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NOTULÆ AD PLANTAS ASIATICAS.

Part III.

MONOCOTYLEDONOUS PLANTS.

BY THE LATE

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Cryptocoryne.

1. *Cryptocoryne elata*. Gr Pl. CLXX.

Spatha axillaris, breviter pedunculata tubo dodrantale alba compressa, marginibus involutis, basi versus connatis, Limbo patente explanato conduplicato recurvo, 1-torto, tri-sulcato, sanguineo purpureo margine processibus carnosis subulatis simplicibus, divisive fimbriat. fauce annulo obsoleto, obliquo notat. ochroleucescens punctis purpureo-brunneis.

At the place where the margins are quite connate, one is rolled up into a hollow cone, and in this the head of the spadix is contained.

Spadix ratione spathæ minute, sinu basi simplici serie fæmi-

nei accedit, stipes graciles filiformes, vasculosa, tunc pars subclavato antherigere, denique apex imus spatheis conicus nudiss. texturæ partes intermediæ.

Ovaria (ut in Pistia) dorso spadice fere per totam longitud. adnat. Stylo sub o. Stigma subsessilis oblongo-discoidea papillosa. Ovula plura cuique ovario, antitropa, funiculata, filamentis, simplicibus vermiciformibus crebris quasi nidulantia.

Antheræ biloculares, raro 1-3 loculares pyxidiformi, apice lati dehiscentes.

Pollen tubes often imbedded in the anther itself.

Fructus nudus. Spatha nempe lapsa spadicis vestigius nullis, e carpellis 8, ventro planis, lateribus sub-bicarinatis, connatis, apice recurvis centrale sulcatis conflatis.

Rhizomat. fol. florifer. brev. Petioli altiuscul. vaginant. 3 pedales apici canaliculati cæterum teretes; lamina anguste et longe lanceolata, subacutá, carnoso-coriacea, integra, venis 2 indistincti, obliquis. Spatha petiol. 2-3 brevior axillaris lamina obliq. ascendent., tubo compresso.

Æstivat. involuto-convolut., vagina marginibus involutis mag. folium quodque initio vestit. Processus ciliiformibus *axillaribus* (from the whole axil. not from central point), pluribus.

Spathæ limbus æstivatione 1-tortus compressus angulatus marginales valvatim incurvatæ, æquales, but in the tube one margin is thicker, and the two are valvately applied, with a tendency to incurvation. It is from the thicker margin that the hollow cone has its origin. This plant is remarkable for the process of the spatha covering the apex of the spadix, for the pyxidate anthers, the direction of the females, and their broad attachment, the vermiform conducting tissue, the imitation of a compound fruit, and above all, for the embryo.

1. Plant about the natural size.
2. Lamina of leaf.
3. Lateral view of inflorescence.
4 Front do.

5. Spathæ in æstivation, *a* is the line along which it will open.
5*a*. Shews æstivation of lamina of spatha.
5*b*. Æstivat. of spatha, about the faux.
5*c*. Ditto of the tube.
6 Long section of base of spatha, but not of spadix, shewing hollow conical shaped process.
7. Another section parallel to, and through dorsum of spadix, shews that this arises from the thickest margin.
8. Another spadix removed.
9. Spadix, spatha removed.
10. Two anthers these generally will be found to exsert a cone of mucilage, in which the grains of pollen are imbedded, these are represented also as emitting boyaux.
11. Perfect pollen grain.
12. Young grains just escaping from parent cell, from the same anthers equally developed.
13. Young grain, 14 more developed.
15. Long section of the ovarial part of the spadix.
16. Ovulum and filament.
17. Ovule structure of.
18. Vermiform filament, doubtless *conducting*.

2. C*rytocoryne elata, fruit and ripe seeds,* Pl. CLXXI. Fig. II.

1. Fruit not of full size.
2. Ditto full size and open; *a* remains of the winged axis; *b*, *b*, *b*, *b*. portions of the white membrano-cellular septa.
3. Seed.
4. Same longit. section; *a* testa, *b* callous urceolar nucleus. *c*. cotyledon, *d* inner (accessory) radicle, *e* axis from which the plumula and young leaves originate.

5, 5. Two seeds from the same, both germinating in the fruit.

6. Same long section, *a* hilum, *b* testa, *c* callous urceolar nucleus, *d* cotyledon, *e* primary radicle, *f* axis.

7. same subspontaneously separated from the cotyledon, nucleus, and testa; *a* cicatrix of cotyledon; *b* primary radicle.

