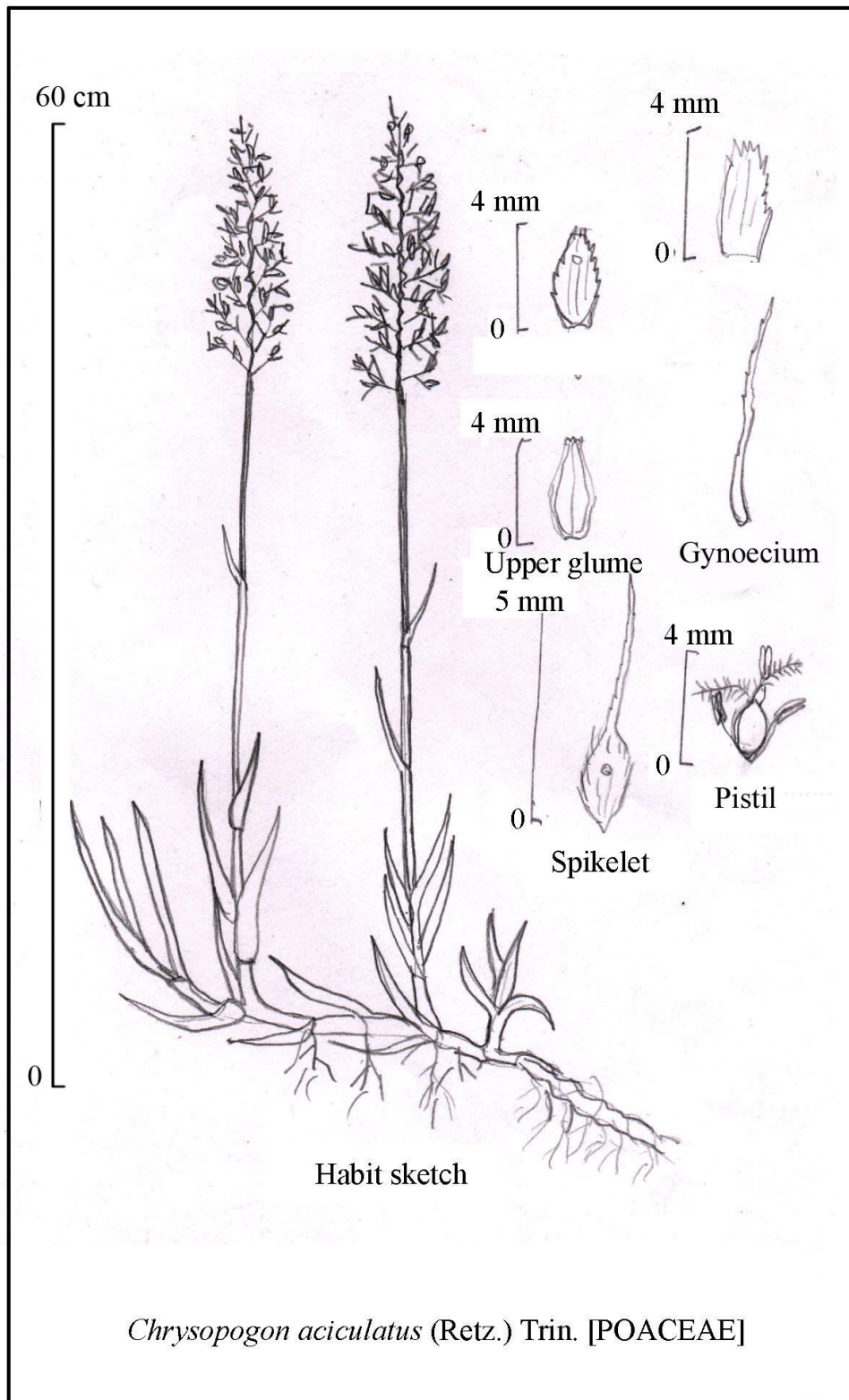
Sonai, Udalguri; Binu. 02; February 27, 2014.

Coix L.

Sp. Pl. 2: 972. 1753; Hook. f., FBI 7: 99. 1897; Bor, FA 5: 453. 1940; Bor, Grasses of India 263. 1960; Shukla, GNEI 290.1996.

Annual or perennial. Culms robust, up to 3 m tall, branched. Leaf blades broad. Inflorescence spikelets, unisexual. Female spikelets in groups of 3 (1 fertile, 2 sterile)

PLATE – 49



enclosed within an involucre at the base of the inflorescence. Male spikelets in spikes protruding out the involucre in 2-3 groups and 2-flowered. Glumes very broad, often winged. Stamens 3.

5 species in the world; 1 species and 3 var. in India (Hook. f., 1897); 3 species in N. E. India (Shukla, 1996); 2 species and 2 var. in Assam (Bor, 1940) and 1 species in the study area.

Coix lacryma-jobi L., Sp. Pl. 10: 971. 1753; Hook. f., FBI 7: 100. 1897; Bor, FA 5: 453. 1940; Mitra, Fl. Pl. of Eastern India 1: 235. 1958; Bor, Grasses of India 264. 1960; Shukla, GNEI 292. 1996; Chowdhury, Assam's Flora 304. 2005.

Perennial herb. Culms up to 2.5 m tall. Leaf blades firm, cordate at the bases, acuminate, 10-45 cm long and up to 2.5 cm broad. Ligule membranous, up to 1 mm long. Inflorescence a raceme type. Male spikelets loosely imbricate. Lower glume papery, winged, ovate and the upper glume also papery, acuminate. Stamens 3. Female spikelets enclosed within an involucre. Grains black, greenish white and bead like. (Photo File 30. o)

Habitat: Found along roadside ditches.

Fls. and Frts.: Jul.-Nov.

Vern. name: Kawri-moni(As.), Mogor (Bd.)

Sonai, Udalguri; Binu. 144; July 02, 2015.

Cryptococcum Stapf.

Perennial or annual herb. Culms prostrate or erect, rooting at nodes. Leaves linear lanceolate. Ligule membranous. Inflorescence a spreading or panicle. Spikelets awnless, 2-flowered. Glumes sub-equal. Lodicules 2. Stamens 3. Stigmas shortly exerted. Caryopsis ellipsoid.

Key to species

1a. Panicles contracted; pedicels very short. *C. patens*

1b. Panicles spreading; pedicels much longer. *C. accrescens*

Cryptococcum accrescens (Trin.) Stapf, O. (1922) *Icones Plantarum* (Hooker's) Edn. Ser. 5, 1 (4): Pl. 3906; Syn. *Panicum accrescens* Trin., *Sp. Graminum* 1 (8): Pl. 88 (1827).

Annual. Culms hollow, creeping, upper part of culms more erect, 10-40 cm long. 7-9 noded and rooting from the lower nodes. Culm nodes glabrous. Leaf blade lanceolate, 2-6 cm long and 3-5 mm wide, pubescent, scabrous. Inflorescence panicle, elliptic. Panicle branches spreading. Spikelets solitary, obovate. Lower glume ovate and upper glume obovate. Stigmas 3. Styles 2. Caryopsis globose.

Habitat: Abundant in moist shady areas.

Fls. and Frts.: Jan.-Jun.

Barnagaon, Udalguri; Binu. 49; April 19, 2014.

Cryptococcum patens var. *latifolium* (Honda) Ohwi, *Acta Phytotax. Geobot.* 11: 47. 1942; Bor in *Fl. Assam* 5: 239. 1940 et *Grass. Burm. Ceyl. Ind. Pak.* 291. 1960.

Annual or perennial. Culms 10-50 cm long, rooting at the nodes, glabrous. Leaves linear to lanceolate, hairy. Leaf sheaths shorter than the internodes. Ligules short, truncate. Panicles 3-15 cm long. Rachis keeled, hairy on keels. Spikelets globose, brown. Lower glumes 1mm long, 3-nerved obtuse. Lemma 3-5-nerved. Palea linear to lanceolate, cymbiform. Stamens 3. Caryopsis elliptic.

Habitat: Common in the forest areas.

Fls. and Frts.: Sep.-Feb.

Rawta Reserve Forest, Udalguri; Binu. 83; February 02, 2014.

Cymbopogon Spreng.

Pl. Pugill. 2: 14. 1815; *Andropogon* L. sub genus *Cymbopogon* Hack. in D.C., *Monogr. Phan.* 6: 603-612. 1889; Hook. f., *FBI* 7: 202. 1897; Bor, *FA* 5: 382. 1940; Gupta in *J. Bomb. Nat. Hist. Soc.* 75 (2): 450-453. 1979; Shukla, *GNEI* 73, 1996.

Perennial herb, rarely annual herb. Culms thickly tufted, erect and unbranched. Leaf sheaths cylindrical and glabrous. Leaf blades linear to lanceolate, serrate on the

margins. Aromatic when crushed. Panicle compact or loose, interrupted by the spathes or spatheoles. Racemes paired. Spikelets 2-flowered, generally paired: one sessile and the other pedicelled. Lower floret in sessile spikelet reduced to lemma and the upper hermaphrodite. Stamens 3. Styles 2.

Over 40 species, confined to old world tropics and sub tropics (Clayton and Renvoize, 1986); 23 species and 1 variety in India; 10 species, 2 varieties in N. E. India (Shukla, 1996); 9 species in Assam (Bor, 1940) and 3 species in the study area.

Key to species

1a. Leaf blades rounded or cordate at the base; lower

glume with a deep median groove.*C. jwarancusa*

1b. Leaf blades attenuate or narrowed at the base;

lower glume without a median groove:

2a. Sessile spikelet unawned, 5-6 mm long..*C. khasianus*

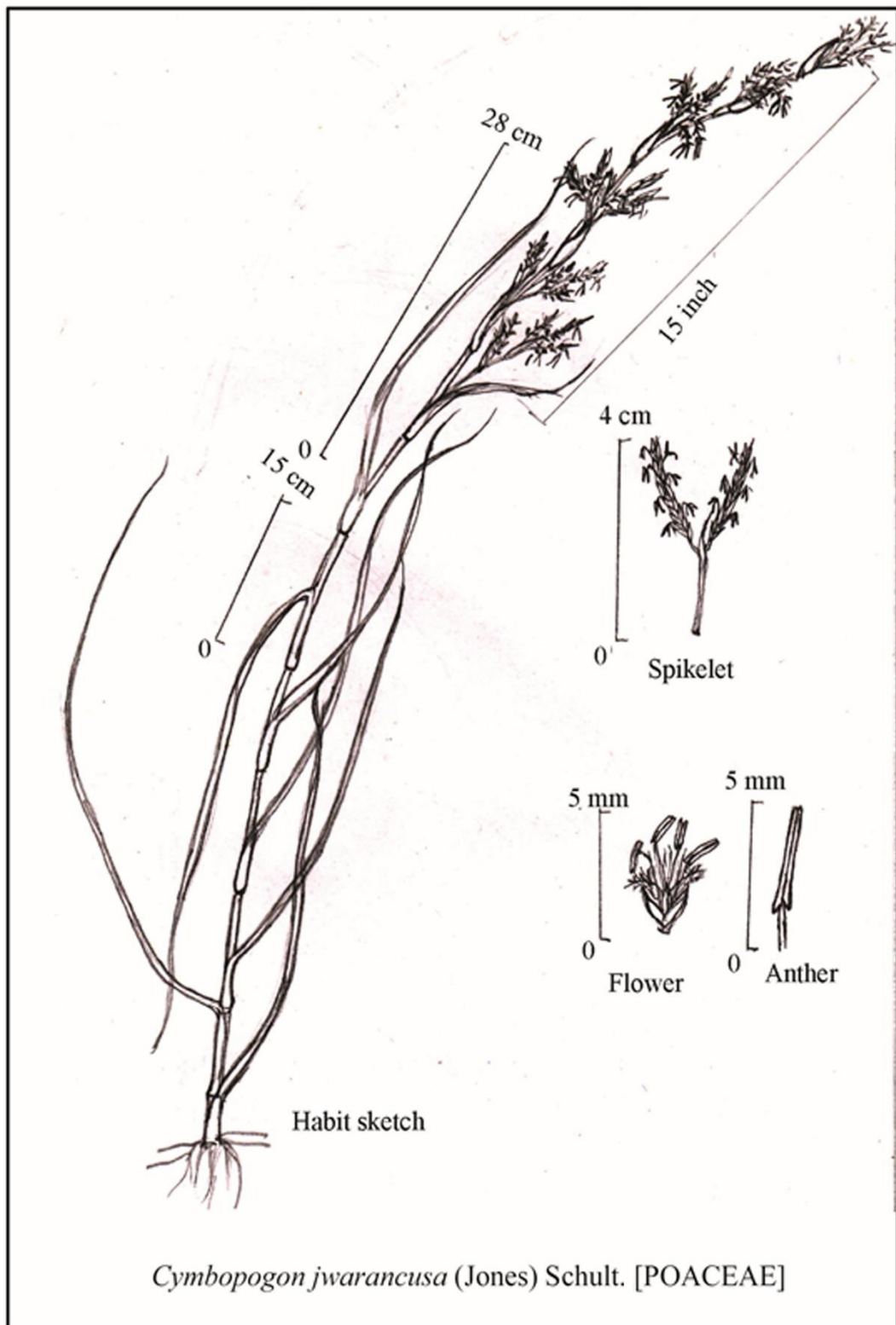
2b. Sessile spikelet awned, 4-7 mm long.*C. nardus*

**Cymbopogon jwarancusa* (Jones) Schult., Mant. 2: 458. 1824. Stapf in Kew Bull. 1906: 313, 354. 1906; Blatter and Mc Cann, Bombay Grasses 102. 1935; Bor in J. Bombay nat. Hist. Soc. 52: 178. 1955; Sultan & Stewart, Grasses W. Pak. 1: 114. 1958; Bor, Grasses Burma Ceyl. Ind. Pak. 128. 1960.

Perennial herb. Culms erect or geniculately ascending, upto 150 cm high. Leaf blades upto 30 cm long and 5 mm wide, whitish, narrowed at the base, attenuate to a filiform tip. Basal sheaths glabrous, flat and coiled. Ligule 0.5-4 mm long. False panicle 15-40 cm long, erect. Spatheoles lanceolate to narrowly elliptic, becoming reddish, 1.5-2.5 cm long. Racemes 13-22 mm long, lowest pedicel not swollen. Internodes and pedicels densely ciliate along the margins and on the back. Sessile spikelets lanceolate, 4.5-5.5 mm long. Lower glume shallowly concave on the back. Upper lemma deeply bifid, with an awn 7-10 mm long. (**Plate 50**) (Photo File 30. K)

Habitat: Common in river banks of hilly areas.

PLATE – 50



Fls. and Frts: Feb.-May.

Angrajuli, Udalguri; Binu. 75; April 27, 2014.

Cymbopogon khasianus (Hack.) Stapf ex Bor in Ind. For. Rec. Bot.1 (3): 92. 1938, Fl. Assam 5: 390. 1940 et Grass. Burm. Ceyl. Ind. Pak. 128. 1960. *Andropogon nardus* var. *khasianus* Hack. in D.C. Monogr. Phan. 6: 603. 1889; Hook. f., Fl. Brit. India 7: 205. 1896.

Perennial. Culms upto 2 m high, jointed, glabrous, arising from stout root stocks. Leaves glabrous, margin scabrid, tapering towards a fine point. Sheaths shorter than the internodes, striate. Lingules membranous 2 mm long. Panicles leafy, 30-100 cm long. Spathes lanceolate, 1.5-4 cm long, obtuse. Pedicelled spikelets. Lower glumes ovate to lanceolate, 2-keel winged. Upper glumes cymbiform. Lemma of lower florets hyaline. Upper florets hermaphrodite palea hyaline, nerveless. Stamens 3. Anthers brown. Styles 2. Stigmas feathery. (Photo File 30. B)

Habitat: Common in open places.

Fls. and Frts.: Aug.-Dec.

Gersong, Udalguri; Binu. 154; October 21, 2015.

Cymbopogon nardus (L.) Rendle, Cat. Welw. Afr. Pl. 2: 155. 1899; *Andropogon nardus* L., Sp. 1046. 1753; Hook. f., FBI 7: 206. 1897; Bor, FA. 5: 388. 1940; Bor, Grasses of India 130. 1960; Shukla, GNEI 78. 1996; Chowdhury, Assam's Flora 304. 2005.

Perennial. Culms tufted, erect, up to 2.5 m long. Leaf sheaths glabrous at the base. Leaf blades up to 1 m long, 1.5 cm broad, narrowed at the base. Panicle up to 1 m long, often drooping. Racemes 1.5 cm long. Sessile spikelet 4 mm long, awned and awn 7.5 mm long. Lower glume ovate and narrowly winged.

Habitat: Found in high area.

Fls. and Frts.: Aug.-Oct.

Vern. name: Citronella (As., Bd. and Rh.)

Maidanguri, Udalguri; Binu. 173; October 11, 2016.

Cynodon Richard.

Persoon, Synop. Pl. 1: 85. 1805; Hook. f., FBI 7: 288. 1897; Bor, FA 5: 125. 1940; Bor, Grasses of India 468. 1960; Jain in Bull. Bot. Surv. India 9: 134-151. 1967; Shukla, GNEI 241. 1996.

Perennial herb. Culms with creeping stolons, erect. Leaf blades glabrous. Ligule a row of hairs or membranous. Spikes 2 to several. Spikelets all are alike, laterally compressed, imbricate, 1-flowered, rarely 2-flowered. Glumes sub-equal or the upper longer, membranous. Lemma broader than glumes. Palea 2-keeled. Lodicules 2 and very minute. Stamens 3. Styles 2 and free.

25 species in tropical and warm regions of the world; 8 species (Clayton and Renvoize, 1986); 1 species in India (Hook. f., 1897); 2 species in N. E. India (Shukla, 1996); 1 in Assam (Bor, 1940) and 1 species in the study area.

Cynodon dactylon (L.) Pers., Syn. Pl. 1: 85. 1805; *Panicum dactylon* L., Sp. Pl. (ed. 1): 58. 1753; Hook. f., FBI 7: 288. 1897; Fischer in Rec. Bot. Surv. Ind. 12 (2): 151. 1938; Bor, FA 5: 125. 1940; Mitra, Fl. Pl. of Eastern India 1: 166. 1958; Bor, Grasses of India 469. t. 470. 1960; Deb in Bull. Bot. Surv. India 3: 132. 1961; Jain, I. c. 139. 1967; Shukla, GNEI 241. 1996; Chowdhury, Assam's Flora 304. 2005.

