

REVISION OF
THE FLORA OF THE BOMBAY PRESIDENCY.

BY

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PART XV

(Continued from p. 900, Vol. XXXIV.)

(With 7 plates).

ARACEÆ (Cke. ii, 816).

BY

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Genera 107. Species 1000.—Tropical and temperate.

Cooke mentions 11 indigenous genera. We add *Rhaphidophora* as new to the Presidency and treat *Colocasia* as an indigenous genus. We are not considering the cultivated species.

Key, partly after Cooke :

- A. Flowers 1-sexual, monoœcious (often dioœcious in *Arisœma*).
 - I. Water or marsh plants. Spadix without a barren appendix.
 - 1. Floating stemless herbs ; leaves forming a rosette-like tuft 1. *Pistia*.
 - 2. Submerged aquatic or marsh herbs
 - (a) Ovaries in one whorl 2. *Cryptocoryne*.
 - (b) Ovaries spirally arranged 3. *Lagenandra*.
 - II. Terrestrial tuberous herbs.
 - 1. Spadix with a barren terminal appendix
 - (a) Ovules not parietal
 - i. Male flowers stipitate ; flowers often dioœcious 4. *Arisœma*.
 - ii. Male flowers sessile or nearly so ; flowers always monoœcious
 - (1) Flowers and leaves present together
 - (i) Ovules 1-2, basal 5. *Typhonium*.
 - (ii) Ovules many, basal and apical. 6. *Therioophonum*.
 - (2) Flowers appearing before the leaves
 - (i) Ovules orthotropous ; males and females remote ; neuters present 7. *Sauromatum*.
 - (ii) Ovules anatropous ; males and females contiguous ; neuters 0. 8. *Amorphophallus*.
 - (b) Ovules many, parietal 9. *Colocasia*.
 - 2. Spadix without a barren appendix ; ovules parietal
 - (a) Female inflorescence adnate to base of spathe, stigma stellate. 10. *Ariopsis*.
 - (b) Spadix free from the spathe ; stigma discoid 11. *Remusatia*.

- B. Flowers hermaphrodite, a few rarely unisexual. Perianth 0.
 Spadix without an appendix, sessile; ovary 1—2-celled; berries confluent ... 12. *Rhaphidophora*.
- C. Flowers hermaphrodite. Perianth of 4-6 segments. Spadix without an appendix, flowering upwards, ovary 1-3-celled; stem scandent, leaves distichous ... 13. *Pothos*.

1. PISTIA, Linn.

Species 1.—Tropics and subtropics, with the exception of Polynesia and Macronesia, sometimes ascending up to 5,000 or 5,800 ft., mostly in the plains, sometimes also in somewhat brackish water.

The Bombay plants all belong to the following variety:

Pistia stratiotes, Linn. Sp. Pl. (1753) 963, var. *cuneata* Engl. in Fl. Bras. III, 2 (1879) 214.—*P. stratiotes* Linn.; Roxb. Corom. Pl. III (1819) 63, t. 269; Fl. Ind. III (1832) 131.—*P. crispata* Bl. in Rumphia I (1835) 78.—*Koddapail* Rheede Hort. Malab. XI (1692) 63, t. 32.—*Kiambam kitsii* Rumph. Herb. Amb. VI, 177.

Leaves almost obtriangular, tip rotundate, slightly emarginate, the upper margin slightly crisped or not crisped.

2. CRYPTOCORYNE, Fisch.

Species 40.—Indo-Malayan. Marsh plants.

Cooke mentions 3 species: *C. retrospiralis*, *C. spiralis*, *C. cognata*. We add 4 more not known from the Presidency before and describe 2 new ones.