8. Same: vertical of lower face, or base: *a* cicatrix of cotyledon; *b* primary radicle.

9. one of the young leaves shewing its convoluto-involute vernation.

3. *Cryptocoryne elata*. Pl. CLXXI. Fig. I.

Represents the stages of development after the protrusion of the radicle and appearance of plumula.

1. Young fruit.
2. Young abortive ovule, (after fecundation)
3. Do. long section.
4. Do. nucleus, and inner tegument?
5. Apex of do. represents what I thought I saw of the boyau and its penetration, all the above were from the same fruit, no. 1, from which all remaining figures likewise were taken.
6. Young seed.
7. Same, most of the spongy testa removed, the radicle projects from the nucleus, and the plumula is developing, *a* foramen with callous edges.
8. Same, nucleus cut away at the base, shews the extent of the cotyledon and the loose tissue lining the nucleus.
9. Nucleus of same. Embryo removed.
10. Embryo.
11. Apex of nucleus projecting, radicle and plumula seen laterally.
12. Do. in front.
13. Do. dorsum or radical face.
14. More developed seed, long section.
15. Same: upper half of testa removed.
16. Embryo viewed on its radical face.
17. Head of Embryo viewed on its face opposite the radicle.

4. *Cryptocoryne* (*Eusiphonia*) *cordata* Gr. Pl. CLXXII.

Pedunculus axillaris, *solitarius* singulus 2-3 uncialis.

Spatha dodrantalis, tuba membranacea, venosa angusta, subcylindracea, marginibus apicem versus excipe coalitis.

Lamina, caudata oblique ascendentia, caudato-acuminata marginibus revolutis, simplicibus, colore ut videtur purpurascenti-viridis, tubo ad apicem *spadicis brevis*, processu ½ *hollow cone-shaped*, venoso! membranaceo. Spadix basi feminea, supra femina, organa neutra medio gracilis nudissim. apice oblonga, clavata, antherigera.

Ovarii axi adnati, 6-8 unilocular. ovula plura filis tenuibus nidulant. angulo interna affixa anatropa. Styli tot quot ovarii robusto ascendentes patentes. Stigmata terminalibus discoid. oblonga. Corpusculæ late clavatæ, uniseriatæ, ovaria supra pedunculi partes nudæ basin ambiunt. Antheræ bi-pyxidatæ sessiles, processus terminalis: explanate subfoliacea venosa, acuminata ⅓ brevior quam pars antherifera.

Herba immersa spathæ apice excepto. Caule simplici basi radicans. Foliis pluribus longe petiolatis, petiolis basi vaginatis lamina cordato-ovata. Inflorescente foliis summis paullo longior.

Omnia Cryptocoryna, nisi tuba spathæ: ad laminam fere marginibus coalitis. Processus pileans ½ *hollow cone-shaped*, membranaceo-venosus. Laminæ margines simplices. Processus supra ovar. neutrii. Ovaria stylis prædita et apice spadicis explanata.

Forma verisimiliter subgenerica, quibus habitu etiam differt et statione *C. veræ* nempe incolæ littorum inundatorum limosorum, hac peninsula in colæ aquarum stagnatarum.

1. Plant half size.
2. Base of spatha laid open.
3. Transverse of spatha, about the centre shewing it to be connate.
4. Spadix and long section of the front ovaria.
5. Anther.
6. Ovulum immersed in the hairs.

5. *Cryptocoryne sp.*

Planta demissa. Rhizomate vel caulis, distanter annulato. Petioli subspithamæi basi. 2-3 vaginantes, cito teretifacti, folia cordata basi reniformia, plus minus repanda of a thick fleshy coriaceous texture, obtuse emarginate veins indistinct ; above bright green ; subtus purpurascent. papillis vel punctis (Stomata ?) Ad basin cujusque novelli stipulæ membranaceæ magnæ erectæ binæ. Pedunculus axillaris brevis.

Spatha biuncialis, uncinata extrorsum, linea junctionis sulcata, lamina sublanceolata patentia, caudato-cuspidata, papillosa, an oblique smooth part at the faux, initio livido sanguineo demum atrascens, textura coriacea.

From the base of the convolution internally, descends a large, dimidiate *hollow cone*, totally inclosing the antheriferous part of the spadix.

Ovaria 6, arcte coalita verticalia. Styli totidem robusto-breves *patentes*. Stigmata 6, oblonga, discoidea, foveolata or depressed in the centre, 1-celled with a few subbiseriate antitropous ovula, towards the base surrounded by cellular hairs.