Perennial. Culms slender, glabrous, smooth. Leaf blades linear, 2-15 cm long, up to 3 mm wide. Ligule a conspicuous ring of white hairs. Inflorescence of 2-4 fascicled spikes. Spikelets 2.5 cm long. Glumes lanceolate, upper longer. Lemma firm, ciliate on the keel. Keels of palea scaberulous. Anthers oblong, 1.25 mm long. (**Plate 51**) (Photo File 30. X)

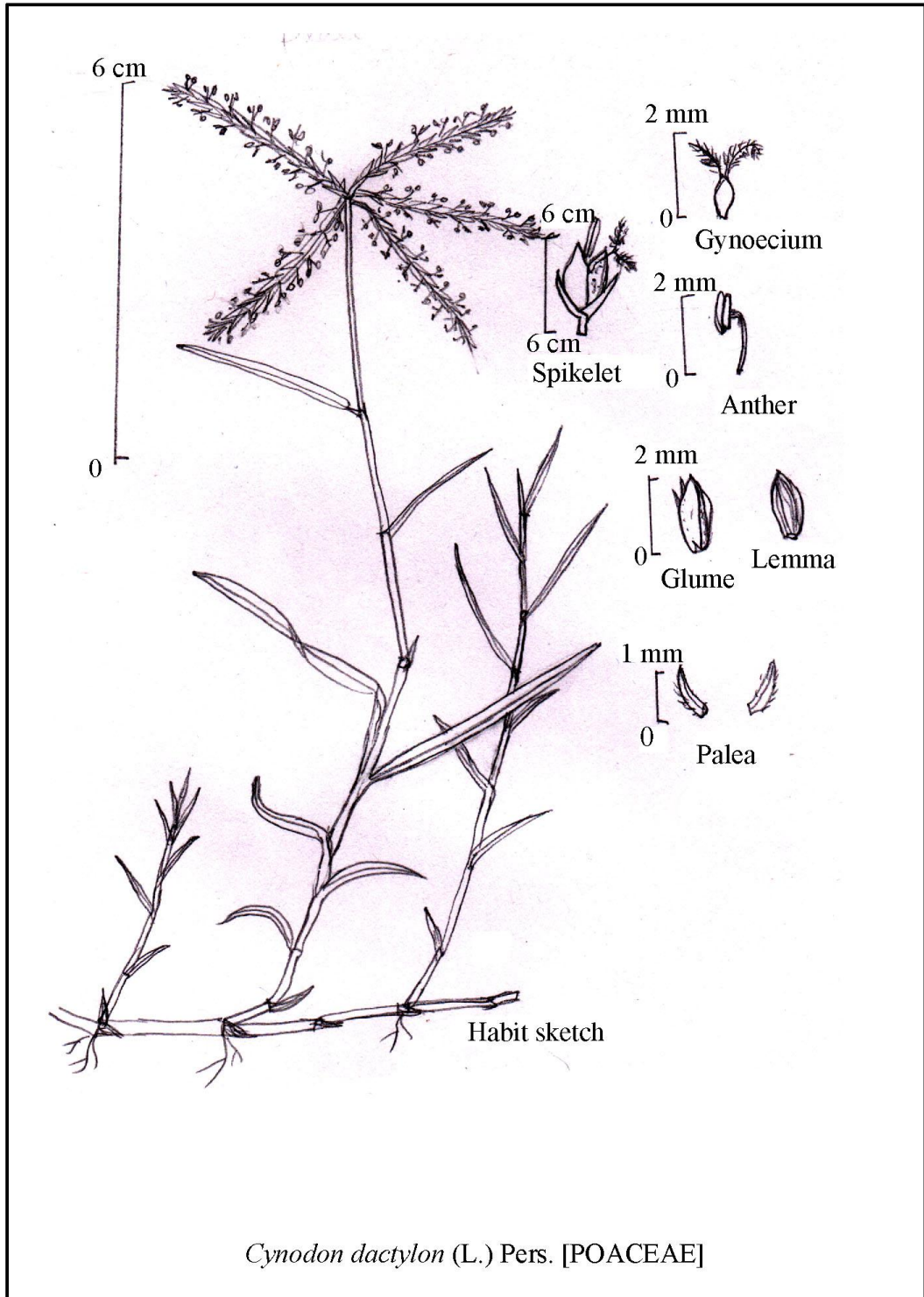
Habitat: Grows amidst grasses.

Fls. and Frts.: Nov.-Jun.

Vern. name: Dubori bon (As. and Rh.), Dawri hagra (Bd.)

Udalguri Nalbari; Binu. 01; February, 2014.

PLATE - 51



***Cynosurus* L.**

Sp. Pl. 1: 72. 1753.

Perennial or annual. Tufted, hairless. Leaves rolled in the bud; blades hairless. Ligules hairless, membranous. Stems or culms few, tufted, erect or curving upwards. Inflorescence spike like panicle, dense very bristly. Spikelets sessile.

***Cynosurus cristatus* L.**, Sp. Pl. 1: 72. 1753.

Perennial. Compactly tufted. Culms wiry, erect, 20-70 cm high, unbrached. Leaf sheaths smooth. Leaf blade glabrous. Panicle linear oblong. Glumes lanceolate. Keel scabrid. Lemmas narrowly ovate to oblong. Palea slightly shorter than lemma. Caryopsis oblong.

Habitat: Common along the road side.

Fls. and Frts.: Jan.-Aug.

Khawrang, Udalguri; Binu. 36; March 09, 2014.

***Dactyloctenium* Willd.**

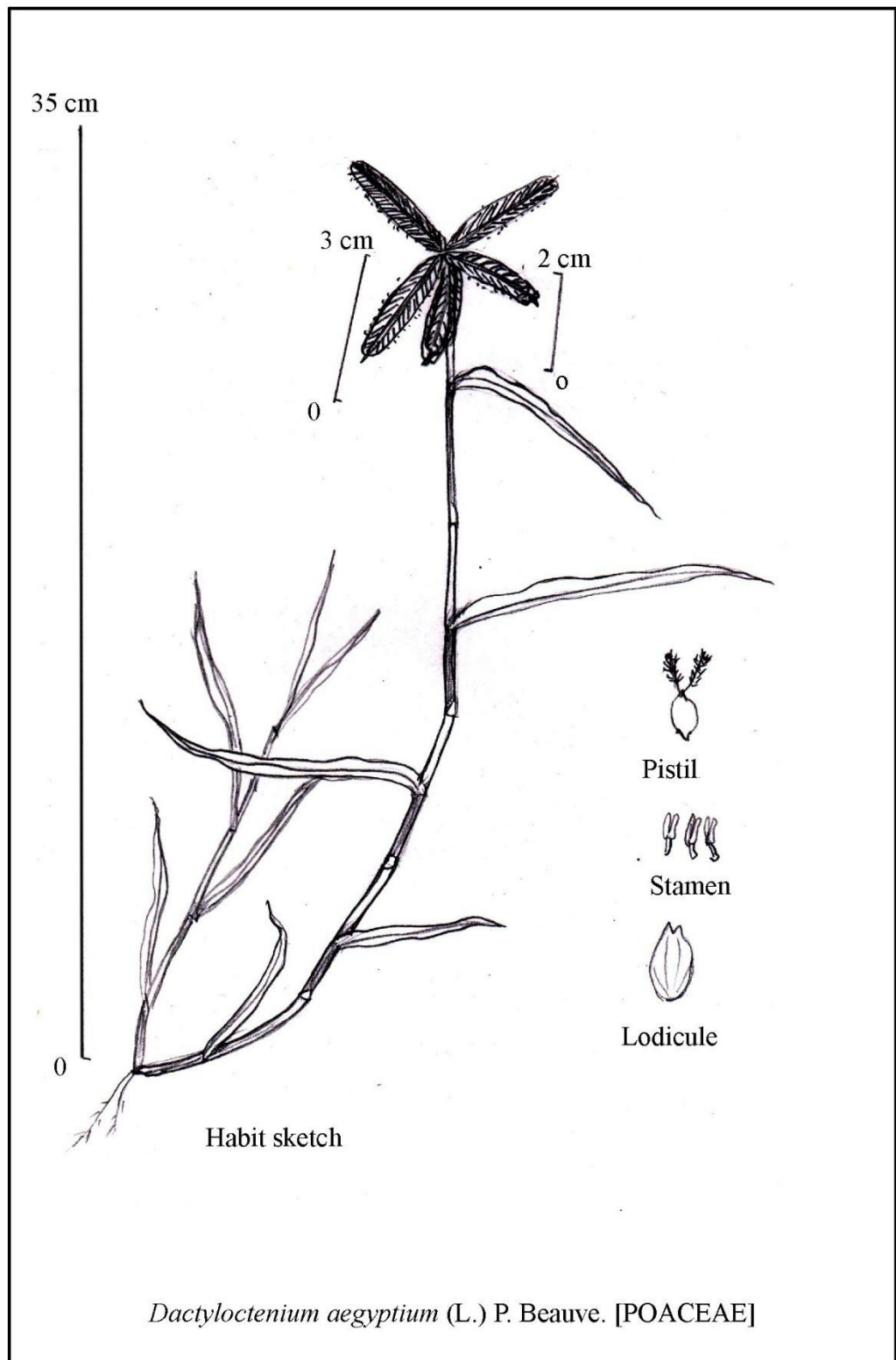
Enum. Hort. Berol. 1029. 1809; Hook. f., FBI 7: 295. 1897; Bor, FA 5: 110. 1940; Mitra, Fl. Pl. of Eastern India 1: 162. 1958; Bor, Grasses of India 488. 1960; Shukla, GNEI 248. 1996.

Annual or perennial herb. Culms creeping. Leaf blades flat. Spikes in terminal umbel, rarely solitary. Spikelets laterally compressed, densely imbricate, sessile, 3-5 flowered, flattened rachis. Glumes slightly unequal, keeled, 1-nerved, persistent. Palea equal to the lemma in length, 2-keeled. Lodicules 2. Stamens 3.

13 species in the world, 5 species in India and 1 in N. E. India (Shukla, 1996); 1 in Assam (Bor, 1940) and 1 species in the study area.

***Dactyloctenium aegyptium* (L.) P. Beauv.**, Ess. Agrostogr. 15, 72, 159, Pl. 15, f. 2: 15. 1812; *Eleusine aegyptiaca* (L.) Desf., Fl. Atlant. 1: 85. 1798; Hook. f., FBI 7: 295. 1897; Bor, FA 5: 110. 1940; Mitra, Fl. Pl. of Eastern India 1: 162. 1958; Bor, Grasses of India 489. 1960; Shukla, GNEI 248. 1996; Chowdhury, Assam's Flora 305. 2005.

PLATE – 52



Annual herb. Culms stoloniferous, ascending. Leaf blades linear, acute, 2.0-10 cm long, up to 0.4 cm broad. Ligule short. Spikes 2-6, digitate. Rachis keeled. Spikelets 3.5 mm long, 3-5- flowered. Glumes slightly unequal. The lower glume 1.5-20 mm long and the upper glume 2 mm long, mucronate. Palea 2-keeled. Stamens 3. (**Plate 52**) (Photo File 30. n)

Habitat: Grows along roadside.

Fls. and Frts.: Jan.-Sep.

Vern name: Bobosa bon (Rh.)

Udalguri Nalbari; Binu. 47; April 15, 2014.

Dendrocalamus Nees.

Linnaea 9: 476. 1834; Munro, Trans. Linn. Soc. Lond. 26: 1-157. 1868; Hook. f., FBI 7: 403-408. 1897; Bor, FA 6-12. 1940; Shukla, GNEI 194. 1996.

Culms often large, arborescent. Inflorescence a large compound panicle. Spikelets usually congested in groups at the nodes of the panicle branches. Spikelets with 2-3 hermaphrodite florets. Glumes 2-3, membranous. Paleas of lower florets, 2-keeled. Lodicules absent. Stamens 6. Filaments free. Anthers mucronate.

20 species, 35 species in India, Sri Lanka to China and Philippines (Clayton and Renvoize, 1986); 15 species in India (Biswas, 1988); 17 species in N. E. India (Shukla, 1996); 7 in Assam (Bor, 1940) and 1 species in study area.

Dendrocalamus hookeri Munro, Trans. Linn. Soc. 26: 151. 1868; Gamble in Hook. f., Fl. Brit. India 7: 405. 1896; Borin Fl. Assam 5: 8. 1940.

Tall bamboo. Culms tufted, erect or curved in the upper portion , 10-20 m high, 8-12 cm across, branched above. Culm sheaths broad, hairy on the upper surface, glabrous and shining below, auriculate at base. Leaves broad, oblong, rounded at the base or attenuate into a short petiole, margin scabrid. Ligule truncate, smooth. Panicles large. Spikelets condensed into a semi globose heads, spikelets 6-10 mm long, acute. Spikelets 6-10 mm long, acute. Spikelets 6-10 mm long. Glumes short, rounded,

obtuse, clasping the base of spikelets. Lemmas ovate to lanceolate, many nerved. Paleaciliate, with pedicellate tips. Styles hairy, stigmas coiled. Caryopsis ovoid, hairy at the top.

Habitat : Common in forests forming dense clamps.

Fls. and Frts.: Feb.-Sep.

Bhairabkunda, Udalguri; Binu.38; March 14, 2014.

Digitaria Haller,

Hist. Stirp. Helv. 2: 244. 1768; Bor, Fl. Assam 5: 202. 1940; Mitra, Fl. Pl. of Eastern India 1: 198. 1958; Shukla, GNEI 316. 1996.

Annual or perennial herb. Culms erect with or without a creeping base. Ligule membranous. Inflorescence solitary, terminal. Racemes like a spike, digitate. Rachis flattened. Spikelets in groups of 2 or 3. Lower glume absent or minute. Upper glume nerveless or 1-3 nerved. Lower floret sterile. Upper floret hermaphrodite. Palea 2-nerved. Lodicules 2. Stamens 3.

170 species, 230 species (Clayton and Renvoize, 1986); 26 species in India; 13 species and 2 var. in N. E. India (Shukla, 1996); 10 species in Assam (Bor, 1940) and 2 species in study area.

Key to species

1a. Spikelets elliptic to lanceolate. *D. ciliaris*

1b. Spikelets elliptic to acute. *D. setigera*

Digitaria ciliaris (Retz.) Koeler. Descr. Gram. 27. 1802; *Panicum ciliare* Retz., Obs. Bot. 4. 16. 1786; Bor in Fl. Assam 5: 204. 1940.

Annual. Culms sub-erect from a geniculate base, 10-50 cm high, rooting in the lower nodes. Leaves linear, rounded at base, tapering towards the apex, glabrous. Sheaths loose, glabrous. Ligules membranous, truncate. Inflorescence sub-digitate, 4-9 racemes. Racemes 5-12 cm long, rachis winged, scabrid. Spikelets compressed.

Lemma membranous, 5-7-nerved. Palea chartaceous. Stamens 3. Styles 2. Caryopsis plano-convex.

Habitat: Common weed throughout the area.

Fls. and Frts.: Feb.-Dec.

Udalguri Nalbari; Binu. 33; March 09, 2014.

Digitaria setigera Roth in Roem. & Schult., Syst. Veg. 2: 474. 1817; Bor Grass. Burm. Ceyl. Ind. Pak. 305. 1960; Bor in Fl. Assam 5: 205. 1940.

Annual herb. Culms sub-erect, geniculate at base. Internodes swollen at nodes. Leaves linear to lanceolate, glabrous or hairy near the mouth; sheaths loose, with tubercle based hairs. Ligules membranous truncate. Inflorescence sub-digitate, of 3-9 racemes. Rachis flexuous, hispid. Spikelets 2-nut, one sessile and the other pedicelled, 2.0-2.5 mm long, acute. Lower glumes small or absent. Upper glumes 1-2 mm long, 3-nerved. Lemmas broad, 5-7 nerved. Palea and lodicules not seen. Stamens 3. Styles 2, laterally exserted. Stigmas feathery.

Habitat: Common weed of cultivation and marshes.

Fls. and Frts.: Aug.-Feb.

Udalguri Nalbari; Binu. 13; February 27, 2014.

Dimeria R. Br. Kew Bull. 1951 (3): 455-459.

Annual or perennial herb. Culms slender. Leaves narrow. Inflorescence a false spike. Rachis triquetrous or flattened. Spikelets numerous, solitary, shortly pedicelled, apparently 1-flowered as the lower floret reduced to an empty lemma. Glumes rigid, 1-nerved. Lemma keeled, 1-nerved, 2-toothed or 2-lobed, rarely entire, with a twisted awn in between the lobes. Paleas small or absent. Lodicules small or sometimes absent. Stamens 2, rarely 3. Stigmas shortly exserted laterally near the base of the spikelets. Caryopsis linear.

Dimeria ornithopoda Trin., Fund. Agrost. 167. t. 14. 1820; Hook. f., Fl. Brit. India 7: 104. 1896; Bor in Fl. Assam 5: 420. 1940 et Grass. Burm. Ceyl. Ind. Pak. 142. 1960.

Annual herb. Culms highly branched, glabrous, hairy at nodes. Leaves erect, usually black spotted or brown when dry, acute, hairy, scabrid on margin. Ligule membranous. Inflorescence of 2 racemes, sessile. Rachis glabrous, scabrid only on margin. Spikelets sessile, compressed on the rachis. Lower glumes short and upper glumes long. Lemmas linear, awn 5-10 mm long. Stamens 3. Anthers short, 1mm long. Styles 2. Stigmas feathery. Caryopsis elongated. (Photo File 30. N)

Habitat: Abundant in open areas and on hill slopes.

Fls. and Frts.: Sep.-Feb.

Bhairabkunda, Udalguri; Binu. 14; February 27, 2014.

***Echinochloa* P. Beauv.**

Ess. Agrostogr. 53. 161, pl. 11 (2). 1812, nom. cons. vs. Tema Adanson 1763; *Panicum* Set. *Echinochloa* of Hooker, FBI 7: 30. 1897; Bor Grasses of India 307. 1960; Mitra, Fl. Pl. of Eastern India 1: 188. 1958; Shukla, GNEI 322. 1996.

Annual or perennial herb. Leaf blades linear with contracted or decurrent base. Ligule absent or a fringe of stiff hairs. Panicle of crowded, secund spikes. Spikelets crowded, ovate. Glumes unequal. Lower glumes short, acute. Lower floret male or sterile and the upper floret hermaphrodite. Palea similar to lemma in texture. Stamens 3.

30-40 species in the world; 7 species in India and in this region (Shukla, 1996); 5 species in Assam (Bor, 1940); and 3 species in the study area.

