

Compendium Genera Aracearum Malesianum

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ABSTRACT

A summary of the aroids of the Flora Malesiana region at the rank of genus is provided. Identification notes for each genus and, where appropriate, their major subdivisions are given. The last monograph and all subsequent key literature is cited for each genus, and also compiled as a general entry. All 42 of currently recognized indigenous Malesian aroid genera (excluding three genera of former Lemnaceae) are detailed, and illustrated.

KEY WORDS

Araceae, Flora Malesiana, Indonesia, Malaysia, Singapore, Brunei Darussalam, Philippines, Timor Leste, Papua New Guinea, Borneo, Sumatera, Jawa.

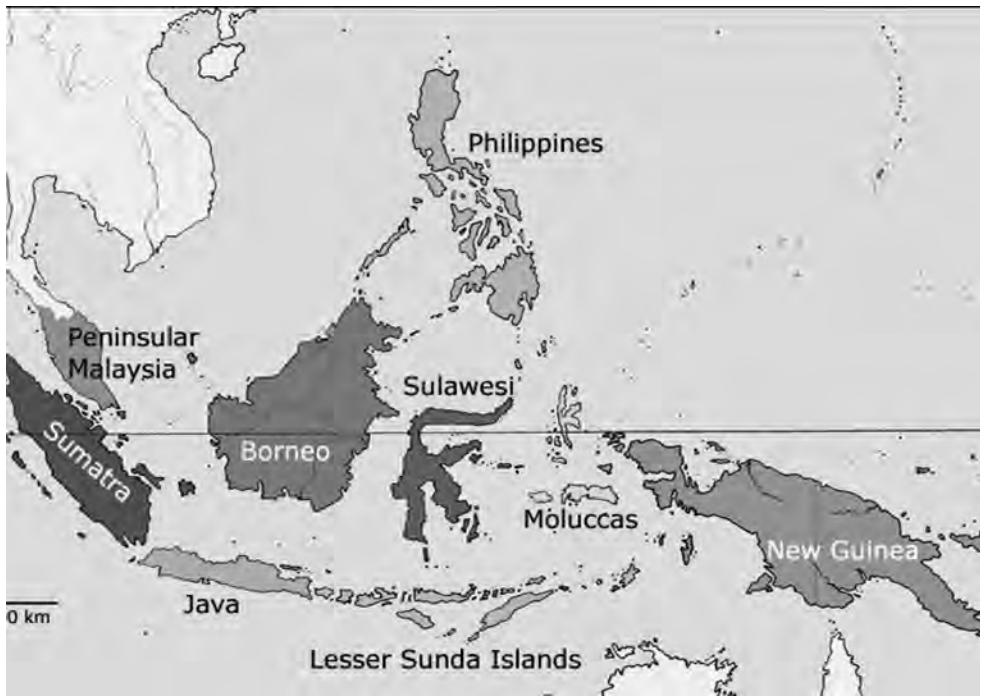
INTRODUCTION

Five years have passed since publication of the last review of the Araceae for Borneo (Boyce et al 2010). In that time understanding of generic delimitation has much improved, which combined with a wealth of new species discovered, and described (Boyce 2015), an updated review, expanded to include the Flora Malesiana region—the plant-geographical unit spanning seven countries in Southeast Asia: Indonesia, Malaysia, Singapore, Brunei Darussalam, the Philippines, Timor Leste, and Papua New Guinea—is a useful exercise.

Flora Malesiana (FM) is a systematic account of the flora of Malesia, the plant-geographical unit spanning seven countries in Southeast Asia: Indonesia, Malaysia, Singapore, Brunei Darussalam, the Philippines, Timor Leste, and Papua New Guinea (<http://floramalesiana.org/>).

The Araceae is one of the larger plant families of Malesia, currently comprising 42 described genera (excluding three genera of former Lemnaceae) and an estimated 1,200 species (excluding nine species of former Lemnaceae) with a substantial percentage of species either only recently named, or yet to be formally described (Boyce & Croat 2011; Boyce 2015).

Taxonomic entries below are arranged alphabetically by genus. Literature at the end of each genus entry is presented in date order, beginning with the most recent comprehensive account for each genus, with papers arranged A–Z by author within any given year.



Map 1. Map showing the Flora Malesiana area.

Aglaodorum Schott, *Gen. Aroid.*:58. 1858; Mayo et al. *The Genera of Araceae* 225, Pl. 78, 123A. 1997; Boyce et al. *The Araceae of Borneo, Aroideana* 33: 58–61, Pl. 32. 2010. Fig. 1.

Taxonomy & Distribution

One species occurring from southern Cambodia and Vietnam through Peninsular Malaysia and Sumatera to N. Borneo. **One species in the FM region.**

Ecology

Aglaodorum occurs as a colonial helophyte in open swamps, and on mud in freshwater and brackish tidal zones, usually in full sun.

Distinguishing Characteristics

Aglaodorum griffithii (Schott) Schott, the only species, is closely allied to *Aglaonema*, differing by vegetative and fruit features associated with a swamp-dwelling habitat. *Aglaodorum* and *Aglaonema* are distinguished by the presence of staminodes associated with the whorl of pistillate flowers in *Aglaodorum*. These are not easy to observe, however. Characters of *Aglaodorum* which are far more readily seen are the spongy rhizome and petioles and, in fruiting material, the large spongy fruits that act as floating dispersal units when ripe, in much the same manner as those of *Nypa fruticans* (Arecaceae). In striking contrast, the fruits of *Aglaonema* are red or more rarely pink and bird-dispersed. The helophytic habitat of *Aglaodorum* is diagnostic.

Notes

Seeds of *Aglaodorum* differ markedly from those of *Aglaonema* in their means of germinating. Fully developed seed of *Aglaodorum* remain inside the fruit, which acts as a flotation unit, later splitting to allow extension of numerous cilia-like prophylls, reminiscent of those of *Cryptocoryne ciliata* (Roxb.) Schott. By comparison, seeds of *Aglaonema* are dispersed by birds, falling to the ground with the pericarp removed, and germinating by extension of a single radical.

Literature

1969

Nicolson, D. H. 1969. A Revision of the Genus *Aglaonema*. (Araceae). *Smithsonian Contr. Bot.* 1: 1–69.



Fig. 1. *Aglaodorum griffithii* (Schott) Schott. **A.** Plants in habitat. **B.** Inflorescence at pistillate anthesis. **C.** Ripe infructescence. **D.** Germinating seed. Unless otherwise stated all images are © Peter C. Boyce & Wong Sin Yeng.

Aglaonema Schott, *Wiener Z. Kunst* 1829: 892. 1829; Mayo et al., *The Genera of Araceae* 223, Pl. 77, 122D. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 61, Pl. 33. 2010. Fig. 2.

Taxonomy & Distribution

About 22 species distributed from tropical and subtropical Asia, occurring from NE India to SW China south as far as Jawa and east to New Guinea. **17 species in the FM region but the taxonomy remains imperfectly understood.**

Ecology

Aglaonema species occur in primary and secondary perhumid to ever-wet broadleaf evergreen forests. A few species are restricted to *kerangas* (tropical heath forest) or monsoonal perhumid semi-deciduous forests, and then often (always?) on limestone.

Distinguishing Characteristics

Most *Aglaonema* species are suffruticose, with the larger species occasionally reaching more than 1.5 m tall, although older plants often topple, with the decumbent portion of the stem rooting along its length and developing several erect shoots from older portions. A few species, mainly from monsoonal areas, have a creeping rhizome-like stem.

Literature

1969

Nicolson, D. H. 1969. A Revision of the Genus *Aglaonema*. (Araceae). *Smithsonian Contr. Bot.* 1: 1–69.

1998

Hay, A. 1998. A new species of *Aglaonema* Schott (Araceae) from Terengganu, Malaysia. *Gard. Bull. Singapore* 50: 1–4.

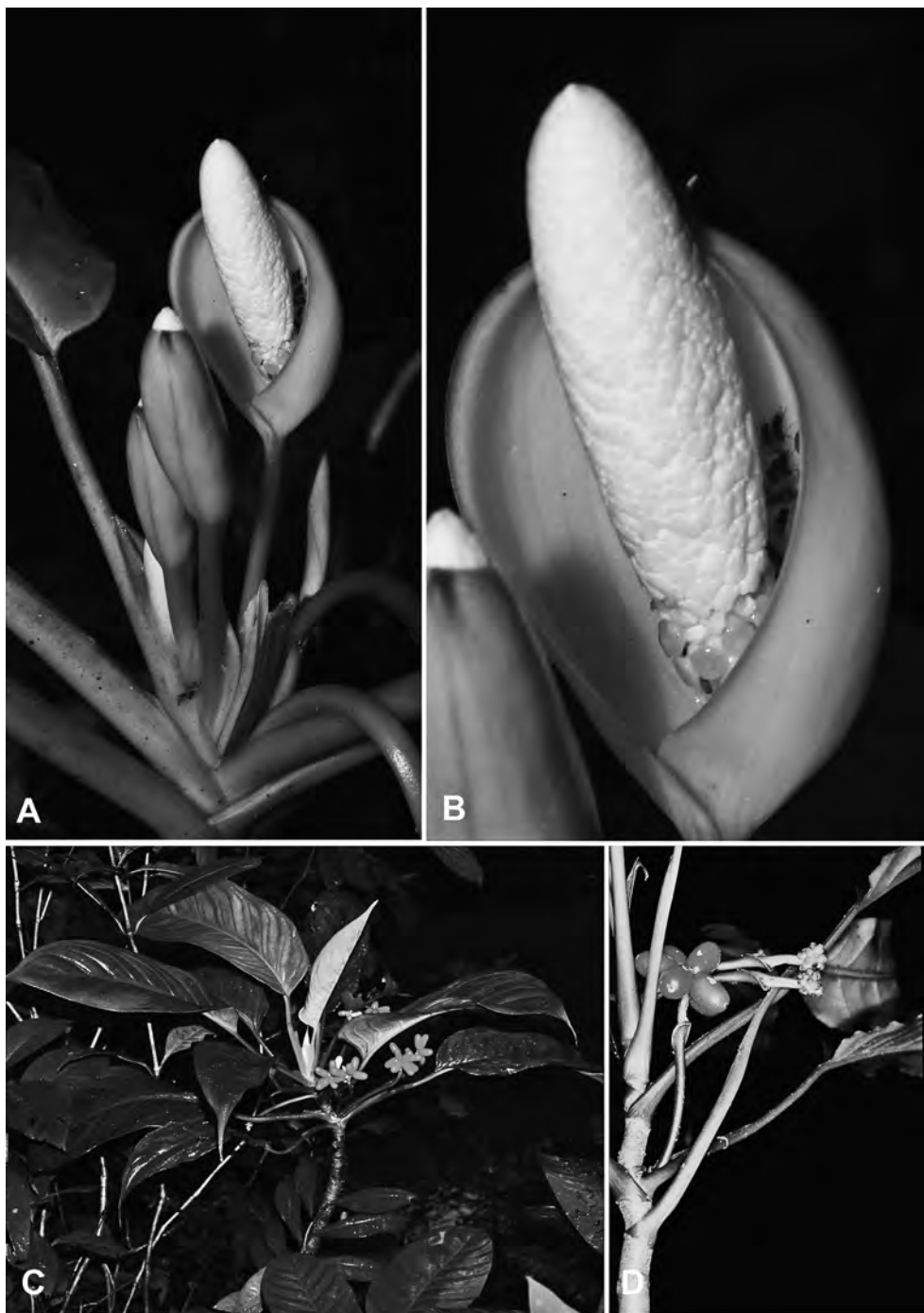


Fig. 2. *Aglaonema simplex* (Blume) Blume. A–B. Inflorescence at pistillate anthesis. C–D. Fruiting plants.