Space round base of the naked attenuated filiform part of the spadix rather flat, occupied by the lobed yellowish papillose bodies in number 6, alternating with ovaria. The filiform part of spadix is about 4 lines long.

Anthers of two cells placed vertically, and rather crowded towards the top of the spadix, which is prolonged beyond them into a fleshy subconical peak.

Peduncle of naked fruit, not elongated, fruit ovate, conical, as many lobes as carpella, rugose, reddish out side, styles apices recurved, rather elongated at the apex, stigmatigerous.

Seeds few, refracted from base, stoutly subulate.

Testa tinged with dense flesh coloured, cellular Albumen ?

Embryo axile, not reaching into the curvature of the base of the seed, radicle superior, not thickened. Plumula large, exserted, passing down in the axis of the seed, of two un-

equal subulate leaves. Native names *Verupha, Alloor Gojah.*

Obs. The remarkable points of Ambrosinea are the septum of the spatha, the vertical ovaria, and the development of the ovulum.

Of this portion of the subject, the chief points are the non-correspondence in growth between the nucleus and testa, the induration or callosity, the perforation of its apex by the radicle, the obliquity of this, the structure of the plumula; and the ampulation of the cotyledon.

This last, however remarkable it may be in the fruit, and even before the rupture of the testa, is so far explainable as it happens after the commencement of the development of the young leaves, which is to be taken probably, as the date of the commencement of germination. But the protrusion of the radicle from the apex of the nucleus long before this process has commenced, its immediately taking on a tendency to a downwards direction, and the development of the plumula outside those coats in which, in accordance with generalaties, it should be developed, are singular anomalics.

[When the fruit has attained a large size, the ovula are comparatively unchanged, they are urceolate, the base of the testa having become nearly globular, this tegument is crowded and its surface rendered irregular by fascicles of raphides.

I see now only one tegument, but it looks like a secundine, with a nucleus incorporated in it, the centre of this is occupied by a sub-hour glass cavity, and in its apex is distinguishable a grumous mass.

Pressure does not demonstrate any lining membrane, but it causes the escape of the grumous mass, and of the fluid contents. The ovules at this period are a good deal imbedded in hairs, these seem to retain their original appearance.

A magnifying power of 1-250 shews a mebranous tube, perhaps traceable throughout the neck of the nucleus, at its wider

part, expanding into a sac. In those carpella in which ovula are not abortive, we find them of an oboval shape, of considerable size.

The testa now is spongy, very thick above, below, forming only a thin covering to the round base of the nucleus, which is much less altered in shape, the foramen of the testa is very distinct, and callous.

There are two other points connected with this plant fitted for enquiry.

1. How is such a fruit to be distinguished from a really syncarpus one?.

2. Is the primary radicle of Monocot's generally rudimentary and abortive?. The only way to settle the first, is by the existence of axile vessels, but then if we were to conceive a dioiceus plant in which no prolongation of the spadix beyond the ovaria took place, I doubt whether there would be vessels inside the placental vessels. In reference to this point, such fruits ought to be observed as have one dehiscense on the axis remaining isolated in the centre.

But compared with other Aroideæ, such as Aglaonema, the separation and exhaustion of the cotyledon in fruit, is not a little remarkable, for in Aglaonema, the cotyledon, which is very large, is perfectly fresh, aud juicy, and when the first true leaf is a span long, and even when it is $\frac{1}{2}$ foot long, and radicles are plentiful, its nutritious male apex is only absorbed about $\frac{1}{3}$ of the distance. In this, the primary radicle is hardly ever developed.

If the embryo is not developed, the nucleus remains attenuatedly conical, if it is developed, its apex becomes enlarged; and the whole figure is irregularly hour glass-shaped, and the axis rectilinear. The embryo undergoes its first changes of mere enlargement in the apex of the nucleus, but whether from the constriction below this, and the hardness of the nucleus, or a certain degree of obliquity which the embryo assumes before its apex protrudes, it does not extend

below the swollen apiculous part, until its head is exserted, and the plumule has commenced its development.

But nothing can shew clearer that its protrusion is not the consequence of resistance opposed to it, than this, namely that it commences elongating downwards directly that resistance is counteracted, and until the cotyledon reaches the fundus of the nucleus, it continues to enlarge downwards, quicker than the plumule does upwards.

Pl. CLXXIII. Fig. III. *c*, *d*, *e*. Represents the embryo of a monster, *c* radicle, *d* plumula, *e* cotyledon.