Key to species

1a. Ligule a fringe of hairs atleast in the lower leaves. ***E. stagnina***

1b. Ligule absent:

2a. Leaf blades without the decurrent base; racemes distant. ***E. colonum***

2b. Leaf blades with a decurrent base; racemes crowded.. ***E. crus-pavonis***

***Echinochloa colona* (L.) Link, Hort. Berol. 2: 209. 1833; Hook. f., FBI 7: 32. 1897; Bor, FA 5: 246. 1940; Mitra, Fl. Pl. of Eastern India 1: 189. 1958; Bor, Grasses of**

India 308. t. 309. 1960; Deb in Bull. Bot. Surv. India 3: 133. 1961; Shukla, GNEI 323. 1996; Chowdhury, Assam's Flora 305. 2005.

Annual herb. Culms tufted, slender, erect, 40 cm tall. Leaf blades linear. Ligule absent. Panicle erect, 5 cm long. Spikes distant, 2 cm long. Spikelets crowded, 2.5 mm long, unawned. Glumes membranous. Upper glume and the lower lemma equally acute, similar in texture. Lower floret male and the upper floret hermaphrodite. Lemma and palea coriaceous and smooth. Anthers 1 mm long.

Habitat: Found along roadside.

Fls. and Frts.: Jun.-Feb.

Vern. name: Bioni bon (As.)

Kahibari, Udalguri; Binu. 17; February 27, 2014.

Echinochloa crus-pavonis (Kunth) Schult., Mant. 2: 269. 1824; *Oplismenus cruspavonis* H. B. K., Nov. Gen. and Sp. 1: 108. 1816; *Panicum crusgalli* sensu Hooker, FBI 7: 31. 1897 *pro parte*; Bor, FA 5: 248. 1940; Mitra, Fl. Pl. of Eastern India 1: 189. 1958; Bor, Grasses of India 310. 1960; Deb in Bull. Bot. Surv. India 3: 133. 1961; Shukla, GNEI 324. 1996; Chowdhury, Assam's Flora 306. 2005.

Annual. Culms robust, up to 2 m tall. Leaf blades lanceolate, 0.9 cm long, 2.4 cm broad. Ligules absent. Panicle 20 cm long. Racemes several. Spikelets crowded, awned, 3.0 mm long. Glumes membranous, unequal. 3-5 nerved, acute. The upper glume 5 nerved, cuspidate. Lower floret sterile and upper floret hermaphrodite. Lemma awned. Lemma and palea coriaceous, shining.

Habitat: Grows along roadside of wasteland.

Fls. and Frts.: Feb.-Aug.

Udalguri Nalbari; Binu. 76; April 27, 2014.

Echinochloa stagnina (Retz.) P. Beauv., Ess. Agrost. 53. 161. 171. 1812; *Panicum stagninum* Retz., Obs. Bot. 5: 17. 1789; *P. crusgalli* sensu Hook. f., FBI 7: 30. 1897 *pro parte*; Bor, FA 5: 244. 1940; Mitra, Fl. Pl. of Eastern India 1: 188. 1958; Bor,

Grasses of India 311. 1960; Deb in Bull. Bot. Surv. India 3: 1961. Shukla, GNEI 325. 1996; Chowdhury, Assam's Flora 306. 2005.

Annual or perennial herb. Culms robust, 1.0-1.5 m tall. Leaf blades linear, 40 cm long, tapering to a fine point, 2.5 cm broad. Ligule a rim of stiff hairs. Inflorescence 25 cm long. Spikelets ovate, 5 mm long, awned. Glumes membranous: the lower glume acute, 5-7 nerved and the upper glume acuminate, shortly awned, 5-7 nerved. Lower floret male or sterile and upper floret hermaphrodite, acuminate. Stamens 2.

Habitat: Grows along roadside in moist places.

Fls. and Frts.: Feb.-Sep.

Kahibari, Udalguri; Binu. 16; February 27, 2014.

Eleusine Gaertn.

Fruct. Sem. Pl. 1: 7. 1788; Hook. f., FBI 7: 293. 1897; Bor, Fl. Assam 5: 107. 1940; Bor, Grasses of India 492. 1960; Shukla, GNEI 249.1996.

Annual or perennial herb. Leaf blades mostly flatten. Spikes 2-5, digitate or sub-digitate, crowded at the tip of the main axis. Rachis not produced. Spikelets laterally compressed, sessile, 2 rowed, secund on a flattened rachis. flowers 3-6. Glumes persistent with 1-5 nerved. Lemma 3 nerved and similar to the glumes. Palea shorter than lemma with 2 keeled.

9 species in the world; 6 in India (Hook. f., 1897); 2 species in N. E. India (Shukla, 1996); 3 species in Assam (Bor, 1940) and 2 species in the study area.

Key to species

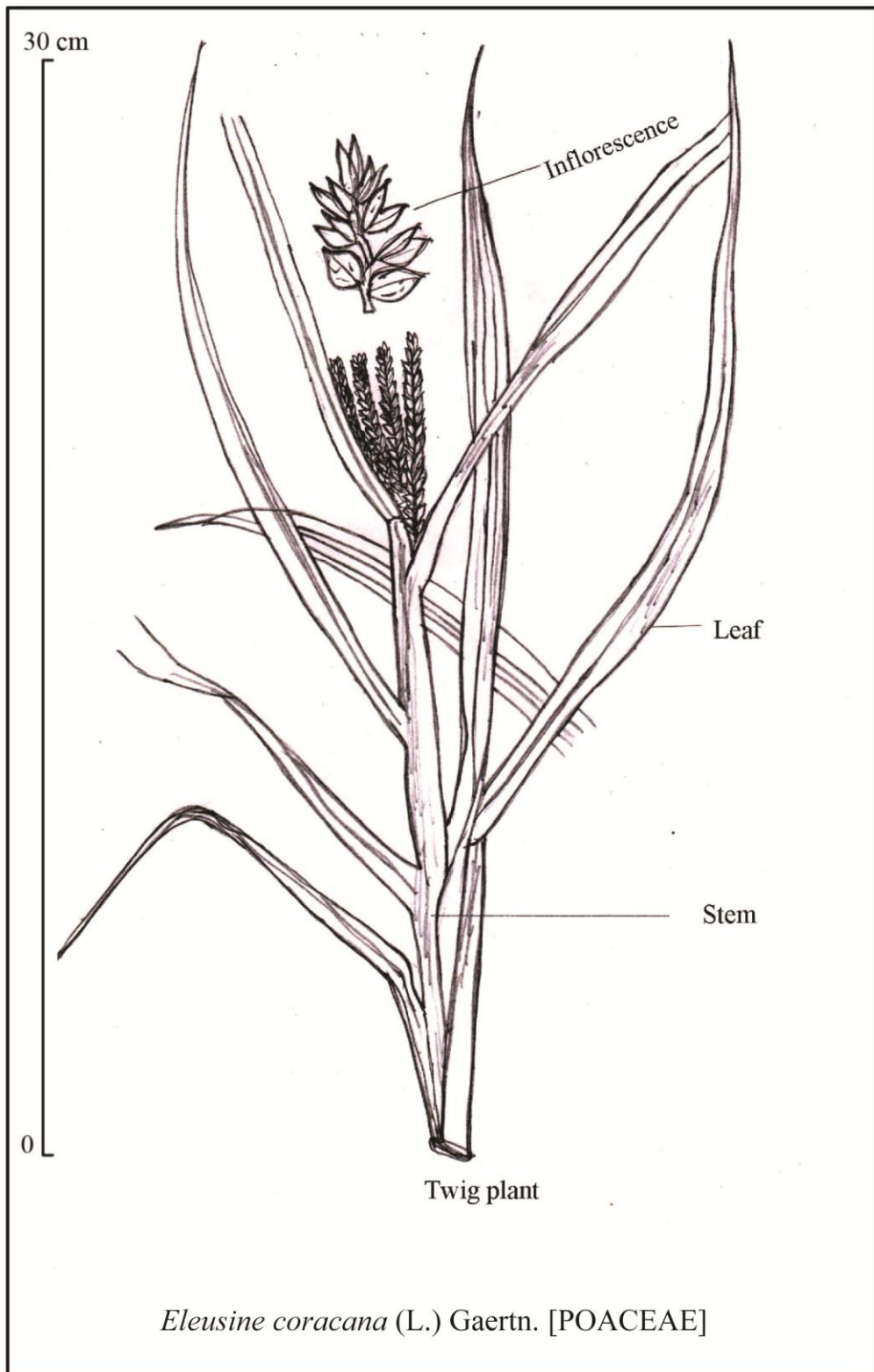
1a. Spikes slender, narrow, not more than 5 mm wide,

 strait; caryopsis oblong, trigonous. *E.indica*

1b. Spikes stout, up to 1 cm across; caryopsis globose. *E. coracana*

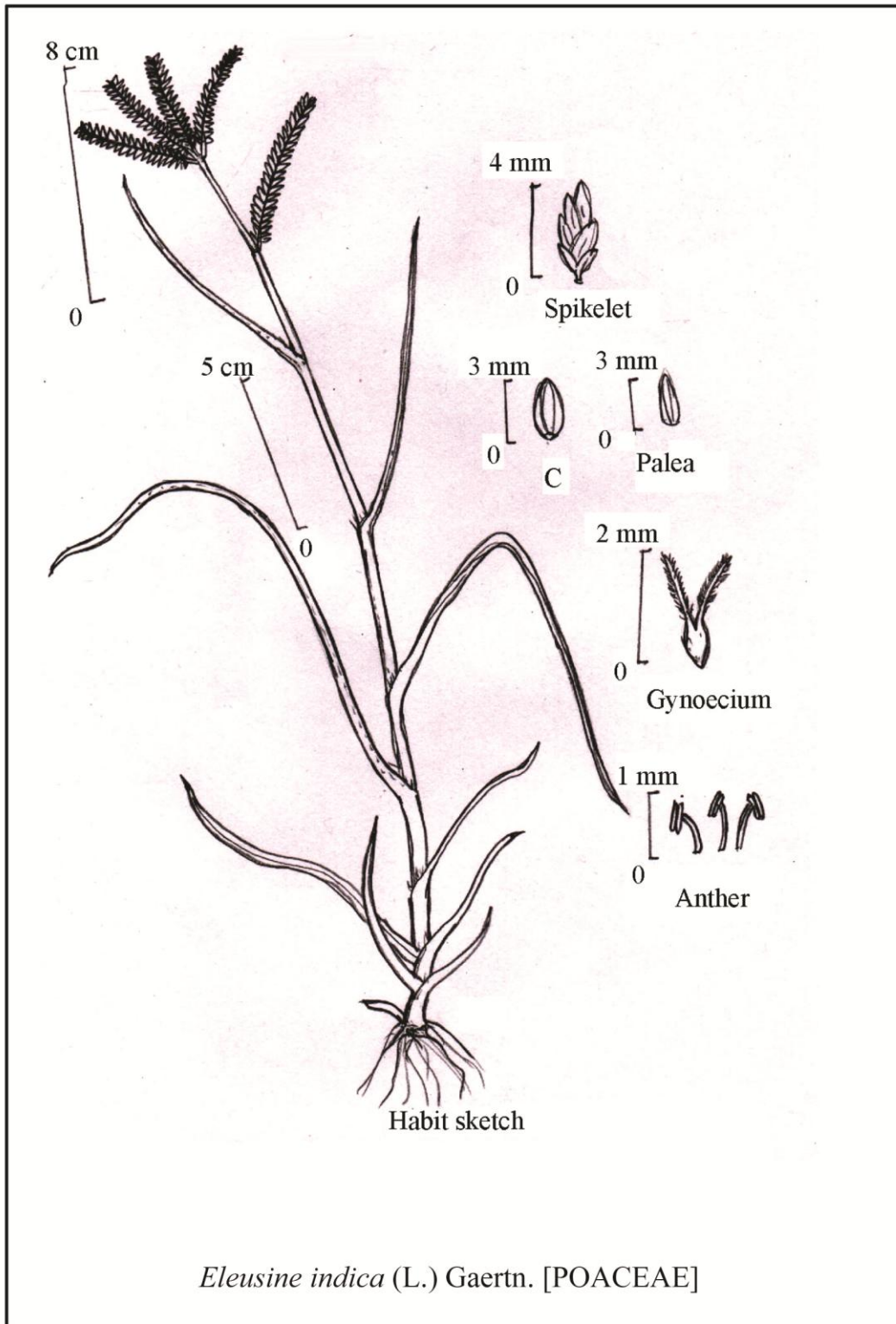
Eleusine coracana(L.) Gaertn., Fruct. Sem. Pl. 1: 8. 1788; *Synosurus coracanus* L., Syst. Nat., ed. 10, 2: 875. 1759; Bor, Fl. Assam 5: 109. 1940.

PLATE – 53



Eleusine coracana (L.) Gaertn. [POACEAE]

PLATE – 54



Annual. Culms solitary, branched, stout 0.5-1.5 m high, glabrous. Leaves linear, glabrous, margin scabrid. Sheaths loose. Ligule a ring of hairs. Inflorescence stout, umbellate, 4-8 racemes, 5-8 cm long. Spikelets numerous, congested, obtuse, 3-5-flowered, globose, acute. Lower and upper glumes ovate. Lemmas as long as the glumes. Palea hyaline. Stamens 3. Styles 2. Caryopsis globose, rounded, black or bright red at maturity. (**Plate 53**) (Photo File 30. h)

Habitat: Cultivated for its grains in winter.

Fls. and Frts.: Oct.-Dec.

Kalajhar, Bhutan border, Udalguri; Binu. 183; December 18, 2015.

Eleusine indica (L.) Gaertn., Fruct. 1: 8. 1788; *Cynosurus indicus* L., Sp. Pl. (ed. 1): 72. 1753; Hook. f., FBI 7: 293. 1897; Bor, FA 5: 108. 1940; Mitra, Fl. Pl. of Eastern India 1: 161. 1958; Bor, Grasses of India 493. 1960; Deb in Bull. Bot. Surv. India 3: 133. 1961; Shukla, GNEI 251. 1996; Chowdhury, Assam's Flora 306. 2005.

Annual. Culms 10-70 cm tall, often compressed. Leaves crowded at the base. Leaf blades linear, acute, 20 cm long, 0.4 cm broad. Ligule, 10 cm long, digitate. Spikelets 3-6 flowered. Glumes lanceolate: the lower 3 mm long and the upper 4 mm long. Lemma 3 mm long. Palea about 2 or 3 the length. (**Plate 54**) (Photo File 30. i)

Habitat: Grows amidst grasses.

Fls. and Frts.: Jun.-Apr.

Vern. name: Bobosa bon (Rh.)

Udalguri Nalbari; Binu. 03; February 27, 2014.

Eragrostis Wolf.

Gen. Pl. Vocab. Char. Def. 23. 1776; Hook. f., FBI 7: 312. 1897; Bor, FA 5: 93. 1940; Mitra, Fl. Pl. of Eastern India 1: 158. 1958; Bor, Grasses of India 495. 1960; Shukla, GNEI 254. 1996.

Annual or perennial. Leaf blades narrow. Inflorescence an open or contracted panicle. Spikelets pedicelled, laterally compressed, awnless, several flowered. Rachilla tough

and persistent. Glumes equal or unequal, 1-nerved or the upper 3-nerved. Lemma membranous to coriaceous, loosely or densely imbricate, entire, awnless, 3-nerved. Palea equal or shorter than the lemma, 2-keeled. Stamens 2 or 3.

300 species in the world (Clayton and Renvoize, 1986); 31 species in India (Hook. f., 1897); 12 species in N. E. India (Shukla, 1996); 15 species in Assam (Bor, 1940); and 6 species in the study area.

Key to species

1a. Spikelets breaking up from above downwards:

2b. Paleas ciliate on the keels:

3a. Panicles compact; lemmas ciliate on margin. *E. coarctata*

3b. Panicles not compact; lemmas not ciliate on the keel... .. *E. tenella*

2b. Paleas not ciliate on the keels. *E. japonica*

1b. Spikelets breaking up from below downwards:

4a. Spikelets ovate or oblong, 3 mm wide. *E. unioides*

4b. Spikelets lanceolate, less than 3 mm wide:

5a. Spikelets 2-2.5 mm wide, oblong. *E. gangetica*

5b. Spikelets less than 2 mm wide, linear to lanceolate.... *E. nigra*

Eragrostis coarctata Stapf in Hook. f., Fl. Brit. India 7: 313. 1896; Bor in Fl. Assam 5: 94. 1940 et Grass. Burm. Ceyl. Ind. Pak. 507. 1960; Babu Herb. Fl. Dehra Dun 611. 1977.

Annual herb. Tufted grasses. Culms geniculate, ascending from the nodes, glabrous, 10-50 cm high. Leaves linear, glabrous, margin scabrid. Leaf sheaths loose. Ligule a ring of short hairs. Panicles compact. Spikelets crowded on short pedicels 2-3 mm long. Glumes subequal. Lemmas ovate, acute, 3-nerved, lateral nerves prominent, margin scabrid. Palea smaller than the lemma, 2-nerved, hyaline. Stamens 3. Stigmas feathery. (Photo File 30. m)

Habitat: Found in damp places near river bank.

Fls. and Frts.: Sep.-Feb.

Udalguri Nalbari; Binu. 18; February 27, 2014.

Eragrostis gangetica (Roxb.) Steud., Syn. Pl. Glumac. 1: 266. 1854; *Poa gangetica* Roxb., Fl. Ind. 1: 341. 1820. *E. stenophylla* sensu Hook. f., FBI 7: 318. 1897; Bor, Fl. Assam 5: 101. 1940; Bor, Grasses of India 508. 1960; Deb in Bull. Bot, Surv. India 3: 133. 1961; Jainand Shukla in Ind. For. 105(12): 880-885. 1979; Shukla, GNEI 255. 1996; Chowdhury, Assam's Flora 306. 2005.

Annual herb. Culms tufted, slender. Leaves 4-15 cm long, 0.5 cm broad, linear to lanceolate or lanceolate, base rounded, apex acute or acuminate. Panicle congested. Spikelets 1.5 mm wide. Lemmas imbricate, 1.5 mm long, obtuse at the tip. Palea deciduous. Stamens 3. (Photo File 30. O)

Habitat: Grows along roadside and in waste land.

Fls. and Frts.: Apr.-Jul.

Udalguri Nalbari; Binu. 64; April 19, 2014.

Eragrostis japonica (Thunb.) Trin., Mem. Acad. Petersb. Ser. 1, 6: 405. 1831; Bor in Fl. Assam 5; 97. 1940 et Grass. Burm. Ceyl. Ind. Pak. 509. 1960; Babu Herb. Fl. Dehra Dun 612. 1977. *Poa japonica* Thunb. Fl. Jap. 51. 1784.