- A. Upper tube of spathe almost absent or much shorter than the lower tube
- I. Leaf-blade broadly lanceolate. Blade of spathe spirally twisted from the base ... 1. *C. Huegelii*.
- II. Leaf-blade linear-lanceolate or linear-ob lanceolate. Blade of spathe more or less spirally twisted from the base
1. Blade of spathe with the margin entire ... 2. *C. unilocularis*.
2. Blade of spathe with the margin denticulate
- (a) Leaves up to 20 cm. long ... 3. *C. spiralis*.
- (b) Leaves up to 85 cm. long ... 4. *C. tortuosa*.
- B. Lower tube of spathe slightly wider, below the upper tube more or less constricted
- I. Leaf-blade lanceolate to linear-lanceolate, acute at the base, gradually narrowed into the petiole
1. Blade of the spathe long, linear-lanceolate, spirally twisted along the whole length ... 5. *C. retrospiralis*
2. Blade of spathe ovate-lanceolate, contracted into a long subulate tail. Tube of spathe shorter than the long caudate lamina ... 6. *C. cognata*.
- II. Leaf-blade broadly lanceolate-acuminate ... 7. *C. cognatoides*.
- C. Lower tube of spathe narrower than the upper tube and several times shorter; blade broadly ovate-lanceolate, fimbriate-ciliate ... 8. *C. ciliata*.
- Imperfectly known species: Leaf-blade elliptic-lanceolate, acute at both ends ... 9. *C. Dalzellii*.

1. *Cryptocoryne Huegelii*, Schott Aroid. (1853) 8, t. 12; Prodr. (1860) 18; Hook f. F.B.I. vi, (1893) 494; Engler in Engl. Pflanzenr. iv, 23F (1920) 236.

Description : Petioles 15-20 cm. long, vaginate beyond the middle. Leaf-blade oblong-elliptic, narrowed into the petiole, acute at the apex, 15-18 cm. long, in the middle 3-4 cm. broad, primary lateral nerves several on either side, diverging at an acute angle from the midnerve. Peduncle 2-3 cm. long. Tube of spathe 20 cm. long, lower tube narrowly cylindrical, 2.5 cm. long, 0.6-1 cm. wide, upper tube scarcely any, passing over into the blade. Blade linear-lanceolate, long acuminate, about 17 cm. long, 1.5 cm. broad below, inside with transverse, parallel, erose lamellæ, spirally twisted along its whole length. Female inflorescence 4-5-gynous, male 4 mm. long, thinly cylindrical, the interval between the two inflorescences about 1.2 cm. long; appendix short, stout. Ovary oblong, narrowed into a thin style; stigma oblong-oval.

Locality : Savantvadi (Dalgado in Herb. Calc.).

Distribution : The only other specimen is Huegel's No. 2446 in the Hof-museum Herb. Vienna, collected in the East Indies, but no definite locality is given.

2. *Cryptocoryne unilocularis*, (Roxb.) Kunth Enum. iii, (1841) 13; Wight Ic. iii, (1843) t. 774 (*non* Schott).—*Ambrosinia unilocularis* Roxb. Fl. Ind. iii, (1832) 493.—*Cryptocoryne Roxburghii* Schott Prodr. (1860) 18; Dalz. & Gibs. Bombay Fl. (1861) 257; Hook. f. F.B.I. vi, (1893) 494.—*Arum spirale* Grah. Cat. Bomb. Pl. (1839) 228.

Description : Caudicle about 5 mm. thick; internodes short. Petiole scarcely distinct, broadly vaginate, vagina passing into the blade, blade narrowly linear-acuminate, 20-30 cm. long, 0.5-1 cm. broad, lateral nerves sub-parallel with the midrib. Peduncle very short; lower tube of spathe oblong almost cylindrical, about 1.5 cm. long, 3.5-4 mm. wide, inside purple-spotted, upper tube narrower, 2 mm. wide and scarcely 1 cm. long; blade purple, narrowly linear-lanceolate, spirally twisted. Female inflorescence 4-gynous, male about 3 mm. long, separated from the female by a naked interval of about 1 cm.; appendix shortly conical. Ovary elongate-oblong; ovules biseriate. Style short, stigma oval. Capsule unilocular.

Locality : Konkan (Herb. Kew ex Engler).

Distribution : N. Circars, Konkan.

We have not seen any specimens. Roxburgh was the first to mention the plant from India, giving as locality 'Coromandel.' Graham mentions it in his Cat. Bombay Pl., but there is no specimen to confirm his identification. In Dalzell and Gibson's Bombay Fl. the species is mentioned as being common. This statement induces Cooke (Fl. Bomb. II, 819) to doubt its occurrence in the Presidency. It is certainly strange that a plant which is said to be common, should not have been seen during a period of 70 years.

