

## The genus *Amydrium* (*Araceae*: *Monsteroideae*: *Monstereae*) with particular reference to Thailand and Indochina

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*Summary.* The genus *Amydrium* (*Araceae*) is recorded for the first time from Vietnam, with two species, *A. hainanense* and *A. sinense*, hitherto known only from China (including Hainan). Neither species was treated in the last revision of *Amydrium* (Nicolson 1968) and their recognition requires alterations to his account. A key to the Asian genera of *Monstereae* and *Anadendreae*, an expanded generic description, keys to fertile, sterile and juvenile plants and a review of the genus is presented. Both newly recorded Vietnamese species are illustrated.

### INTRODUCTION

*Amydrium* Schott, a genus of terrestrial subscandent herbs and root-climbing lianes occurring from Sumatra to New Guinea and from southern China to Java, was last revised by Nicolson (1968). Nicolson merged *Epipremnopsis* Engl. into the then monospecific *Amydrium*, recognizing four species in all. Since Nicolson's account two more species have been recognized: *A. sinense* (Engl.) H. Li and *A. hainanense* (C. C. Ting & C. Y. Wu ex H. Li *et al.*) H. Li. *Amydrium sinense*, based upon Engler's *Scindapsus sinensis* (Engler 1900), was overlooked by Nicolson. *Amydrium hainanense*, described initially in *Epipremnopsis* (Li *et al.* 1977), was later transferred to *Amydrium* (Li 1979). Additionally, two species recognized by Nicolson, *A. zippelianum* and *A. magnificum*, have since been shown to be conspecific (Hay 1990; Boyce 1995). *Amydrium* as here defined comprises five species.

*Amydrium* is currently placed in *Monsteroideae* tribe *Monstereae* (*sensu* Mayo *et al.* 1997) but has a chequered history of infrafamilial placement. In publishing *Amydrium* (then monospecific: *A. humile* Schott) Schott (1863) stated that it should be placed before *Anadendrum* in subtribe *Monsterinae* (*sensu* Schott 1860), an assemblage equivalent to a combined *Anadendreae* and *Monstereae sensu* Mayo *et al.* 1997. However, Engler (1876) placed *Amydrium* (still monospecific) in subfamily *Pothoideae* subtribe *Heteropsinae* (together with neotropical *Heteropsis* Kunth) but later (Engler 1905) moved *Amydrium* to *Monsteroideae* while retaining his newly published *Epipremnopsis* in *Pothoideae* (tribe *Potheae*). Thus *Amydrium* (*sensu* Nicolson 1968) is often considered intermediate between *Pothoideae* and *Monsteroideae*. However, while *Amydrium* is in some respects anomalous in *Monsteroideae* (ripe

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Accepted for publication May 1999.

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fruits without abscising stylar region and very sparse trichosclereids), it is decidedly atypical in *Pothoideae* (swiftly deciduous spathe, presence of trichosclereids, and aperigoniate flowers). More work, ideally involving detailed macromolecular comparison of species of *Monsteroideae* and *Pothoideae*, is needed to place *Amydrium* with more certainty (compare *Anadendrum* Schott and *Heteropsis*, which are similarly problematic).

#### IDENTIFICATION

Lianescent aroids are often collected under incorrect names in Asia (see, e.g., Boyce 1998 for further discussion). Part of the problem with accurate identification arises from an apparent lack of readily observable critical characters, a difficulty exacerbated by the tendency of key writers to concentrate on fertile characters which are difficult to observe and interpretatively ambiguous vegetative characters. We have attempted where possible to concentrate on readily observable characters in the keys presented here. In particular, we have employed the feature typical of most monsterooid genera, trichosclereids. All monsterooid genera except *Amydrium* have abundant trichosclereids (sparse and scattered in *Amydrium*). These are readily observable by tearing a mature leaf lamina and looking for 'hairs' protruding from the damaged edges and are extremely reliable in Asia as a means of assigning a genus to the tribe *Monstereae*. For a discussion on identifying lianes of the tribe *Potheae* see Boyce (1998).

The keys presented below should go some way towards easing the identification of the smaller-inflorescenced lianescent aroids to genus in Asia. However, while it has proved relatively easy to key these out by this method, species with large inflorescences have proved very intractable and here we have had to resort to critical floral characters in order to produce a reliable key for those taxa. As we gain a better insight into unvarying (or at least unambiguous) vegetative and macrofloral characters we hope to be able to produce more user-friendly keys for these larger flowered taxa.

All morphological terms employed follow Stearn (1992).

#### KEY TO THE GENERA OF *ANADENDREAE* AND *MONSTEREAE* IN THAILAND AND INDOCHINA

1. Inflorescence small; spathe usually less than 9 cm long just prior to opening . . . 2  
    Inflorescence moderate to large; spathe usually more than 9 cm long just prior  
    to opening . . . . . 4
2. Spathe in bud slender, with a long, slender peduncle, conspicuously long-beaked  
    (beak to  $\frac{1}{3}$  length of entire spathe), spathe opening with inside white,  
    greenish white or purple and conspicuously glossy-waxy. Flowers with a  
    membranous perigon of fused tepals (perigoniate). Fruits separate berries,  
    dark red when ripe. Trichosclereids absent . . . . . **Anadendrum**  
    Spathe in bud stout, short to long-pedunculate, not conspicuously long-beaked,  
    or if beak present then less than  $\frac{1}{6}$  length of entire spathe, opening with  
    inside yellow, greenish or white, only moderately waxy. Flowers aperigoniate.