Annual. Culms erect or geniculately ascending from base, glabrous. Leaves linear, acute. Leaf sheaths loose. Ligule membranous, 1 mm long. Panicles linear or contracted. Branches verticillate, spreading. Rachis scabrid. Spikelets linear compressed, 6-10 flowered, 1-3 mm long. Lower glumes linear, obtuse, 1-nerved, hyaline; upper glumes similar to the lower glumes. Lemmas ovate, 3-nerved. Palea keeled, hyaline. Stamens 2. Styles 2. Stigmas feathery. Caryopsis shining, elliptic. (Photo File 30. b)

Habitat: Grows weed of paddy field.

Fls. and Frts.: Oct.-Feb.

Maoriabasti, Udalguri; Binu. 48; April 19, 2014.

Eragrostis nigra Nees ex Steud., Syn. Pl. Glumac. 1: 267. 1854; Hook. f., FBI 7: 324. 1897; Bor, Fl. Assam 5: 101. 1940; Mitra, Fl. Pl. of Eastern India 1: 160. 1958; Bor, Grasses of India 511. 1960; Deb in Bull. Bot. Surv. India 3: 133. 1961; Shukla, GNEI 257. 1996; Chowdhury, Assam's Flora 306. 2005.

Annual. Culms tufted, slender, 75 cm tall, leafy at the base. Leaf blades 10 cm long, 0.4 cm broad. Ligule a few cilia. Inflorescence a large, lax panicle, 46 cm long. Spikelets 5 mm long, long pedicelled. Pedicel longer than the spikelet. Glumes acuminate. Lemmas imbricate, acute. Stamens 3. Anthers 0.4 mm long.

Habitat: Grows along roadside.

Fls. and Frts.: Mar.-Dec

Serfang, Udalguri; Binu. 67; April 19, 2014.

Eragrostis tenella (L.) P. Beauv. ex Roem. and Schult., Syst. Veg. 2: 756. 1817; *Poa tenella* L., Sp. Pl. (ed. 1): 69. 1753; Hook. f., FBI 7: 315. 1896; Bor, Fl. Assam 5: 96. 1940; Bor, Grasses of India 1: 513. 1960; Shukla, GNEI 257. 1996; Chowdhury, Assam's Flora 306. 2005.

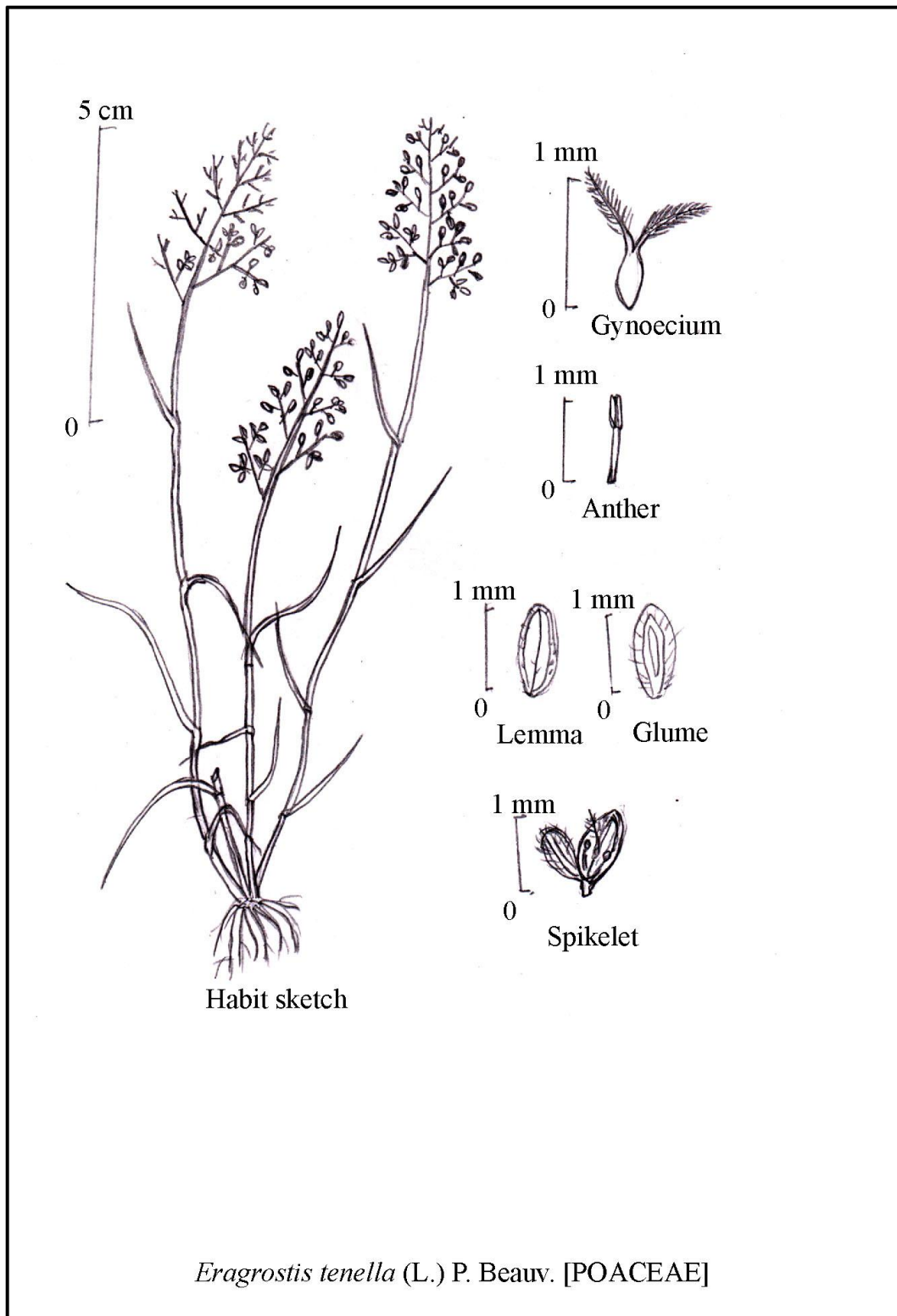
Annual. Culms loosely, slender, 40 cm long, unbranched. Leaf blades linear, 12 cm long, 0.2 cm broad. Ligule a fringe of short hairs. Panicle open, 11 cm long, 1.2 cm broad. Spikelets 4 mm long, 3-9 flowered. Glumes obtuse, 1-nerved. Lemmas 1 mm long, membranous. Palea 1 mm long, 2-keeled. Anthers minute. **(Plate 55)**

Habitat: Grows along roadside.

Fls. and Frts.: Feb.-Oct.

Udalguri Nalbari; Binu. 04; February 27, 2014.

Eragrostis unioloides (Retz.) Nees ex Steud., Syn. Pl. Glumac. 1: 264. 1854; *Eragrostis amabilis* sensu Hook. f., FBI 7: 317. 1897; Fischer in Rec. Bot. Surv. India 12 (2): 152. 1938; Bor, Fl. Assam 5: 99. 1940; Mitra, Fl. Pl. of Eastern India 1: 159. 1958; Bor, Grasses of India 515. 1960; Deb in Bull. Bot. Surv. India 3: 133. 1961; Shukla, GNEI 258. 1996; Chowdhury, Assam's Flora 306. 2005.



Annual. Culms slender, solitary, erect, 40 cm long. Leaves confined to base. Leaf blades 0.9 cm long, 0.25 cm broad. Ligule a short membrane. Inflorescence ovate. Spikelets strongly compressed with several flowered, up to 7 mm wide. Glumes 2 mm long. Lemmas imbricate, membranous. Paleas deciduous. (Photo File 30. c)

Habitat: Found along the forest margin.

Fls. and Frts.: Throughout the year.

Udalguri Nalbari; Binu. 21; February 27, 2014.

Hackelochloa Kuntze

Rev. Gen. Pl. 2: 776. 1891; Hook. f., FBI 7: 159. 1897 *pro parte.*; Bor, Fl. Assam 5: 441. 1940; Mitra, Fl. Pl. of Eastern India 1: 209. 1958; Bor, Grasses of India 159. 1960; Shukla, GNEI 95. 1996.

Annual. Culms much branched. Inflorescence racemes solitary. Spikelets paired: each pair dissimilar: one sessile and the other pedicelled. Sessile spikelets globose. Lower glume deeply pitted, honey comb like. Pedicelled spikelets often reduced.

2 species in the world, both found in India and in this region (Shukla, 1996); 1 in Assam (Bor, 1940) and in the study area.

Hackelochloa granularis (L.) Kuntze., Rev. Gen. Pl. 2: 776. 1891; *Cenchrus granularis* L., Mant. Pl. 2: 575. 1771; Hook. f., FBI 7: 159. 1897; Mitra, Fl. Pl. of Eastern India 1: 209. 1958; Bor, Grasses of India 159. 1960; Deb in Bull. Bot. Surv. India 3: 134. 1961; Shukla, GNEI 95. 1996; Chowdhury, Assam's Flora 306. 2005.

Annual. Culms much branched, 0.4-1.0 m tall. Leaf blades lanceolate, 5-9 cm long, 1 cm broad. Racemes solitary, 1.0-2.0 cm long. Sessile spikelets globose, 1.5 mm long. Glumes unequal. The lower glume pitted. Pedicelled spikelet ovate and as long as the sessile. (Photo File 30. j)

Habitat: Found in forest margin.

Fls. and Frts.: Jun.-Oct.

Udalguri Nalbari; Binu. 139; July 20, 2015.

Hemarthria R. Brown

Prodr. Nov. Holl. 207. 1810; *Rottboellia* Linn. f., Nov. Gram. 22. 1779. sect. *Hemarthria* Hack., Monogr. Androp. 289. 1889; Hook. f., FBI 7: 152. 1897; Bor, Fl. Assam 5: 435. 1940; Mitra, Fl. Pl. of Eastern India 1: 208. 1958; Bor, Grasses of India 160. 1960; Shukla, GNEI 95. 1996.

Perennial. Culms ascending. Leaves linear, 6-20 × 0.2-0.5 cm long. Leaf blades linear. False spikes compressed, curved, solitary. Joints of pedicels fused into internodes, latter hollowed to accommodate the sessile spikelets. Spikelets paired, 2-flowered. Glumes almost equal, 2-keeled. The lower floret sterile and the upper floret hermaphrodite.

10-12 species in the world; 4 species in India; 3 species in N. E. India (Shukla, 1996); 3 in Assam (Bor, 1940) and 1 species in the study area.

Hemarthria protensa Steud., Syn. Pl. Glumac. 1: 359. 1854; *Rottboellia protensa* (Steud.) Hack. In DC., Monogr. Phan. 6: 289. 1889; Hook. f., FBI 7: 153. 1897; Bor, Fl. Assam 5: 437. 1940; Mitra, Fl. Pl. of Eastern India 1: 208. 1958; Bor, Grasses of India 161. 1960; Shukla, GNEI 99. 1996; Chowdhury, Assam's Flora 306. 2005.

Perennial. Culms erect from a creeping base, 0.5-1 m tall. Leaf blades linear, 6-30 cm long, 0.5 cm broad, glabrous on both the surfaces. Ligule short, ciliate membrane. Sheaths much shorter than the internodes. Racemes straight or curved, 9-12 cm long. Sessile spikelet 6-7 mm long. Lower glume acute. Lemma 4-6 mm long. Upper floret hermaphrodite. Lemma 1.5 mm long. Palea curved, winged. Pedicelled spikelet 6-7 mm long. Terminal spikelet with a long pedicel. Fruits caryopsis, oblong, compressed. (Photo File 30. I)

Habitat: Found in marshy area.

Fls. and Frts.: Apr.-Jun.

Udalguri Nalbari; Binu. 52; April 19, 2014.

Heteropogon Pers.

Syn. Pl. 2: 253. 1807; Hook. f., FBI 7: 199. 1897; *Andropogon* L., Sp. Pl. (ed. 1): 1045. 1753 and Gen. Pl. (ed. 5): 1754; Mitra, Fl. Pl. of Eastern India 1: 231. 1958; Bor, Grasses of India 162. 1960; Shukla, GNEI 99. 1996.

Annual or perennial. Inflorescence a solitary terminal spike. Spikelets paired. Lower 1 to several pairs long, persistent, similar in shape and male or sterile. Spikelets in upper pairs dissimilar. Florets 2: the lower floret sterile and the upper hermaphrodite. Glumes equal. Upper lemma with a stout, long, geniculate awn.

12 species in the world (Clayton and Renvoize, 1986); 7 in India; 1 in N. E. India (Shukla, 1996); 1 in Assam (Bor, 1940) and 1 species in the study area.

Heteropogon contortus (L.) P. Beauv. ex Roem. & Schult., Syst. Veg. 2: 836. 1817; *Andropogon contortus* L., Sp. Pl. (ed. 1): 1045. 1753; Hook. f., FBI 7: 199. 1897; Bor, Fl. Assam 5: 402. 1940; Bor, Grasses of India 1630. 1960; Mitra, Fl. Pl. of Eastern India 231. 1958; Shukla, GNEI 99. 1996; Chowdhury, Assam's Flora 306. 2005.

Perennial. Culms branched, up to 75 cm tall. Leaf blades linear, 5-21 cm long, 0.2-0.5 cm broad, tapering to a fine point. Ligule a short, ciliate membrane. Spikelets solitary, terminal, 2.0-7.0 cm long. Spikelet 5 mm long in pairs; lower 1-7 pairs homogamous and up to 12 pairs heterogamous. Glumes equal. Lower floret reduced to a hyaline lemma, sterile. The upper female with staminodes in the sessile spikelets of the heterogamous pairs. Palea absent. Pedicelled spikelet of the heterogamous pair and lower few spikelets of the homogamous pairs male or sterile. Stamens 3.

Habitat: Grows in hilly tracts.

Fls. and Frts.: Jun.-Dec.

Gerensi, Bhutan border, Udalguri; Binu. 153; December 05, 2015.

Hymenachne P. Beauv. Ess. Agrost. 48. t. 10 f. 8. 1812; *Panicum* L. sect. *Hymenachne* of Hook. f., FBI 7: 39. 1897; Bor, FA 5: 218. 1940; Mitra, Fl. Pl. of Eastern India 1: 195. 1958; Bor, Grasses

of India. 313. 1960; Shukla, GNEI 327. 1996.

Perennial. Aquatic or marshy grasses. Culms decumbent at base. Leaf blades lanceolate cordate at the base. Panicle cylindrical, spike like; spikelets lanceolate to acuminate. Glumes unequal, the lower shorter than the upper glume with a distinct stipe. Upper lemma and palea membranous.

5-8 species in the world; 2 species in India and in N. E. India (Shukla, 1996); 2 in Assam (Bor, 1940) and 1 species in the study area.

Hymenachne assamica (J. D. Hooker) Hitchcock, Lingnan Sci. J. 7: 222. 1931; *Panicum assamicum* Hook. f., FBI 7: 40. 1897; Bor, FA 5: 219. 1940; Bor, Grasses of India 313. 1960; Debin Bull. Bot. Surv. India 3: 134. 1961; Shukla, GNEI 327. 1996; Chowdhury, Assam's Flora 306. 2005.

Perennial. Semi-aquatic herbs. Culms slender, 30-40 cm tall. Leaf blades lanceolate to acuminate, 4-6 cm long, 0.2 cm broad. Inflorescence like a spike, up to 15 cm long, 1 cm broad. Spikelets ovate to acute, 3 mm long. Lower glume shorter than the upper glume. Upper glume, 1.5 mm long. Lower floret sterile and the upper hermaphrodite. Lemma and palea membranous. Stamens 3. Stigma bifid.

Habitat: Common in waste land.

Fls. and Frts.: Throughout the year.

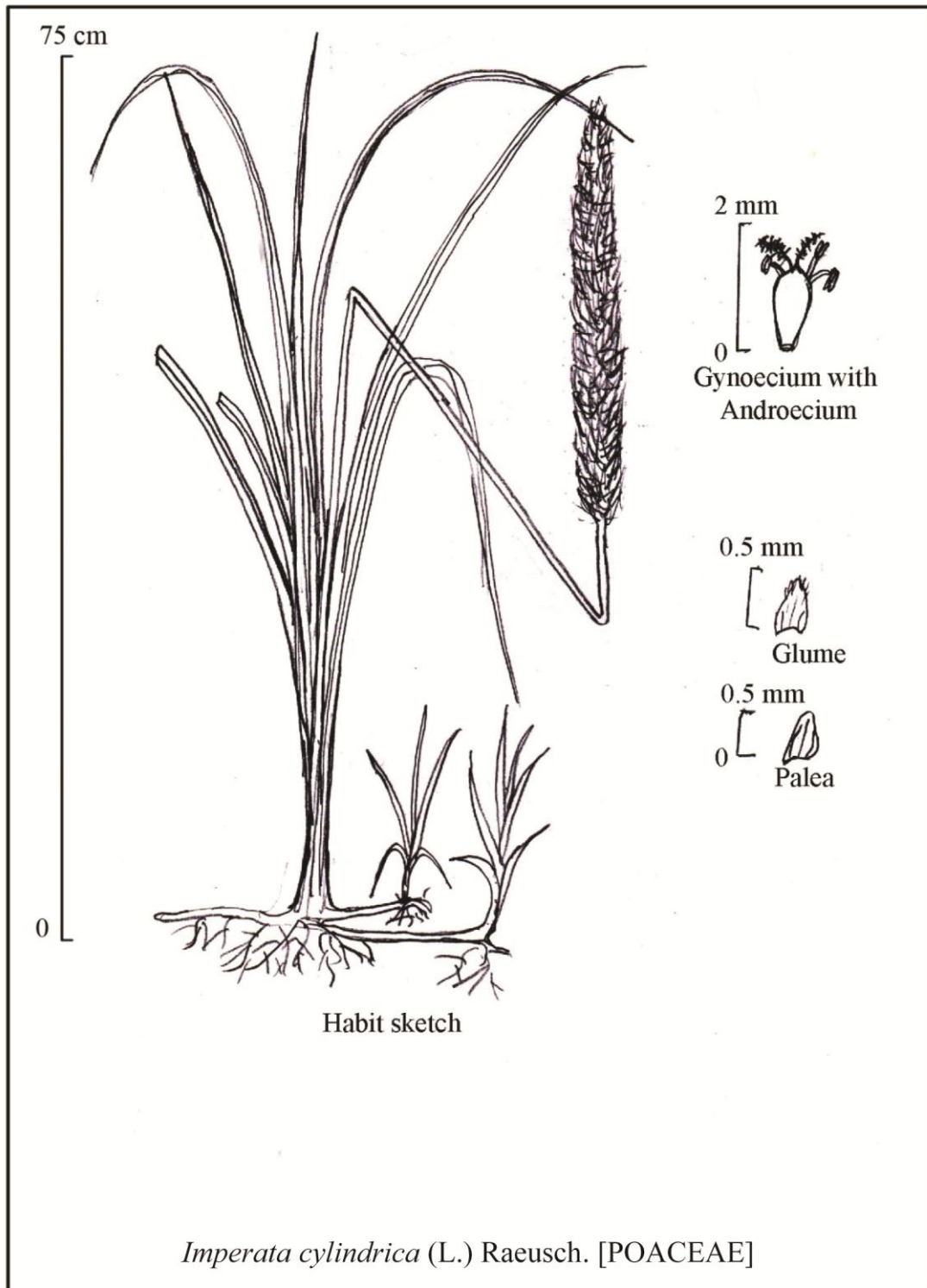
Kahibari, Udalguri; Binu. 45; April 15, 2014.