Cooke says that Dalzell has supplied no specimen of this species and Haines has not found any at Kew. Engler mentions the same localities as Hook. f. in the F.B.I., viz., 'the Northern Circars and the Konkan', adding a mistake by including the N. Circars in the W. Ghats of the Malabar Coast. In addition, he gives as source for his information regarding the two localities the 'Herb. Kew.' If he relied on the F.B.I. the next question would arise whether Hook. f. has seen any specimens, and if he has not, why he included Graham's *Arum spirale* and Dalzell and Gibson's *Cryptocoryne Roxburghii* under Schott's *C. Roxburghii*? Their descriptions are certainly not such as to lead unmistakably up to *C. Roxburghii* Schott.

3. *Cryptocoryne spiralis* Fisch. ex Wydler in Linnæa v, (1830) 438; Bl. in Rumphia i, (1835) 84, t. 36 C.; Wight Ic. iii, t. 773; Schott Melet. (1832) 6; Aroid. (1853) 8, t. 13; Schnitzl. Iconog. fasc. iv, (1846) t. 72; Hook. f. F. B. I. vi, (1893) 494; Cke. ii, 818; Engler Pflanzenr. iv, 23 F (1920) 237.—*Arum spirale* Retz. i, (1779) 30; Bot. Mag. t. 2220; Lodd. Bot. Cab. t. 525.—*Ambrosinia spiralis* Roxb. Hort. Beng. (1814) 65; Fl. Ind. iii, (1832) 492.

Description : Caudicle 10-20 cm. long or longer, about 4-5 mm. thick, stoloniferous; internodes 1-1.2 cm. long. Petiole scarcely distinct, broadly vaginate, vagina passing over into the blade; blade linear-lanceolate, 10-15 cm. long, 8-12 mm. broad, long-narrowed from the middle to the base; lateral nerves ascending towards the apex. Peduncle very short, included together with the tube in a sheath. Lower tube of the spathe, including the inflorescence, obconical, about 2 cm. long, almost 1 cm. wide above, 7-8 mm.

below ; upper tube scarcely any ; blade purple, linear-lanceolate, 10 cm. long or longer, below more than 1 cm. broad, within strongly transversely lamellate, with a denticulate margin, purple, at first twisted, finally straight. Female inflorescence 5-gynous, male one 3-4 mm. long, separated from each other by a naked interval of about 8 mm. ; appendix shortly conical, 1.5 mm. long. Ovaries oblong, narrowed into a short, outward-bent style ; stigma broadly elliptic.

Locality : Khandesh : Bhusawal (Gammie !).—Konkan (Dalzell, Stocks).—Deccan : Poona (Herb. Econ. Bot. !).—N. Kanara : Santgul (Talb. 860 ! Herb. Calc.) ; Siddhapur in rice fields, 1,500 ft., rainfall 100 in. (Sedgwick 7066 !, 7066b !).—It grows on the margins of ditches and ponds and in rice fields, submerged during the rains.

Distribution : From Khandesh to N. Kanara, Calicut, Coromandel Coast, Pondicherry, Bengal, E. Bengal, Ceylon.

Flowers : Nov. (Poona) ; Dec. (Bhusawal).

4. *Cyrtocoryne tortuosa*, Blatter & McCann *sp. nov.* [*Pertinet ad sectionem Unitubulosarum* Engl. *Accedit ad C. Huegelii* Schott sed differt lamina foliorum lineari-lanceolata vel lineari-oblancoolata, foliis duplo longioribus pedunculo longiore, spatha multo longiore, spathæ lamina coriacea margine denticulata inferne 8.5 cm. lata intus rugosissima, inflorescentia mascula longiore, interstitio inter inflorescentiam femineam et masculam maiore, stigmate discoideo margine sinuato, appendice minime truncata.]