- Fruits not a berry, styler region mostly abscising to reveal ovary cavity, if fruits berry-like and styler region not abscising then fruits ripening white or orange. Trichosclereids present (but sparse in *Amydridium*) . . . . . 3
3. Trichosclereids abundant (many 'hairs' apparent when a mature leaf lamina is torn). Petiole broadly canaliculate; leaf sheath margins broad, spreading, persistent, extending to apical geniculum; leaf lamina thinly coriaceous, often variegated silvery grey. Ripe fruits with styler region abscising . . . **Scindapsus**  
Trichosclereids sparse (very few 'hairs' apparent when a mature leaf lamina is torn). Petiole narrowly canaliculate or terete; petiole sheath margins narrow, erect or slightly inrolled, soon drying and degrading into weak fibres, then falling to leave an obscure scar, sheath either ligulate with free ligules extending beyond apical geniculum or sheath at most extending only to half way along petiole, if the latter then remainder of petiole terete except for two prominent adaxial keels extending to apical geniculum; leaf lamina variously-textured. Ripe fruits with styler region not abscising . . . . . **Amydridium**
4. Trichosclereids sparse (very few 'hairs' apparent when a mature leaf lamina is torn). Higher order venation reticulate. Ovary 1-locular, placenta 1, intrusive-parietal, ovules 2. Ripe fruits with styler region not abscising . . . . **Amydridium**  
Trichosclereids abundant (many 'hairs' apparent when a mature leaf lamina is torn). Higher order venation striate or reticulate. Ovary never as above combination. Ripe fruits with styler region abscising . . . . . 5
5. Ovule solitary, placentation basal. Fruit with a solitary seed . . . . . **Scindapsus**  
Ovules 4 – 6 or more, placentation intrusive-parietal. Fruit with more than one seed . . . . . 6
6. Ovules 8 or more, superposed on 2 (rarely 3) intrusive parietal placentas. Seeds many, ellipsoid, straight, 1.3 – 3.2 × 0.6 – 1.0 mm; testa brittle, smooth . . . . .  
. . . . . **Rhaphidophora**  
Ovules 4 (– 6) at base of a single intrusive parietal placenta. Seeds few, curved, 3 – 7 mm × 1.5 – 4.0 mm; testa bony and ornamented . . . . . **Epipremnum**

**Amydridium** Schott, Ann. Mus. Bot. Lugduno-Batavum 1: 127 (1863); Engl. in A. & C. DC., Monogr. Phan. 2: 250 (1879); Engl. & K. Krause in Engl., Pflanzenr. 37 (IV. 23B): 118 (1908); Ridl., Fl. Malay. Penins. 5: 118 – 119 (1925); Nicolson, Blumea 16 (1): 123 – 127 (1968); Backer & Bakh. f., Fl. Java 3: 104 – 105 (1968); H. Li in C. Y. Wu & H. Li, Fl. Reip. Pop. Sinicae 13 (2): 22 – 26, Pl. 4, 8 – 16 (1979); A. Hay in R. J. Johns & A. Hay, Student's Guide Monocot. Papua New Guinea. Part 1: 47 – 49, Fig. 18 (1981); M. L. Sai in B. Zhu *et al.*, Fl. Guizhou. 6: 549 – 550, Fig. 162 (1987); P. C. Kao in P. C. Kao & Z. M. Tan, Fl. Sichuan. 9: 380 – 382, Pl. 120 1 – 3 (1989); A. Hay, Aroids of New Guinea: 47 – 48, Pl. VIII, c (1990); P. C. Boyce (1997) in M. J. E. Coode *et al.*, A checklist of the flowering plants and gymnosperms of Brunei Darussalam: 341; Mayo, Bogner & P. C. Boyce, Genera of *Araceae*: 116 – 118, pl. 13, pl. 113 A (1997); P. C. Boyce & Ressler (1999) [http://www.vwc.edu/wwwpages/presslar/greenhouse/amyridium/genus\\_am.htm](http://www.vwc.edu/wwwpages/presslar/greenhouse/amyridium/genus_am.htm). Type species: *A. humile* Schott.

*Epipremnopsis* Engl. in Engl, Pflanzenr. 37 (IV. 23B): 1 – 3 (1908); Merr., Enum Philipp. Pl. 1: 177 – 178 (1922); Ridl., Fl. Malay. Penins. 5: 120 (1925); H. Li *et al.*,

Acta Phytotax. Sin. 15 (2): 102, fig. 15, 1 (1977); Fl. Yunnan 2: 745 – 747, Pl. 203, 8 – 16 (1979). Type species: *E. media* (Zoll. & Moritzi) Engl.

Small to medium-sized, occasionally very large, root-climbing lianes (*sensu* Schimper 1903) or creeping to scandent herbs, most species producing long flagelliform foraging shoots lacking foliage leaves; trichosclereids sparsely present in vegetative parts (only petiole and sheath *vide* Seubert 1997), more abundant in style (*vide* Carvell 1989). *Leaves*: foliage leaves often remote from one another, interspersed with few to rather many cataphyll-bearing nodes; petiole geniculate apically and basally, sheath very short (barely exceeding basal geniculum) to usually less than half as long as petiole, occasionally reaching apical geniculum, rarely ligulate and exceeding it; lamina ovate-cordate to lanceolate or pandurate-trilobed or pinnatifid to pinnatisect, sometimes with round to oval perforations; primary lateral veins pinnate, running into marginal vein, higher order venation reticulate. *Inflorescence* 1 – several in each floral sympodium, terminal on shoot but often displaced by sympodial branching and then, in fruit, appearing lateral on stem; peduncle erect, subequal or half as long as petiole; spathe conchiform to ovate or canoe-shaped, apiculate, often thick-textured, sometimes reflexed at anthesis and then deciduous; spadix sessile to long-stipitate, sometimes very short. *Flowers* bisexual, aperiogoniate. *Stamens* 4 – 6, free; filaments short, broadly linear; anthers equalling or shorter than filaments, thecae ovoid, extrorse, dehiscing by a longitudinal slit. *Pollen* (Grayum 1984, 1992) fully zonate, hamburger-shaped, medium-sized (mean 39 µm, range 38 – 41 µm); exine either densely and minutely punctate in one half and virtually psilate in the other, or uniformly foveolate-fossulate, apertural exine psilate or obscurely verrucate. *Gynoecium* obpyramidal or obconoid, tetragonal; ovary 1-locular; ovules 2; funicle anatropous, short; placenta situated near the base of a deeply intrusive septum; stylar region broader than ovary, slightly prominent centrally below stigma, otherwise ± truncate; stigma small, hemispheric to longitudinally elongate. *Infructescence* comprised of numerous medium to large berries; fruits subglobose, truncate to domed at apex, clearly separate, white (*A. medium*, *A. humile*) or indistinctly separate, orange-red (*A. zippelianum*, *A. sinense*) when ripe; stylar region not abscising (q.v. *Epipremnum*, Boyce 1998). *Seed* subglobose to heart-shaped; testa smooth, glossy; embryo curved and partly green; endosperm present (*vide* Seubert 1993). *Chromosomes* 2n = 60.