Imperata Cirillo

Pl. Rar. Neapol. 2: 26. 1792; Hook. f., FBI 7: 106. 1897; Bor, FA 5: 309. 1940; Mitra, Fl. Pl. of Eastern India 1: 211. 1958; Bor, Grasses of India 169. 1960; Shukla, GNEI 101. 1996.

Perennial herb. Basal leaves crowded. Inflorescence contracted with spike, silvery. Spikelets paired: one short and the other long pedicelled, unawned. Callus hairs twicethe length of glumes. Glumes membranous. Florets 2: the lower floret sterile and the upper hermaphrodite. Stamens 2.

PLATE – 56



12 species in the world, 8 species (Clayton and Renvoize, 1986); 2 species and 1 var. in India (Hook. f., 1897); 1 in N. E. India (Shukla, 1996); 1 species in Assam (Bor, 1940) and 1 species in study area.

Imperata cylindrica (L.) Raeusch., Nomencl. Bot. ed. 3: 10. 1797; P. Beauv., Ess. Agrost. 165. 1812; Hook. f., FBI 7: 106. 1897; Bor, FA 5: 310. 1940; Mitra, Fl. Pl. of Eastern India 1: 21. 1958; Bor, Grasses Ind. Pak. 169. 1960; Deb in Bull. Bot., Surv. India 3: 134. 1961; Shukla, GNEI 101. 1996; Chowdhury, Assam's Flora 306. 2005.

Perennial. Culms solid, hollow at the base, 75 cm tall. Nodes densely bearded. Leaves 50 cm long, tapering to a fine point. Ligule a ciliate, membrane. Inflorescence spike like, very dense. Spikelets lanceolate, 1 mm long; glumes equal. Upper glume keeled. Lower floret sterile. Upper hermaphrodite. Stamens 2. (**Plate 56**) (Photo File 30. P)

Habitat: Common grass grows in waste land.

Fls. and Frts.: Jul.-Mar.

Vern. name: Ulu bon (Rh.), Thuri (Bd.)

Khawrang, Bhutan border, Udalguri; Binu. 15; February 27, 2014.

Isachne R. Brown

Prodr. Fl. Nov. Holl. 196. 1810; Hook. f., FBI 7: 21 1897; Bor, FA 5: 194. 1940; Mitra, Fl. Pl. of Eastern India 1: 183. 1958; Bor, Grasses India 576. 1960; Shukla, GNEI 283. 1996.

Annual or perennial. Culms slender. Leaf blades linear to lanceolate. Ligule a rim of minute hairs. Inflorescence a panicle. Spikelets elliptic, obtuse, unawned, pedicelled, 2-flowered. Glumes equal or longer or shorter than the florets. Florets 2. The lower floret male and the upper floret hermaphrodite. Lodicules 2. Stamens 3.

100-110 species in the world, 16 species in India (Hook. f., 1897); 9 species in N. E. India (Shukla, 1996); 6 species and 1 var. in Assam (Bor, 1940) and 1 species in the study area.

Isachne globosa (Thunb.) Kuntze., Revis. Gen. Pl. 2: 778. 1891; Hook. f., FBI 7: 24. 1897; Mitra, Fl. Pl. of Eastern India 1: 184. 1958; Bor, Grasses of India 580. 1960; Shukla, GNEI 285. 1996; Chowdhury, Assam's Flora 307. 2005.

Annual. Culms slender, 10-45 cm long. Leaf blades linear, 5 cm long. Panicle 2-3 cm long. Spikelets 2 mm long, elliptic to globose. Glumes equal or shorter than the spikelet with membranous and faintly nerved. Florets 2. The lower floret male and the upper floret hermaphrodite. Stamens 3.

Habitat: Grows along the roadside.

Fls. and Frts.: Throughout the year.

Udalguri Nalbari; Binu. 25; November 27, 2014.

Ischaemum L.

Sp. Pl. 2: 1047. 1753.

Perennial. Culms usually decumbent at base. Young leaves usually convolute and flat at maturity. Inflorescence a spiciform raceme of 2 or more racemes. Rachis fragile, many jointed. Spikelets 2-nuts, one sessile and the other pedicelled. Both spikelets 2-flowered, lower floret male and the upper hermaphrodite. Glumes equal, keeled. Lower lemma male; upper lemma hermaphrodite. Paleas hyaline. Lodicules quadrangular. Stamens 3. Stigmas oblong or linear. Caryopsis dorsally compressed.

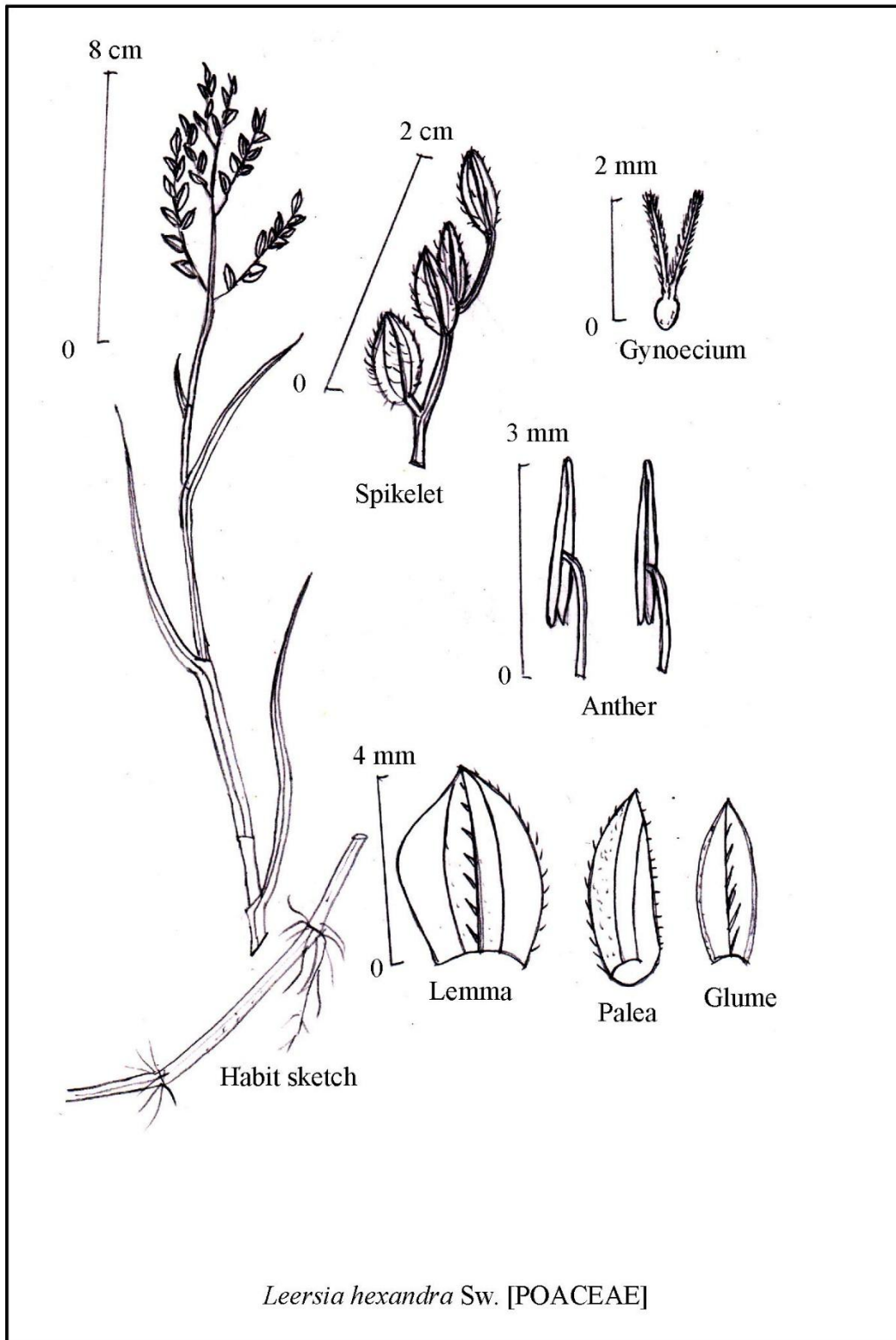
Ischaemum hirta Hack., Hook. f. Fl. Brit. India 7: 135. 1896; Bor in Fl. Assam 5; 427. 1940 *et* Grass. Burm. Ceyl. Ind. Pak. 179. 1960.

Annual. Culms rooting at lower nodes, glabrous, 25-50 cm high. Leaves lanceolate, acute, margin hairy. Sheaths loose, pubescent. Ligule membranous. Inflorescence of 2 spiciform racemes, hairy. Spikelets 2-nuts, one sessile and the other pedicelled. Lower florets male or empty. Upper florets hermaphrodite. Lemmas 4 mm long, 2-lobed, awned. Stamens 3. Stigmas 2, feathery.

Habitat: Common in open areas.

Fls. and Frts.: Jun.-Nov.

PLATE - 57



Leersia hexandra Sw. [POACEAE]

Udalguri Nalbari; Binu. 140; September 02, 2014.

Leersia Sw.

Prodr. Veg. Ind. Occ. 21. 1788 *nom gen. cons.*; Hook. f., FBI 7: 94. 1897; Bor, FA 5: 173. 1940; Mitra, Fl. Pl. of Eastern India 1: 181. 1958; Bor, Grasses India 599. 1960; Shukla, GNEI 299. 1996.

Perennial herb, aquatic or semi-aquatic. Culms, slender, cylindrical. Leaf blades linear. Spikelets pedicelled, laterally compressed. One floret, hermaphrodite. Glumes reduced. Lemma compressed keeled, unawned, 5-nerved and keels ciliate. Palea similar to lemma in texture, 3-nerved. Lodicules 2. Stamens 1, 3 or 6.

18 species in the world; 2 species in India (Hook. f., 1897); 1 in N. E. India (Shukla, 1996); 1 species in Assam (Bor, 1940) and 1 species in the study area.

Leersia hexandra Sw., Prodr. Veg. Ind. Occ. 21 1788; Hook. f., FBI 7: 94. 1897; Bor, FA 5: 173. 1940; Mitra, Fl. Pl. of Eastern India 1: 181. 1958; Bor, Grasses of India 599. 1960; Deb in Bull. Bot. Surv. India 3: 134. 1961; Shukla, GNEI 299. 1996; Chowdhury, Assam's Flora 307. 2005.

Perennial. Aquatic and semi-aquatic grass. Culms slender, simple. Leaf blades linear, acuminate, 7-10 cm long. 0.4 cm broad. Panicle terminal, 5-7 cm long. Spikelets shortly pedicelled, imbricate. Glumes reduced to a rim. Lemma compressed, 3 mm long, ciliate on the keels and the margins. Palea 2-keeled, 2.7 mm long. Stamens 6, 2.3 mm long. Styles solitary. Stigmas 2. (**Plate 57**)

Habitat: Common in moist waste land.

Fls. and Frts.: Throughout the year.

Vern. name: Arali Bon (Rh.), Alari Hagra (Bd.)

Udalguri Nalbari; Binu. 51; April 19, 2014.

Microstegium Nees

Lindley, Nat. Syst. Bot. 2: 447. 1836.

Perennial. Rarely annuals. Culms simple or branched, rooting at the lower nodes, sometimes with distinct aerial roots. Inflorescence a sub-digitate or fascicled racemes. Spikelets 2-nats, one sessile and the other pedicelled. Glumes subequal; lower deeply concave, 2-toothed. Leaves florets male or neuter. Upper florets hermaphrodite, lemmas short, entire or 2-fid or reduced to a dilated base of awn. Paleas absent or if present very minute. Lodicules 2. Stamens 3, sometimes 2. Caryopsis firm.

Microstegium ciliatum (Trin.) A. Camus, Ann. Soc. Linn. Lyon. N. S. 68: 201. 1921; Bor in Fl. Assam 5: 330. 1940 *et* Grass. Burm. Ceyl. Ind. Pak. 193. 1960; Babu Herb. Fl. Dehra Dun 623. 1977. *Pollinia ciliata* Trin. In Mem. Acad. Sci. Petersb. 2 (6): 306. 1832; Hook. f., Fl. Brit. India 7: 116. 1896.

Perennial. Culms tufted. Leaves linear to lanceolate, sessile, apex acute; sheaths clasping, striate, glabrous. Ligule membranous, truncate 1mm long. Inflorescence a panicle of 4-8 fales racemes, digitate, racemes 5-8 cm long, fragile, rachis jointed, each internode ending in sessile spikelets. Pedicels 4 mm long. Lower florets neuters. Upper florets hermaphrodite: lemma small, awned; palea hyaline. Stamens 3, anthers elongated. Styles 2, stigma plumose.

Habitat: Found in association with ferns and other herbaceous plants.

Fls. and Frts.: Aug.-Feb.

Udalguri Nalbari; Binu. 158; November 30, 2015.

Narenga Bor.

Narenga porphyrocoma (Hance *ex* Trin.) Bor in Ind. For. 66: 267. 1940; Bor, Grasses Burm. Ceyl. Ind. Pak. 198. 1960.

Perennial. Culms solitary, 1-3 m high, glabrous, hairy at the nodes. Leaves linear, hairy on the dorsal surface, midrib prominent, margin scabrid. Leaf sheaths loose, glabrous, densely hairy at the jointed between blade and sheath. Ligule membranous, truncate, 3 mm long. Inflorescence a contracted panicle, covered with golden brown hairs. Branches erect, very fragile. Spikelets dense. Spikelets sessile, callus with tufts of cilia. Lower florets empty. Upper florets hermaphrodite, golden brown, or yellow

with hairs at the back and on the margin. Keels ciliate. Lodicules 2. Stamens 3. Styles 2. Stigmas plumose.

Habitat: Common on hillslopes of Bhutan boarder.

Fls. and Frts.: Sep.-Jan.

Garobasti, Udalguri; Binu. 35; March 09, 2014.

Oplismenus P. Beauv.

Fl. Oware and Benin 2: 14. t. 58. 1807; Hook. f., FBI 7: 65. 1897; Bor, FA 5: 262. 1940; Mitra, Fl. Pl. of Eastern India 1: 197. 1958; Bor, Grasses of India 315. 1960; Shukla, GNEI 330. 1996.

Annuals or perennials. Culms slender. Leaf blades lanceolate to ovate. Panicle of several short spikes, arranged on a central axis. Spikelets solitary, paired or in clusters on the rachis. Glumes sub-equal, similar, membranous. Lower floret sterile, longer than the glumes. Lower lemma short awned. Stamens 3.

15 species in the tropics and sub-tropics; 3 species in India (Hook. f., 1897); 3 species in N. E. India (Shukla, 1996); 3 species in Assam (Bor, 1940) and 2 species in the study area.

Key to species

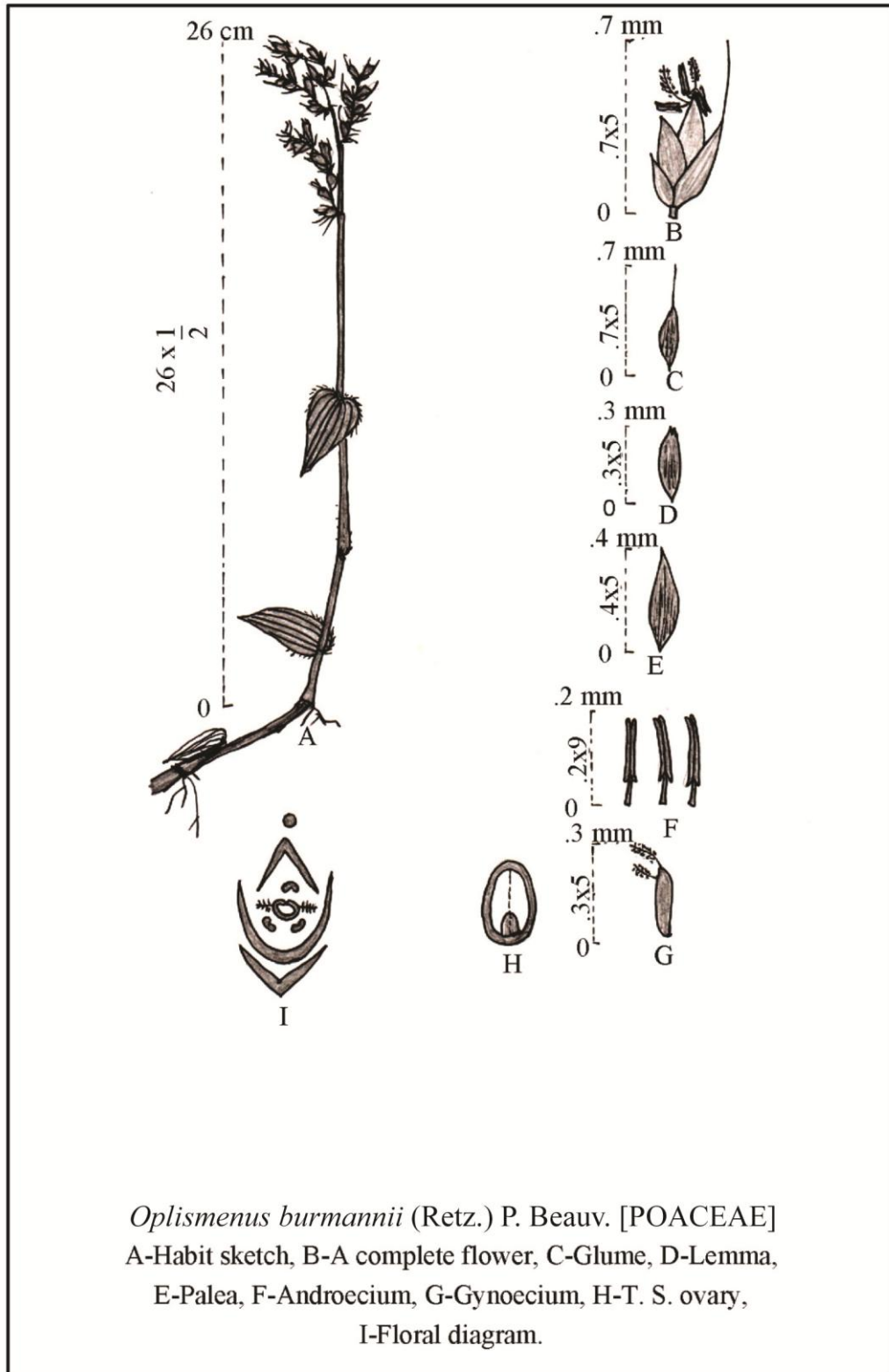
1a. Awns stiff, reddish, smooth, viscid. *O. compositus*

1b. Awns capillary, pale, minutely barbed. *O. burmannii*

Oplismenus burmannii (Retz.) P. Beauv., Ess. Agrost. 54, 168, 169. 1812; *Panicum burmannii* Retz., Obs. Bot. 3: 10. 1783; Hook. f., FBI 7: 68. 1897; Bor, FA 5: 263. 1940; Mitra, Fl. Pl. of Eastern India 1: 197. 1958; Bor, Grasses of India 317. 1960; Shukla, GNEI 332. 1996; Chowdhury, Assam's Flora 307. 2005.

