BULL. BOT. SURV. INDIA
Vol. 15, Nos. 3 & 4: pp. 189-203, 1973

MATERIALS TOWARDS A MONOCOT FLORA OF ASSAM-III. (TACCACEAE, DIOSCOREACEAE & STEMONACEAE)

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ABSTRACT

In continuation with the previous publications in the Bulletin, preliminary taxonomic studies on three more families of the Monocotyledons of Assam region (*Taccaceae*, *Dioscoreaceae* and *Stemonaceae*) are presented here.

Taccaceae Dumort. Anal. Fam. 57, 58. 1829 (*'Tacceae'*, p. 58).

Perennial, rhizomatous herbs. *Rhizomes* tuberous, straight or curved. *Leaves* large, radical, long petioled, elliptic-ovate or oblong, entire (ours), acuminate, pinnately-nerved. *Flowers* few to many, umbellate, on a long bare scape, pedicellate, bracteate, actinomorphic, bisexual, subtended by two pairs (ours) of spathaceous involucral bracts; *floral bracts* under the pedicel filiform (ours); *pedicels* long, slender; *perianth* urceolate or subcampanulate; *lobes* 6, bi-seriate, subequal, scarcely united at the base, mostly somewhat corolline; *stamens* 6, inserted near the base of the perianth; filaments short, dilated or appendaged laterally on each side at the base, and inflexed and cucullate above the anthers with two ribs or horns on the inner face; *anthers* sessile within the hood, 2-celled, dehiscing by longitudinal slits; *ovary* inferior, 1-celled, with 3 parietal placentas; ovules numerous, anatropous; styles short; stigmas 3, broad. *Fruit* a berry (ours); seeds numerous, ovoid-elliptic, compressed, longitudinally striate, albuminous.

Tacca J. R. & G. Forst. Char. Gen. Pl. 69. 1776; *nom. cons.*

Generic character as in the family

1a. Inner pair of the involucral bracts stipitate and larger than the outer sessile pair ... *T. integrifolia*-1.

1b. Both pairs of the involucral bracts sessile and subequal ... *T. laevis*-2.

1. **T. integrifolia** Ker-Gawl. in Curtis, Bot. Magaz. t. 1488. 1812; Drenth in Blumea 20: 390. 1972. *T. cristata* Jack, Mal. Misc. 1, 5: 23. 1821. *T. choudhuriana* D. B. Deb in Ind. For. 90: 241-243. 1964. (*Type Choudhuri* 36457!).

Rhizomes 8-22 cm long, 3-8 cm thick. *Leaves* 2-10 × 1-4 dm, glabrous or puberulus beneath; petioles 1.8-6 dm long, sometimes, along with the scapes, rough, with minute emergences. *Scapes* 4-10 dm long, 1.5-2.5 cm thick; outer involucral bracts sessile, ovate, acuminate, 5-13 × 3-9 cm, glabrous or puberulus, greenish-yellow, purple-veined, inner ovate-oblong or rotundate, including 4-6 cm long stipes, 14-25 × 5.5-15 cm, often vaulted over the, at length, drooping flowers; floral bracts filiform, 12-34 cm long. *Flowers* 5-20 (-40) on each scape, pale pinkish brown or violet; pedicels 3-4.5 cm long; perianth-lobes oblong, 1-2 × 0.6-1.2 cm, obtuse, spreading or ultimately reflexed; filaments 1-2 mm long, dilated to 3-4 mm at the base, anthers 2-3 mm long; stigmas 3, each 2-lobed. *Fruits* oblong, turbinate, 4-7 × 2-2.5 cm, 6-ribbed, dark brown to violet; seeds 4-5 × 1.5-2 mm (Fig. 2).

Fls. & frts.: Feb.-Nov. Usually as forest undergrowth in moist places; 300-1000 m.

A highly variable species in respect of size of vegetative parts. *T choudhuriana* Deb, originally distinguished on the basis of larger leaves and involucral bracts, falls

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Taccaceae. Figs. 1-2 : 1. *Tacca laevis* Roxb. 2. *T. integrifolia* Ker-Gawl.

within the variation range of *T. integrifolia* Ker-Gawl.

ARUNACHAL PRADESH: Kameng; Lohit; Siang; Subansiri; Tirap. MEGHALAYA: K. & J. Hills.

2. **T. laevis** Roxb. Fl. Ind. 2: 171. 1832.

Rhizomes 1-2 cm thick. *Leaves* 2-4 × 0.7-2 dm, glabrous; petioles 2-4 dm long. *Scapes* 4-8 dm long, 3-5 mm thick, curved, purplish-green; involucral bracts subequal, 5-9 × 1.5-3.5 cm, glabrous; floral bracts filiform. *Flowers* 4-15 on each scape, greenish-grey, bluish, violet or chocolate-coloured; pedicels 3-4 cm long; perianth-lobes oblong, 1-1.5 × 0.4-1 cm, outer subacute, inner obtuse; filaments *ca* 1 mm long, anthers 1-1.5 mm long; stigmas 3, each 2-lobed, the lobes variously curled. *Fruits* oblong, turbinate, black, 6-ribbed (Fig. 1).

Fls. & frts.: Throughout the year. In moist, shady places; 100-1500 m.

Locally, the rhizomes are squashed into paste and applied on cuts and wounds.

Roxburgh (*l.c.*) and Hooker f. (Fl. Brit. Ind. 6: 288. 1892) have described the scapes to be shorter than the petioles. However, in Assam plants, the scapes are about as long as the leaves. Drenth (*l.c.*) has considered it to be synonymous with the preceeding *T integrifolia* with which we do not agree.

ARUNACHAL PRADESH: Tirap. ASSAM: Cachar; Lakhimpur. MANIPUR. MEGHALAYA: Garo Hill; K. & J. Hills. TRIPURA.

Dioscoreaceae R. Brown, Prodr. 294. 1810 ('Dioscoreae').

Dioecious climbers (ours). *Rootstock* usually a firm or woody corm, sometimes a rhizome, bearing tubers; tubers entire or variously lobed, sessile or long-stalked and then deeply descending. *Stems* twining, sometimes producing bulbils. *Leaves* alternate or opposite, petiolate, simple, lobed, or palmately compound with the middle leaflet usually larger than the laterals; leaf-tips generally with a prominent gland; nerves palmate in simple leaves, usually pinnate in compound leaves, reticulate; petioles with a pulvinus at each end. *Spikes or racemes* solitary or several together, in leaf-axils, or on terminal or axillary leafless branches; bracts ovate-lanceolate or orbicular, usually long-acuminate; bracteoles similar but smaller. *Flowers* small, sessile or subsessile, actinomorphic, unisexual (sometimes a few spp. also producing bisexual flowers); tepals 6, biseriate, suberect or spreading, inner usually somewhat shorter and narrower; female flowers with staminodes; stamens subequalling the tepals, 6, biseriate, or 3, with 3 of the inner whorl sometimes represented by staminodes; *ovary* inferior, 3-celled, ovules two in each cell; styles 3, free or connate, entire or bifid. *Capsules* 3-winged, dehiscing from the apex downwards along the wing margins; seeds compressed, winged.