**DISTRIBUTION.** 5 spp., in tropical and subtropical East Asia: Brunei, P. R. China (Guandong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Sichuan, Yunnan), Indonesia (Irian Jaya, Java, Kalimantan, Maluku, Sulawesi, Sumatra), Malaysia (Peninsula, Sabah, Sarawak), Myanmar, Papua New Guinea, Philippines, Singapore, Thailand, Vietnam.

#### KEYS TO THE SPECIES OF *AMYDRUM*:

##### KEY TO HERBARIUM MATERIAL

1. Leaf lamina of flowering shoots entire . . . . . 2
- Leaf lamina of flowering shoots pinnatifid, pinnatipartite, pinnatisect or, if entire, then with perforations . . . . . 3

2. Base of leaf lamina cordate; flowering shoots not adherent-climbing (i.e., no clasping roots visible along stem) (Peninsular Malaysia; Sumatra) · · 2. **A. humile**  
Base of leaf lamina cuneate to shortly decurrent; flowering shoots root-climbing (i.e., clasping roots visible along stem (P. R. China, N Vietnam) · 4. **A. sinense**
3. Leaf lamina of flowering shoots pinnatifid to pinnatisect, if pinnatifid then sometimes perforated · · · · · 4  
Leaf lamina of flowering shoots entire, moderately to greatly perforated (P. R. China (incl. Hainan), N Vietnam) · · · · · 1. **A. hainanense**
4. Leaf lamina of flowering shoots pinnatifid to pinnatipartite, almost always perforated (Myanmar, Thailand, Cambodia, Vietnam?, Peninsular Malaysia, Singapore, Sumatra, Java, Borneo, Philippines, Maluku) · · · · · 3. **A. medium**  
Leaf lamina of flowering shoots pinnatipartite to pinnatisect, never perforated (Philippines, Sulawesi, Maluku, New Guinea) · · · · · 5. **A. zippelianum**

## FIELD KEY TO FERTILE SPECIMENS

1. Plants always flowering on root-climbing shoots · · · · · 2  
Plants mostly flowering on non-climbing shoots, if flowering shoots climbing then never adherent (Peninsular Malaysia; Sumatra) · · · · · 2. **A. humile**
2. Leaf lamina of flowering shoots entire, perforated or not · · · · · 3  
Leaf lamina of flowering shoots pinnatifid, pinnatipartite or pinnatisect, sometimes perforated · · · · · 4
3. Leaf lamina moderately to greatly perforated (P.R. China (incl. Hainan), N Vietnam) · · · · · 1. **A. hainanense**  
Leaf lamina never perforated (P.R. China, N Vietnam) · · · · · 4. **A. sinense**
4. Leaf lamina perforated, segments spreading, lamina seldom exceeding 50 cm in length; plants lacking net-like fibres on the apices of flowering shoots; ripe infructescences white (Myanmar, Thailand, Cambodia, Vietnam?, Peninsular Malaysia, Singapore, Sumatra, Java, Borneo, Philippines, Maluku) · · · · · 3. **A. medium**  
Leaf lamina not perforated, segments usually drooping, lamina often exceeding 75 cm in length; plants with copious net-like fibres on the apices of flowering shoots; ripe infructescences dark orange-red (Philippines, Sulawesi, Maluku, New Guinea) · · · · · 5. **A. zippelianum**

## FIELD KEY TO STERILE AND JUVENILE SPECIMENS

1. Plants without adherent climbing stems · · · · · 2  
Plants with adherent climbing stems · · · · · 8
2. Leaves entire, with or without perforations · · · · · 3  
Leaves variously divided, with or without perforations · · · · · 7
3. Leaf base cordate · · · · · 4  
Leaf base rounded to cuneate (P.R. China, N Vietnam) · · · · · 4. **A. sinense**
4. Leaf lamina thinly coriaceous · · · · · 5  
Leaf lamina thickly coriaceous (Peninsular Malaysia; Sumatra) · · 2. **A. humile**

5. Petiolar sheath extending almost to apical geniculum. Leaf lamina lanceolate, often with perforations. Stems smooth (P. R. China (incl. Hainan), N Vietnam) . . . . . 1. **A. hainanense**  
 Petiolar sheath short, often not exceeding basal geniculum, never extending more than half way along petiole. Leaf lamina various. Stems various . . . .6
6. Leaf lamina mostly ovate, never with perforations. Stems rough (P. R. China, N Vietnam) . . . . . 4. **A. sinense**  
 Leaf lamina broadly ovate to oblong-lanceolate, occasionally with a few perforations. Stems smooth (Myanmar, Thailand, Cambodia, Vietnam?, Peninsular Malaysia, Singapore, Sumatra, Java, Borneo, Philippines, Maluku) . . . . . 3. **A. medium**
7. Leaf pinnatifid to pinnatisect, never perforated (Philippines, Sulawesi, Maluku, New Guinea) . . . . . 5. **A. zippelianum**  
 Leaf pinnatifid to pinnatifid, almost always perforated (Myanmar, Thailand, Cambodia, Vietnam?, Peninsular Malaysia, Singapore, Sumatra, Java, Borneo, Philippines, Maluku) . . . . . 3. **A. medium**
8. Apices of adherent stems with copious net-like fibres; leaf lamina various, often exceeding 75 cm in length; (Philippines, Sulawesi, Maluku, New Guinea) . . . . . 5. **A. zippelianum**  
 Apices of adherent stems without net-like fibres, although cataphylls sometimes degrading into weak, free fibres or if net-like fibres present then lamina segments drooping; leaf lamina, usually not exceeding 50 cm, if longer then with net-like fibres and usually drooping segments . . . . . 9
9. Leaf lamina entire, much perforated (P. R. China (incl. Hainan), N Vietnam) . . . . . 1. **A. hainanense**  
 Leaf lamina not as above . . . . . 10
10. Leaf lamina entire, never perforated (P. R. China, N Vietnam) . . . . 4. **A. sinense**  
 Leaf lamina pinnatifid, pinnatifid or pinnatisect, perforated or not . . . 11
11. Leaf lamina pinnatisect or pinnatifid, never perforated, segments usually drooping, lamina often exceeding 75 cm in length; plants with copious net-like fibres at the apices of adherent shoots; (Philippines, Sulawesi, Maluku, New Guinea) . . . . . 5. **A. zippelianum**  
 Leaf lamina pinnatifid or pinnatifid, almost always perforated, segments spreading, lamina seldom exceeding 50 cm in length; plants lacking net-like fibres at the apices of adherent shoots; (Myanmar, Thailand, Cambodia, Vietnam?, Peninsular Malaysia, Singapore, Sumatra, Java, Borneo, Philippines, Maluku) . . . . . 3. **A. medium**