The changes that occur as the seeds advance, consist in an enormous disproportion between the plumule and cotyledon, so that the fact is at once pointed out, that the development of the plumule constitutes germination, which is always attended by the enlargement of that organ, and the absorption of the cotyledon. So that the great anomaly of a cotyledon becoming ampullated, in a measure disappears. Accordingly we find that the tissue of the nucleus becomes free from fecula.

In this Malacca species nothing can be plainer than the germination inter pericarp et testa.

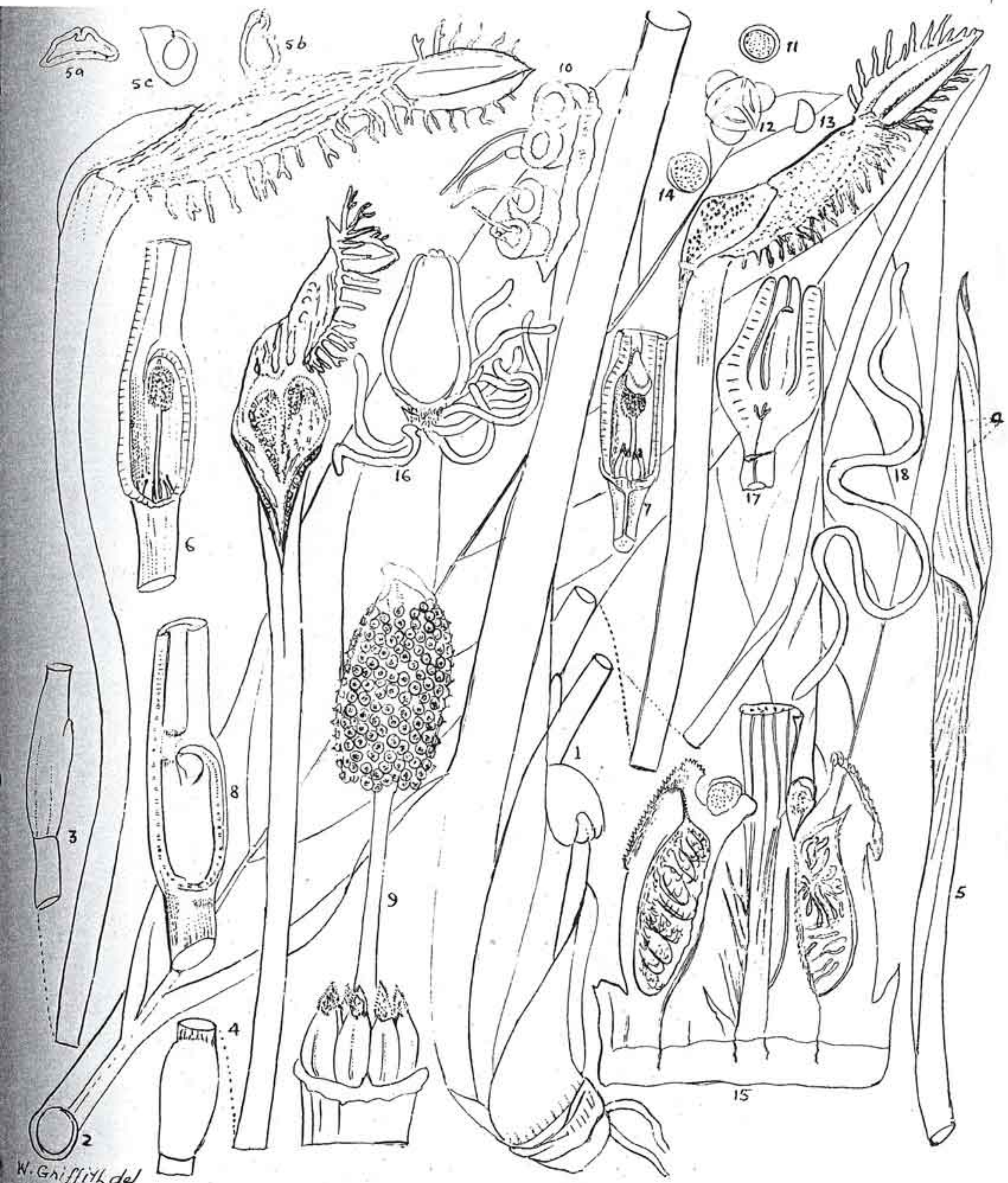
For in the fruit at the time of dehiscence, the cotyledon will be found to separate, the axis is an immensely large fleshy cone, producing from the whole surface the subulate leaves of the plumule, the innermost being distinctly leaves in form, vernation, etc.