Dioscorea L. Sp. Pl. 1032. 1753 et Gen. Pl. ed. 5. 456. 1754.

Generic character as in the family

1a. Stems twining to the left. Leaves compound.
2a. Middle leaflet 3-costate. Stamens 6. Capsules 4-6 cm long ... *D. hispida* var. *daemona*-1.

2b. Middle-leaflet 1-costate. Stamens 3. Capsules 1-3 cm long:
3a. Plants deciduously red-brown tomentose. Stems prickly; bulbils absent. Leaves 5-foliolate; leaflets subequal, elliptic-lanceolate, 10-16 × 3-5 cm. Male flowering axes, on much-branched leafless branches. Capsule-wings *ca* 1 cm, with rather straight sides ... *D. cumingii* var. *inaequifolia*-2.

3b. Plants not with the above combination of characters:
4a. Tubers *ca* 4, long-stalked. Stems unarmed, glabrous or sparsely red-hairy; bulbils absent. Leaves 3-foliolate. Male flowering axes on leafless branches ... *D. arachidna*-3.
4b. Tuber solitary, sessile. Stems sometimes prickly, glabrous to villous; bulbils usually present. Leaves 3-7-foliolate. Male flowering axes axillary or on leafless branches.

5a. Stems usually prickly. Leaflets broadly oblanceolate or obovate. Hairs red-brown or white. Capsule-apex slightly truncate ... *D. pentaphylla*-4.
5b. Stems unarmed. Leaflets ovate-lanceolate, sometimes obovate. Hairs white. Capsule-apex obtuse:
6a. Stems villous when young; bulbils few or sometimes absent, hairy. Leaflets ovate-elliptic, the middle one upto 10×6 cm ... *D. kamoonensis*-5.
6b. Stems glabrous; bulbils numerous, in almost every leaf-axil. Leaflets lanceolate, glabrescent, the middle one upto 12×2.5 cm ... *D. melanophyma*-6.

1b. Stems twining to the left or to the right. Leaves simple :
7a. Stems twining to the left:
8a. Stems prickly, puberulus to villous ... *D. esculenta*-7.
8b. Stems unarmed, glabrous:
9a. Bulbils abundant. Leaves large, commonly *ca* 20×20 cm, tip with a large gland. Capsule wings 20-22×7-9 mm, less than half as broad as long; seeds winged at the base ... *D. bulbifera*-22.
9b. Bulbils rare. Leaves usually smaller, tips eglandular. Capsule wings 15-25×12-15 mm , more than half as broad as long; seeds winged all around:
10a. Leaves commonly 8×6 cm , hispid ... *D. deltoidea*-8.
10b. Leaves commonly 12×9 cm, glabrous ... *D. prazeri*-9.
7b. Stems twining to the right:
11a. Plants hairy, particularly on the petiole and inflorescence:
12a. Bulbils numerous, stalked, pyriform, upto 10 cm long. Leaves ovate-cordate, upto *ca* 28×23 cm , 7-nerved. Capsule wings upto 35×30 mm ... *D. listeri*-14.
12b. Plants not with the above combination of characters:
13a. Male flowers well spaced, 1-2 mm apart *ca* 20-25 on 3-5 cm long axes. Capsule wings 25-30×23-26 mm ... *D. orbiculata*-10.
13b. Male flowers congested, touching each other, *ca* 25-40 on 2-2.5 cm long axes. Capsule wings 12-18 mm long and 11-18 mm broad:
14a. Stamens 3. Capsule wings upto 13×11 mm ... *D. decipiens*-12.
14b. Stamens 6. Capsule wings 12-18 mm long, 13-18 mm broad:
15a. Leaves lanceolate, obtuse or rounded at the base, commonly *ca* 15×5 cm, 5-costate ... *D. trinervia*-11.
15b. Leaves ovate, cordate at the base, commonly *ca* 12×9-10 cm 7-9-costate ... *D. puber*-13.
11b. Plants glabrous:
16a. Stems 4-angled, prominently winged ... *D. alata*-23.
16b. Stems terete, smooth or ridged (rarely faintly winged in *D. hamiltoni*):
17a. Leaves 3.5-6×2-2.5 cm. Male flowering axes straight, produced in leaf-axils only ... *D. japonica* var. *nagarum*-21.
17b. Plants not with the above combination of characters. Leaves usually larger. Male flowering axes straight or zig-zag, generally produced on leafless branches:
18a. Leaf-base (except in lowermost leaves) obtuse or rounded. Male axillary leafless branches, in general, shorter than the axillant leaves; flowers 2-3 mm apart, on straight or twisted axes. Capsule wings *ca* 30×24-27 mm ... *D. wattii*-20
18b. Leaf-base cordate, hastate or sagittate (sometimes rounded in *D. glabra* but then the male flowers congested and capsule wings smaller). Male axillary leafless branches, shorter or longer than the axillant leaves; flowers congested or 2-3 mm apart, on straight or zig-zag axes. Capsule wings generally smaller, 15-35×11-20 mm:
19a. Male flowering axes zig-zag:
20a. Stems and leaves drying coppery red ; stems wiry. Capsule wings 20-35×13-20 mm ... *D. hamiltoni*-19.
20b. Stem and leaves drying greenish-brown or blackish; stems stout. Capsule wings 17-20×15-18 mm ... *D. alata*-23.
19b. Male flowering axes straight, or slightly angular:
21a. Male axillary leafless branches much shorter than the axillant leaves, male flowers *ca* 2 mm apart ... *D. wallichii*-18.
21b. Male axillary leafless branches, in general, much longer than the axillant leaves; male flowers congested, touching each other:
22a. Stems abundantly prickly at the base; bulbils not produced ... *D. glabra*-15.
22b. Stems unarmed; bulbils produced in abundance:
23a. Bulbils globose *ca* 1 cm diam. Internodes of the male inflorescence generally shorter than the flowering axes ... *D. belophylla*-16.
23b. Bulbils globose, irregular or variously lobed, 4-10 cm long. Internodes of the male inflorescence generally longer than the flowering axes ... *D. lepcharum*-17.