## CONSPECTUS OF SPECIES

1. **Amydrium hainanense** (*C. C. Ting & C. Y. Wu ex H. Li et al.*) *H. Li* in *C. Y. Wu & H. Li*, *Fl. Reip. Pop. Sinicae* 13 (2): 24, Pl. 4, 11 – 16 (1979); *P. C. Boyce & Ressler* (1999) [http://www.vwc.edu/wwwpages/presslar/greenhouse/amydrium/genus\\_am.htm](http://www.vwc.edu/wwwpages/presslar/greenhouse/amydrium/genus_am.htm). Type: Hainan, *X. Q. Liu* 26378 (GUIZ *n.v.* (photograph of type in *Acta Phytotax. Sin.* 15(2): Pl. 5, 1!))

*Epipremnopsis hainanensis* C. C. Ting & C. Y. Wu ex H. Li *et al.*, Acta Phytotax. Sin. 15 (2): 102 (1977); Fl. Yunnan 2: 747, Pl. 203, 11 – 16 (1979). Type as above.

Large root-climbing liane to 5 m. *Stem* stout, on climbing shoots up to 1.5 cm diam.; internodes 2 – 3 cm long, epidermis smooth. *Foliage leaves* clustered, only interspersed with cataphyll-bearing nodes on juvenile, terrestrial stems; petiole moderately robust; apical geniculum prominent, 20 – 30 cm on climbing shoots, on juvenile branches 4 – 5 cm; sheath narrow, reaching base of leaf lamina, early caducous, falling to leave a prominent scar, base amplexicaul; leaf lamina ovate-lanceolate to falcate-lanceolate, entire, chartaceous, mid-green when fresh, drying dark brown to almost black, 25 – 45 × 8.5 – 17.3 cm on climbing shoots, 13 – 17 × 5 – 6.5 cm on juvenile branches, usually with large and small, ovate or oblong, 4 – 6 × 1.5 – 4 cm perforations, these sometimes reaching margin and midrib; apex abruptly acuminate; base oblique-rounded to oblique sagittato-cordate; posterior lobes frequently of unequal size; primary lateral veins numerous, prominent abaxially, ascending and arched. Inflorescence solitary; peduncle terete, stout, 8 – 10 × c. 0.4 cm diam., epidermis smooth, mid-green; spathe shortly cymbiform, 8 – 5 × 8 – 9 cm, apex rostrate, yellowish red; spadix stipitate; stipe 3 – 10 mm; fertile portion of spadix cylindrical, 4.3 – 6 × 1.3 – 1.5 cm diam., apex obtuse, base subtruncate; *Flowers*: stamens 6; ovary hexagonal, cylindrical; stylar region truncate, 3 × c. 2.5 mm; stigma sessile, longitudinally oblong. Figs 1, 2.

DISTRIBUTION. China (Guangdong, Guangxi, Hainan, Hunan and Yunnan, *vide* Li 1979); N Vietnam (Ha Tay).

GEOGRAPHICALLY REPRESENTATIVE SELECTION OF COLLECTIONS STUDIED.

CHINA. Yunnan: 28 Sept. 1980 (fl.), 134 (KUN).

VIETNAM. Ha Tay: Ba Vi, c. 80 km W of Hanoi, 21°03'N, 105°21'E, 19 July 1995 (sterile), *V. D. Nguyen & Croat* 77830 (HN, K, MO) & 5 March 1997 (sterile), *Boyce* 1150 (HN, K, M) & 25 Sept. 1998 (fl., fr.) *V. D. Nguyen* s.n. (HN, K).

ECOLOGY. Dense wet hill to montane forest, on precipitous slopes or beside water, climbing on trees or creeping over rocks; 300 – 1600 m.

A species of remarkable appearance with mature leaf laminae often so profoundly perforate as to resemble a fragile net of tissue. *Amydrium hainanense* is widespread but somewhat erratic in distribution, which may explain why it was described only quite recently. Its discovery in Vietnam is not unexpected, although it is perhaps surprising that it has remained undetected for so long on a relatively well collected mountain. However, on Ba Vi it appears to be restricted to one locality in very wet dense forest on precipitous slopes.

There is nothing with which to confuse this species in Indochina; even in the juvenile stage the leaves are unmistakable. Cultivated specimens might conceivably be mistaken for the horticulturally popular highly perforate-leaf forms of *Monstera adansonii* Schott var. *laniata* (Schott) Madison (syn. *M. friedrichsthali* Schott) but can be distinguished by the prominently raised reticulate leaf venation.

2. *Amydrium humile* Schott, Ann. Mus. Bot. Lugduno-Batavum 1: 127 (1863); Engl. & K. Krause in Engl., Pflanzenr. 37 (IV. 23B): 118 (1908); Nicolson, Blumea 16 (1):