Alocasia (Schott) G. Don, *Hort. Brit.*, ed. 3: 631. 1839, *nom. cons.*; Mayo et al. 1997. *The Genera of Araceae* 283–286, Pl. 104i-ii & 130B; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 63, Pl. 35 & 36. 2010. Figs. 3–4.

Taxonomy & Distribution

About 100 species distributed from the subtropical eastern Himalayas throughout subtropical and tropical Asia into the tropical western Pacific and subtropical eastern Australia. **63 described species and ca. 24 undescribed species in the FM region.**

Ecology

Primary and secondary perhumid to ever-wet subtropical and broadleaf tropical forests, predominantly in the lowlands, extending from sea level to lower and mid-montane zones, a few species occurring in open swamps. Many *Alocasia* species are locally endemic limestone obligates, especially on Borneo and the Philippines. A few species are tolerant of quite strong seasonality. Throughout its range *Alocasia macrorrhizos* (L.) G. Don occurs only in association with human disturbance.

Distinguishing Characteristics

In the sterile state almost all *Alocasia* species have conspicuous waxy glands in the axils of the primary veins on the abaxial surface of the leaf. These are unique to *Alocasia*. Notwithstanding, *Alocasia* is often confounded with *Colocasia*, and in older literature these were separated on the basis of ovule number and placentation—many ovules on parietal placentas in *Colocasia*, few on basal placentas in *Alocasia* (e.g. Mayo et al. 1997: 90). These states are not really of practical use in field identification (Hay 1996). However, they translate in fruiting plants into markedly different dispersal syndromes, apparently involving birds in *Alocasia*, in marked contrast to the mammal dispersal syndrome of *Colocasia* where the fruits are smelly and inconspicuously colored with many tiny seeds in slimy mucilage. In respect of synflorescence architecture, *Alocasia* may be readily distinguished from *Colocasia* by its bimodular synflorescence subunits. Inflorescence multiplication in *Colocasia* is achieved in such a way that the whole synflorescence is equivalent to one bimodular unit in *Alocasia*. Where the inflorescence terminating the vegetative module has only one further inflorescence in the axil of its subtending cataphyll in *Alocasia* (with the synflorescence being built up by relay axes), in *Colocasia* the second inflorescence has a third in the axil of its prophyll and so on up to ca. 8 in *Colocasia gigantea*. The relay axis in *Colocasia* is vegetative and thus the whole synflorescence is displaced to a quasi-lateral position on one side of the shoot.

Literature

1968

Nicolson, D.H. 1968. The genus *Xenophya* Schott (*Araceae*). *Blumea* 16: 115–118.

1991

Hay, A. & R. Wise. 1991. The genus *Alocasia* (*Araceae*) in Australasia. *Blumea* 35: 499–545.

1994

Hay, A. 1994. *Alocasia simonsiana* - a new species of *Araceae* from New Guinea. *Blumea* 38: 331–333.

1997

Hay, A., P. C. Boyce & Wong K. M. 1997. *Alocasia melo*. *Bot. Mag.*, n.s. 14(2): 82–86, pl. 315.

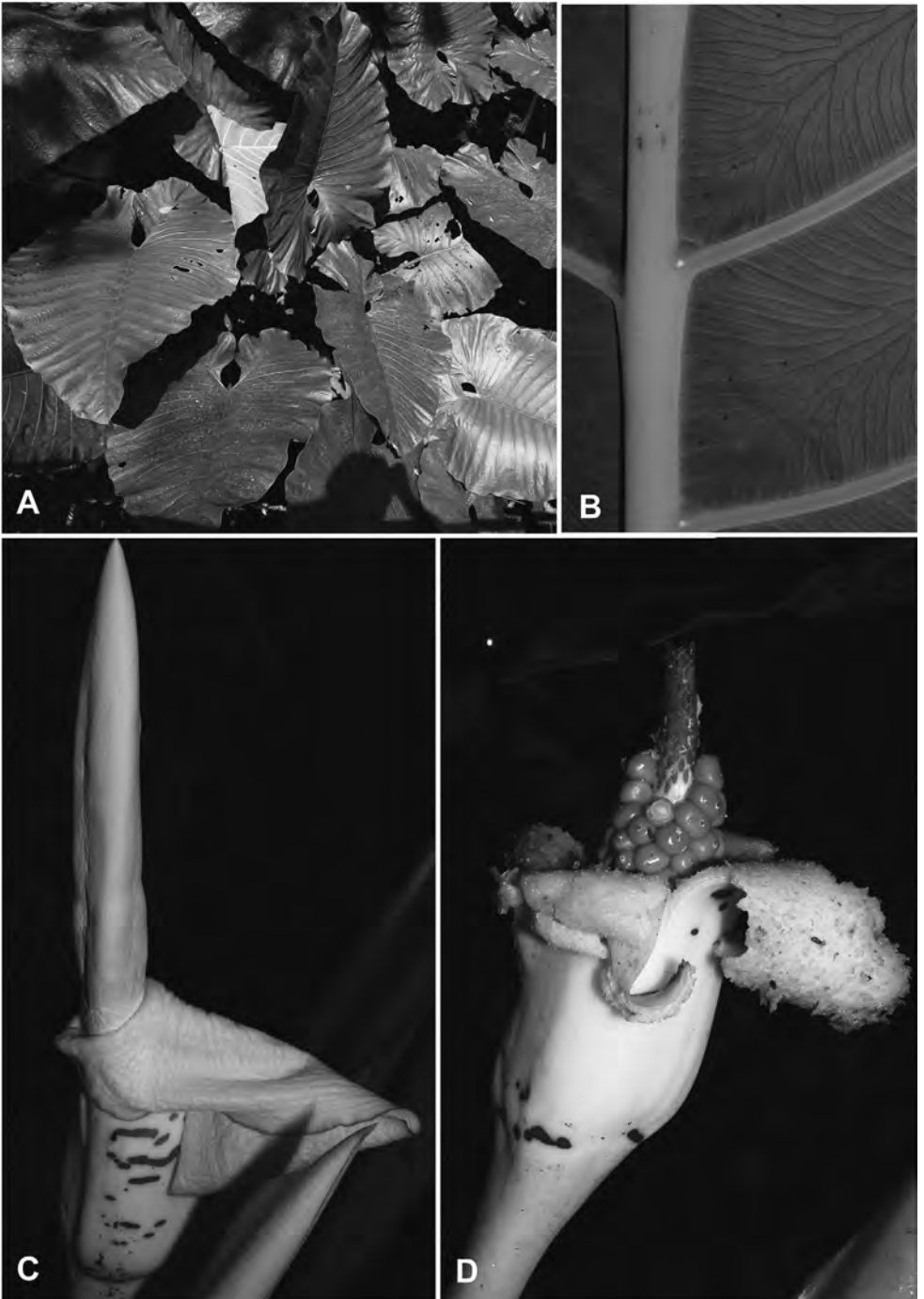


Fig. 3. *Alocasia sarawakensis* M.Hotta. **A.** Plants in habitat. **B.** Waxy glands on the under surface of leaf blade. **C.** Inflorescence at staminate anthesis. **D.** Ripe infructescence beginning to open to expose fruits.

1998

Hay, A. 1998. The genus *Alocasia* (Araceae-Colocasieae) in West Malesia and Sulawesi. *Gard. Bull. Singapore* 50: 221–334.

Yuzammi & A. Hay 1998. *Alocasia subirmaniana* (Araceae-Colocasieae): a spectacular new aroid from Sulawesi, Indonesia. *Teloepa* 7: 303–306.

1999

Hay, A. 1999. The genus *Alocasia* (Araceae-Colocasieae) in the Philippines. *Gard. Bull. Singapore* 51: 1–41.

2000

Hay, A. 2000. *Alocasia nebula*. *Bot. Mag., n.s.* 17: 14–18, pl. 381.

2007

Boyce, P. C. 2007. Studies on the *Alocasia* Schott (Araceae-Colocasieae) of Borneo: I. Two new species from Sarawak, Malaysian Borneo. *Gard. Bull. Singapore* 58(2): 141–154.

2011

Kurniawan, A. & P. C. Boyce. 2011. Studies on the *Alocasia* Schott (Araceae–Colocasieae) of Borneo II: *Alocasia baginda*, a new species from East Kalimantan, Indonesian Borneo. *Acta Phytotax. Geobot.* 60(3): 123–126.



Fig. 4. *Alocasia reginae* N.E.Br. **A.** Plant in habitat. **B.** Undersurface of leaf blade. **C.** Inflorescence at pistillate anthesis. **D.** Inflorescence at staminate anthesis. **E.** Spadix at pistillate anthesis.

Amorphoballus Blume ex Decne., *Nouv. Ann. Mus. Hist. Nat.* 3:366. 1834, *nom. cons.*; Mayo et al. 1997, *The Genera of Araceae* 235–239, Pl.79 i-iv & 124C-D; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 61, Pl. 34. 2010. Figs. 5–6.

Taxonomy & Distribution

Over 200 species distributed from tropical Africa and Madagascar, throughout the Indian subcontinent, the subtropical eastern Himalayas, subtropical and tropical Asia into the tropical western Pacific and N.E. Australia. **About 63 species in the FM region.**

Ecology

Lowland to upper hill forest seasonally dry, or perhumid to ever-wet broadleaf subtropical to tropical forest. Several species are locally endemic limestone obligates.

Distinguishing Characteristics

The often large, occasionally gigantic, inflorescence and decompose leaf are unique for the genus. Individual plants of the Malaysian species produce the inflorescence and leaf blade at different times, although in ever-wet habitats it is not uncommon to encounter populations where plants are at every stage of development.

Notes

The decompose leaves of *Amorphoballus* have the blade trisect, and with the primary divisions usually pinnatisect, bipinnatisect or dichotomously further divided, rarely undivided, highest order divisions (leaflets) entire, never fenestrate or lobed and only ever with one tip and bases decurrent, rarely petiolulate and the fact that the trisect parts are erect as they develop.

Literature

1911

Engler, A. 1911. Araceae–Lasioideae. In: A. Engler (ed.), *Das Pflanzenreich* 48(IV. 23C): 56–109, Figs. 22–37.

1925

Ridley, H. N. 1925. *Flora of the Malay Peninsula* 5: 92–95. Reeve & Co., London.

1982

Mayo, S. J., E. Widjaja & P. Gibbon. 1982. *Amorphoballus lambii*. *Curtis's Bot. Mag.* 184 (2): 61–64, t. 852.

1985

Bogner, J., S. J. Mayo & M. Sivadasan. 1985. New and changing concepts in *Amorphoballus*. *Aroideana* 8(1): 15–25.

1989

Bogner, J. 1989. A new *Amorphoballus* (Araceae) from Sarawak. *Willdenowia* 18: 441–443.

1992

Bogner, J. & W. L. A. Hettterscheid. 1992. Notes on the genus *Amorphoballus* (Araceae). 1. Three new species from tropical Asia. *Blumea* 36: 467–475.

1994

Hettterscheid, W. L. A. 1994. Preliminary taxonomy and morphology of *Amorphoballus* Blume ex Decaisne (Araceae), in M. M. Serebryanyi (ed.), *Proc. Moscow Aroid Conf.* 1992: 35–48.

Hettterscheid, W. L. A. 1994. Notes on the genus *Amorphoballus* (Araceae). 2. New species from tropical Asia. *Blumea* 39: 237–281.