The testa ruptured. At this period the testa has lost all its spongy matter, and is a fine membrane, it separates with the proportionally small urceolate nucleus and cotyledon. And is erect, not that the perforation of the nucleus takes place before the cotyledon has assumed its mature organisation. I should be inclined to refer the whole of the phenomena to a very early, and included germination.

The embryo has now an obliquely exserted apex, as seen in the right hand figure III. Pl. CLXXIII; this is of the usual

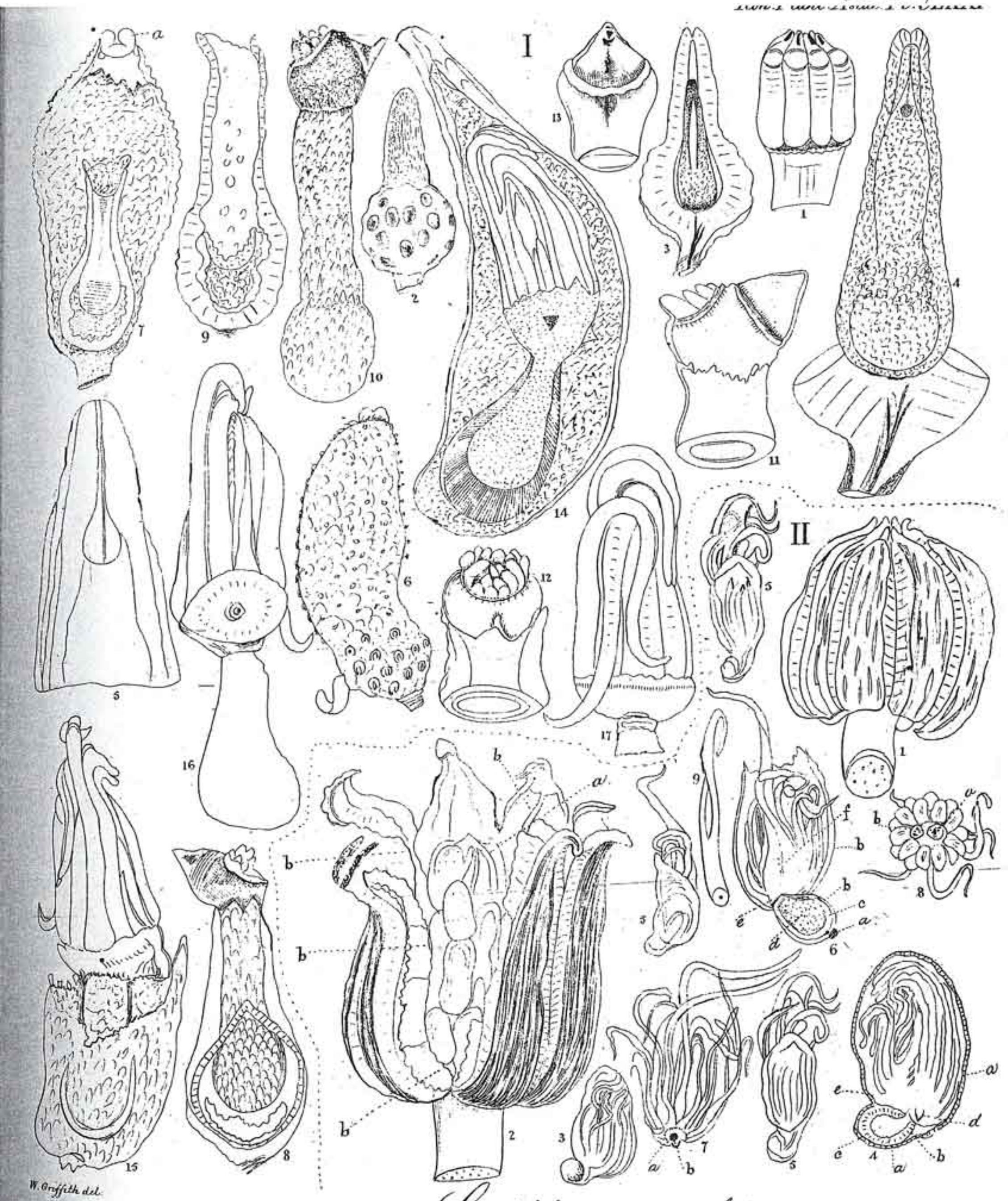
appearance, the included part is laxly cellular, and by transmitted light, is not very much like embryonic tissue, the cavity of the nucleus is complete, then lined with irregular tissue; at the fundus is a loose mass of similar cellular tissue. *a*, adherent, *b*, does not appear to be an independent body.]