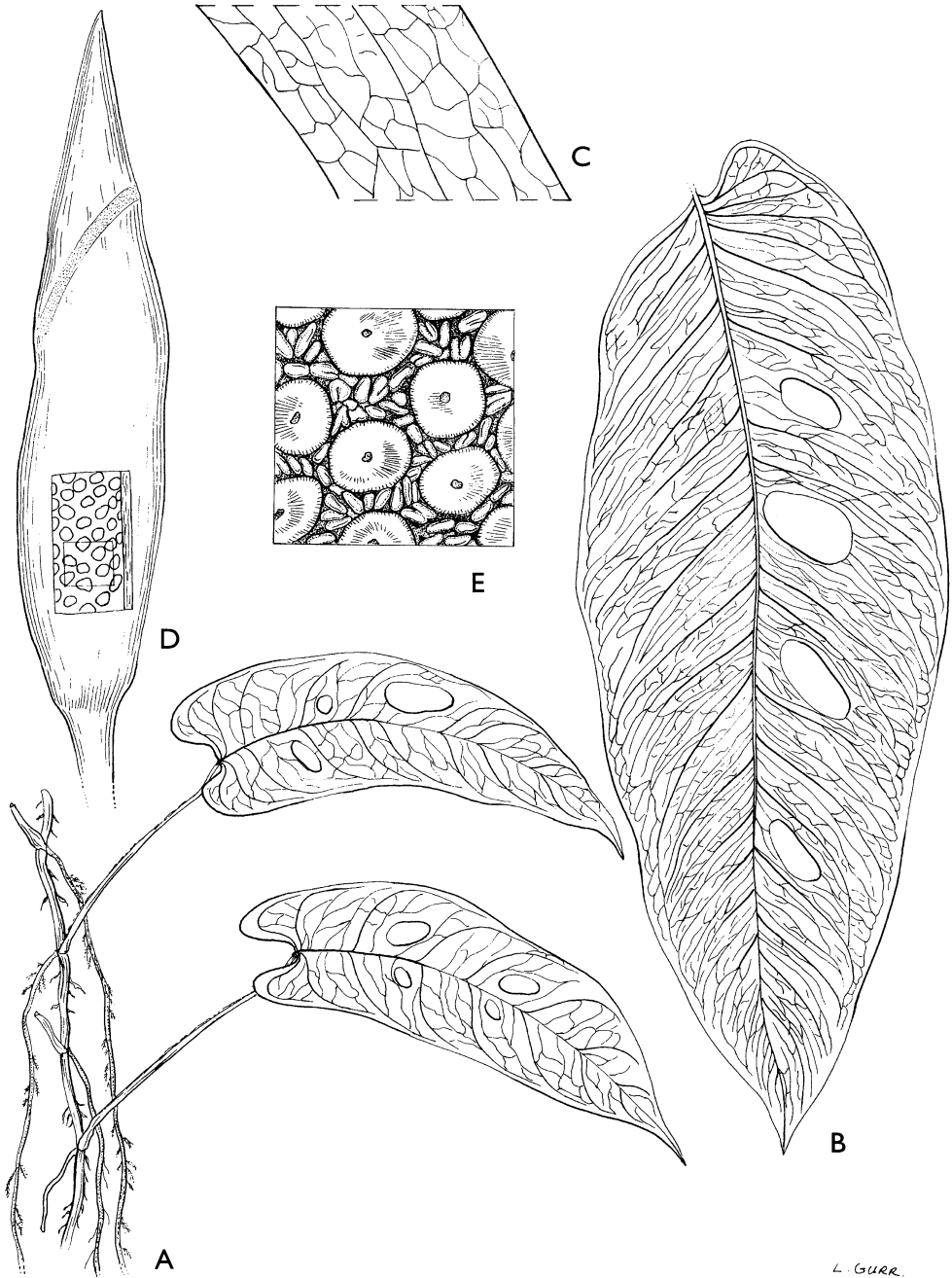


FIG. 1. *Amydrium hainanense*. **A** pre-adult shoot  $\times \frac{1}{4}$ ; **B** lamina (abaxial view)  $\times \frac{1}{4}$ ; **C** venation detail (abaxial surface)  $\times 3$ ; **D** inflorescence prior to opening  $\times 2$ ; **E** spadix detail  $\times 12$ . Drawn from V. D. Nguyen & Croat 77830 by Linda Gurr.





FIG. 2. *Amydrium hainanense*. **A** fertile shoot  $\times 1/4$ ; **B** immature infructescence  $\times 2/3$ ; **C** spadix detail  $\times 3$ . Drawn from V. D. Nguyen & Croat 77830 by Linda Gurr.

123 – 127 (1968); Mayo, Bogner & P. C. Boyce, *Genera of Araceae*: pl. 13 M, (1997); P. C. Boyce & Ressler (1999) [http://www.wvc.edu/wwwpages/presslar/greenhouse/amyridium/genus\\_am.htm](http://www.wvc.edu/wwwpages/presslar/greenhouse/amyridium/genus_am.htm). Type: Indonesia: Sumatra, *Korthals* s.n. (holotype L!).

*Epipremnum humile* (Schott) Hook. f., *Fl. Brit. Ind.* 6: 559 (1893); *Rhaphidophora humilis* (Schott) Ridl., *Mat. Fl. Malay. Penins.* 3: 41 (1908) ('*humile*'). Type as above.

For a detailed description of *A. humile* see Nicolson (1968).

DISTRIBUTION. Indonesia (Sumatra), Malaysia (Peninsular).

ECOLOGY. Humid evergreen primary to disturbed forest at low to medium altitude. Often, but not habitually, on limestone, occasionally in long-abandoned rubber plantations; 35 – 1800 m.

The only *Amydrium* species that does not flower on climbing shoots, *A. humile* forms sprawling colonies with coriaceous, occasionally almost sub-succulent, green to greyish leaves scattered along rooting sterile branches the internodes of which often exceed 20 cm. Arising sporadically from these scattered nodes are condensed branches, bearing three or more leaves, from which the inflorescences arise.

**3. *Amydrium medium*** (*Zoll. & Moritzi*) Nicolson, *Blumea* 16: 124 (1968); P. C. Boyce (1997) in M. J. E. Coode *et al.*, A checklist of the flowering plants and gymnosperms of Brunei Darussalam, 341; Mayo, Bogner & P. C. Boyce, *Genera of Araceae*: pl. 13 A – H, pl. 113 A (1997); P. C. Boyce & Ressler (1999) [http://www.wvc.edu/wwwpages/presslar/greenhouse/amyridium/genus\\_am.htm](http://www.wvc.edu/wwwpages/presslar/greenhouse/amyridium/genus_am.htm). Type: Indonesia: Java, 25 Dec. 1842 (fl.), *Zollinger* 982 (holotype L!; isotypes B!, FI!, G, P!).

*Scindapsus medius* Zoll. & Moritzi, *Syst. Verz.*: 82 (1846); *Anadendrum medium* (Zoll. & Moritzi) Schott, *Bonplandia* 5: 45 (1857); *Epipremnum medium* (Zoll. & Moritzi) Engl. in A. & C. DC., *Monogr. Phan.* 2: 250 (1879); *Epipremnopsis media* (Zoll. & Moritzi) Engl. in Engl., *Pflanzenr.* 37 (IV. 23B): 1 (1908). Type as above.

*Rhaphidophora huegelii* Schott, *Bonplandia* 5: 45 (1857); *Scindapsus huegelii* (Schott) Ender, *Index Aroid.*: 74 (1864); *Epipremnopsis huegelii* (Schott) Engl. in Engl., *Pflanzenr.* 37 (IV. 23B): 138 (1908) ('*huegeliana*'). Type: Philippines: Luzon, Manila *Huegel* (W).