1. **D. hispida** Dennst. var. **daemona** (Roxb.) Prain & Burk. in Ann. R. Bot. Gard. Cal. 14: 192. 1936. *D. daemona* Roxb. Fl. Ind. 3: 805. 1832.

Tubers irregularly subglobose, upto 30 cm in diam. *Stems* upto 30 m, usually somewhat prickly, covered with a deciduous golden pubescence. *Leaves* alternate, 3-foliolate; petioles 10-20 (-30) cm long; petiolule 7-10 mm long; middle leaflets elliptic-oblong or obovate, acuminate or obutuse, 10-20 (-30) × 8-12(-15) cm, palmately 3-costate; lateral leaflets smaller, 5-costate. *Male flowering axes* on axillary, 15-30 cm long, villous leafless branches; axes 1-4-together, 7-12 mm long, 10-20-flowered; bracts orbicular, 1.2 mm, hairy; tepals hairy, outer suborbicular, *ca* 0.5 mm, inner oblong-obovate, *ca* 1 mm long. *Female flowering axes* axillary, solitary or paired, 30-50 cm long, 10-15-flowered, hairy; bracts lanceolate, *ca* 2.5 mm long. *Capsules* ascending, imbricating, stramineus, glabrous or hispidulous on angles; wings semi-elliptic or semi-obovate, 4-6 × 1.1-1.3 cm; margins stout, sometimes separating; seeds *ca* 1 cm long with a basal wing *ca* 2 × 0.8 cm (Figs. 1, 1a).

Fls.: June-August; *frts.*: August-December. 100-1000 m.

Tubers are poisonous but sometimes eaten after a thorough wash.

Backer (Fl. Java 3: 155. 1968) considers it to be synonymous with *D. hispida* Dennst.

ARUNACHAL PRADESH: Siang. ASSAM: Kamrup; Lakhimpur. MEGHALAYA: Garo Hills; K. & J. Hills.

2. **D. cumingii** Prain et Burk. var. **inaequifolia** (Elmer ex Prain et Burk.) Burk. in Fl. Males. Ser. 1, 4: 317. 1951; Panigrahi & Naik in Bull. bot. Surv. India 8: 89-90. 1966; A. S. Rao & D. M. Verma *ibid.* 11: 411. 1969. *D. inaequifolia* Elmer ex Prain et Burk. in Elmer, Leafl. Philip Bot. 5: 1595. 1913.

Stems upto 6 m high, with scattered straight or recurved prickles. *Leaves* alternate; petiole 8-14 cm long, prickly; petiolule 5-10 mm long; leaflets chartaceous, acute, pinnately 13-15-nerved on either side of the midrib. *Male flowering axes* on upto 45 cm long leafless branches that are paired in leaf-axils; axes 4-6-together, sometimes on short stumpy branchlets, 2-5 cm long, 30-40-flowered, but sometimes only 2-3 mm long with 2-3 flowers at tips; bracts ovate, *ca* 1.5 × 2 mm; tepals ovate-lanceolate, *ca* 1 mm long, pale yellow; stamens 3. *Female flowering axes* on long leafless branches, 2-3-together, slender, hanging, 30-40 cm long, *ca* 25-flowered; bracts ovate, *ca* 3 mm long; tepals ovate, *ca* 2 mm long. *Capsules* 10-15, pubescent, ascending, imbricating for about half their length, or subhorizontal; base truncate or retuse; apex truncate; seeds winged at base.

Fls. & frts.: May-July. 100-150 m

3. **D. arachidna** Prain et Burk. in J. Asiat. Soc. Beng. N. S. 10: 21. 1914.

Tubers oblong, *ca* 5 × 2.5 cm, on 10-20 cm long stalks, flesh white. *Stems ca* 2 mm thick, faintly ridged. *Leaves* alternate; petioles *ca* 3 cm long, glabrous or puberulus; petiolules 4-5 mm long; middle leaflets elliptic to obovate, upto 9.5 × 5 cm, mucronate, glabrous or pubescent along nerves beneath. *Male flowering axes* on 15-22 cm long axillary leafless branches that are usually solitary, but if paired then one of them only *ca* 5 cm long; axes solitary, rarely paired, 2-3 cm long, narrowly winged, puberulus, bearing 50-70 congested flowers; bracts orbicular, *ca* 1.3 mm, white; outer tepals suborbicular *ca* 1 mm long. *Female flowering axes* slender, slightly angled, upto 30-flowered; bracts and tepals as in the male. *Capsules* ascending, imbricating for about two third their length, yellowish-brown; base subcordate; apex obtuse; wings 18 × 5 mm; seeds winged at base.

Fls.: July. 200-1250 m.

Tubers eaten by Mikirs.

ASSAM: N. Cachar & Mikir Hills; Nowgong. MEGHALAYA: K. & J. Hills.

4. **D. pentaphylla** L. Sp. Pl. 1032. 1753. *D. triphylla* L., *l.c.*

Stems upto 10 m high; bulbils profuse, globose or ellipsoid, brownish outside, yellow or purplish inside. *Leaves* alternate, 3-5-foliolate; petioles usually about three-fourths as long as the middle leaflet; petiolules 3-5 mm long; middle leaflets elliptic, oblanceolate or obovate, upto 15×4.5 cm, outer leaflets shorter. *Male flowering axes* usually on large leafless branches, rarely axillary, upto 3 cm long and upto 50-flowered; buds congested; tepals lanceolate, 1-1.5 mm long. *Female flowering axes* 1-3-together, upto 25 cm long; tepals as in the male. *Capsules* ascending, pubescent when young, rounded at both ends; wings upto 2×0.6 cm; seeds winged at base.

Fls. & frts.: Aug.-Nov.