A tall tufted herb. Rhizome 1.5 cm. thick, descending perpendicularly and getting thinner, with very long vermiform roots. Leaves including petioles up to 85 cm. long, upright, upper part of lamina slightly recurved. Petioles vaginate at base for about 20 cm., then deeply channelled with sharp edges for about 25 cm., fleshy, spongy, striate, 8 mm. diam. from dorsal to ventral side, 1.5 cm. from side to side, purple or pale green tinged with purple. Lamina slightly inequilateral, up to 40 cm. long and 6.5 cm. broad where broadest, dark green above, paler beneath, linear-lanceolate or linear-oblancoolate, apex acute or acuminate or subobtuse, sometimes apiculate, margin entire, very narrowly hyaline, undulate ; midrib very stout, semicylindrical, 5-7 mm. diam., striate, slightly depressed above, very prominent below, light green and striate with purple below ; lateral nerves 3 at base on either side running up for $\frac{3}{4}$ the length of the blade and disappearing into the margin, besides 3-7 on either side starting at different heights and running into the tip, all depressed above, prominent beneath, and communicating by transverse veins. Peduncle up to 8 cm. long, 8 mm. diam., cylindrical, slightly compressed, slightly thicker upwards, enclosed by a cataphyll and the vagina of a leaf. Cataphyll linear, membranous, 12 cm. long, 1 cm. broad, margins slightly incurved, tip rounded. Tube of spathe underground. Spathe up to 27 cm. long. Tube white or tinged with red purple, trigonous-cylindrical, flattened on the ventral side, convex on the dorsal 4 cm. long, 1.5 cm. broad transversely. Lamina thickly fleshy-coriaceous, stiff, brittle, lanceolate, long acuminate-caudate, 23 cm. long, up to 8.5 cm. broad at base, dark purple on both sides, spirally twisted from the base either to the left or the right (in bud the spathe is not twisted, then the lower part becomes twisted and in flower the whole blade, and finally it uncoils without spreading out entirely), lower part of blade very strongly rugose inside, diminishing upwards, the ridges in the lower part 2-3 mm. high, transverse, more or less parallel, purple, except sometimes for the lowest cm. yellowish ; margins of blade before opening out kept together by a row of teeth on each margin which are about 2-4 mm. long. Spadix 3.3 cm. long. Female inflorescence 6 mm. long, at base 7 mm. diam. ; ovaries 6, verticillate, connate ; stigmas irregularly discoid, cream-coloured, very minutely papillose, with the margins undulate and tinged with purple. Nude part of spadix between male and female inflorescences 2 cm. long, filamentous cream-coloured. Male inflorescence 7 mm. long, 3.5 mm. diam., cylindrical, yellow. Flowers diandrous. Stamens very short. Tip of spadix adnate to the septum of the spathe. Appendix white, truncate, about 1.5 mm. broad, scarcely 1 mm. long.

Locality : W. Ghats : Edge of a ditch at Lingmala near Mahableshwar, alt. 4,000 ft. (McCann 3334 ! type, 3335 !, 3336 !, 3340 !, co-types).

Flowers : 24th September 1930.

5. *Cryptocoryne retrospiralis* (Roxb.) Fisch. ex Wydler in Linnæa v, (1830) 428; Kunth Enum. iii, (1841) 12; Wight Ic. iii, t. 772; Cke. ii, 818.—*Ambrosinia retrospiralis* Roxb. Fl. Ind. iii, (1832) 492.

Description : Cke. i, 818.

Locality : *Konkan* : Bombay (Law) ; banks of the Pen River (Law) ; beds of rivers (Gibson) ; river-bed near Mira (Gibson 151).—*Deccan* : Poona, on river-banks (Perrotet, Ranade! Herb. Econ. Bot.!) ; Ganeshkhind Bot. Gard. (Patwardhan!).—*N. Kanara* : Nugi (Talbot 1583!, Herb. Calc.) ; Arbail (Talbot!).

Distribution : Konkan, Deccan, N. Kanara, Mysore, Travancore, Carnatic, Godavari District, Chota Nagpur, E. Bengal, Assam, Burma.

Flowers : Jan. (N. Kanara).

6. *Cryptocoryne cognata* Schott in Bonplandia, v, (1857) 222 ; Hook. f. F. B. I. vi, (1879) 494 ; Cke. ii, 819 ; Engler Pflanzenr. iv, 23F (1920) 247.

Description : Cke. ii, 819.