Annual herb. Culms slender up to 35 cm tall. Leaf blades lanceolate, hairy on both surfaces. Spikelets 2 mm long, paired with short pedicelled. Lower glume short, 3-nerved, awned and the upper glume 3-5 nerved. Lower floret sterile and the upper floret hermaphrodite. Lemma awned. Anthers 1.5 mm long. (**Plate 58**)

PLATE – 58



Oplismenus burmannii (Retz.) P. Beauv. [POACEAE]
 A-Habit sketch, B-A complete flower, C-Glume, D-Lemma,
 E-Palea, F-Androecium, G-Gynoeccium, H-T. S. ovary,
 I-Floral diagram.

Habitat: Grows in forest margin.

Fls. and Frts.: Sep.-May.

Vern. name: Ban potia bon. (Rh.)

Barnadi Wildlife Sanctuary, Udalguri; Binu. 151; November 20, 2014.

Oplismenus compositus (L.) P. Beauv., Ess. Agrost. 54, 168, 169. 1812; *Panicum compositum* L. Sp. Pl. (ed. 1) 57. 1753; Hook. f., FBI 7: 66. 1897; Bor, FA 5: 262. 1940; Mitra, Fl. Pl. of Eastern India 1: 197. 1958; Bor, Grasses of India 317. 1960; Deb in Bull. Bot. Surv. India 3: 135. 1961; Shukla, GNEI 334. 1996; Chowdhury, Assam's Flora 307. 2005.

Perennial herb. Culms slender and upto 8 cm tall. Leaf blades lanceolate, acuminate, 3.0-0.9 cm long and 1 cm broad. Panicle 10 cm long. Racemes 2 cm long. Spikelets lanceolate, 2.5 mm long. Glumes equal. Lower floret sterile and the upper hermaphrodite. Anthers pendulous. (Photo File 30. e)

Habitat: Grows in forest margin.

Fls. and Frts.: Jun.-Feb.

Vern. name: Ban potia bon. (Rh.)

Barnadi Wildlife Sanctuary, Udalguri; Binu. 20; November 08, 2014.

Oryza L.

Gen. Pl. 5: 155. 1754; Sp. Pl. 1: 333. 1753; Hook. f., FBI 7: 92. 1897; Bor, Fl. Assam 5: 169. 1940; Mitra, Fl. Pl. of Eastern India 1: 180. 1958; Bor, Grasses of India 601. 1960; Shukla, GNEI 300. 1996.

Annual or perennial herb. Leaf blades long, linear to lanceolate. Ligule well developed, membranous. Inflorescence a panicle. Spikelets persistent, hermaphrodite with 3-flowered, awned or unawned. Glumes minute, scale like. Fertile lemma laterally compressed, papery, keeled, acute, awned or unawned. Palea similar to lemma in texture and length. Lodicule 2. Stamens 6.

20 species in the tropics and sub-tropics; 5 species in India (Hook. f., 1897); 4 species

And 2 varieties in N. E. India (Shukla, 1996); 3 species and 1 variety in Assam (Bor, 1940) and 2 species in the study area.

Key to species

1a. Ligule of lower leaves 15-40 mm long.. *O. sativa*

1b. Ligule of lower leaves upto 3 cm long. *O. officinalis*

Oryza officinalis Wall. ex Watt., Dict. Econ. Prod. Ind. 5: 501. 1891; Bor in Fl. Assam 5: 171. 1940. *Oryza latifolia* Hook. f., Fl. Brit. Ind. 7: 92. 1896 *nor.* Desv. 1813.

Annual. Culms erect, tufted, 2-3 m high, branched from base, glabrous. Leaves linear, lanceolate, midrib prominent, margin scabrid, acute, sheaths loose, glabrous. Ligule a truncate membrane, 3-5 mm long. Panicles 10-30 cm long. Rachilla scabrid. Spikelets ovate to lanceolate, 3-4 mm long, acute. Glumes reduced to bract like structures. Lemmas broad, compressed, acute. Palea similar to lemmas but smaller. (Photo File 30. D)

Habitat: Frequent in marshes and a weed of cultivation.

Fls. and Frts.: Oct.-Jan.

Orang, Udalguri; Binu. 133; October 15, 2015.

Oryza sativa L., Sp. Pl. 1: 333. 1753; Hook. f., FBI 7: 92. 1897; Bor, Fl. Assam 5: 170. 1940; Bor, Grasses of India 605. 1960; Deb in Bull. Bot. Surv. India 3: 135. 1961; Shukla, GNEI 301. 1996; Chowdhury, Assam's Flora 308. 2005.

Annual herb. Culms up to 1.6 m tall, rooting at the nodes and the nodes are glabrous. Leaf blades linear, acuminate, 30-50 cm long, 0.6-0.7 cm broad. Leaf sheaths smooth. Ligule 20 mm long, lanceolate. Panicle lax. Rachis angular. Pedicel angular, swollen at the tip. Spikelets 0.7 cm long, awned. Lemma granulate. Palea similar to lemma in texture. (Photo File 30. L)

Habitat: Cultivated for its grain in wet field.

Fls. and Frts.: Oct.-Jun.

Vern. name: Dhan (As. and Rh.), Mai (Bd.)

Orang, Udalguri; Binu. 143; October 20, 2015.

***Panicum* L.**

Sp. Pl. 1: 55. 1753; Gen. Pl. 5: 29. 1754; Hook. f., FBI 7: 26. 1897; Bor, Fl. Assam 5: 222. 1940; Mitra, Fl. Pl. of Eastern India 1: 186. 1958; Bor, Grasses of India 319. 1960; Shukla, GNEI 334. 1996.

Annual or perennial herb. Leaf blades linear to lanceolate. Ligule membranous or hairy. Panicles open. Spikelets lanceolate to oblong. Glumes membranous, unequal: the lower glume short and the upper glume long like the spikelet. Lower floret male or sterile and the upper floret hermaphrodite. Upper lemma and palea coriaceous. Stamens 3. Caryopsis compressed.

475-500 species in the world, 55 species in India (Hook. f., 1897); 17 species in N. E. India (Shukla, 1996); 17 species in Assam (Bor, 1940) and 1 species in the study area.

Panicum sermentosum Roxb., Fl. Ind. 1: 311. 1820; Hook. f., Fl. Brit. India 7: 54. 1896; Bor in Fl. Assam 5: 235. 1940 *et* Grass. Burm. Ceyl. Ind. Pak. 330. 1960.

Perennial. Culms tall, up to 5m high, scrambling, swollen at the nodes, hairy below the panicle. Leaves linear, lanceolate, softly hairy, margin scabrid. Sheaths loose, hairy towards the mouth. Ligule membranous. Panicles 10-15 cm long. Spikelets ovate, elliptic, 2-nerved. Palea ovate, smaller than the lemma. Lodicules 2. Stigmas 3. Styles 2, stigmas feathery.

Habitat: Common in open shrubby area, climbing on other plants.

Fls. and Frts.: Oct.-Jan.

Bhairabkunda, Udalguri; Binu. 135; November 20, 2015.

***Paspalum* L.**

Syst. Nat. 10: 855. 1759; Hook. f., FBI 7: 10. 1897; Bor, Fl. Assam 5: 250. 1940; Mitra, Fl. Pl. of Eastern India 1: 190. 1958; Bor, Grasses of India 334. 1960; Shukla, GNEI 344. 1996.

Annual or perennial. Inflorescence of several one sided spikes arranged on the main axis. Spikelets oblong, obtuse, falling entire from a very short pedicel, secund, 2 or 4 rowed. Rachis flattened. Lower glume absents or minute. The upper glume membranous. Lower floret reduced to empty lemma and upper floret hermaphrodite. Lemmas equal or sub-equal. Lower lemma membranous and upper lemma coriaceous. Palea similar to lemma in texture. Lodicules 2. Stamens 3.

250 species in the warmer parts of the world, 350 species (Clayton and Renvoize, 1986); 15 species in India (Hook. f., 1897); 6 species, 1 var. in N. E. India (Shukla, 1996); 7 species and 1 var. in Assam (Bor, 1940) and 4 species in the study area.

Key to species

1a. Spikelets arranged in 4-rows on the broad rachis. *P. longifolia*

1b. Spikelets arranged in 2-rows on a narrow or broad rachis:

2a. Spikelets ovate to lanceolate, 1-nerved:

3a. Spikelets 1.5-2 mm long, yellowish green.... . *P. conjugatum*

3b. Spikelets 2.5-4.0 mm long, violet. *P. distichum*

2b. Spikelets ovate to elliptic or orbicular, 3-nerved. *P. orbiculare*

Paspalum conjugatum Berg., Acta Helv. Phys.-Math. 7: 129. 1772; Paspalum tenue Gaertn., Fruct. Sem. Pl. 2: 2. 1791; Hook. f., FBI 7: 11. 1897; Bor, Fl. Assam 5: 255. 1940; Mitra, Fl. Pl. of Eastern India 190. 1958; Bor, Grasses of India 336. 1960; Shukla, GNEI 345. 1996; Chowdhury, Assam's Flora 308. 2005.

Perennial. Culms 33 cm tall. Leaf blades 15 cm long, 0.5 cm broad, linear, glabrous, ciliate on the margins. Ligule a pubescent row. Inflorescence slender with 2 diverging sub-opposite spikes, 8-12 cm long. Spikes 2-3, 10 cm long. Spikelets 2-rowed, 1.5 mm long, ovate. Lower glume absent but the upper glume ovate. Lower floret sterile and the upper floret hermaphrodite. Lemma similar to upper glume. Both palea and lemma are coriaceous.

Habitat: Grows along the road side.

Fls. and Frts.: Jun.-Feb.

Nalbari, Udalguri; Binu. 150; September 10, 2014.

Paspalum distichum L., Syst. Nat. ed. 10. 2: 855.1759; Hook. f. Fl. Brit. India 7: 12. 1896; Bor in Fl. Assam 5: 255. 1940 *et* Grass. Burm. Ceyl. Ind. Pak. 338. 1960.

Annual. Culms compressed, prostrate with erect flowering culms, glabrous. Leaves flat, blades shortly hairy, sheaths loose, hairy on margins. Ligules membranous, with few cilia at the back. Racemes usually 3, rachis flat, scabrid. Spikelets ovate to lanceolate. Lower glumes rarely present; upper glumes as long as spikelets, 3-5-nerved. Lemma similar to upper glumes. Palea 2, coriaceous, nerveless, embracing the inner whorls. Stamens 3. Styles 2. Stigmas feathery, violet.

Habitat: Common in open area.

Fls. and Frts.: Jan.-Dec.

Kothalguri, Udalguri; Binu. 32; March 09, 2014.

Paspalum longifolium Roxb., Fl. Ind. 1: 283. 1820; Bor in Fl. Assam 5: 252. 1940 *et* Grass. Burm. Ceyl. Ind. Pak. 339. 1960.

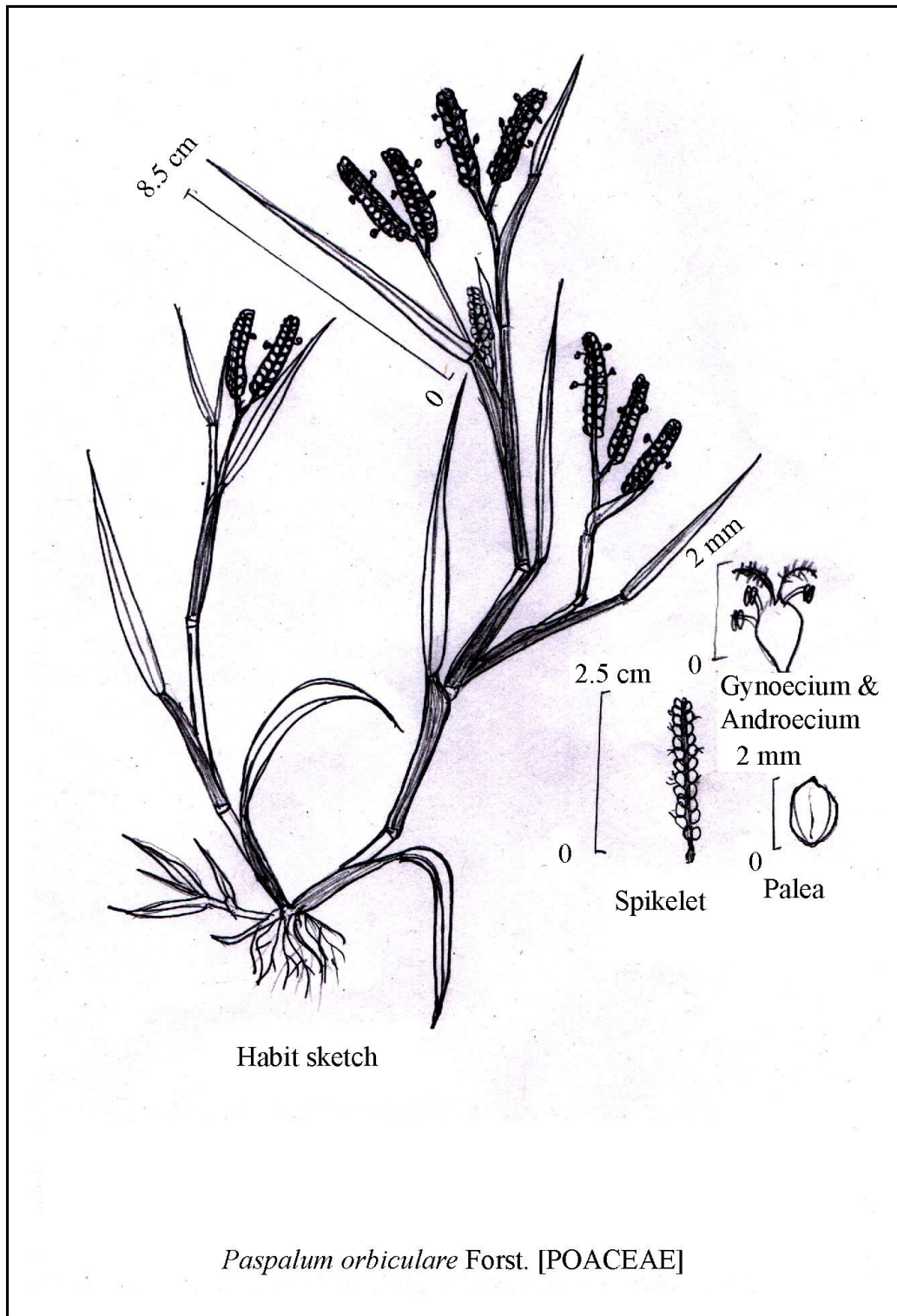
Perennial. Culms up to 0.9 m high. Leaves linear, apex acute, margin scaberulous. Leaf sheaths loose, hairy near the mouth. Ligules short, membranous, ciliate. Inflorescence a panicle of false spikes, 5-10 cm long, alternate, rachis flat. Spikelets arranged in 4-rows, glabrous or sparsely hairy on the pedicels. Spikelets 2mm long, lower glumes zero. Upper glumes as long as the spikelets, 3-nerved. Lower florets barren. Upper florets hermaphrodite. Palea as long as lemma. Stamens 3. Styles 2. Stigmas brownish, feathery. Caryopsis bluish.

Habitat: Common in open marshy area.

Fls. and Frts.: Apr.-Nov.

Serfang, Udalguri; Binu. 53; April 19, 2014.

Paspalum orbiculare Forst., Fl. Insul. Austr. Prodr. 7. 1786; Bor in Fl. Assam 5: 254. 1940 *et* Grass Burm. Ceyl. Ind. Pak. 340. 1960.



Annual or perennial. Culms erect, geniculate from base, glabrous, 20-75 cm long, branched from the lower nodes. Leaves linear, lanceolate, glabrous, margin scabrid, sheaths loose, glabrous or with few hairs. Ligule membranous. Spikelets 2-5, alternate, rhachis flat, winged at the tip. Spikelets biseriate, 1.5-2.5 mm long, glabrous, acute. Lower glumes absent. Upper glumes ovate. Lower florets empty. Upper florets hermaphrodite. Lemma shining. Stamens 3. Styles short. Stigmas feathery. (**Plate 59**)

Habitat: Common weed of cultivated field.

Fls. and Frts.: Jan.-Jul.

Goraimari, Udalguri; Binu. 46; April 11, 2014.

Pennisetum Rich.

Pers. Syn. Pl. 1: 72. 1805; Hook. f., FBI 7: 82. 1897; Bor, FA 5: 294. 1940; Mitra, Fl. Pl. of Eastern India 184. 1958; Bor, Grasses of India 341. 1960; Shukla, GNEI 348. 1996.

Annual or perennial. Culms tufted, branched or unbranched. Leaf blades linear or lanceolate. Ligule a rim of cilia. Inflorescence 1 to several, dense spikes. Spikelets solitary or in groups of up to 4. Glumes equal or sub-equal. Lower floret male or sterile and upper floret hermaphrodite. Palea absent. Lower and upper lemmas are not similar. Stamens 3. Anthers bear at the tip.

80-130 species in the warmer regions of the world; 12 species in India (Hook. f., 1897) 6 species in N. E. India (Shukla, 1996); 5 species in Assam (Bor, 1940); and 3 species in the study area.