Prain & Burkill (in Ann. R. Bot. Gard. Calc. 14: 165. 1936) recognised 16 vars. of which the following 4 are reported from our area. Due to meagre field-data, in several cases, we were unable to distinguish these amongst the herbarium collections. The species, with its vars., is widely distributed throughout our area from 100-1500 m. The following descriptions have been extracted from Prain & Burkill (*l.c.*), to facilitate future identifications.

var. Prain et Burk. *l.c.*

Plants white-hairy. *Tubers* elongated, *ca* 15×3 cm, flesh soft, white. *Stems* sparsely prickly. *Leaves* 3-5-foliolate, greyish, even in drying.

var. **hortorum** Prain et Burk. *l.c.*

Plants sparsely white-hairy. *Tubers* roundish, *ca* 15×10 cm, sometimes slightly lobed, rather free from rootlets, flesh soft, purplish white, fibrous. *Stems* rather prickly. *Leaves* usually 3, sometimes 4-foliolate, blackening in drying.

var. **communis** Prain et Burk. *l.c.*

Plants rusty red-hairy. *Tubers* subglobose or ellipsoid, sometimes faintly lobed, 5-8 cm long, clothed with rootlets; flesh firm. *Stems*, except when young, glabrous, unarmed. *Leaves* with a tendency to darken in drying, generally 5, sometimes 3 or 4 foliolate, or in abnormal cases variously lobed, villous beneath.

var. **kussok** Prain et Burk. *l.c.*

Plants rusty-red-hairy. *Tubers* ovoid-globose, clothed with rootlets, flesh firm, pale yellow. *Stems* somewhat prickly, sparsely hairy. *Leaves* sparsely hairy or glabrescent with age, tending to blacken in drying.

5. **D. kamoonensis** Kunth, Enum. Pl 5: 395. 1850; Hook. f. Fl. Brit. Ind. 6: 290. 1892, *'kumaonensis'* (*sphalm*).

Tubers subglobose. *Stems* stramineus, hairy when young; bulbils globose, 5-10 mm diam. greyish brown, pubescent when young. *Leaves* alternate 3- or 5-foliolate (sometimes, simple leaves among flowers); petioles 4-7 cm long, about half as long as the middle leaflets, hairy; petiolules 1-2 mm long; middle leaflets ovate-lanceolate, 7.5-11×2.5-4.8 cm, subcaudate-acuminate, glabrous or hispidulous along nerves, hairy beneath, outer leaflets 2-3-nerved from the base. *Male flowering axes* usually axillary, sometimes on leafless branches, 2-6-together, villous, 2-6 cm long; bracts ovate, 3.5-4 mm long, villous; tepals ovate, 1 mm long, pubescent. *Female flowering axes* 1-3-together, pendulous, pubescent, upto 27 cm long, upto 50-flowered; bracts 3-4 mm long; tepals as in the male. *Capsules* ascending, imbricating to *ca* half their length, hairy when young; wings 2-2.5×0.6-0.8 cm; seeds winged at base, wings *ca* 10×5 mm (Figs. 2, 2a).

Fls. & frts.: Aug.-Oct. 1000-1500 m.

MEGHALAYA: K. & J. Hills.

var. **straminea** Prain et Burk. in J. Asiat. Soc. Beng. N. S. 10: 12. 1914. *D. mengtzeana* R. Knuth in Engl. Pflanzenrch. heft 87: 142. 1924.

Plants more densely hairy. *Leaves* larger, 3-foliolate; petioles 10-11 cm long; petiolules *ca* 6 mm long; middle leaflets lanceolate, *ca* 15-16×4.5-5.5 cm. *Male bracts ca* 2.5 mm long; tepals ovate, *ca* 2.5 mm long.

Fls.: Oct.

NAGALAND.



Dioscoreaceae. Figs. 1-6 : 1. *Dioscorea hispida* var. *daemona* (Roxb.) Pr. *et* Burk. 1a. Seed. 2. *D. kamoonensis* Kunth. 2a. Seed. 3. *D. melanophyma* Pr. *et* Burk. 4. *D. bulbifera* L. 4a. Seed. 5. *D. puber* Blume. 5a. Seed. 6. *D. glabra* Roxb. 6a. Seed.

6. **D. melanophyma** Prain et Burk. in J. Asiat. Soc. Beng. N. S. 4: 452.1908.

Tubers ovoid, upto 10 cm long, flesh rose-tinted. *Stems* 2-6 m high, stramineus; bulbils globose, 4-7 mm diam., blackish. *Leaves* alternate, 3-, 5- or 7-foliolate; petioles 2-6 cm long; petiolules 1-7 mm long; middle leaflets 5-12 × 1-2.5 cm, acuminate; simple leaves sometimes present towards the apices. *Male flowering axes* solitary, two, or rarely three together in the axil of small leaves or bracts towards the stem apices, white-pubescent, 4-7 cm long, rather laxly 20-40-flowered; bracts and bracteoles white-pubescent; tepals ovate, 1 mm long, pubescent. *Female flowering axes* pendulous, solitary or paired in upper leaf-axils 5-10 cm long, pubescent, 8-20-flowered. *Capsules* ascending, imbricating for about one third their length, green to bronze-coloured in age; base rounded; apex truncate; wings 12-14 × 5 mm, sometimes smaller; seeds winged at base (Fig. 3).

Fls. & frts.: Sept.-Nov. 1000-1500 m.

ARUNACHAL PRADESH: Kameng. MEGHALAYA: K. & J. Hills.

7. **D. esculenta** (Lour.) Burk. in Gard. Bull. Str. Settl. 1: 396. 1917. *Onus esculentus* Lour. Fl. Cochinch. 194. 1790. *D. sativa* L. Sp. Pl. 1033. 1753, *p. min. p.*; *non* Hook. f. Fl. Brit. Ind. 6: 295. 1892. *D. aculeata* L. Herb. Amb. 23. 1754, *non* L. 1753.

Plants pubescent with T-shaped hairs. *Tubers* 4-many, cylindrical or lobed, deeply buried, flesh white. *Stems* very prickly at base, sparsely so upwards. *Leaves* alternate, ovate-cordate, acuminate, 10-15 × 10-17 cm, 9-13-costate, puberulus beneath; petioles long, pubescent, sometimes prickly. *Male flowering axes* usually solitary, slightly angled, pubescent, *ca* 20 cm long, 70-100-flowered; bracts ovate, *ca* 2.5 mm long; tepals ovate-lanceolate, *ca* 1.8 mm long; stamens 6. *Female flowering axes* solitary, hairy, upto 40 cm long; *ca* 55-flowered; bracts *ca* 2 mm long; tepals ovate, *ca* 3 mm long, hairy. *Capsules* reflexed; stipe *ca* 3 mm long, base subtruncate; apex subretuse; wings *ca* 27 × 12 mm.

Several races are in cultivation for their edible tubers. 100-1000 m.

ASSAM: Goalpara; Darrang; Nowgong; Sibsagar; Lakhimpur. MEGHALAYA: Garo Hills; K. & J. Hills.