Fig. 5. *Amorphophallus pendulus* Bogner & Mayo. A. Leaves in habitat. B. Inflorescence at staminate anthesis. C. Sub-mature infructescence.

1996

Hettterscheid, W. L. A. & S. Ittenbach. 1996. Everything you always wanted to know about *Amorphoballus* but were afraid to stick your nose into. *Aroideana* 19: 7–129.

1998

Barthlott, W. & W. Lobin (eds.). 1998. *Amorphoballus titanum*. *Trop. und subtrop. Pflanzenw.* 99: 1–225.

Ham, R. v. d., W. L. A. Hettterscheid & B. J. v. Heuven 1998. Notes on the genus *Amorphoballus* (Araceae) - 8. Pollen morphology of *Amorphoballus* and *Pseudodracontium*. *Rev. Palaeobot. Palynol.* 103: 95–142.

1999

Giordano, C., 1999. Observations on *Amorphoballus titanum* (Becc.) Becc. ex Arcangeli in the forest of Sumatra. *Aroideana* 22: 10–19.

2000

Ham, R. v. d., W. L. A. Hettterscheid & B. J. v. Heuven. 2000. Exine architecture in echinate pollen of *Amorphoballus* (Araceae) in relation to taxonomy. In: M.M. Harley, C.M. Morton & S. Blackmore (eds.). *Pollen and spores: Morphology and Biology*, pp. 241–248.

2001

Hettterscheid, W. L. A. & R. v. d., Ham. 2001. Notes on the genus *Amorphoballus* (Araceae) - 11. New and obsolete species from East Malaysia and continental Southeast Asia. *Blumea* 46: 253–282.

2005

Ham, R. v. d., G. Grob, W. L. A. Hettterscheid, W. Star & B. J. v. Heuven. 2005. Notes on the genus *Amorphoballus* (Araceae) – 13. Evolution of pollen ornamentation and ultrastructure in *Amorphoballus* and *Pseudodracontium*. *Grana* 44(4): 252–265.

2006

Hettterscheid, W. L. A. 2006. Notes on the Genus *Amorphoballus* (Araceae) 15. New Species from SE Asia. *Aroideana* 29: 53–79.

2010

Agung Sedayu, A., M. C. M. Eurlings, B. Gravendeel, W. L. A. Hettterscheid. 2010. Morphological character evolution of *Amorphoballus* (Araceae) based on a combined phylogenetic analysis of trnL, rbcL and LEAFY second intron sequences. *Bot. Stud. (Taipei)* 51(4): 473–490.

Boyce, P. C., I. B. Ipor & W. L. A. Hettterscheid. 2010. A Review of the white-flowered *Amorphoballus* (Araceae: Thomsoniae) species in Sarawak. *Gardens' Bulletin Singapore* 61(2): 249–268.

2012

Hettterscheid, W. L. A., A. Wistuba, V. B. Amoroso, M. P. Medecilo & C. Claudel. 2012. *Amorphoballus natolii* (Araceae), a new species from limestone on Palawan, Philippines. *Bot. Stud. (Taipei)* 53(3): 415–420.

2013

Magtoto, L. M., D. G. Mones, K. A. Ballada, K. A., C. M. Austria, R. M. Dizon, W. V. Alangui, A. A. Reginaldo, W. M. Galvan, K. T. Dizon & W. L. A. Hettterscheid. 2013. *Amorphoballus adamsensis* (Araceae), a new species from Ilocos norte, Philippines *Blumea* 58(3): 267–270.

2015

Yuzammi, J. R. Witono & W. L. A. Hettterschied. 2015. Conservation status of *Amorphoballus discophoris* Backer & Alderw. (Araceae) in Java, Indonesia. *Reinwardtia* 14(1): 27–33.



Fig. 6. *Amorphophallus eburneus* Bogner. **A.** Plant in habitat. **B.** View into lower spathe. **C.** Detail of spadix base, pistillate flowers below, staminate above. **D.** Ripe infructescence. **E.** Emerging leaf. **F.** Mature leaf blade.

Amydrium Schott, *Ann. Mus. Bot. Lugduno-Bataavum* 1:127. 1863; Mayo et al. 1997. *The Genera of Araceae* 116–118, Pl.13 & 113A. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 24, Pl. 3. 2010. Fig. 7.

Taxonomy & Distribution

Five species in tropical and subtropical E Asia from Myanmar to SW China as far south as Jawa and extending east to New Guinea. **3 species in the FM region.**

Ecology

Primary and secondary perhumid broadleaf tropical forests at low to moderate altitudes, seldom in tropical kerangas (*Amydrium medium* (Zoll. & Moritz) Nicolson). *Amydrium humile* Schott is restricted to forested Karst limestone.

Distinguishing Characteristics

Inclusively *Amydrium* is difficult to distinguish from other lianescent aroids, in particular *Epipremnum*. Two Malesian species (*Amydrium humile* Schott and *A. medium* (Zoll. & Moritz) Nicolson) are together uniquely distinguished by producing white, indehiscent berries, while the widespread (Philippines and Sulawesi to New Guinea) *Amydrium zippelianum* (Schott) Nicolson produces orange prismatic monstercarps (leathery pistils with the stylar portion sloughing away to reveal the pulp cavity and seeds). Literature reports the leaf blades of *Amydrium* as having sparse trichosclereids (abundant in other genera of Monstereae) but our observations do not wholly support this for the Malesian species. It is probable that *Amydrium* is phylogenetically heterogeneous.

Literature

1968

Nicolson, D. H. 1968. A revision of *Amydrium* (Araceae). *Blumea* 16: 123–127.

1995

Boyce, P. C. 1995. Plant portrait 269: *Amydrium zippelianum*. *Bot. Mag.* 12 (2): 85–89.

1999

Nguyen D.V. & P. C. Boyce. 1999. The genus *Amydrium* (Araceae–Monsteroideae–Monstereae) with particular reference to Thailand and Indochina. *Kew Bull.* 54(2): 379–393.



Fig. 7. *Amydrium medium* (Zoll. & Moritzi) Nicolson. **A.** Plant in habitat. **B.** Pre-adult plant; leaf blades are less divided and not yet perforated. **C.** Inflorescence at staminate anthesis. **D.** Ripe infructescence.

Anadendrum Schott, *Bonplandia (Hannover)* 5:45. 1857; Mayo et al. 1997. *The Genera of Araceae* 113, Pl.11. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 24–27, Pl. 4. 2010. Fig. 8.

Taxonomy & Distribution

About 40 species in tropical and subtropical Asia, from Myanmar to SW China as far east as the Philippines; most species in Sunda are as yet undescribed. **10 described species and about 20 undescribed species in the FM region.**

Ecology

Primary and secondary perhumid broadleaf tropical forests, at low to moderate altitudes. Some *Anadendrum* species are limestone-obligates, e.g. *A. calcicola* P.C.Boyce & S.Y.Wong, *A. muluensis* P.C.Boyce & S.Y.Wong.

Distinguishing Characteristics

Anadendrum is distinguished by having each flower with a perigone of fused membranous tepals, and inflorescences produced in distinctive fans at the tips of clinging shoots. Fruiting plants of *Anadendrum* and most *Pothos* are superficially similar by producing red or orange berries. However, those of *Anadendrum* are apically truncate with a conspicuous transverse linear stigma, whereas *Pothos* has ellipsoid to globose berries with a punctiform stigma.

Literature

1905

Engler, A. 1905. Araceae–Pothoideae. In: A. Engler (ed.), *Das Pflanzenreich* 21(IV.23B): 46–50, Fig. 19.

1986

Hotta, M. 1986. Checklist of the genus *Anadendron* (Araceae). In M. Hotta, (ed.), *Diversity and dynamics of plant life in Sumatra* 2: 121–126.

2009

Boyce, P. C. 2009. *Anadendrum* (Araceae: Monsteroideae: Anadendreae) in Thailand. *Thai For. Bull. (Bot.)* 37: 1–8.

2010

Boyce, P. C. & Wong S. Y. 2010. Studies on Monstereae (Araceae) of Borneo I: Two Novel *Anadendrum* from Sarawak. *Sarawak Mus. J.* 67(88, n.s.): 285–294.



Fig. 8. *Anadendrum affine* Schott. **A.** Plant in habitat—the fan-like growth is distinctive. **B.** Inflorescence at staminate anthesis. **C.** Ripe (bottom) and sub-mature (top) infructescences.

Apoballis Schott, Oesterr. Bot. Z. 8: 318. 1858. Fig. 9.

Taxonomy & Distribution

Currently considered to comprise 12 species occurring from southern Thailand and Myanmar through the Malay Peninsula and Sumatera (Sumatera is the centre of diversity), south to Java and Nusa Tenggara. *Apicallis* is as yet not recorded from Borneo. **12 species in the FM region; the taxonomy of the seemingly highly variable *Apoballis mutata* (Hook.f.) S.Y.Wong & P.C.Boyce is poorly understood.**

Ecology

Primarily mesophytes in lowland to upper perhumid to moist hill-forest. Very rarely [*Apoballis okadae* (M.Hotta) S.Y.Wong & P.C.Boyce] rheophytic.

Distinguishing Characteristics

Apoballis is distinct from *Schismatoglottis* by the combination of a deciduous petiolar sheath, prominent inflated naked interstice with sparse staminodes, thickly spongy spathe limb barely opening at anthesis and semi-persistent into fruiting, and a lower spathe splitting at the base, close to the peduncle insertion, when the fruits are ripe. Inflorescences smell of almond oil (benzaldehyde), and the pollen is spiny (not psilate)—see Ulrich et al. (2012).

Literature

2000

Hay, A. & Yuzammi. 2000. Schismatoglottideae (Araceae) in Malesia I – *Schismatoglottis*. *Telopea* 9(1) 1–177 [= *Schismatoglottis* Rupestris Group].

2010

Wong S. Y. & P. C. Boyce. 2010. Studies on Schismatoglottideae (Araceae) of Borneo IX: A new genus, *Hestia*, and resurrection of *Apoballis*. *Bot. Stud. (Teipei)* 51: 249–255.

2012

Ulrich, S., M. Hesse, D. Bröderbauer, S. Y. Wong & P. C. Boyce. 2012. *Schismatoglottis* and *Apoballis* (Araceae: Schismatoglottideae): A new example for the significance of pollen morphology in Araceae systematics. *Taxon* 61(2): 281–292.