*Epipremnum truncatum* Engl. & K. Krause in Engl., *Pflanzenr.* 37 (IV.23B): 63 (1908).

Type: Philippines: Leyte, Palo, Jan. 1906 (fr.), *Elmer* 7291 (holotype B!; isotype L!).

*Epipremnopsis subcordata* M. Hotta, *Acta Phytotax. Geobot.* 22: 2 (1966). Type: Malaysia: Sarawak, Bintulu, about 8 km E from Minah Camp, along survey route from Sg. Minah, 19 Oct. 1963 (fr.), *Hirano & Hotta* 347 (holotype KYO!).

[*Rhaphidophora kerrii* Gagnep., *nom. nud. in sched. K et P*]

For a detailed description of *A. medium* see Nicolson (1968).

DISTRIBUTION. Brunei Darussalam, Indonesia (Java, Kalimantan, Maluku, Sumatra), Malaysia (Peninsular, Sabah, Sarawak), Myanmar, Philippines, Thailand.

GEOGRAPHICALLY REPRESENTATIVE SELECTION OF THAI AND INDOCHINESE COLLECTIONS STUDIED.

MYANMAR. Tenasserim: Zimba Valley, 24 Nov. 1924 (fl.), *Parker* 2273 (K).

THAILAND. Kanchanaburi: Kwa Noi river basin, Neeckey, near Wangka, 13 May 1946 (fr.), *Kostermans* 413 (K). Chumpon: 40 km S of Chumpon, 24 March 1971 (sterile), *Bogner* 433 (K). Surat Thani: Ban Yao, 23 Feb. 1930 (fl.), *Kerr* 18232 (K). Krabi: Kaw Pa, 13 April 1930 (fl./fr.), *Kerr* 19404 (K). Nakhon Si Thammarat: Lansaka, Kamjan, Khao Luang N.P., SE side, 24 March 1993 (fl., fr.), *Chantaranothai et al.* 1366 (K, KKU, TCD); Tung Song, 18 Feb. 1928 (fr.), *Put* 2373 (K). Trang: Khao Chong, 9 Oct. 1970 (fl., fr.), *Charoenphol et al.* 3503 (K); Khao Chong F.S., 17 Jan. 1962 (fl.), *Nicolson* 1701 (K).

ECOLOGY. Low to mid-elevation humid to wet primary to disturbed evergreen forest on a variety of substrates; 65 – 1500 m.

An unmistakable aroid liane by virtue of the mature leaves with prominently reticulate venation, perforations and pinnation (see Mayo *et al.* 1997: 117, pl.13, B) and ripe fruits with domed styler tissue resembling white berries (see Boyce & Ressler 1999).

Juvenile specimens can be confused with *Rhaphidophora korthalsii* Hassk. and *R. tetrasperma* Hook. f., particularly in regions where the three taxa are sympatric, e.g., in southern Peninsular Thailand. However, both the *Rhaphidophora* have a shingling juvenile stage (see Boyce 1998) whereas *A. medium* has spreading leaves.

**4. *Amydrium sinense* (Engl.) H. Li** in C. Y. Wu & H. Li, Fl. Reip. Pop. Sinicae 13 (2): 23, Pl. 4, 8 – 10 (1979); M. L. Sai in B. Zhu *et al.*, Fl. Guizhou. 6: 549 – 550, Fig. 162 (1987); P. C. Kao in P. C. Kao & Z. M. Tan, Fl. Sichuan. 9: 380 – 382, Pl. 120 1 – 3 (1989); P. C. Boyce & Ressler (1999) [http://www.vwc.edu/wwwpages/presslar/greenhouse/amyridium/genus\\_am.htm](http://www.vwc.edu/wwwpages/presslar/greenhouse/amyridium/genus_am.htm). Type: China, Sichuan, Nan chuan, Sept. 1891 (fr.), *Rosthorn* 758 (holotype B!).

*Scindapsus sinensis* Engl., Bot. Jahrb. Syst. 29: 234 (1900); Engl. & K. Krause in Engl., Pflanzenr. 37 (IV. 23B): 80 (1908); *Epipremnopsis sinensis* (Engl.) H. Li, Acta Phytotax. Sinica 15 (2): 102 (1977); Fl. Yunnan 2: 745 – 747, Pl. 203, 18 – 10 (1979). Type as above.

*Rhaphidophora dunniana* H. Lév., Repert. Spec. Nov. Regni Veg. 9: 325 (1911); Rehder, J. Arnold. Arbor. 17: 57 (1936). Type: China, Guizhou, Feb. 1905, *Esquirol* 246 (holotype (fl.) E!; isotype (sterile) K!).

Creeping and root-climbing liane to 8 m. *Stem* slender, 3 – 5 mm diam.; internodes 3 – 5 cm long, epidermis rough. *Foliage leaves* scattered, interspersed with few to rather many cataphyll-bearing nodes; petiole slender, 5.5 – 9 (– 15) cm; sheath narrow, extending to c. half way along petiole, soon degrading into free fibres and falling to leave an obscure scar; (foliage) leaf lamina oblong-ovate to oblong-lanceolate, entire, stiffly chartaceous to coriaceous, light green when fresh, after drying dark brown to black-brown, 9 – 23 × 4 – 8 cm, apex acute, base rounded, cuneate to cordate (the latter in juvenile leaves), slightly to strongly asymmetric; lateral veins many, diverging at c. 30° from midrib, reaching and forming marginal vein. *Inflorescence* solitary; peduncle terete, stout, 3.5 – 6 × 0.2 – 0.3 cm diam., epidermis rough, pale green; spathe fusiform in bud, c. 7 × c. 2.2 cm at widest point green, opening cymbiform, depressed-ovate, 8 – 9 × 11.5 cm (i.e. wider than long),

notably thickened, soon falling to leave a prominent wide scar, yellow-green to yellow; spadix stipitate; stipe 5 – 10 mm; fertile portion of spadix obovoid, c. 4 × 1.8 cm, apex obtuse, narrowed towards the base. *Flowers*: filaments 4 mm long; anthers oblong, 3 mm long; ovary 5 – 6-angular, cylindric, 4 × 5 mm; stylar region truncate; stigma sessile, nearly circular. *Fruits* green ripening through yellow to orange-red, malodorous (*vide* H. Li (1979)) or pleasantly smelling and sweet tasting (*vide* Dzu, pers. obs.). *Seeds* 1 – 2, brown, obovate, kidney-shaped, 2 mm long. Fig. 3.