Key to species

- 1a. Cultivated annually; rachis stout; spikelets crowded,
gaping to expose the grains. *P. americanum*
- 1b. Wild perennial; rachis slender, spikelets solitary,
not gaping to expose the grains. *P. purpureum*

Pennisetum americanum (L.) K. Schum., Engl. Pflanzenw. Ost. Afr. B. 51. C. t. 4. f. A and B. 1895; *Panicum americanum* L., Sp. Pl. (ed.1): 56. 1753. *Alopecurus typhoides* Burm. f., Fl. Ind. 27. 1768; Bor, FA 5: 297. 1940; Bor, Grasses of India 350. 1960; Deb in Bull. Bot. Surv. India 3: 135. 1961; Shukla, GNEI 349. 1996; Chowdhury, Assam's Flora 308. 2005.

Annual. Culms erect 1.2 m tall. Leaf blades linear, acute, 30 cm long, 2.5 cm broad. Ligule a fringe of hairs. Spikes solitary, tapering at both the ends, 26 cm long. Spikelets pedicelled, solitary, 3 mm long. Glumes, unequal. Lower floret male or sterile. Upper floret hermaphrodite. Lemma as long as the spikelet. Palea truncate. Anthers 3 mm long.

Habitat: Grows in open areas.

Fls. and Frts.: Apr.-Nov.

Bhairabkunda, Udalguri; Binu. 44; April 05, 2014.

Pennisetum purpureum Schum., Beskr. Guin. Pl. 44. 1827; Bor, FA 5: 298. 1940; Mitra, Fl. Pl. of Eastern India 1: 185. 1958; Bor, Grasses of India 348. t. 349. 1960; Shukla, GNEI 351. 1996; Chowdhury, Assam's Flora 308. 2005.

Perennial. Culms tufted, 0.6-0.9 m tall. Leaf blades linear, 25 cm long, 2.5 cm broad. Inflorescence dense, like spike. Spikelets solitary, sessile, acuminate and 5 mm long. Lower glume minute. Upper 0.5 long. Lower lemma empty. Palea absent. Upper floret hermaphrodite. Palea narrower than the lemma. (Photo File 30. d)

Habitat: Found along the roadside.

Fls. and Frts.: Aug.- Nov.

Udalguri Nalbari; Binu. 138; August 14, 2015.

Phragmites Trin.

Fund. Agrost. 134. 1820; Hook. f., FBI 7: 303. 1897; Bor, FA 5: 87. 1940; Bor, Grasses of India 415. 1960; Mitra, Fl. Pl. of Eastern India 1: 157. 1958; Shukla, GNEI 149. 1996.

Perennial. Culms hollow, 3-5 m tall. Leaf blades flat. Ligules ciliate, membranous. Panicle large, lax. Lemmas heteromorphous, the lowest much longer than the subtending ones, thin, linear, glabrous.

3 species in the world, 2 species in India (Hook. f., 1897); 1 species and 2 variety in N. E. India (Shukla, 1996); 1 species and 1 variety in Assam (Bor, 1940); 1 species in the study area.

Phragmites karka (Retz.) Trin. *ex* Steud., Nom. Bot. (ed. 2) 2: 324. 1841; Hook. f., FBI 7: 304. 1897; Bor, FA 5: 88. 1940; Mitra, Fl. Pl. of Eastern India 1: 157. 1958; Bor, Grasses of India 416. 1960; Shukla, GNEI 149. 1996; Chowdhury, Assam's Flora 309. 2005.

Perennial. Culms robust, 3 m tall, hollow. Leaf blades linear. Ligule hairy. Panicle 34 cm long, 8 cm broad. Pedicels hairy. Spikelets several flowered, 1.8 cm long. Glumes equal, membranous. Palea much shorter than lemma. Stamens 3. Styles 2.

Habitat: Common in wet places.

Fls. and Frts.: Sep.-Feb.

Vern. name: Nal khagraor Ekora (Rh.), Angkhwr (Bd.)

Sonai, Udalguri; Binu. 148; September 01, 2014.

Poa L.

Nov. Gen. Sp. 1: 158. 1816; Bor, Grasses Burm. Ceyl. Ind. Pak. 557. 1960; Bor in Rech. F., Fl. Iran. 70: 30. 1970.

Annual or perennial. Rhizomatous or stoloniferous or decumbent. Culms 40-140 cm high. Culms tuberous or not tuberous. Culm internodes hollow. Leaves usually mostly basal. Sheath margins jointed. Leaf blades linear or linear to lanceolate. Plants bisexual with spikelets. Inflorescence paniculate. Rachilla hairless. Glumes 2. Stigmas 2, white. Fruit ellipsoid or fusiform.

Poa khasiana Stapf, Hook. f., Fl. Brit. India 7: 343. 1896; Bor in Fl. Assam 5: 68. 1940 *et* Grass. Burm. Ceyl. Ind. Pak. 557. 1960.

Perennial herb. Culms tufted, erect, 30-70 cm long. Rooting from lower nodes. Culm internodes terete, smooth. Leaves basal. Leaf sheaths loose. Inflorescence a panicle. Peduncle smooth. Spikelets solitary, oblong. Glumes persistent. Lodicules 2. Anthers 3, 1 mm long. Fruits caryopsis.

Habitat: Found in wasteland damp places.

Fls. and Frts.: Sep.-Dec.

Bandarguri, Udalguri; Binu. 136; October 20, 2015.

Polytoca R. Brown

Hook. f., FBI 7: 100. 1897; Bor, Fl. Assam 5: 455. 1940; Mitra, Fl. Pl. of Eastern India 1: 245. 1958; Bor, Grasses of India 267. 1960; Shukla, GNEI 294. 1996.

Perennial herb. Culms usually tall, male and female sex occasionally on separate plants. Leaf blades large, broad. Inflorescence 3, fragile racemes arranged on a peduncle and several lateral racemes, entirely female at the base and male on the top, enclosed by a spathe and a leaf sheath. Male spikelets 2-flowered, paired and the pairs alternat. Female spikelets enclosed in a structure derived from the hardened lower glume and partly by the narrow joint.

6 species in the world; 6 species in India (Hook. f., 1897); 2 species in N. E. India (Shukla, 1996); 2 species in Assam (Bor, 1940) and 1 species in the study area.

Polytoca digitata (Linn. f.) Druce., Hook. f., FBI 7: 101. 1897; Bor, FA 5: 456. 1940; Bor, Grasses of India 267. 1960; Deb in Bull. Bot. Surv. India 3: 135. 1961. Deb, *l.c* 135. 1961. Shukla, GNEI 294. 1996; Chowdhury, Assam's Flora 309. 2005.

Perennial herb. Culms slender, 0.5-0.9 m tall. Leaf blades linear, 25 cm long and 1 cm broad. Ligule membranous. Inflorescence racemes and several lateral racemes entirely female or male above and female below. Male spikelets paired, one sessile and other pedicelled. Palea similar to the lemma in texture. Stamens 3. Fertile spikelets paired, 1 sessile the other pedicelled. Pedicelled spikelets reduced to empty glume. Sessile spikelet coriaceous. Lower floret sterile the upper female. Style long.

Habitat: Found in grassland.

Fls. and Frts.: Jun.-Feb.

Gersong, Udalguri; Binu. 39; April 05, 2014.

Pseudostachyma Nees.

Clayton and Renvoize in Genera Graminum 56. 1986; *Cephalostachyum* Munro, *l. c.* 26: 139. 1868; Hook. f., FBI 7: 415. 1897; Majumdar in Fl. Ind. Enum. Monocot. 281. 1989; Shukla, GNEI 216. 1996; Barooah & Borthakur, Diver. and Distr. of Bamboos in Assam 162. 2003.

Culms shrubby or arborescent. Erect or climbing. Culm sheaths shorter than internodes, auricled. Panicle terminal or made up of bracteate spikes or clusters of spikelets. Spikelets all alike or of 2 types, fertile and sterile. Fertile spikelets smaller, 1-several flowered. Glumes 1-4, mucronate. Fertile lemmas similar to glumes. Palea shorter than lemma. Stamens 6. Filaments free. Ovary stalked, ovate. Styles 1-2. Stigmas 2-3.

60 species in Madagascar, India and Malesia extending to China and Hawaii (Clayton and Renvoize, 1986); 5 species in India (Hook. f., 1897); 12 species in N. E. India (Shukla, 1996); 4 species in Assam (Barooah and Borthakur, 2003) and 1 species in the study area.

Pseudostachyma polymorphum (Munro) R. Majumdar in Karthikeyan *et al.*, Fl. Ind. Enum. Mono. 282. 1989; *Pseudostachyma polymorphum* Munro in Trans. Linn. Soc. 26 (1): 142, t. 4, 1868; *et* in Hook. f., FBI 7: 409. 1897; Bor, FA 5: 19. 1940; Shukla, GNEI 225. 1996; Seethalakshmi and Kumar, Bamboos of India 255. t. 89. 1998; Barooah & Borthakur, Diver. and Distr. of Bamboos in Assam 172. 2003; Chowdhury, Assam's Flora 310. 2005.

Perennial. Culms distinct, up to 15 m tall. Nodes not swollen. Internodes 2.5 cm in diameter. Leaf blades lanceolate, unequally rounded at the base, short petioled. Ligules short. Culm sheaths shorter than the internodes, short auricled. Inflorescence a large, leafy panicle. Spikelets 5 mm long with 1 fertile flower. Empty glumes 1.

Flowering glumes similar to empty glumes. Palea 2-keeled, ciliate on the keels. Lodicules 3, acute. Stamens 6, free. Ovary narrow, style rigid. Stigmas 2, short hairy. (Photo File 30. M)

Habitat: Found in marshy places.

Fls. and Frts.: Jan.-Dec.

Vern. name: Nal bah (Rh.), Nwlw (Bd.)

Bhairabkunda, Udalguri; Binu. 72; February 27, 2014.

Saccharum L.

Sp. Pl. 1: 54. 1753; Gen Pl. 5: 28. 1754; *Erianthus* Michx., Fl. Bor. Amer. 1: 54. 1803; Hook. f., FBI 7: 118. 1897; Bor, FA 5: 318. 1940; Bor, Grasses of India 208. 1960; Mitra, Fl. Pl. of Eastern India 1: 212. 1958; Shukla, GNEI 122. 1996.

Perennial. Culms robust. Leaf blades narrow to broad, with a very thick midrib. Ligule membranous. Panicle large, much divided. Spikelets all alike, awned or unawned, villous, paired, one sessile the pedicelled in each pair, flowered. Glumes equal. Upper lemma awned and in some cases unawned.

60 species in the world; 5 species in India (Hook. f., 1897); 10 species and 2 varieties in N. E. India (Shukla, 1996); 4 species in Assam (Bor, 1940) and 3 species in the study area.

Key to species

1a. Peduncle hairy below panicle; glumes

coriaceous and brown below. *S. spontaneum*

1b. Peduncle not hairy; glumes uniform:

2a. Spikelet callus hairs white. *S. officinarum*

2b. Spikelet callus hairs reddish. *S. procerum*

Saccharum officinarum L., Sp. Pl. 1: 54. 1753; Hook. f., FBI 7: 118. 1897; Bor, FA 5: 321. 1940; Mitra, Fl. Pl. of Eastern India 1: 213. 1958; Bor, Grasses of India 212. 1960; Shukla, GNEI 125. 1996; Chowdhury, Assam's Flora 309. 2005.

Cultivated perennial herb. Culms erect, tufted at the bases, upto 4 m tall, solitary, sometimes branched. Leaf blades rigid with a strong median nerve, up to 1 m long and 5 cm broad. Panicle large in size, pyramidal, thick, spreading and up to 8 cm long. Glumes equal, 3 mm long. Lower floret sterile. Upper floret hermaphrodite. (Photo File 30. H)

Habitat: Cultivated plants on high area.

Fls. and Frts.: Jan.-Mar.

Vern. name: Kuhiyar (As. and Rh.), Khuser (Bd.)

Sonapur, Udalguri; Binu. 179; February 15, 2016.

Saccharum procerum Roxb., Fl. Ind. 1: 428. 1820; Hook. f., FBI 7: 119. 1897; Bor, FA 5: 321. 1940; Mitra, Fl. Pl. of Eastern India 1: 213. 1958; Bor, Grasses of India 213. 1960; Shukla, GNEI 125. 1996; Chowdhury, Assam's Flora 309. 2005.

Perennial herb. Culms upto 4 m tall. Leaf blades linear and tapering to a point, villous in the lower most, strips of green blade narrower than the midrib, margins very scabrid. Panicle large. Spikelets 3-4 mm long. (Photo File 30. C)

Habitat: Grows along the road side.

Fls. and Frts.: Jun.-Dec.

Gerensi, Udalguri; Binu. 141; December 05, 2015.

Saccharum spontaneum L., Mant. 2: 183. 1771; Hook. f., FBI 7: 118. 1897; Bor, FA 5: 319. 1940; Bor, Grasses of Burma, Ceyl., Ind., Pak. 214. 1960; Shukla, GNEI 126. 1996; Chowdhury, Assam's Flora 309. 2005.

Perennial grass; tall. Root stocks creeping. Stems 3-4 m high. Leaves narrowly linear, finely acuminate, 1.5 m long. Panicle lanceolate, contracted, up to 50 cm long. Spikelets all alike, 4 mm long, lanceolate. Glumes equal. (Photo File 30. t)

Habitat: Common in wasteland.

Fls. and Frts.: Nov.-Dec.

Vern. name: Kohua Bon (Rh.), Khasi Hagra (Bd.)

Gerensi, Udalguri; Binu. 142; November 05, 2015.

Setaria P. Beauv.

Hook. f., FBI 7: 77. 1897; Bor, FA 5: 283. 1940; Mitra, Fl. Pl. of Eastern India 1: 200. 1958; Bor, Grasses of India 358. 1960; Shukla, GNEI 357. 1996.

Annual or perennial herb. Leaf blades linear. Ligule hairy or a ciliate membrane. Inflorescence terminal, lax or spike. Spikelets subtended by one to several persistent bristles, flowers two. Glumes membranous and unequal. The lower glumes are very small. Lower florets male or sterile: lemma membranous and upper florets hermaphrodite: lemma crustaceous. Palea is longer than the lemma. Lodicules 2. Stamens 3.

100-140 species in tropical and temperate regions of the world, 7 species in India (Hook. f., 1897); 11 species in N. E. India (Shukla, 1996); 8 species in Assam (Bor, 1940) and 1 species in the study area.

Key to species

1a. Spikelets 3mm long; inflorescence an erect. *S. glauca*

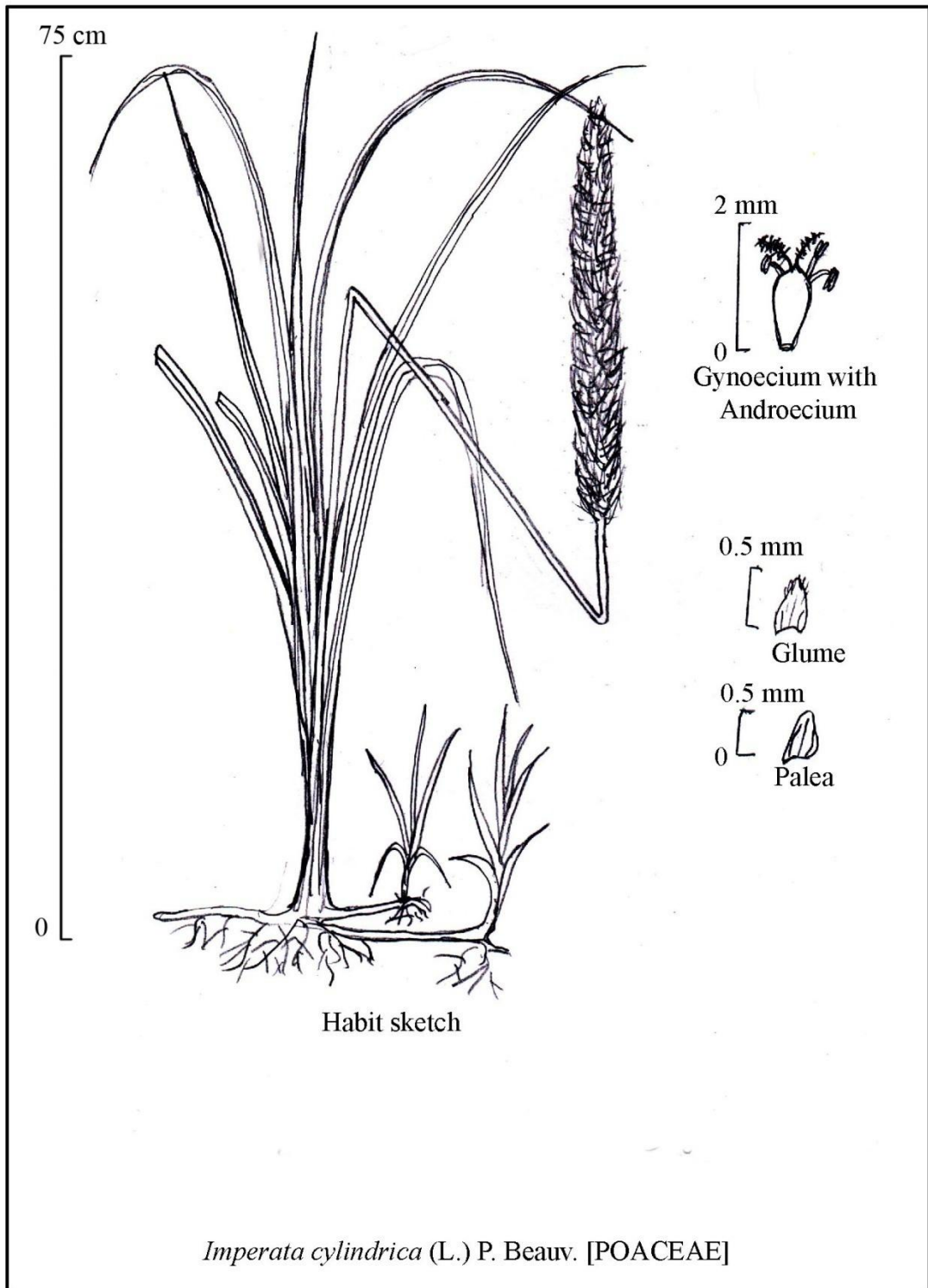
1b. Spikelets 2 mm long; inflorescence dense. *S. viridis*

Setaria glauca (L.) P. Beauv., Ess. Agrost. 51. 1812; Hook. f., FBI 7: 80. 1896; Bor in Fl. Assam 5: 290. 1940 et Grass. Burm. Ceyl. Ind. Pak. 360. 1960.