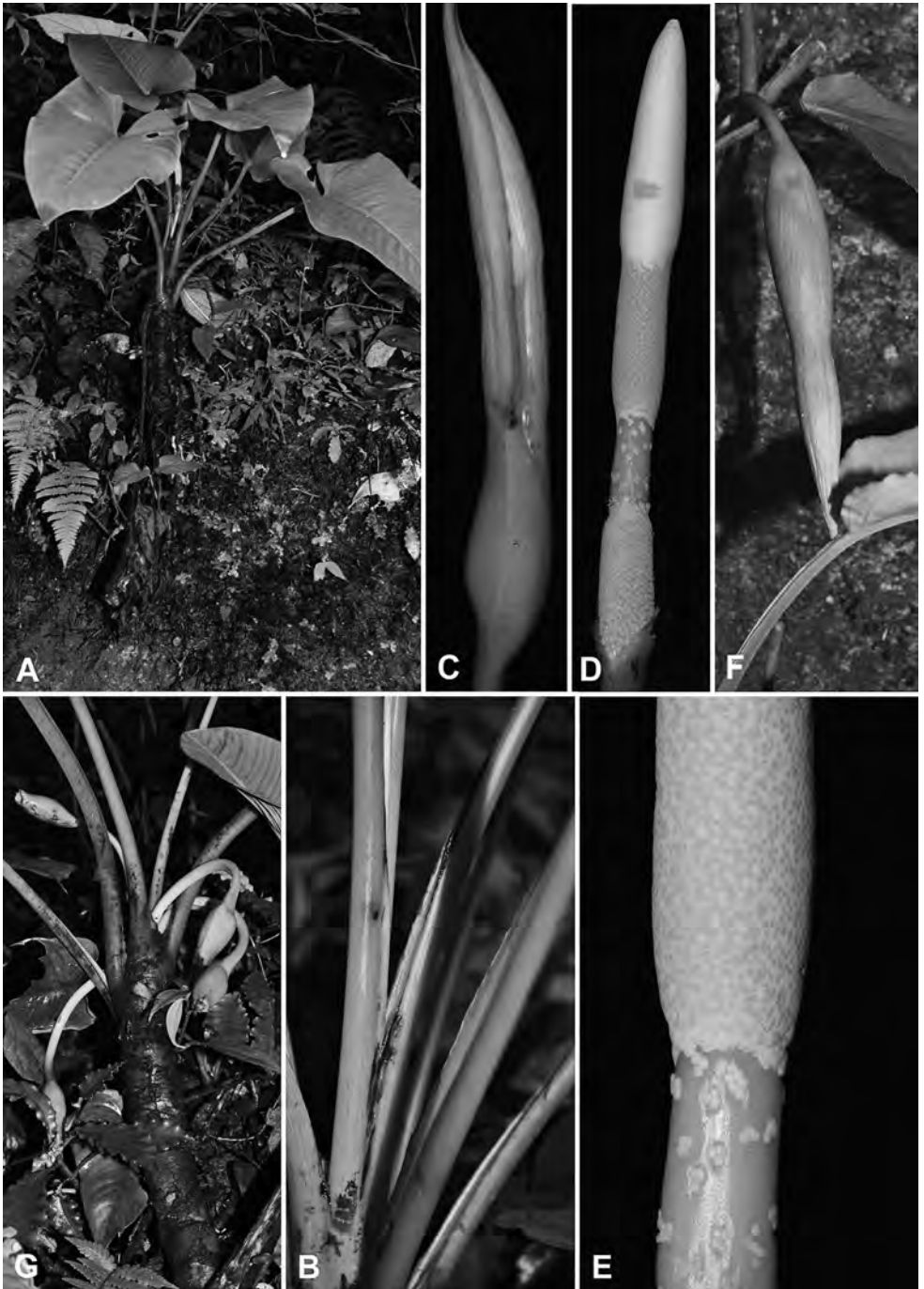


Fig. 9. *Apoballis mutata* (Hook.f.) S.Y.Wong & P.C. Boyce. **A.** Plant in habitat. **B.** Persistent petiolar sheaths. **C.** Inflorescence at pistillate anthesis. **D.** Spadix at pistillate anthesis. **E.** Interstice and staminate flower zone. **F.** Post anthesis inflorescences. **G.** Mature infructescences.

Aridarum Ridl., *J. Bot.* 51: 201.1913; Mayo et al., *The Genera of Araceae* 192–194, Pl. 54, 55 & 118D. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 39–41, Pl. 16. 2010. Figs. 10–11.

Taxonomy & Distribution

25 described species confined to Borneo, most species have restricted distributions and all species display a high degree of geological obligation. Further taxonomic novelties are known to exist. **More than 25 species in the FM region.**

Ecology

Obligate rheophytes, sometimes (unverified data) reported as facultative lithophytes or terrestrials in forest. Individual species occurring in deep shade to almost full sun, from the lowlands to lower montane zone in ever-wet to perhumid broadleaf forests.

Distinguishing Characteristics

Aridarum species display a variety of significant staminate flower arrangements. Many species have the anther connective excavated, with the thecae inserted on the rim of the connective and within this group there several taxonomically significant configurations. In species with staminate flowers comprised of paired stamens those allied to *A. purseglovei* (Furtado) M.Hotta (=Hotta's section *Caulescentia sensu* Boger & Hay 2000, pr. pte) have the thecae are on the facing edges of each stamen pair. Species allied to *A. nicolsonii* (equivalent to Hotta's genus *Heteroridarum*) the thecae are on the opposing ends of each stamen. *Aridarum* species monostaminate staminate flowers have the thecae together on the proximal (with respect to the spadix axis) side of the anther.

A small number of *Aridarum* species, including the Type species of the genus, *Aridarum montanum* Ridl., have the anther connective unexcavated, or somewhat umbonate. In these species the thecae are always on the ends of the stamen and either produced into a long setiform structure, or in the form of a stout hook.

There is compelling evidence that *Aridarum sensu* Bogner & Hay (2000) is polyphyletic.

Literature

2000

Bogner, J. & A. Hay. 2000. Schismatoglottideae in Malesia II – *Aridarum*, *Bucephalandra*, *Phymatarum* and *Piptospatha*. *Telopea* 9(1): 183–193, Fig. 1–3.

2006

Okada, H. 2006. A new species of *Aridarum*, Schismatoglottideae, from the Muller Range, Central Kalimantan, Indonesia. *Acta Phytotax. Geobot.* 57: 61–64.

2007

Wong S. Y. & P. C. Boyce. 2007. Studies on Schismatoglottideae (Araceae) of Borneo II: *Aridarum crassum*, a new species from Sarawak, Malaysian Borneo. *Gard. Bull. Singapore* 58(2): 279–286.

2012

Wong S. Y., P. C. Boyce & Low S. L. 2012. Studies on Schismatoglottideae (Araceae) of Borneo XXIV – Two new species of *Aridarum* from Kalimantan, and notes on the *Aridarum* Burttii Complex. *Willdenowia* 42: 261–268.

2013

Boyce, P. C. & Wong S. Y. 2013. Studies on Schismatoglottideae (Araceae) of Borneo XXVII – New species of *Aridarum*, and notes on the *Aridarum* Rostratum Complex. *Willdenowia* 43: 91–99.

Boyce, P. C. & Wong S. Y. 2013. Studies on Schismatoglottideae (Araceae) of Borneo XXII: the enigmatic *Aridarum montanum* Ridl. refund. *Gard. Bull. Singapore* 65(1): 1–5.

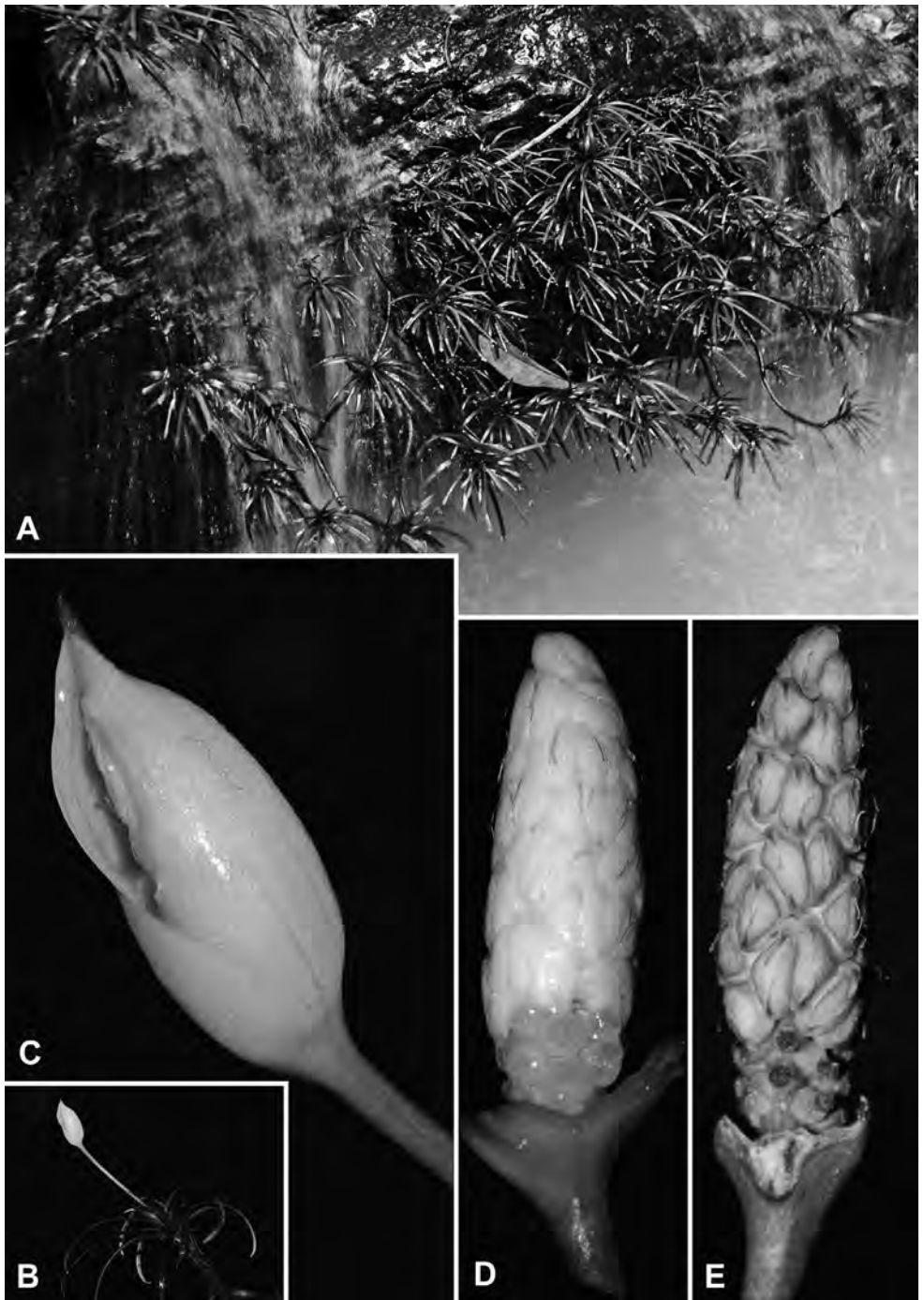


Fig. 10. *Aridarum montanum* Ridl. **A.** Plants in habitat. **B.** Flowering shoot. **C.** Inflorescence at pistillate anthesis. **D.** Spadix at pistillate anthesis. **E.** Alcohol-preserved spadix. Image A © Mike Lo. Used with permission.