**DISTRIBUTION.** China (Guangxi, Guizhou, Hubei, Hunan, Sichuan and Yunnan, *vide* Li 1979); N Vietnam (Ha Giang).

**GEOGRAPHICALLY REPRESENTATIVE SELECTION OF COLLECTIONS STUDIED.**

**CHINA.** Guangxi: Ling-yun, 13 July 1937 (sterile), X. Liu 28605 (MO); Nam dan, 7 Oct. 1937 (fr.), Z. Huang 410?8 (MO); no further data (fr.), C. Wang 41058 (GH). Guizhou: Feb. 1905 (sterile), Esquirol 246 (type of *Rhaphidophora dunniana*); 25 July 1983 (fl.), Xiang Qian Team 2461 (KUN). Yunnan: Houang Tsao-pa (juvenile) *Cavalerie* 7372 (E, K); Xichou, Fadou, 28 Sept. 1960 (fl.), H. Li 142 (KUN).

**VIETNAM.** Ha Giang: Dong Van, 12 Nov. 1997 (fr.), V. D. Nguyen 214 (HN); Hoang Su Phi, Ho Thau, on the road to Chin lung thy, 16 Nov. 1997 (fr.), V. D. Nguyen 221 (HN).

**ECOLOGY.** Evergreen humid to wet forest, terrestrial when juvenile, climbing on trees or over rocks at maturity; 550 – 1900 m.

Although widespread and often abundant in nature *Amydrium sinense* is usually encountered as the juvenile form with small ovate-cordate leaves scattered along lengthy, flexuous creeping stems and is therefore frequently overlooked. Only periodically does one encounter the adult fertile climbing stage in which the leaves, although of a similar shape, are considerably larger and congested along a stout stem.

As with *Amydrium hainanense*, the discovery of *A. sinense* in northern Vietnam is not a surprise, although that this discovery should be an adult fertile specimen is a little unexpected. *A. sinense* may be much more widespread in Vietnam, but probably overlooked as a juvenile *Anadendrum*.

Li (1979) notes that the stems and leaves of *A. sinense* are used for treating traumatic injury, fractures and angina pectoris.

**5. *Amydrium zippelianum*** (Schott) Nicolson, *Blumea* 16: 126 (1968); A. Hay, *Aroids Papua N. Guinea*: 47, pl. viii, c (1990); P. C. Boyce, *Bot. Mag.* 12 (2): 85 – 89, *Plant portrait* 269 (1995); Mayo, Bogner & P. C. Boyce, *Genera of Araceae*: pl. 13 J – K (1997); P. C. Boyce & Ressler (1999) [http://www.vwc.edu/wwwpages/presslar/greenhouse/amyridium/genus\\_am.htm](http://www.vwc.edu/wwwpages/presslar/greenhouse/amyridium/genus_am.htm). Types: 'New Guinea', Zippel s.n. (L 898!, L 894!).

*Rhaphidophora zippeliana* Schott, *Ann. Mus. Bot. Lugduno-Batavum* 1: 129 (1863); [*Pothos miniata* Zipp. ex Miq., *Ann. Mus. Bot. Lugduno-Batavum* 1: 130 (1863), *nom. superfl. pro. Rhaphidophora zippeliana* Schott]; *Epipremnum zippelianum* (Schott) Engl., *Bot. Jahrb. Syst.* 1: 182 (1880); Engl. in Beccari, *Malesia* 1: 274, t. 20, fig. 10 – 12 (1882); *Epipremnopsis zippeliana* (Schott) Alderw., *Bull. Jard. Bot. Buitenzorg sér. 3, 4*(5): 378 (1920). Type as above.