Annual herb, grass. Culms decumbent, loosely tufted from the geniculate base, glabrous, hairy only below the panicle. Leaves flat, hairy, or glabrous. Leaf sheaths glabrous, membranous, ciliate. Ligule a rim of cilia. Inflorescence on erect, cylindrical spike. Spikelets solitary or in groups, ovoid, awned. Glumes 5-nerved. Both upper and lower lemma similar, nerveless. Palea hyaline, flat. Stamens 3. Anthers 1mm long. Styles 2. Stigmas feathery. Lower floret empty or sometimes male. Caryopsis round. **(Plate 60)** (Photo File 30. Q)

Habitat: Abundant on all types of soils specially on fallows.

PLATE – 60



Fls. and Frts.: Feb.-Jul.

Angragaon, Udalguri; Binu. 79; April 27, 2014.

Setaria viridis (L.) P. Beauv., Ess. Agrost. 51. 1812; Hook. f., FBI 7: 80. 1897; Bor, Fl. Assam 5: 287. 1940; Mitra, Fl. Pl. of Eastern India 1: 201. 1958; Bor, Grasses of India 365. 1960; Shukla, GNEI 363. 1996.

Annual herb. Culms slender and tufted. Leaf blades linear, upto 14 cm long and 0.5 cm broad. Ligules with soft hairy. Inflorescence very thick with cylindrical spike of 2-6 spikelets. and 2 mm long. Bristles are not equal in length. Glumes are membranous: the lower glumes with one nerved and the upper glumes with 5-7 nerved. Lower florets sterile: lemma 2 mm long and palea with a minute scale. Upper florets hermaphrodite: lemma crustaceous. Anthers 0.3 mm long.

Habitat: Found in grass lands and amidst grasses.

Fls. and Frts.: May-Nov.

Vern. name: Khusengra-argra (Bd.)

Sonai, Udalguri; Binu. 19; May 13, 2014.

Sporobolus R. Br.

Prodr. Fl. Nov. Holl. 169. 1810; Hook. f., FBI 7: 247. 1897; Bor, FA 5: 116. 1940; Mitra, Fl. Pl. of Eastern India 1: 164. 1958; Bor, Grasses of India 623. 1960; Clayton in Kew Bull. 19 (2): 87. 1965 and ibid. 25(2): 247. 1971; Shukla, GNEI 369. 1996.

Perennial. Rarely annual. Leaf blades convolute. Inflorescence a narrow or spreading panicle or spicate. Spikelets crowded or distant, pediceled, 1-flowered. Glumes membranous and unequal. The lower one smaller nerveless than the upper one with 1-nerved. Lemma membranous, 3-nerved, equal and longer than the upper glume. Palea 2-nerved. Stamens 2 or 3. Ovary glabrous and the styles 2.

150-160 species in tropical and sub-tropical parts of the World; 14 species in India (Hook. f., 1897); 3 species in N. E. India (Shukla, 1996); 5 species in Assam (Bor, 1940) and 2 species in the study area.

Key to species

1a. Spikelets 2 mm long; upper glume distinctly

Shorter than the lemma; Panicle contracted;

branches erect or appressed to the axis.*S. fertilis*

1b. Spikelets up to 1.5 mm long; upper glume

shorter or almost equal to the lemma.*S. diander*

Sporobolus diander (Retz.) P. Beauv., Ess. Agrost. 26: 147, 178. 1812; *Agrostis diandra* Retz., Obs. Bot. 5: 19. 1789; Hook. f., FBI 7: 247. 1897; Bor, FA 5: 117. 1940; Mitra, Fl. Pl. of Eastern India 1: 164. 1958; Bor, Grasses of India 629. 1960; Shukla, GNEI 369. 1996; Chowdhury, Assam's Flora 310. 2005.

Annual or perennial herb, grass. Culms nodes glabrous, slender, 30-40 cm tall. Leaf blades linear, glabrous, narrow, 10-15 cm long and 0.2 cm. broad. Ligule with a row of hairs. Panicle narrow, upto 20 cm long and upto 4 cm broad. Spikelets 1.5 mm long, crowded. Lower glume and upper glume 1 mm long. Lemma ovate to lanceolate. Palea hyaline. Stamens 2.

Habitat: Found along forest edges.

Fls. and Frts.: Feb.-Nov.

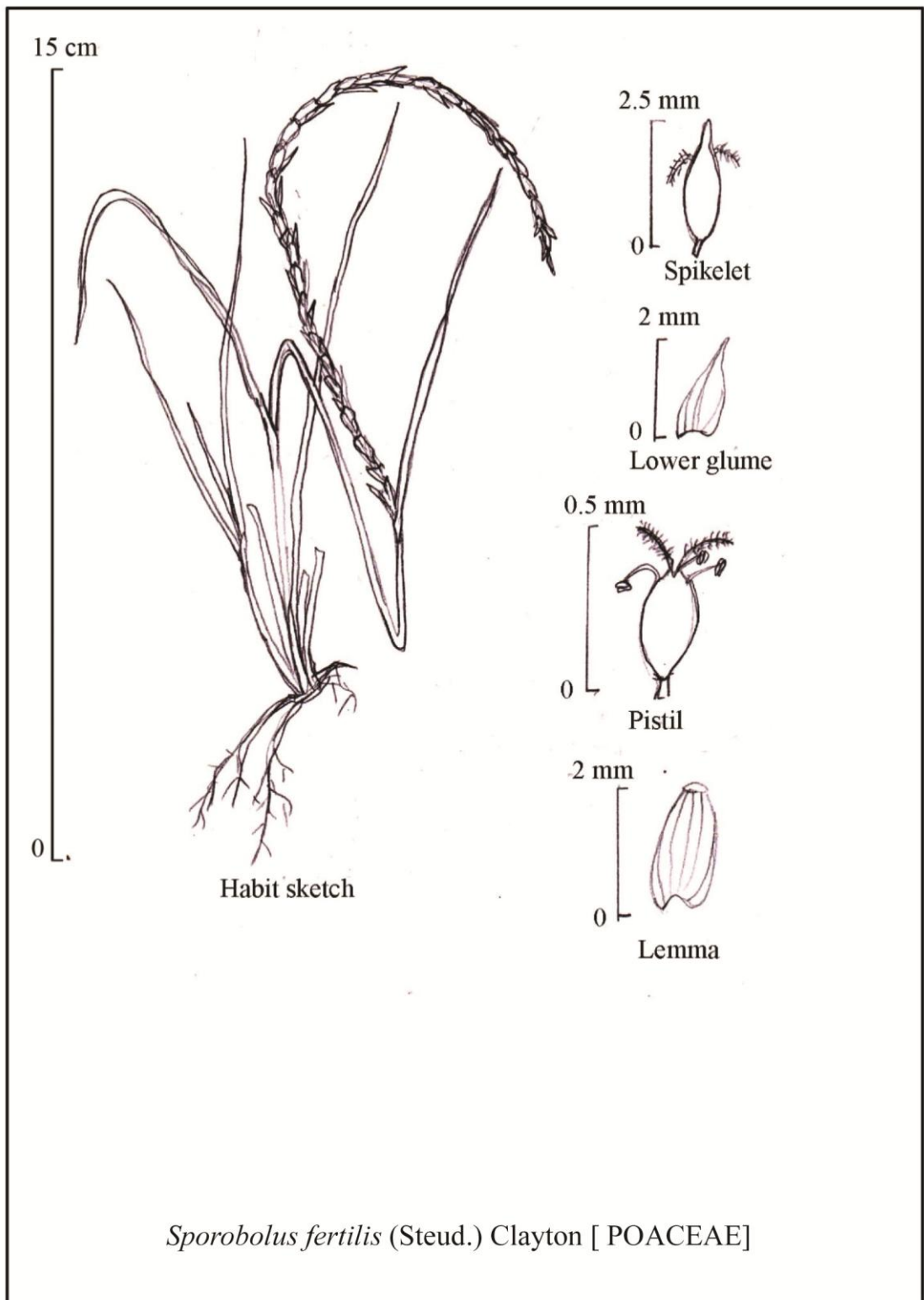
Udalguri Nalbari; Binu. 23; February 27, 2014.

Sporobolus fertilis (Steud.) Clayton, Kew Bull. 19. 291. 1965; Bor, Grasses of India 630. 1960; Shukla, GNEI 370. 1996; Chowdhury, Assam's Flora 310. 2005.

Perennial herb, sometimes annual herbs, grass. Culms nodes glabrous, erect, 0.6-0.8 m tall. Leaf blades linear, 0.7 m long and 0.3 cm broad. Leaf sheaths longer than the internodes. Ligule with a row of short hairs. Panicle 10-17 cm long. Spikelets crowded, shortly pedicelled and sometimes sessile. Glumes unequal, membranous. Lemma 3-nerved, ovate to lanceolate, nerves not clear. Palea hyaline, nerveless. Stamens 3. (**Plate 61**)

Habitat: Found near paddy field.

PLATE – 61



Fls. and Frts.: Jan.-Dec.

Maoriabasti, Udalguri; Binu. 10; February 27, 2014.

Themeda Forssk.

Fl. Aegypt.-Arab. 178. 1775; *Anthistiria* Linn. f., Nov. Gram. Gen. 35. 1779; Hook. f., FBI 7: 210. 1897; Bor, FA 5: 404. 1940; Mitra, Fl. Pl. of Eastern India 1: 238. 1958; Bor, Grasses of India 248. 1960; Shukla, GNEI 138. 1996.

Annual or perennial herb. Culms very rough. Panicle large, enclosed by spathes. Racemes short with a few pairs of spikelets. Spikelets paired. Florets 2. The lower florets sterile and the upper male or sterile in the involucre bracts with pedicel. Glumes equal. Lemma of the sessile spikelet awned. Stamens 3.

30 species in the world, 18 species (Clayton and Renvoize, 1986); 18 species in India and 10 in N. E. India (Shukla, 1996); 9 in Assam (Bor, 1940) and 1 species in the study area.

Themeda subsericans Ridley A. Camus in Lecomte, Fl. Gen. de l'Indo-Chine 7: 364. 1922; Bor, FA 5: 409. 1940; Bor, Grasses of India 254. 1960; Shukla, GNEI. 142. 1996; Chowdhury, Assam's Flora 310. 2005.

Perennial. Culms erect, 1-2 m tall. Leaf blades linear, 20 cm long. Panicle large. Involucral spikelets 1 cm long. Pairs. Sessile spikelets 2.5 mm long. Flowers 2: the lower one sterile and the upper one hermaphrodite. Florets unawned. Spikelets with pedicel and 3, 1.5 cm long. (Photo File 30. G)

Habita: Found in high land.

Fls. and Frts.: Oct.-Dec.

Goraimari, Udalguri; Binu. 134; December 05, 2015.

Thysanolaena Nees.

Edinb. New Phil. J. 18: 180. 1835; Hook. f., FBI 7: 61. 1897; Bor, FA 5: 176. 1940; Mitra, Fl. Pl. of Eastern India 1: 181. 1958; Bor, Grasses of India 650. 1960; Shukla, GNEI 375. 1996.

Perennial. Culms 1-2 m tall, solid, unbranched. Leaf blades broad, tapering towards the tip. Ligule short, truncated and gristly. Panicle large. Spikelets small, pediceled, Flowers 2.

Single genus found in S. E. Asia, India and 1 in the study area.

Thysanolaena maxima (Roxb.) Kuntze, Rev. Gen. Pl. 2: 794. 1891; *T. agrostis* Nees in Edinb, New. Phil. J. 18. 180. 1835; Fischer in Rec. Bot. Surv. India 12 (2): 152. 1938; Bor, FA 5: 176. 1940; Mitra, Fl. Pl. of Eastern India 1: 181. 1958; Bor, Grasses of India 650. 1960; Hook. f., FBI 7: 61. 1897; Shukla, GNEI 376. 1996; Chowdhury, Assam's Flora 310. 2005.

Perennial. Culms erect, unbranched, 1.8 m tall. Leaf blades lanceolate, 45 cm long. Spikelets pedicelled, 1.4 mm long. Glumes almost equal. Lower florets sterile, lemma lanceolate and palea absent. Upper florets hermaphrodite, lemma with thick setae on the margins. Palea small. Stamens 2-3. Styles 2, free.

Habitat: Found in hilly tracts of Bhutan border.

Fls. and Frts.: Aug.-Dec.

Vern. name: Jaru Bon (Rh.)

Udalguri Nalbari; Binu. 94; November 08, 2014.

Triticum L.

Sp. Pl. 1: 85. 1753; Gen. Pl. 5: 37. 1754; Bor, Fl. Assam 5: 84. 1940.

Annual herb. Leaf blades flat. Inflorescence a distichous spike. Spikelets solitary at the nodes, laterally compressed. Glumes subequal, rarely membranous, awned. Lemmas coriaceous, awned or awnless. Palea membranous. Caryopsis tightly or loosely enclosed by lemmas and glumes.

A genus of 25 species, native in the Middle East but in cultivation much throughout the world and 1 species in the study area.

Triticum aestivum L., Sp. Pl. 1: 85. 1753; Hook. f., FBI 7: 367. 1897; Chowdhury,

Assam's Flora 310. 2005.

Annual grass. 1.2 m tall. Culms erect, hollow. Leaves flat, narrow. Spikes long, slender, dorsally compressed. Spikelets 2-5 flowered. Glumes shorter than the lemmas. Lemmas awned or awnless. Palea as long as the lemma. Flowers bisexual. Fruit a caryopsis. (Photo File 30. Y)

Habitat: Widely cultivated for its grains on open dry areas.

Fls. and Frts.: Feb.-Apr.

Vern. name: Ghehu (Rh.)

Kothalguri, Udalguri; Binu.184; April 02, 2014.

Urochloa P. Beauv.

Ess. Agrostogr. 52. 1812.

Annual or perennial herb. Rhizomatous or stoloniferous or decumbent. Culms 20-200 cm high; herbaceous. Branched or unbranched above. Tuberos or not tuberos. Culms nodes hairy or glabrous. Culm leaf sheaths keeled or rounded. Culm internodes solid or hollow. Leaf blade linear or lanceolate, ovate to lanceolate, 2.6-20 mm wide. Ligule present or absent. Plants bisexual, all with bisexual spikelets. Glumes 2. Lower glume zero nerved or 1-2 nerved. Upper glumes 5-11 nerved. Lemmas hairless. Lodicules 2. Stigma 2. Stamens 3. Fruit small, ellipsoid or sub-globose; compressed dorsiventral.

1 species in the study area.

Urochloa ramosa (L.) Stapf in Prain, Fl. Trop. Africa 9: 542. 1919; *Brachiaria ramosa* (L.) Stapf, Fl. Trop. Afr. 9: 542. 1919; Bor, Grasses Burm. Ceyl. Ind. Pak. 284. 1960; *Panicum ramosum* L. Fl. of China Vol. 22 pp. 520-523. 2006.

Annual to short lived perennial. More or less spreading herbs. More flatten. 20- 45 cm high, with short broader leaves and slightly spreading inflorescence. Lower nodes pubescent, cuspidate. Spikelets plump, 2.0-3.5 mm, light brown. Veins on lower glume 3-7. Veins on lower lemma 5. Veins on upper glume 7. Lemmas hairless. Stamen 3. Stigma 2. Fruit small ellipsoid.

Habitat: Grows in grass land.

Fls. and Frts.: Jan.-Dec.

Sonai, Udalguri; Binu. 50; April 19, 2014.

Vetiveria Lem.-Lis.

Bull. Soc. Philom. 1822; 43. 1822; *Andropogon* L. sub genus *Vetiveria* of Hook. f., FBI7: 186. 1896; Bor, FA 5: 354. 1940; Mitra, Fl. Pl. of Eastern India 1: 220. 1958; Bor, Grasses of India 258. 1960; Shukla, GNEI 142. 1996.

Perennial herb. Culms rough with rhizome. Panicle large. Branches whorled, jointed and pedicels slender. Spikelets paired and each pair more or less similar, laterally, compressed. Lower glume tuberculate.

10 species in the world, 2 species in India and 1 species in N. E. India (Shukla, 1996); 1 in Assam (Bor, 1940) and 1 species in the study area.

Vetiveria zizanioides (L.) Nash., in Small, Fl. South-East U. S. 67. 1903; Bor Grasses of India 258. 1960; *Andropogon squarrosus* of Hook. f., FBI 7: 186. 1897; Shukla, GNEI 145. 1996; Chowdhury, Assam's Flora 310. 2005.

Perennial. Culms 1.0-2.0 m tall. Panicle 31 cm long. Spikelets laterally compressed, 2-flowered. Spikelets linear and sessile 3.5-5.0 mm long. Lower floret empty. Upper floret hermaphrodite. Spikelets pedicelled 3.5-4.0 mm long, usually unawned.

Habitat: Grows near river bank.

Fls. and Frts.: Sep.-Dec.

Vern. name: Birina (As.), Ferenga (Bd.)

Sonai, Udalguri; Binu. 146; September 03, 2014.

Zea L.

Gen. Pl. 1: 419. 1754; Sp. Pl. 1: 971. 1758; Hook. f., FBI 7: 102. 1897; Bor, Fl. Assam 5: 451. 1940; Bor, Grasses of India 270. 1960; Shukla, GNEI 296. 1996.

Annual herb. Cultivated. Culms stout. Leaf blades with a midrib and lanceolate. Male spikelets with two large panicle, flowers two. Stamens trimerous. Anthers very large. Female inflorescence compact. Spikelets covered within leafy bracts. Styles very long.

Probably monotypic genus and species.

Zea mays L., Sp. Pl. 2: 971. 1753; Hook. f., FBI 7: 102. 1896; Bor, Fl. Assam 5: 452. 1940; Mitra, Fl. Pl. of Eastern India 1: 234. 1958; Bor, Grasses of India 270. 1960; Shukla, GNEI 296. 1996; Chowdhury, Assam's Flora 310. 2005.

Annual herb. Cultivated. Culms robust, erect, 1.5-2.0 m tall, unbranched. Leaf blades lanceolate, 30-35 cm long, 7.0-7.5 cm broad. Ligule very short with ciliate rim. Male spikelets two, 1 sessile and the other pedicelled with two flower. Glumes pointed, lower floret sterile and upper floret fertile. Stamens trimerous. Anthers large. Female spikelets sessile. (Photo File 30. J)

Habitat: Cultivated in open areas as a fodder value and edible grains.

Fls. and Frts.: Aug.-Sep.

Vern. name: Makoi (Rh. and As.), Jukham (Bd.)

Udalguri Nalbari; Binu. 9; May 14, 2014.