2014

- Wong S. Y., Low S. L. & P. C. Boyce. 2014. Studies on Schismatoglottideae (Araceae) of Borneo XXXV – Seven New species of *Aridarum*. *Aroideana* 37: 9–32.
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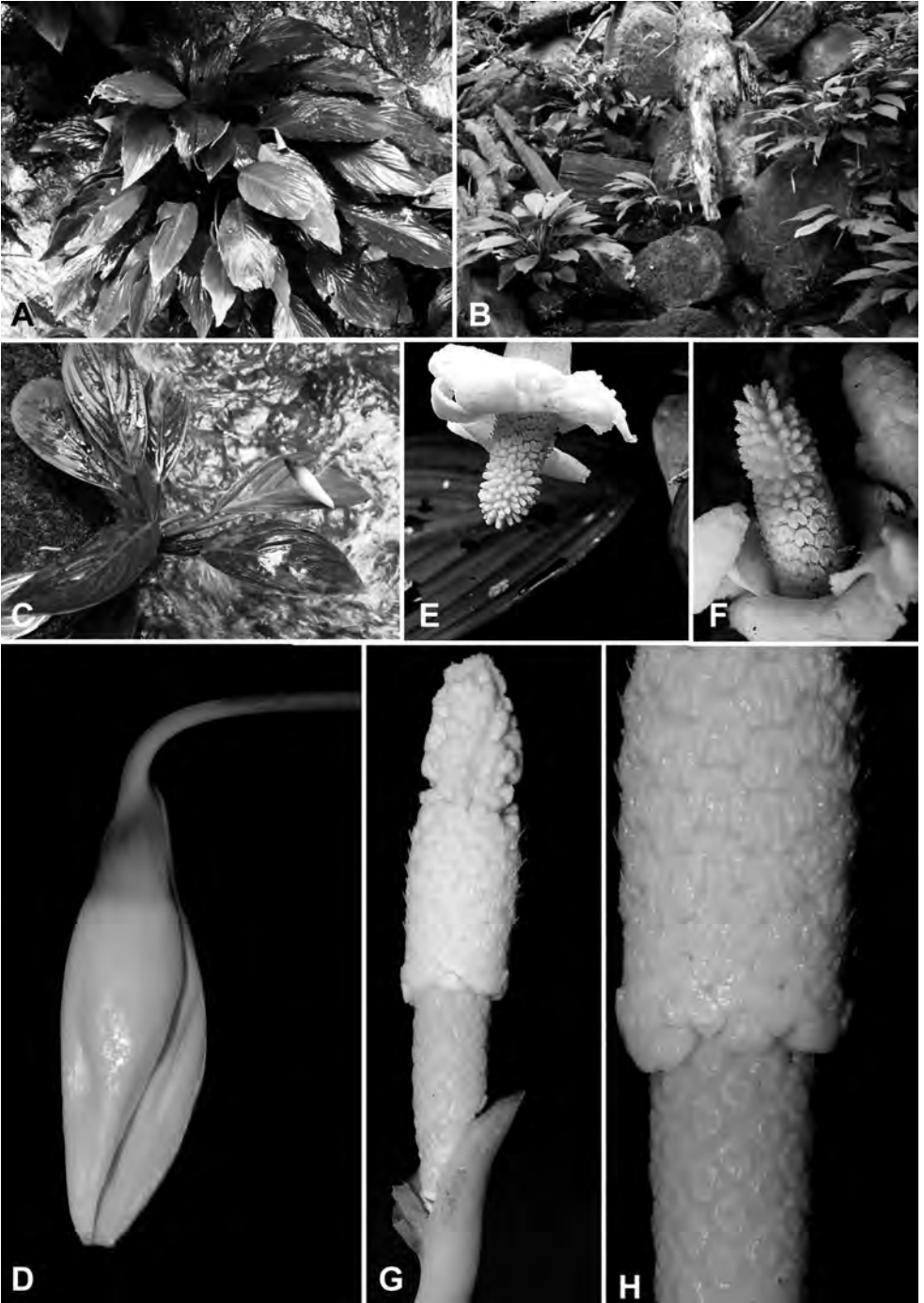


Fig. 11. *Aridarum rostratum* Bogner & A.Hay. **A–C.** Plants in habitat. **D.** Inflorescence at pistillate anthesis. **E & F.** Inflorescence at staminate anthesis. **G.** At onset of staminate anthesis. **H.** Spadix fertile zones at staminate anthesis.

Arisaema Mart. Flora 14(2):459. 1831; Mayo et al., *The Genera of Araceae* 270–275, Pl. 98i–iv & 129A. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 62, Pl. 16. 2010. Fig. 12.

Taxonomy & Distribution

In excess of 200 species occurring from N America south to Mexico, E & NE Africa, the Arabian Gulf, through India to China and Japan and south through SE Asia east as far as the Philippines. **About 14 species in the FM region.**

Ecology

Warm to cool temperate, subtropical or tropical dry, perhumid or ever-wet deciduous to evergreen broadleaf forest, rarely in warm temperate or subtropical coniferous woodland.

Distinguishing Characteristics

The majority of *Arisaema* species are remarkable for their ability to change the sex of the inflorescences dependent on the size, maturity and overall vigour of the plant. Plants flowering for the first time, and weak mature individuals produce staminate inflorescences whereas robust plants in good health flower pistillate. This phenomenon is termed paradioecy. Most Malesian *Arisaema* species are paradioecious.

Literature

2006

Gusman, G. & L. Gusman. **2006.** *The Genus Arisaema: A Monograph for Botanists and Nature Lovers.*



Fig. 12. *Arisaema laminatum* Blume. A. Plant in habitat. B. Pistillate Inflorescence at anthesis. C. Interior of spathe limb. D. Staminate spadix.

Bakoa P.C.Boyce & S.Y.Wong, *Bot. Stud. (Taipei)* 49(4): 398. 2008; Boyce et al., The Araceae of Borneo, *Aroideana* 33: 41, Pl. 17 & 18. 2010. Fig. 13.

Taxonomy & Distribution

Four species, all endemic on Borneo. **Four species in the FM region.**

Ecology

Obligate rheophytes on exposed rocks on waterfalls and riverside sandbanks in lowland perhumid broadleaf forest. Each species is restricted to a particular geology.

Distinguishing Characteristics

Bakoa is delimited by the combination of the spadix more than half adnate to the spathe, fertile staminate flowers restricted to a small zone coincidental with the area exposed by the gaping spathe during anthesis, a fully persistent spathe becoming wholly marcescent at fruiting, and seeds with a blunt micropyle borne on an annuliform basal placenta are unique in the Schismatoglottideae. Fruits of *Bakoa lucens* are a caryopsis (Boyce & Wong 2008); those of *B. nakamotoi* are dehiscent berries (Boyce & Wong 2012).

Generic placement of *Bakoa brevipedunculata* (H.Okada & Y.Mori) S.Y.Wong is doubtfully correct.

Literature

2008

Boyce, P. C. & Wong S. Y. 2008. Studies on Schismatoglottideae (Araceae) of Borneo VII: *Schottarum* and *Bakoa*, two new genera from Sarawak, Malaysian Borneo. *Bot. Stud. (Taipei)* 49: 393–404.

2011

Wong S. Y. 2011. Studies on Schismatoglottideae (Araceae) of Borneo XV: A second species of *Bakoa* from Kalimantan Barat, Indonesian Borneo. *Acta Phytotax. Geobot.* 60(3): 127–129.

2012

Boyce, P. C. & Wong S. Y. 2012. The Fruits of *Bakoa nakamotoi*. *Newslett. Int. Aroid Soc.* 34(3): 6–7.

Wong S. Y. & P. C. Boyce. 2012. The Araceae of Malesia III: *Bakoa* P. C. Boyce & S. Y. Wong. *Malayan Nat. J.* 64(2): 105–114.

2013

Wong S. Y. 2013. Studies on Schismatoglottideae (Araceae) of Borneo XXVIII – A new *Bakoa* from Indonesian Borneo. *Aroideana* 36: 3–7.

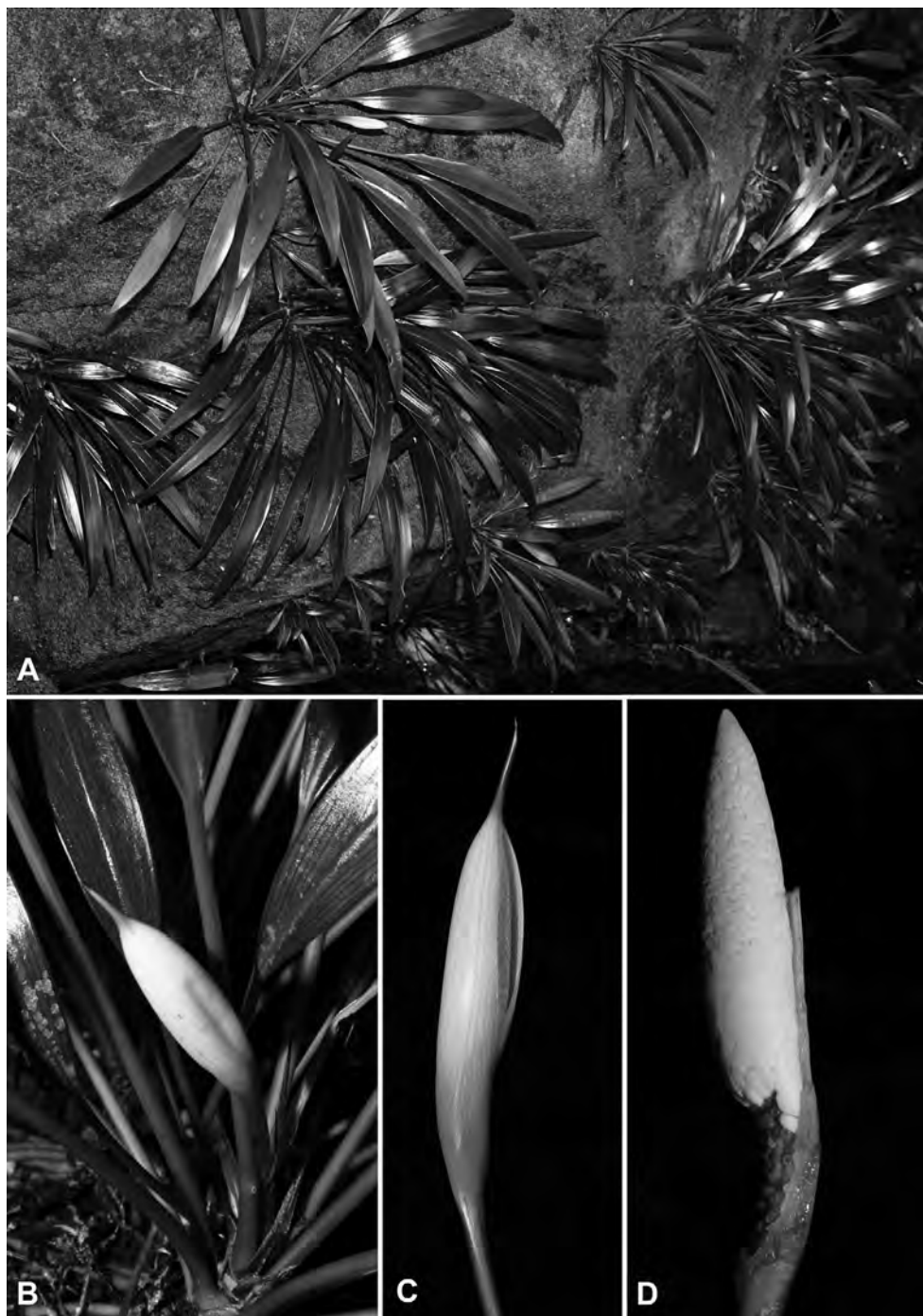


Fig. 13. *Bakoa lucens* (Bogner) P.C.Boyce & S. Y.Wong. A. Plants in habitat. B–D. Inflorescence at pistillate anthesis.

Bucephalandra Schott, *Gen. Aroid.*: t. 56. 1858; Mayo et al., *The Genera of Araceae* 189, Pl. 52. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 41–43, Pl. 19. 2010. Figs. 14–16.

Taxonomy & Distribution

29 described species occurring entirely on Borneo, with most species locally restricted and all geologically obligated. At least a further 20 species await formal description. **More than 50 species in the FM region.**

Ecology

Obligate, seldom facultative, rheophytes on stream and riverside rocks in lowland to lower montane perhumid to moist tropical forest.