Locality : *Konkan* (Stocks). So far endemic.

7. *Cryptocoryne cognatoides* Blatter & McCann *sp. nov.*

[*Pertinet ad sectionem Bitubulosarum* Engler. *Accedit ad C. cognatam* Schott a qua tamen differt radice non tuberosa, foliorum laminis late lanceolato-acuminatis, basi acutis, vel cuneatis, vel rotundis vel subcordatis, nervatione, pedunculis multo longioribus.]

Herba rhizomate prædita 0.7 cm. crasso (non bulboso). Foliorum petioli 20 cm. attingentes vaginati ; lamina late lanceolato-acuminata 20 cm. attingens, medio 2-3 cm. lata basi acuta, vel cuneata, vel rotundata vel subcordata, margine undulata, nervi 3 centrales a basi foliorum usque apicem currentes, laterales utrinque 3 adscendentes deinde in apicem exeuntes. Pedunculus 5-5.5 cm. longus. Spathæ tubus 5 cm. longus, inferne 7 mm., superne 5 mm. amplius, lamina late elongato-lanceolata, 5.2 cm. longa, minime tortuosa, intus transversaliter rugosula. Spadicis inflorescentia feminea 5.5 mm. longa, mascula vero ca. 4 mm. longa, ambæ interstitio 2.2 cm. separatæ ; appendix conicus, brevissimus.

Locality : N. Kanara : In running water (T. R. D. Bell 3091! type, 3091a! 3091b! co-types).

Flowered in October 1917.

8. *Cryptocoryne ciliata* (Roxb.) Fisch. ex Wydler in Linnæa v, (1830) 428 ; Schott Melet. i, (1832) 26 ; Bl. in Rumphia i, (1835) 85 ; Wight Ic. iii, (1840-56) t. 775 ; Hook. f. F. B. I. vi, (1893) 492.—*Ambrosinia ciliata* Roxb. Corom. Pl. vii, (1819) 90, t. 294 ; Fl. Ind. iii, (1832) 491.—*Cryptocoryne elata* Griff. Not. iii, (1851) 434 ; Ic. Pl. As. (1851) t. 170, 171 (*alata*).

Description : Caudicle 1-2 cm. thick, stoloniferous ; internodes very short, roots numerous, sometimes a longer internode between a series of shorter ones. Petioles 10-30 cm. and longer, 4-6 mm. thick, glabrous or papillulose, broadly (up to 2.5 cm.) sheathing. Blade above deep green (except the midrib), oblong-lanceolate or linear-lanceolate, inequilateral, 15-35 cm. long, 2-9 cm. broad, oblique at the base, acute or acuminate at the apex, midrib 3-5 mm. thick, very prominent on both sides, primary lateral nerves several on each side, scarcely prominent, passing away from the midrib at an acute angle. Peduncle very short, in fruit sometimes 5-6 cm. long ; lower tube of spathe 1.5-2 cm. long, scarcely 1 cm. wide, upper tube 15-30 cm. long, 5-6 mm. wide, split at the apex, outside glabrous and dirty greenish, inside almost white, granulate towards the blade with many reddish papilli ; blade ovate-oblong, 5-6 cm. long, 1.5-3 cm. broad, cuspidate, densely fimbriate with lacinia 5-6 mm. long and slightly crisped, at the throat with a yellowish ovate spot about 2 cm. long, otherwise purple. Female inflorescence about 5-7-gynous, 1 cm. long, covered by an ovate process of the spathe and separated by an interval of almost 1 cm. ; appendix shortly broad-conical, about 3 mm. long, 4 mm. thick below. Ovary 8 mm. long, several-seeded ; ovules biseriate, narrowed into a short outward-bent style ; stigma linear-oblong. Syncarpium ovoid-globose, 3-4 cm. wide, 5-7-sulcate and crowded with 5-7 remnants of the styles, 5-7-locular, valvately dehiscent ; cells 3-8-seeded, germinating in the fruit.

Locality : *Western Ghats* (T. Cooke! Herb. Calc.).

Distribution : Mysore, Coromandel, Carnatic, Calcutta, Sunderbunds, Malay Peninsula and Archipelago.