For convenience, Prain & Burkill (in Ann. R. Bot. Gard. Cal. 14: 84. 1936) have grouped these races into the following two varieties:

var. **spinosa** (Roxb.) Prain et Burk. *l.c. D. spinosa* Roxb. ex Hook. f. Fl. Brit. Ind. 6: 291. 1892, as regards male plants.

Plants well provided with thorny root. Includes some cultivated races as also the wild parental form.

var. **fasciculata** (Roxb.) Prain et Burk. l.c.- *D. fasciculata* Roxb. Fl. Ind. 3: 801. 1832.

Plants ill-provided with thorny roots. Composed of races evolved by man in cultivation.

8. **D. deltoidea** Wall. ex Hook. f. Fl. Brit. Ind. 6: 291. 1892, p.p.

Rhizomes creeping, upto 20 cm or more long. *Stems* sulcate and stramineus in age. *Leaves* alternate, ovate-cordate, frequently narrowed by the margins being slightly sinuate in the middle, sometimes with projecting lobes, 5-8 × 4.5-6 cm, hispid beneath, 7-costate; petioles 5-10(-15) cm long. *Male flowering axes* solitary, axillary, flexuose, sometimes branched (rarely on leafless branches), 5-10 (-40) cm long, 15-30-flowered; bracts ovate, 1 mm; tepals oblong, *ca* 1.2 mm; stamens 6. *Capsules* 4-6, reflexed, slightly imbricating, green with purple flecks when young, reddish-stramineus in age; stipes 2-4 mm long; wings 1.5-2.2 × 1.2-1.4 cm.

Fls.: May. 1500 m.

Tubers contain saponin; used for washing hair, and as fish poison.

About the Khasi Hill plants mentioned by Hook. f. (*l.c.*), Prain & Burkill (in Ann. R. Bot. Gard. Cal. 14: 27. 1936) state "There is a specimen at Kew purporting to have come

from the Khasi Hills near Cherrapunji bearing on its label the words 'Coalpits, June 22—50, *J. D. Hooker*' but we believe the label misplaced, the specimen being part of *T. Thomson* 1127 from the Kumaun Himalayas".

ARUNACHAL PRADESH: Kameng.

9. **D. prazeri** Prain *et* Burkill in J. Asiat. Soc. Beng. Suppl. to vol. 73: 2.1904 et in Ann. R. Bot. Gard. Cal. 14: 29. 1936. *D. sikkimensis* Prain & Burk. l.c. 3. *D. clarkei* Prain & Burk. l.c. N. S. 10: 10. 1914.

Rhizomes stout, creeping, freely branched, flesh white or creamish. *Stems* terete or faintly ridged, upto 4 m high, sometimes purplish-brown speckled. *Leaves* alternate (rarely opposite at base), ovate-cordate, usually *ca* 12 × 10-16 cm, sometimes upto 20 × 20 cm, usually 7, sometimes 9-11-costate, basal lobes divergent; petioles 4-8 cm long. *Male flowering axes* axillary, 2 or more-together, slightly winged and twisted, upto 20 cm long; bracts ovate; tepals ovate, *ca* 1.5 mm long; stamens 6. *Female flowering axes* slender, upto 30 cm long, upto 20-flowered. *Capsules ca* 8, reflexed, imbricating, chestnut-brown on ripening; stipes *ca* 3 mm long; base obtuse, apex cordate; wings 22-25 × 12-15 mm; seeds with 5-7 mm broad wing all around.

Fls. & frts.: Sept.-Nov. 1500-1800 m.

The tubers contain saponin; used as an anti-Lice hair-wash and as fish poison.

10. **D. orbiculata** Hook. f. Fl. Brit. Ind. 6: 292. 1892; Sastry in J. Bomb. Nat. Hist. Soc. 65: 517-518. 1968. *D. pyrifolia* var. *ferruginea*-Panigrahi & Naik in Bull. bot. Surv. India 8: 89-90, t. 1. 1966, non Prain et Burk. 1914.

Plants clothed with deciduous, stellate or dendroid, brown hairs. *Tubers* deeply buried on long stalks. *Stems* wiry, upto 10 m, high, prickly at base. *Leaves* alternate or opposite, orbicular-ovate or ovate-cordate, 13.5-18 × 8.5-14 cm, 7-costate, acuminate; petioles 5-10 cm long. *Male flowering axes* axillary or on leafless branches; axes usually 5-7-together; bracts ovate, *ca* 1 mm long; outer tepals broadly ovate, *ca* 1.5 mm, obtuse, hairy; stamens 6; anthers oblong. *Female flowering axes* solitary, axillary, upto 15 cm long, *ca* 30-flowered, tomentose; tepals ovate, tomentose. *Capsules* chestnut-coloured; stipe 8-9 mm; apex truncate; seeds winged all around.

Fls.: May-June. 150-1300 m.

ARUNACHAL PRADESH: Subansiri. ASSAM: Lakhimpur.

11. **D. trinervia** Roxb. ex Prain et Burk. in J. Asiat. Soc. Beng. N. S. 10: 32. 1914. *D. oppositifolia* Hook. f. Fl. Brit. Ind. 6: 292. 1892, *p.p.*, non L. 1753.

Plants deciduously grey-pubescent. *Tubers* deeply buried, upto 1 m long, flesh white or orange tinged. *Stems* slender; bulbils elongated, upto 15 mm diam. *Leaves* usually alternate, sometimes the upper opposite, usually *ca* 15 × 5 cm, sometimes upto 8 cm broad, sometimes upto 20 × 5 cm, shortly acuminate or mucronate; petioles 2-5 cm long. *Male flowering axes* on upto 30 cm long leafless branches; axes 2-4-together, upto 2 cm long and upto 35-flowered; bracts ovate, *ca* 1 mm long; outer tepals ovate, *ca* 1 mm long. *Female flowering axis* decurved, upto 15 cm long, 10-15-flowered; bracts *ca* 1 mm long; outer tepals ovate, *ca* 0.8 mm. *Capsules* greyish brown flecked with red-brown; stipes 4-5 mm long; apex truncate; wings 15-18 × 13-17 mm; seeds winged all around (Figs. 8, 8a).

Fls. & frts.: Aug.-Oct. 700-1600 m.

Tubers edible.

ARUNACHAL PRADESH: Tirap. ASSAM: Kamrup; N. Cachar & Mikir Hills; Nowgong. MEGHALAYA: K. & J. Hills. MIZORAM. NAGALAND.

12. **D. decipiens** Hook. f. Fl. Brit. Ind. 6: 293. 1892.

Plants copiously white-hairy. *Tubers* usually solitary, cylindrical, subsessile, upto 1.5 m long, 9 cm in diam.; flesh white. *Stems* faintly ridged, producing bulbils.