Distinguishing Characteristics

Bucephalandra is distinguished from all other genera by the presence of motile (reflexing) shield-shaped staminodes separating the staminate and pistillate flower zones. These staminodes persist, becoming photosynthetic, after flowering and function to seal the persistent cup-shaped spathe to protect the developing fruit (Wong & Boyce 2013). Superficially similar staminodes occur in the *Aridarum* Rostratum Complex (Boyce & Wong 2013) but these expand laterally and do not persist to provide protection to the developing fruits.

Literature

2000

Bogner, J. & A. Hay. 2000. Schismatoglottideae in Malesia II – *Aridarum*, *Bucephalandra*, *Phymatarum* and *Piptospatha*. *Telopea* 9(1): 195–198.

2012

Wong S. Y. & P. C. Boyce. 2012. Studies on Schismatoglottideae (Araceae) of Borneo XX: Beccari's <La Più piccola delle Aracee> (*Microcasia pygmaea*) recollected and transferred to *Bucephalandra* Schott *Webbia* 67(2): 139–146.

2013

Wong S. Y. & P. C. Boyce. 2013. The role of the interstice staminodes of *Bucephalandra* Schott (Araceae: Schismatoglottideae) *Newslett. Int. Aroid Soc.* 35(2): 11–12.

2014

Boyce, P. C. & Wong S. Y. 2014. Studies on Schismatoglottideae (Araceae) of Borneo XXX – New species and combinations for *Bucephalandra* Schott *Willdenowia* 44: 149–199.

Boyce, P. C. & Wong S. Y. 2014. Studies on Schismatoglottideae (Araceae) of Borneo XXXXI: Additional new species of *Bucephalandra* *Willdenowia* 44: 415–421.

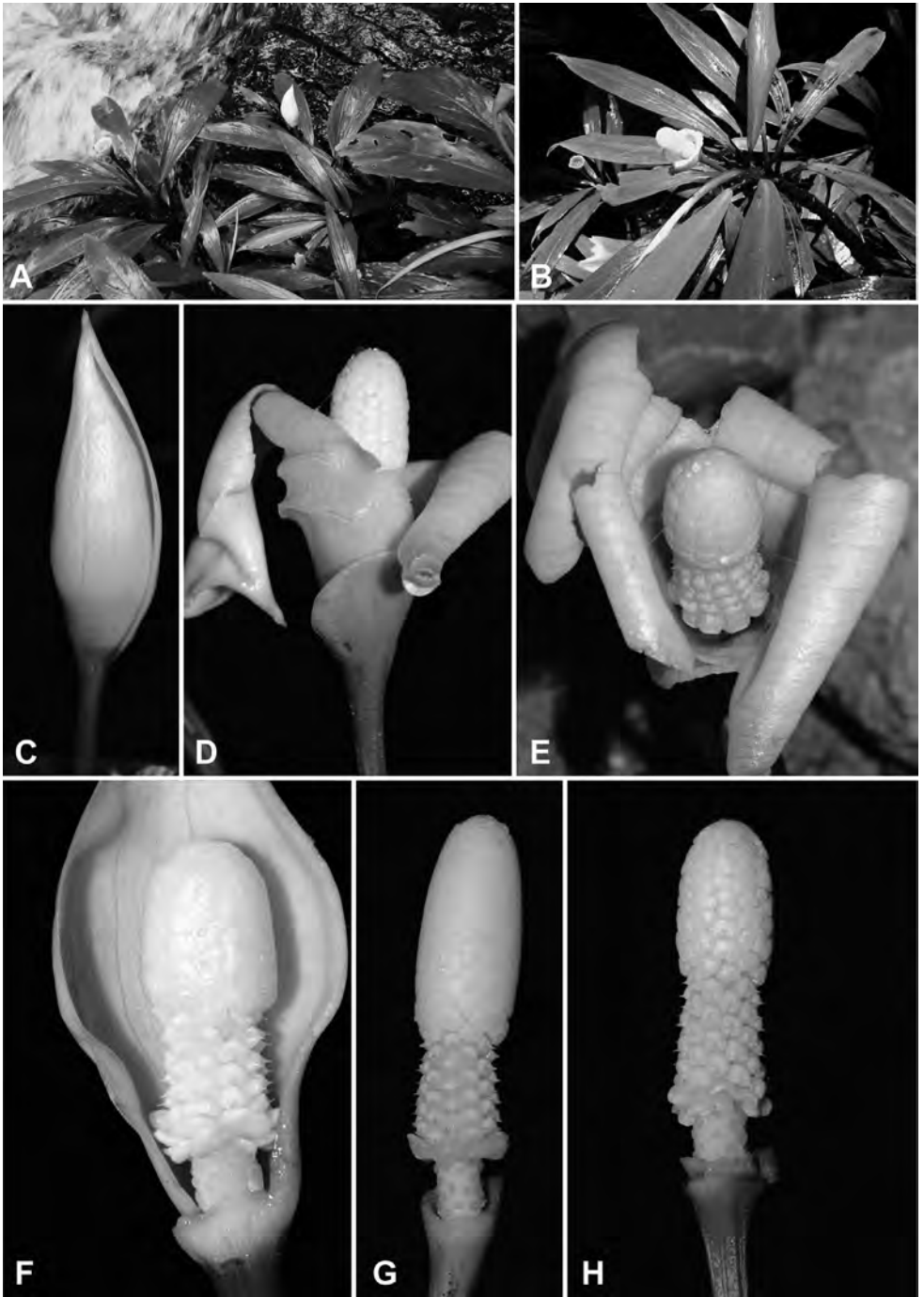


Fig. 14. *Bucephalandra goliath* S.Y.Wong & P.C.Boyce. **A & B.** Plants in habitat. **C.** Inflorescence at pistillate anthesis. **D & E.** Inflorescence staminate. **F.** Spadix at staminate anthesis. **G & H.** Spadix at staminate anthesis.

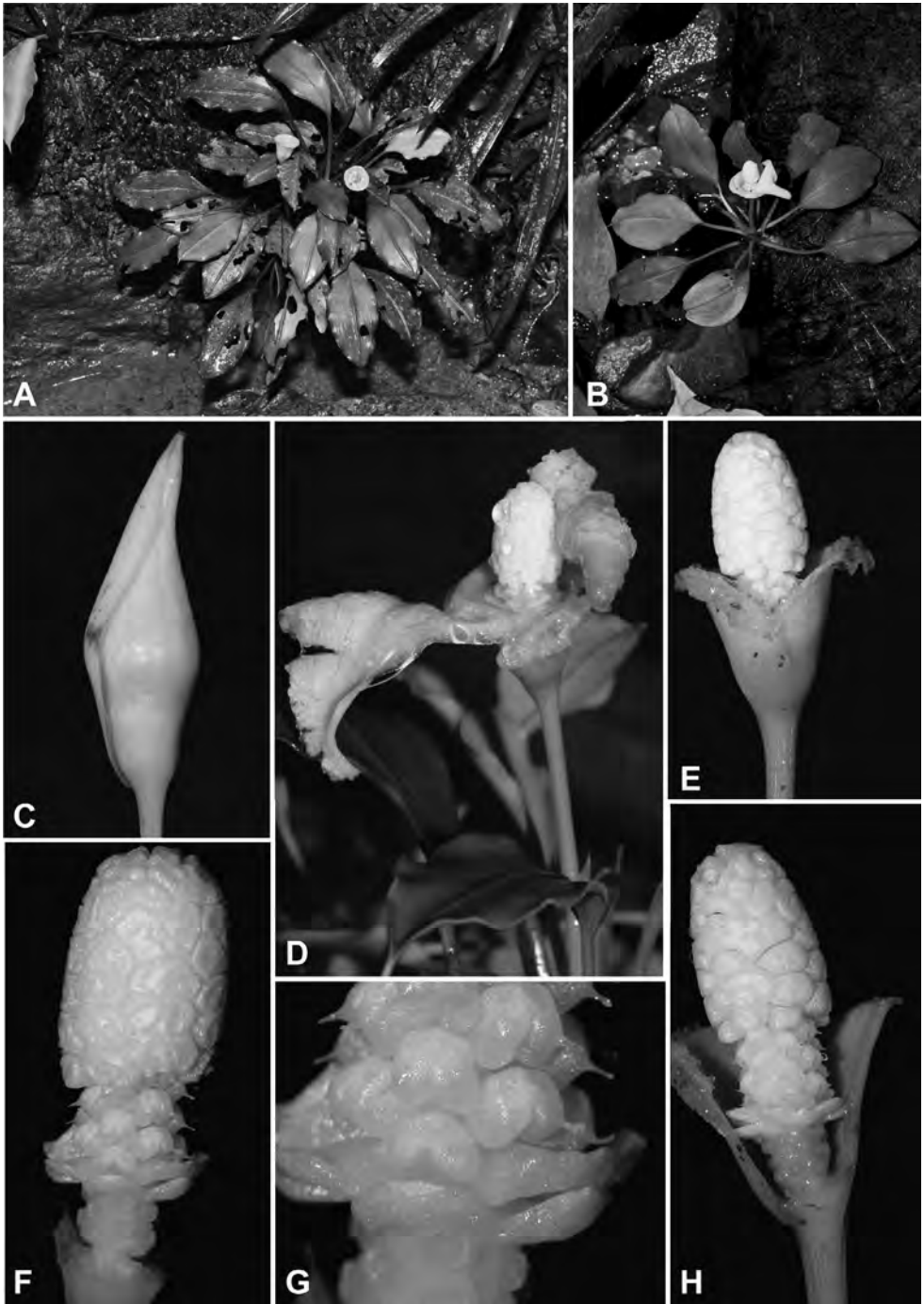


Fig. 15. *Bucephalandra muluensis* (M. Hotta) S.Y.Wong & P.C.Boyce. **A & B.** Plants in habitat. **C.** Inflorescence at pistillate anthesis. **D.** Inflorescence at staminate anthesis. **E.** Inflorescence at staminate anthesis. **F.** Spadix at staminate anthesis. **G.** Staminate flowers and interstice staminodes. **H.** Inflorescence at staminate anthesis.