9. *Cryptocoryne Dalzellii* Schott in Bonplandia v, (1857) 221 ; Engl. Pflanzenr. iv, 23F (1920) 248 ; Cke. ii, 819 (*sub specie dubia*).

Description : Imperfectly known : Blade of leaf lanceolate, petiolate, apparently amplexicaul, the margin transparent and finally crenated ; veins parallel ; surface woolly as if covered densely with cobweb (Dalzell). Fruit ovoid, about 12 by 8 mm., on a solitary stalk ; seeds biseriate, oblong, subtriangular.

Locality : 'Bombay' (Dalzell, Herb. Kew).

3. LAGENANDRA Dalzell.

Species 5.—India, Ceylon.

1. *Lagenandra ovata* (Linn.) Thwait. Enum. Pl. Zeyl. (1864) 334 ; Engler Pflanzenr. iv, 23F (1920) 228, fig. 57, 58.—*Arum ovatum* Linn. Sp. Pl. (1753) 967, ed. 2 (1763) 1371.—*Caladium ovatum* Vent. in Roemer Arch. ii, (1801) 357.—*Cryptocoryne ovata* Schott Melet. i (1832) 6.—*Lagenandra toxicaria* Dalz. in Hook. Journ. Bot. iv, (1852) 289, v, (1853) t. 4 ; Dalz. and Gibs. Bomb. Fl. (1861) 257 ; Cke. ii, 819.

Description : Cke. 1 c.

Note : Leaves black in the shade, appressed to the ground (Sedgwick).

Locality : *Konkan* : In marshes (Dalzell) ; Bombay (Dalzell ! Herb. Calc.) ; Niwendi river bank, Ratnagiri Dist. (Garade ! Herb. Econ. Bot. Poona).—*S. M. Country* : Belgaum (Dalzell). *N. Kanara* : Yellapore (Talbot 1813 ! Herb. Econ. Bot. Poona) ; in streams and marshy places (Talbot 1012 ! Herb. Econ. Bot. Poona) ; in a stream above Malamani Ghat (Sedgwick and Bell 7201 !) ; Anmod, in nala (Sedgwick 3314 !) ; Arbail Ghat (Sedgwick 3459 !).

Distribution : From the Konkan to N. Kanara, Mysore, Coorg, Cochin, Travancore, Ceylon.

Flowers : Jan. and March (N. Kanara) ; May (Ratnagiri).

Fruit : Oct., Nov., Dec (N Kanara).

4. ARISÆMA Mart.

Species 105.—Asia, Abyssinia, America.

Cooke has 4 species. We add 1 new to the Presidency : *A. neglectum*, and describe a new species : *A. longicaudatum*.

A. Appendix of spadix not exerted beyond the spathe

I. Leaflets sessile.

(a) Appendix of spadix tapering from the base to the tip 1. *A. Murrayi*.

(b) Appendix of spadix narrowly clavate 2. *A. Leschenaultii*.

II. Leaflets petiolulate with thread-like tips.

Spathe with a caudate tip.

(a) Appendix 1.5 cm. long 3. *A. caudatum*.

(b) Appendix 4 cm. long 4. *A. longicaudatum*.