Dioscoreaceae. Figs. 7-11 : 7. *Dioscorea decipiens* Hook. f. 7a. Flowers (♂). 8. *D. trinervia* Roxb. *ex*. Pr. *et* Burk. 8a. seed. 9. *D. hamiltoni* Hook. f. 10. *D. wattii* Pr. *et* Burk. 10a. seed. 11. *D. japonica* var. *nagarum* Pr. *et*. Burk.

Leaves usually alternate, sometimes a few opposite, usually ovate, acuminate, rounded or cordate at base, 9-15 × 5-13 cm, 5-7-costate; petioles upto 6 cm long. *Male flowering axes* on upto 25 cm long leafless branches (rarely axillary), upto 6-together, angled, upto 2 cm long, 30-40-fld.; bracts ovate, 0.5 mm long; flowers fragrant; tepals ovate, *ca* 1 mm long, brown. *Female flowering axis* axillary or on leafless branches; bracts *ca* 2 mm long, brown; outer tepals *ca* 0.8 mm long. *Capsules* deciduously white-hairy, yellowish; stipes *ca* 2 mm long; apex retuse; seeds winged all around (Figs. 7, 7a).

Fls.: Sept. 1000 m.

Tubers edible.

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13. **D. puber** Blume, Enum. Pl. Java 1: 21. 1827. *D. anguina* Roxb. Fl. Ind. 3: 803. 1832.

Plants deciduously creamy-white-hairy. *Tubers* 1-2, clavate, long-stalked, upto 2 m deep, 5-8 cm thick; flesh yellow, fibrous in the upper part. *Stems* 4-5 m high, base warted; bulbils upto 7 cm in diam., ash-grey. *Leaves* alternate or sometimes the upper opposite, ovate-cordate, acuminate or mucronate, 10-20 (-24) × 8-15 (-20) cm; petioles 4-11 cm long, pulvinous dull lilac. *Male flowering axes* on 5-18 cm long leafless branches, 1-4-together, 2-2.5 cm long, 25-30-flowered; bracts 2-3 mm long; outer tepals ovate-suborbicular, 1-1.5 mm. *Female flowering axes* solitary or several, sometimes branched, 15-25 cm long, upto 40-flowered; bracts *ca* 1 mm long; outer tepals broadly ovate, *ca* 0.8 mm long. *Capsules* 10-20, puberulus; stipes 2-4 mm long; base truncate; apex retuse; wings 12-18 × 13-18 mm; seeds winged all around (Figs. 5, 5a).

Fls.: June-Oct.; *frts.*: Jan.-Feb. 300-1500 m.

Tubers edible.

ARUNACHAL PRADESH: Siang; Tirap. ASSAM: Darrang; Goalpara; Lakhimpur; Sibsagar; N. Cachar & Mikir Hills; Nowgong. MEGHALAYA: Garo Hills; K. & J. Hills. MIZORAM. TRIPURA.

14. **D. listeri** Prain et Burk. in J. Asiat. Soc. Beng. N. S. 6: 452. 1908.

Stems rusty stramineous in age; bulbils when cut and dried, with red and black blotches. *Leaves* alternate, lower surface with stellate hairs towards base; petioles upto 15 cm long. *Female flowering axes* pubescent, few-flowered. *Capsules* on *ca* 1 cm long stipe, tomentose with stellate hairs, truncate or just retuse at apex; seeds winged all around.

ARUNACHAL PRADESH: Subansiri. ASSAM: Sibsagar. NAGALAND.

15. **D. glabra** Roxb. Fl. Ind. 3: 803. 1832.

Tubers solitary or more, deeply buried on upto 0.5 m long stalks, cylindric, *ca* 4 cm in diam.; flesh white. *Stems* upto 8 m high, terete or faintly ridged. *Leaves* elliptic-ovate, 7-9 × 4.5-6 cm, apex acuminate or mucronate; base rounded or cordate, 5-7-costate; petioles 4-5 (-8) cm long. *Male flowering axes* on upto 70 cm long leafless branches, or on branch endings, (rarely axillary); axes 1-5-together, 1.5-3 cm long, 15-25-flowered; bracts ovate, *ca* 1 mm; tepals broadly ovate, *ca* 1 mm; stamens 6. *Female flowering axes* solitary or paired, upto 40 cm long, *ca* 50-flowered; bracts and tepals as in the male. *Capsule* stipes 3-4 mm long; base slightly retuse; apex retuse; wings 15-18 × 14-20 mm; seeds winged all around (Figs. 6, 6a).

Fls.: Sept.-Oct.; *frts.*: Feb. 200-1000 m.

Tubers edible.

ARUNACHAL PRADESH: Siang. ASSAM: Darrang; Goalpara; Lakhimpur; N. Cachar & Mikir Hills; Nowgong; Sibsagar. MEGHALAYA: K. & J. Hills. MIZORAM.

16. **D. belophylla** (Prain) Haines For. Fl. Chota Nagpur 530. 1910. *D. nummularia* var. *belophylla* Prain, Beng. Pl. 2: 1967. 1903. *D. glabra* Hook. f. Fl. Brit. Ind. 6: 294. 1892 *p.p.*, non Roxb. 1832.

Tubers 1-3, buried on upto 40 cm long stalks, *ca* 20 cm long, flesh white, soft. *Stems*

terete or ridged, purplish-brown. *Leaves* alternate below, opposite above, ovate, sagittate or sometimes upper cordate at base, usually *ca* 15 × 12 cm, sometimes upto 30 × 20 cm, 9-costate; petioles upto 11 cm long. *Male flowering axes* on leafless branches of variable length, 1-3 cm long, 10-30-flowered; bracts ovate, *ca* 0.5 mm; tepals obovate, *ca* 1 mm, red-brown dotted; stamens 6. *Female flowering axes* solitary, short, angled, upto 12-flowered; bracts deltoid, *ca* 0.5 mm; tepals *ca* 1 mm. *Capsules* slightly tawny and subglaucous; stipes 3 mm long; apex retuse; wings 15-18 × 11-15 mm, sometimes larger, upto 22 × 18 mm; seeds winged all around.

Fls.: Aug.-Dec.; *frts.*: Jan.-Feb. 1300-1500 m.

Tubers edible, considered tasty.

ARUNACHAL PRADESH: Kameng. MEGHALAYA: K. & J. Hills.

17. **D. lepcharum** Prain *et* Burk. in J. Asiat. Soc. Beng. N. S. 10: 36. 1914.