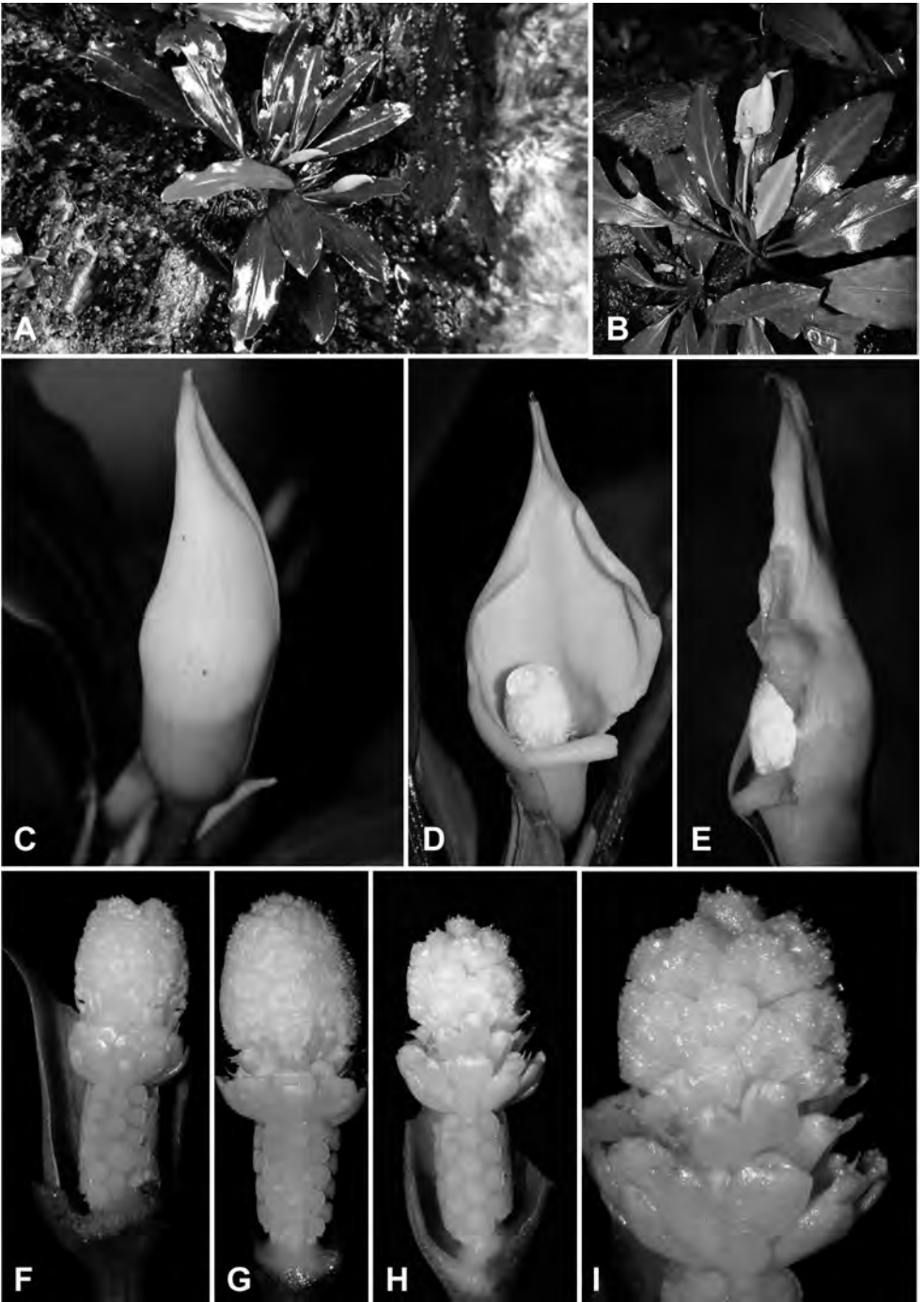


Fig. 16. *Bucephalandra chrysokoupa* S.Y.Wong & P.C.Boyce. A & B. Plants in habitat. C. Inflorescence at pistillate anthesis. D & E. Inflorescence staminate anthesis. F. Spadix at pistillate anthesis. G–I. Spadix at staminate anthesis.

Colocasia Schott in H.W.Schott & S.L.Endlicher, *Melet. Bot.*18. 1832; Mayo, Bogner & Boyce, *Genera of Araceae* 280–283, Pl. 103 & 130A. 1997. Fig. 17.

Taxonomy & Distribution

Probably about 20 species distributed from the subtropical eastern Himalayas throughout subtropical and tropical Asia into the tropical western pacific and NE Australia, with all of this distribution accounted for by *Colocasia esculenta* (L.) Schott, a carbohydrate and green vegetable crop cultivated throughout the subtropics and tropics of both hemispheres.

Three species in the FM region.

Ecology

Primary and secondary perhumid to ever-wet subtropical and broadleaf tropical forests from sea level to ca. almost 2000 m, open swamps; *Colocasia gigantea* (Blume) Hook. is associated with limestone and less often granite.

Distinguishing Characteristics

Colocasia species lack the conspicuous waxy glands in the axils of the primary veins on the abaxial surface of the leaf that are a unique feature of almost all *Alocasia* species. Fruits of *Colocasia* are smelly and inconspicuously coloured with many tiny seeds in slimy mucilage and are mammal dispersed. Inflorescence multiplication in *Colocasia* is achieved in such a way that the whole synflorescence is equivalent to one bimodular unit in *Alocasia*.

Molecular evidence strongly supports the removal of *Colocasia gigantea* from *Colocasia* and the resurrection of *Leucocasia* (Nauheimer et al. 2012a, 2012b).

Literature

1996

Hay, A. 1996. A new Bornean species of *Colocasia* Schott (Araceae: Colocasieae), with a synopsis of the genus in Malesia and Australia. *Sandakanian* 7: 31–48.



Fig. 17. *Colocasia oresbia* A. Hay. **A.** Plants in habitat. Note glossy leaf blade. **B.** Inflorescence at pistillate anthesis. *Colocasia esculenta* (L.) Schott. **C.** Plants in habitat. Note matte-glaucous leaf blade. **D.** Inflorescence at pistillate anthesis.

Cryptocoryne Fisch. ex Wydler, *Linnaea* 5: 428. 1830; Mayo et al., *The Genera of Araceae* 97–198, Pl. 57, 119B. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 53–55, Pl. 29. 2010. Fig. 18.

Taxonomy & Distribution

About 60 aquatic to amphibious species in Asia from India to New Guinea. **About 41 species in the FM region.**

Ecology

In and along streams and rivers, in fresh and brackish tidal zones, sometimes also in forest pools, mainly in lowland rainforests, often forming large submerged or emergent stands. The rhizomes and stolons are usually deeply buried, sometimes only with the spathe limb and the upper part of the spathe protruding above the ground. In more quickly running water the plants are mostly rooted in sand or between stones and rocks while, in more slowly running water, they are found deep in mud.

Distinguishing Characteristics

The inflorescence and fruits of *Cryptocoryne* are immediately diagnostic. The spathe comprises an inflated basal tube, the kettle, with united margins, an upper tube, sometimes twisted, with fused margins, and a terminal limb which opens into a flat, ovate surface that may either reflex, remain erect, when it may be spirally twisted, or arch forwards to form a hood and is usually terminated with a short to very long tail; a distinctive raised to callus-like collar is often found at the transition between the upper tube and limb. The fruits of *Cryptocoryne* are unusual in the family in being dehiscent, the individual carpels opening, with the fully open infructescence resembling a star.

Notes

Cryptocoryne is remarkable among aroids by the species readily hybridizing in nature with the colonial nature of the plants enabling extensive populations of these hybrids to establish, often to the detriment of the originating parents. On-going research is revealing that some supposed species are in fact stabilized hybrids.

Cryptocoryne has one of the most extensive publication lists of any aroid, the majority of it published in Dutch and German. The cited literature here is comprehensive but by no means exhaustive.

Literature

1951

Wit, H. C. D. de. 1951. De bloei van *Cryptocorynen*. *Het Aquarium* 22(3): 58–59.

Wit, H. C. D. de. 1951. *Cryptocoryne cordata*, *Cryptocoryne griffithii*. *Het Aquarium* 22(6): 128–129.

1953

Wit, H. C. D. de. 1953. *Cryptocoryne longicauda* Beccari ex Engler. *Het Aquarium* 23(11): 248–250.

Wit, H. C. D. de. 1953. Description and typification of *Cryptocoryne longicauda* Beccari et Engler (Arac.). *Webbia* 9(2): 455–458.

Wit, H. C. D. de. 1953. *Cryptocoryne baerteliana* Jacobs. ex Milk. *Het Aquarium* 24(2): 41–43.



Fig. 18. *Cryptocoryne longicauda* Becc. ex Engl. **A.** Plant in habitat. **B.** Inflorescences at pistillate anthesis. **C.** Spadix; pistillate flowers at base, staminate flowers at the tip.

1954

Oskam, H. C. & J. D. van Ramshorst, 1954. *Cryptocoryne griffithii* Schott. *Het Aquarium* 24(7): 146–149.

1955

Wendt, A. 1955. *Cryptocoryne cordata*, *grandis* und *griffithii*. *Aq. & Terr.* 2(5): 146–148.

Wendt, A. 1955. Etwas über richtige und falsche Namen unserer *Cryptocorynen*. *DATZ* 8: 236–240.

1956

Legro, R. A. H. & Wit, H. C. D. de. 1956. Enkele aantekeningen over *Cryptocorynen*. *Het Aquarium* 27(7): 148–153.

Ramshorst, J. D. van. 1956. De *Cryptocorynen* 1. *Het Aquarium* 26(*): 280–283.

Ramshorst, J. D. van. 1956. De *Cryptocorynen* 2. *Het Aquarium* 27(1): 15–17.

Ramshorst, J. D. van. 1956. De *Cryptocorynen* 3. *Het Aquarium* 27(2): 37–40.

Wendt, A. 1956. *Cryptocoryne longicauda* Beccari ex Engler. *DATZ* 9: 15–16.

1957

Ramshorst, J. D. van. 1957. De bloeiwijze van *Cryptocoryne versteegii*. *Het Aquarium* 28(2): 33–34.

Vlasblom, J. 1957. Vegetatieve vermeerdering van *Cryptocoryne ciliata*. *Het Aquarium* 28(3): 60–62.

1958

Bruggen, H. W. E. van. 1958. Ervaringen met *Cryptocoryne joborensis*. *Het Aquarium* 28(9): 206–207.

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1959

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Wit, H. C. D. de. 1959. Het genus *Cryptocoryne* (3). *Het Aquarium* 29(8): 172–175.

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Wit, H. C. D. de. 1959. Het genus *Cryptocoryne* 5. *Het Aquarium* 29(10): 224–227.

Wit, H. C. D. de. 1959. Het genus *Cryptocoryne* 6. *Het Aquarium* 29(11): 251–253.

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1960

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Wit, H. C. D. de. 1960. Het genus *Cryptocoryne* 13, *Cryptocoryne cordata* Griffith. *Het Aquarium* 31(3): 50–51.

Wit, H. C. D. de. 1960. Het genus *Cryptocoryne* (13) [=14], *Cryptocoryne consobrina* Schott. *Het Aquarium* 31(5): 112–114.

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1961

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1968

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1971

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1973

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1976

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Cyrtosperma Griff., Not. *Pl. Asiat.* 3:149. 1851; Mayo et al., *The Genera of Araceae* 138, Pl. 26 & 112A. 1997. Boyce et al., *The Araceae of Borneo, Aroideana* 33: 29, Pl. 9. 2010. Fig. 19.

Taxonomy & Distribution

About 13 species in tropical SE Asia as far east as Oceania, with the majority restricted to Papuaia. **About 13 species in the FM region.**

Ecology

Lowland freshwater swamp forest margins, sometimes persisting in flooded pasture, or in swampy areas of lowland perhumid broadleaf evergreen tropical forest, occasionally on kerangas.

Distinguishing Characteristics

Cyrtosperma is most readily distinguished from *Podolasia* by fruits ripening dull purple and barely emerging from between the persistent tepals, and by the warty or crested seeds.

Notes

The majority of *Cyrtosperma* species occur only in Papuaia, with only one or two species occurring in the remainder of Malesia. The most widespread species is *Cyrtosperma merkusii* (Hassk.) Schott, a large plant (2 m or more tall) found in open swampy places in association with habitation, with erect leaves and petioles only lightly armed. Occasionally, much more heavily armed smaller plants with spreading leaves are encountered in wet areas in peatswap forest, often along water courses, these equate to *C. ferox* N.E.Br.

Literature

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Dearden, A. and A. Hay. 2001. A new species of *Cyrtosperma* (Araceae) from West Papua. *Aroideana* 24(1): 102–104.