Griffith, Icon. Plant. Asiat. III
(1851)



Cryptocoryne ciliata Griff.
= C. ciliata

Griffith, Icon. Plant. Asiat. III, Pl. CLXXI
(1851)



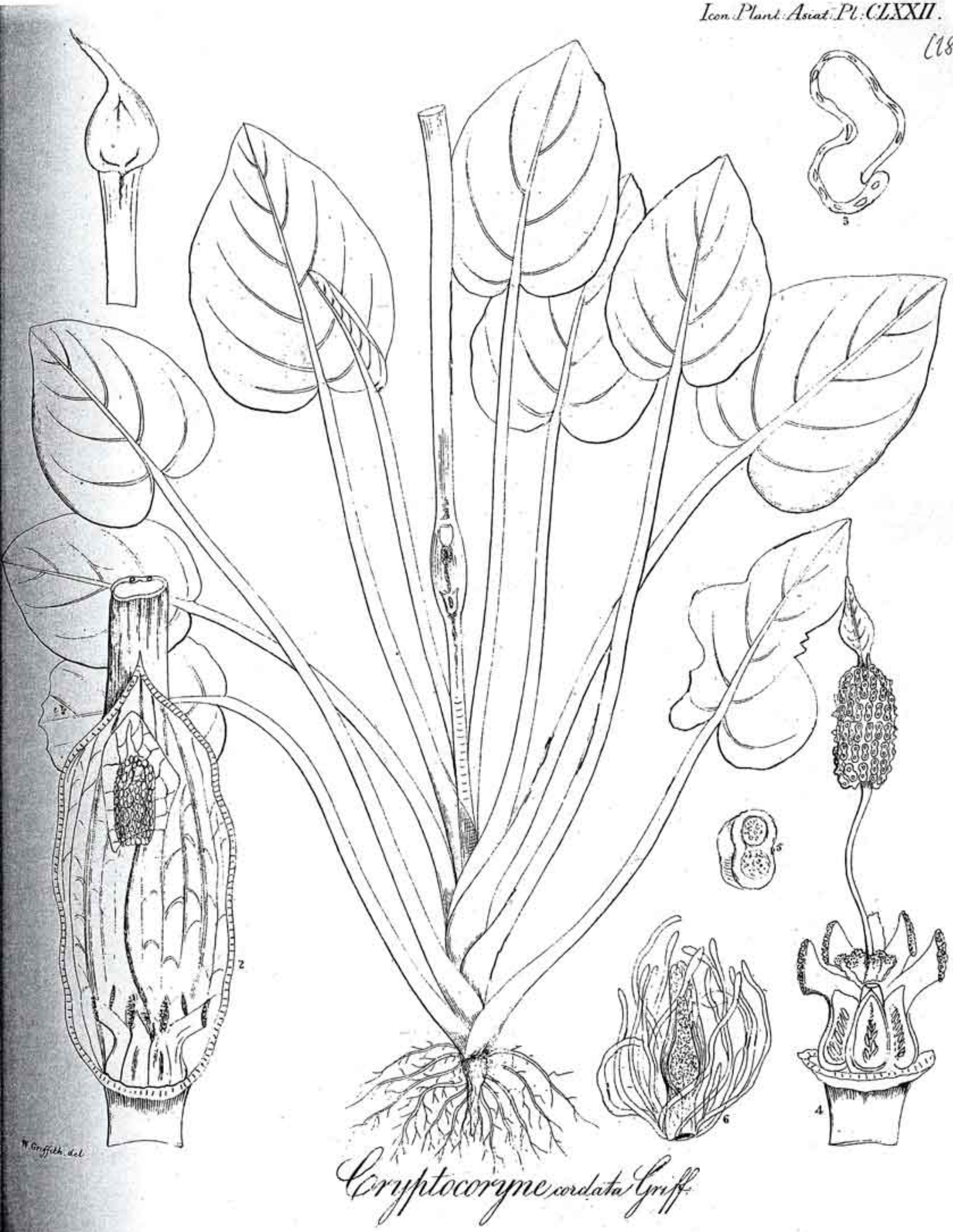
Cryptocoryne alata.

= C. ciliata

Griffith,

Icon. Plant. Asiat. Pl: CLXXII.

(1851)



Cryptocoryne cordata Griff.