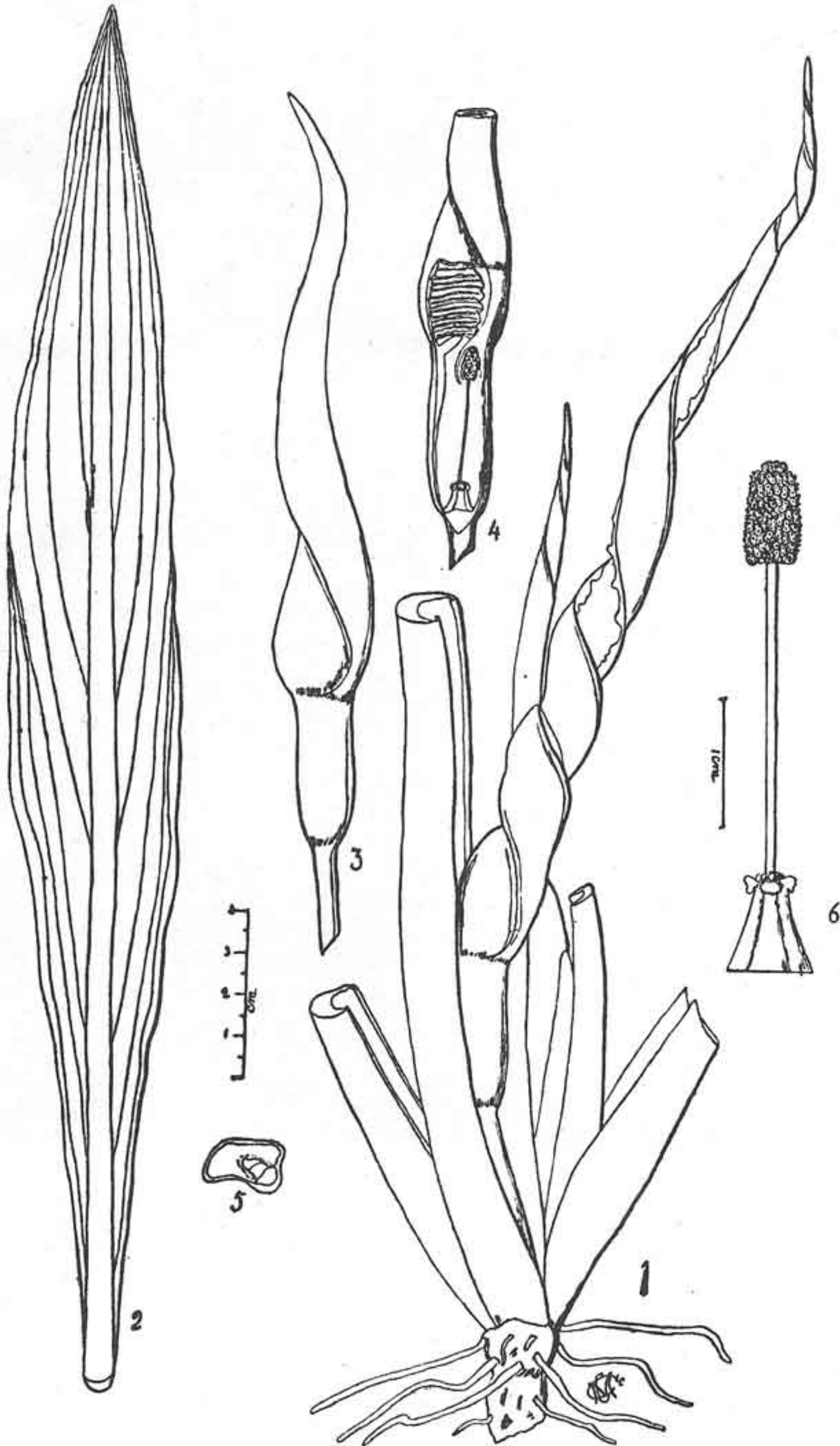
B. Appendix of spadix far exerted beyond the spathe

I. Leaves pedatisect 5. *A. tortuosum*.

II. Leaves radiatisect... .. 6. *A. neglectum*.

1. *Arisæma Murrayi* (Graham) Hook. in Bot. Mag. (1848) t. 4388 ; Cke. ii, 821.

Description : We give a more complete description of this species from live material: Tubers hemispheric, up to 5 cm. diam., root-fibres crowded, arising from the upper side of the tuber, fleshy, white, rather tough. Sheaths broadly linear-oblong, or oblong-lanceolate, mucronate, lowest white, tipped purple, the others pale or dark purplish, the uppermost up to 30 cm. long, the lower much shorter. Leaf one, coming up shortly after the peduncle, but co-existent with the flower and finally reaching higher than the flower, peltate, glossy dark green on the upper surface, paler and shining beneath, divided to the base into 5-11 segments. Segments sessile, ovate-lanceolate-acuminate



Cryptocoryne tortuosa Blatter & McCann, sp. nov.

- 1. Plant with open flower.
- 2. Leaf.
- 3. Bud.
- 4. Section of flower.
- 5. T. S. showing septum with valve in tube.
- 6. Spadix.



Cryptocoryne cognatoides, Blatter & McCann, sp. nov.