Tubers several, laterally spreading and descending on upto 50 cm long, slender stalks, 5-10 × 1.5 cm, flesh white, delicate. *Stems ca* 8-ridged. *Leaves* alternate or opposite, ovate-lanceolate, cordate or subhastate at base, 10-13 × 5-8 cm, 7-costate; petioles upto 10 cm long. *Male flowering axes* on upto 40 cm long leafless branches, 2-6-together, angular, 1-2 cm long, 8-18-flowered; bracts ovate, *ca* 1 mm long; tepals obovate, *ca* 1.3 mm; stamens 6. *Female flowering axes* upto 25 cm long, *ca* 20-flowered; bracts ovate; tepals ovate, *ca* 1.5 mm. *Capsules* greyish, apex retuse; wings *ca* 15-20 × 18-20 mm; seeds winged all around.

ARUNACHAL PRADESH: Siang. ASSAM: Lakhimpur; N. Cachar & Mikir Hills; Nowgong; Sibsagar.

18. **D. wallichii** Hook. f. Fl. Brit. Ind. 6: 295. 1892.

Tubers numerous, fascicled, 0.5-1 m long, 2-7 cm thick, with soft, yellowish flesh. *Stems* stout, sometimes prickly at base. *Leaves* alternate or opposite, sub-coriaceous, ovate-orbicular, cordate, upto 25 × 25 cm, 7-9-costate, with translucent dots and dashes, somewhat glaucous beneath; petioles as long as the blade. *Male flowering axes* on 4-10 cm long leafless branches, 2-3-together, upto 5 cm long, 20-30-flowered; bracts, sepals and petals *ca* 1 mm long, red-brown; stamens 6. *Female flowering axes* slender, decurved, as long as the leaves, *ca* 20-flowered. *Capsules* only few maturing, stramineus with brown flecks; wings *ca* 20 × 15-18 mm, truncate or retuse at apex, almost truncate at base; seeds winged all around.

ASSAM: N. Cachar & Mikir Hills, MANIPUR. MEGHALAYA: K. & J. Hills.

Tubers eaten, after processing.

Prain & Burkill (in Ann. R.Bot.Gard.Cal. 14: 283. 1939) have distinguished all the plants east of the Gangetic delta, including ours, as var. *christiei* on "capsules distinctly glaucous and generally a trifle longer than in var. *vera* (the type var.)".

19. **D. hamiltoni** Hook. f. Fl. Brit. Ind. 6: 295. 1892.

Tubers deeply descending on *ca* 1 m long stalks, flesh white. *Stems* 3-6 m high, terete, 6-angled, or rarely faintly winged; (bulbils present). *Leaves* opposite or alternate, ovate-lanceolate, subcaudately acuminate, 7-17 × 3-13 cm, cordate or hastate at base with diverging lobes, 7-costate; petioles 5-10 cm long. *Male flowering axes* on 5-55 cm long leafless branches which are sometimes further branched, or on branch endings; axes 1-5-together, 5-15 mm long, 5-20-flowered; bracts red-brown dotted; flowers fragrant, yellowish; tepals suborbicular, 0.7-1.2 mm; stamens 6. *Female flowering axes* solitary or paired (sometimes more together), angled, 15-20 cm long, 20-30-flowered; tepals ovate, 1.5-2 mm. *Capsules* coppery brown; stipes 3-5 mm; base obtuse; apex retuse; seeds winged all around (Fig. 9).

Fls.: Aug.-Oct.; *frts.*: Nov.-Jan. 150-1200 m.

The deeply buried tubers are difficult to dig out, but are considered delicious to eat.

ARUNACHAL PRADESH: Tirap. ASSAM: Darrang; Goalpara; Kamrup; N. Cachar & Mikir Hills; Nowgong; Sibsagar. MEGHALAYA: K. & J. Hills. NAGALAND. TRIPURA.

20. **D. wattii** Prain et Burk. in J. Asiat. Soc. Beng. N. S. 4: 457. 1908.

Tubers deeply buried, rather fibrous, flesh red on exposure. *Stems* stout, upto 20 m high, *ca* 7 mm thick, 8-ridged, with scattered recurved prickles. *Leaves* subcoriaceous, usually opposite, sometimes alternate, ovate-lanceolate, 10-17 × 2.5-6.5 cm 5-(rarely 7-) costate; margins strengthened by a light tawny rim; petioles usually 2-5.5, (10) cm long; lower leaves sometimes ovate-cordate, upto 30 × 24 cm. *Male flowering axes* on 10-40 cm long leafless branches, 2-4-together, 2-5.5 cm long, 15-22-flowered; bracts ovate, *ca* 0.5 mm, red-brown; tepals ovate, 2 mm, red-brown; stamens 6. *Female flowering axes* solitary or paired, decurved, 3-15 cm long, 2-22-flowered. *Capsule* stipes 2-3 mm long; apex slightly cordate; seeds winged all around (Figs. 10, 10a).

Fls.: March-April; *frts.*: Oct.-Nov. 150-1200 m.

ARUNACHAL PRADESH: Lohit; Siang. ASSAM: Lakhimpur; Sibsagar. MEGHALAYA: K. & J. Hills.

21. **D. japonica** Thunb. var. **nagarum** Prain et Burk. in Ann. R. Bot. Gard. Cal. 14: 259. 1939.

Stems slender, smooth. *Leaves* alternate, ovate-lanceolate, subcaudately acuminate, slightly cordate at base, 7-costate. *Male flowering axes* axillary or upwards in axils of diminishing leaves, 1-4-together, 3-5 cm long, 15-30-flowered; bracts lanceolate, *ca* 1 mm long; buds globose, spaced a little more than their own diam. apart; tepals broadly ovate, obtuse, *ca* 1.5 mm long; stamens 6. *Female plants* not known (Fig. 11).

Fls.: July. 1650-1900 m.

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22. **D. bulbifera** L. Sp. Pl. 1033. 1753. *D. sativa* Thunb. Fl. Jap. 151. 1784; Hook. f. Fl. Brit. Ind. 6: 295. 1892. (*excl.* syn. *D. cliffortiana* Lamk.), non L. 1753.