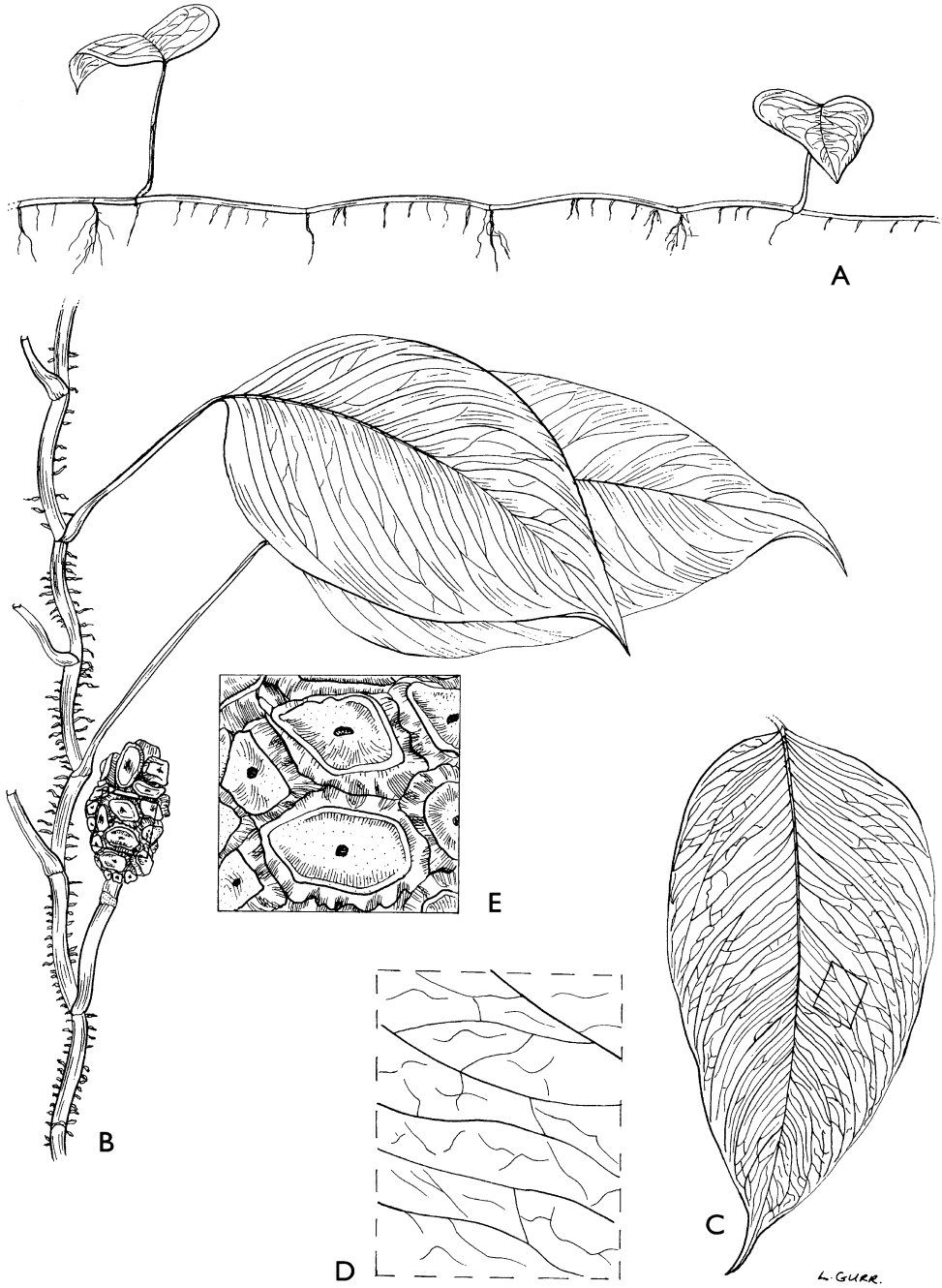


FIG. 3. *Amydrium sinense*. A juvenile shoot  $\times \frac{1}{3}$ ; B fertile shoot  $\times \frac{1}{2}$ ; C lamina (abaxial view)  $\times \frac{1}{2}$ ; D venation detail (abaxial surface)  $\times 3$ ; E spadix detail  $\times 2$ . Drawn from V. D. Nguyen 221 by Linda Gurr.

L. GURR.

- Epipremnum asperatum* Engl., Bull. Soc. Tosc. Ortic. 4: 270 (1879). Types: Papua New Guinea, Fly R., 1876, *d'Albertis* s.n. (FI!); Indonesia, Moluccas, Ternate, Aequi Conora, Sept. 1874, *Beccari* P.M. s.n. (FI!).
- Epipremnum magnificum* Engl., Bull. Soc. Tosc. Ortic. 4: 270 (1879); Engl. in *Beccari*, Malesia 1: 274, t. 20, fig. 6–9 (1882); *Epipremnopsis magnifica* (Engl.) Alderw., Bull. Jard. Bot. Buitenzorg sér. 3, 4 (2): 330 (1922); *Amydrium magnificum* (Engl.) Nicolson, Blumea 16: 125 (1968). Lectotype (selected by Nicolson 1968): Indonesia, Sulawesi, Penisola SE a Lepo-Lepo presso Kandari, July 1874, *Beccari* P.S. s.n. (B!, FI!).
- Rhaphidophora warburghii* Engl., Bot. Jahrb. Syst. 37: 116 (1905). Type: Philippines: Luzon, 1888 (fl.), *Warburg* s.n. (holotype B!).
- Epipremnum elmerianum* Engl. in Engl., Pflanzenr. 37 (IV. 23B): 66 (1908). Type: Philippines: Lyete, near Palo, Jan. 1906 (fr.), *Elmer* 7295 (holotype B!, isotypes BO!, G!, K!).
- Epipremnum philippinense* Engl. & K. Krause in Engl., Pflanzenr. 37 (IV. 23B): 137 (1908). Types: Philippines: Luzon, Tayabas prov., Lucban, May 1907 (fr.), *Elmer* 7623 (B!), *Elmer* 9253 (B†, PNH†).
- Epipremnum luzonense* K. Krause, Bot. Jahrb. Syst. 45: 659 (1911). Type: Philippines: Luzon, Laguna prov., near Paete, July 1909, *Ramos* PNH 10052 (PNH†).
- Epipremnum mampuanum* Alderw., Bull. Jard. Bot. Buitenzorg sér. 3 1(5): 378 (1920). Type: Sulawesi, Mt Mampoe, *van Vuuren* sub. *Alderwerelt* 251 ex. cult Bogor Bot. Gard. (BO)
- [*Epipremnum miniatum* Elmer ex Merr., Leafl. Philipp. Bot. 10 (133): 3622 (1938) *nom. nud. sine descr. Latin.*; Elmer, Enum. Philipp. fl. pl. 1: 177 (1923) *nomen*. Based on: Philippines: Luzon, Sorsogon prov., Irosin (Mt Bulusan), Oct. 1915, *Elmer* 14522 (K!, PNH†, US); Philippines: Luzon, Sorsogon prov., Irosin (Mt Bulusan), Nov. 1915, *Elmer* 15113 (K!, P!, US); Philippines: Luzon, Sorsogon prov., Irosin (Mt Bulusan), June 1916, *Elmer* 16422 (K!, PNH†, US)].
- [*Epipremnum sorsogonense* Elmer ex Merr., Enum. Philipp. fl. pl. 1: 177 (1923) *nom. nud. sine descr. Latin.* Based on: Philippines: Luzon, Sorsogon prov., Irosin (Mt Bulusan), June 1916, *Elmer* 16422 (K!, PNH†, US)].

For a detailed description of *A. zippelianum* see Boyce (1995).

DISTRIBUTION. Indonesia (Irian Jaya, Maluku, Sulawesi), Papua New Guinea, Philippines.

ECOLOGY. Primary to disturbed lowland to mid-elevation rainforest. 30–1800 m.

The characters distinguishing *A. magnificum* and *A. zippelianum* cited (with caution) by Nicolson (1968) have since been shown to be unreliable (Hay 1990; Boyce 1995). Bogner (pers. comm.) remarked that populations of *A. zippelianum* in the Philippines (referable to *A. magnificum* in Nicolson 1968) divided into those in which plants had mature leaves with drooping leaflets and those which had spreading leaflets. The significance of this character is not fully understood and does not correlate with the stipitate vs. sessile spadix and asperulous vs. smooth petioles and peduncles hitherto used to distinguish *A. magnificum* and *A. zippelianum*. Mature, flowering plants in cultivation at K originating from the Philippines (i.e. referable to *A. magnificum*) and Papua New Guinea (referable to *A. zippelianum*) are indistinguishable.

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