Tubers solitary, subsessile, globose or pyriform, 10-15 cm in diam., flesh white or yellowish, sometimes with purple flecks, brown-tinged on exposure. *Stems* upto 25 m high, terete, faintly winged. *Leaves* alternate, broadly ovate-cordate, subcaudately acuminate, 10-24 (-33) × 8-22 (-32) cm, 5-7-costate; petioles 7-13 cm long. *Male flowering axes* 1-4 in axils of bracts on leafless branch terminations, forming upto 1 m long pendulous inflorescence, rarely in leaf axils; axes 2-15 cm long, 12-70 (-100)-flowered; flowers whitish or pale rosy, congested, fragrant; bracts broadly ovate, 1.5 mm; outer tepals lanceolate, 1.3-4 mm long; stamens 6. *Female flowering axes* 1-2 or more together, axillary, 20-45 cm long, 35-45-flowered; bracts ovate; tepals lanceolate, 1-1.5 mm long. *Capsules* bright chestnut, imbricating; stipes *ca* 1 mm; wings rounded at both ends (Figs. 4, 4a).

Fls.: July-Sept.; *frts.*: Sept.-Dec. 100-1600 m.

Sometimes cultivated for edible tubers; also bulbils, reported to be medicinal.

ARUNACHAL PRADESH: Kameng; Siang; Tirap. ASSAM: Darrang; Goalpara; Kamrup; Lakhimpur; N. Cachar & Mikir Hills; Nowgong; Sibsagar. MEGHALAYA: Garo Hills; K. & J. Hills. MIZORAM. NAGALAND. TRIPURA.

23. **D. alata** L. Sp. Pl. 1033. 1753.

Tubers usually solitary, very polymorphic and may be grouped into (1) cylindric or clavate upto 1.7 m deep, (2) globose, stout and short, (3) pyriform (4) fingured, flesh white, yellowish or purplish. *Stems* upto 15 m high, usually 4-winged, but in some races only angled, unarmed or prickly; bulbils usually abundant. *Leaves* opposite or sometimes alternate, ovate, subcordate or hastate with rounded or acute lobes, 11-17 × 7-15 cm, though usually *ca* 15 × 14 cm, 5-costate; petioles 6-10 cm long, base usually winged, sometimes purple flushed. *Flowers*



Stemonaceae. Figs. 1-2 : 1. *Stemona tuberosa* Lour. 1a. Flower. 2. *Stichoneuron membranaceum* Hook. f. 2a. Inflorescence.

rare. *Male flowering axes* on upto 30 cm long leafless branches, solitary or paired, 1.5-2 cm long; bracts ovate, 1 mm; buds spaced their own diam. apart; tepals 1 mm; stamens 6. *Female flowering axis* solitary, usually narrowly winged, 20-60 cm long, 7-20-flowered; bracts ovate, 2 mm; tepals 2 mm. *Capsules* reddish brown on drying; stipes 2-5 mm; base obtuse; apex retuse; seeds winged all around.

The most commonly cultivated species amongst *Dioscoreas*; several races are cultivated for their edible tubers.

ARUNACHAL PRADESH: Siang. ASSAM: Nowgong; Sibsagar. MEGHALAYA: Garo Hills; K. & J. Hills. MIZORAM. NAGALAND.

Stemonaceae Engler in E. & P. Nat. Pflanzenfam. II. 5. 8. 1887—*Roxburghiaceae* Wall. Pl. As. Rar. 3: 50. 1832.

Perennial, erect herbs with rhizomes, or climbers with fasciculated tuberous roots. *Leaves* alternate or opposite (ours), subsessile or petiolate, subcaudately acuminate, palmately- or pinnately-nerved, with numerous, close, transverse, parallel veins. *Flowers* axillary, solitary, or more and then subracemose, bracteate, actinomorphic, bisexual; perianth lobes 4, biseriate, subequal, free, or rarely connate at the base, petaloid; stamens 4, inserted in the torus or on the base of the perianth-lobes; filaments short; anthers basi-fixed or dorsi-fixed, 2-celled, cells longitudinally dehiscent, connective sometimes produced above into a long appendage; ovary inferior or half-inferior, 1-celled, ovules 2-numerous, erect or pendulous, stigma small, sessile. *Capsules* ovoid-oblong, compressed, 2-valved; seeds ovoid, terete, beaked, albuminous.

1a. Climbers with fasciculated, tuberous roots. Leaves petiolate, palmately-nerved. Flowers large; perianth-lobes 5-6.5 cm long; anthers appendaged at the top — *Stemona*-1.

1b. Erect herbs with rhizomes. Leaves subsessile, pinnately-nerved. Flowers small; perianth-lobes *ca* 1 mm long; anthers not appendaged — *Stichoneuron*-2.

1. **Stemona** Lour. Fl. Cochinchin. 404. 1790.

S. tuberosa Lour. l.c.

Roots 15-30 cm long, cream-coloured. *Stems* 3-6-m long, scandent or climbing. *Leaves* usually opposite, sometimes alternate, ovate-cordate, 10-25 × 5-15 cm, 9-13-costate, younger leaves lanceolate, rounded at the base; petioles 4-9 cm long. *Flowers* usually 2, sometimes 1, to a leaf-axil; pedicel 5-7 cm long; subtended by a bract and jointed *ca* 1 cm below the apex; bracts lanceolate, 5-10 mm long; perianth-lobes lanceolate, 7-10 mm broad, greenish with several purplish veins; filaments *ca* 3 mm long, stout, red, deeply grooved in front, crenulate-margined; anthers *ca* 15 mm long, foetid smelling, appendage linear, *ca* 18 mm long; ovules numerous. *Capsules* ovoid, *ca* 4.5 cm long, 5-8-seeded (Figs. 1, 1a).

Fls. & frts.: March-July. 150-900 m.

Roots are reported to be relished by pigs.

ARUNACHAL PRADESH: Kameng; Siang; Tirap. ASSAM: Darrang; Lakhimpur; Sibsagar. MEGHALAYA: K. & J. Hills.

2. **Stichoneuron** Hook. f. Fl. Brit. Ind. 6: 299. 1892.

S. membranaceum Hook. f., l.c.

Rhizomes creeping. *Stems* angular, 3-6 dm high. *Leaves* alternate, subdistichous, oblong-lanceolate, 8-15 × 4-6.5 cm, membranaceous, pubescent along nerves beneath. *Peduncles* wiry, 2-2.5 cm long, bearing a subracemose cluster of minute flowers; bracts setaceous, ciliolate; pedicels 4-6 mm long. *Flowers* greenish-yellow; perianth campanulate; lobes ovate; stamens inserted on the base of the perianth-lobes; anther-cells diverging; ovary half-inferior, ovules numerous, pendulous (Figs. 2, 2a).

Fls.: Feb.-June. 600-1000 m.

ASSAM: N. Cachar & Mikir Hills. MEGHALAYA: K. & J. Hills.