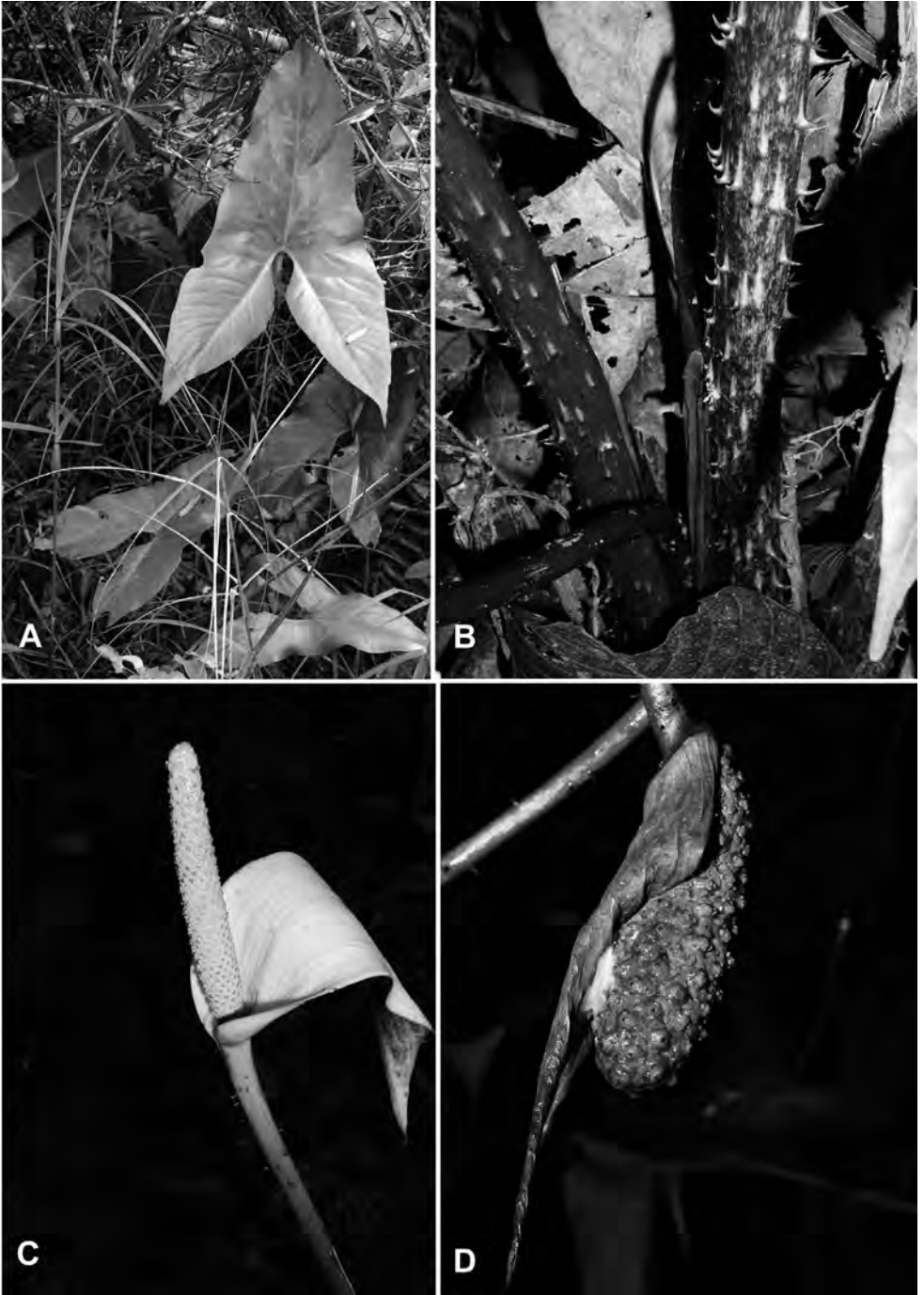


Fig. 19. *Cyrtosperma ferox* N.E.Br. **A.** Juvenile plant. **B.** Petiole bases with distinctive ascending prickles. **C.** Inflorescence at pistillate anthesis. **D.** Ripe infructescence.

Epipremnum Schott, *Bonplandia (Hannover)* 5:45. 1857; Mayo et al., *The Genera of Araceae* 120-121, pl.15 & 109C. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 27, Pl. 5. 2010. Fig. 20.

Taxonomy & Distribution

Approximately 15 species occurring throughout tropical Asia from NE India to the Ryukyu Islands southwards to eastern Australia (Queensland) and Oceania (Cook Islands: Rarotonga). **13 species in the FM region.**

Ecology

Low to mid-elevation perhumid broadleaf tropical forest, occasionally persisting in disturbed areas or growing lithophytically in exposed situations. The widespread *Epipremnum pinnatum* is associated exclusively with limestone in its few localities on Borneo and in Peninsular Malaysia although elsewhere in its (primarily eastern Malesian) range appears not to be a limestone obligate.

Distinguishing Characteristics

Excepting the highly distinctive *Epipremnum pinnatum* (L.) Engl., without ripe fruit *Epipremnum* is difficult to distinguish from *Rhaphidophora* and *Scindapsus*. In ripe fruit *Epipremnum* is diagnosed by each pistil containing several relatively large kidney-shaped seeds (as opposed to each pistil containing a single large kidney-shaped seed in *Scindapsus* and many rather small ellipsoid seeds in *Rhaphidophora*).

Literature

1908

Engler, A. & K. Krause. 1908. Araceae–Monsteroideae. In: A. Engler (ed.), *Das Pflanzenreich* 37(IV.23B): 54–67, Figs 22–27.

1998

Boyce, P. C. 1998. The genus *Epipremnum* Schott. (Araceae–Monsteroideae–Monstereae) in west and central Malesia. *Blumea* 43: 183–218.

2004

Boyce, P. C. 2004. A Review of *Epipremnum* (Araceae) in Cultivation. *Aroideana* 27: 199–205.



Fig. 20. *Epipremnum giganteum* (Roxb.) Schott. **A.** Plant in habitat. **B & C.** Inflorescence at pistillate anthesis. **D.** Developing infructescence.

Fenestratarum P. C. Boyce & S. Y. Wong, *Aroideana* 37E(2): 8. 2014. Fig. 21.

Taxonomy & Distribution

Two species, both endemic on Borneo. **Two species in the FM region.**

Ecology

Fenestratarum is rheophytic on riverside rocks and boulders under open perhumid lowland forest.

Distinguishing Characteristics

Fenestratarum is diagnosed by the combination of a nodding inflorescence on a very slender erect peduncle, an unstricted spathe limb, with the portion equating to the limb having large translucent areas separated by opaque veins, and the portion equating to the lower spathe uniformly opaque, by completely fused lower spathe margins reducing access to the spadix to a narrow opening on the median ventral side of the spathe, thecae in deep pits and lacking thecae horns, sterile appendicle staminodes, basal placentation, orthotropous ovules with a beak-like micropylar appendage, funnel-form splashcups held erect by straightening of the distal portion of the peduncle, and indehiscent berries.

Literature

2014

Boyce, P. C. & S. Y. Wong. 2014. Studies on Schismatoglottideae (Araceae) of Borneo XXXXIII: *Fenestratarum culum* - A new genus and species from Kalimantan Barat, Indonesian Borneo. *Aroideana* 37E(2): 4–10.

2015

Boyce, P. C. & S. Y. Wong. 2015. Studies on Schismatoglottideae (Araceae) of Borneo XXXXVI: *Fenestratarum mulyadii* – A second species of a recently described genus. *Aroideana* 38E-2: 4–9.

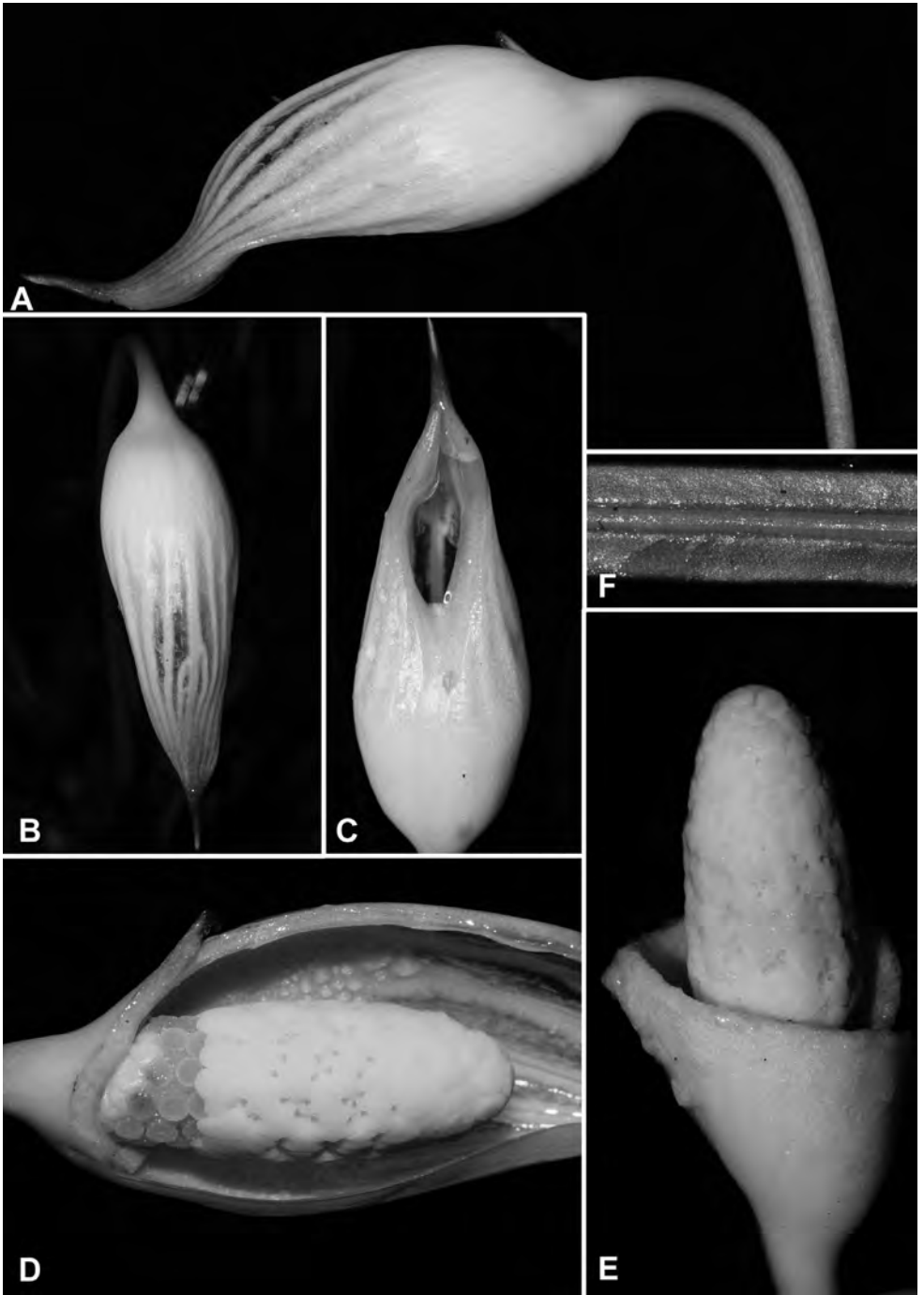


Fig. 21. *Fenestratarum culum* P.C.Boyce & S.Y.Wong. **A–D.** Inflorescence at pistillate anthesis. **E.** Inflorescence at late staminate anthesis. **F.** Leaf blade, abaxial view.

Furtadoa M. Hotta, *Acta Phytotax. Geobot.* 32: 142 (1981). Fig. 22.

Taxonomy & Distribution

Two species, one occurring in Peninsular Malaysia and one restricted to Sumatera. **Two species in the FM region.**

Ecology

Furtadoa sumatrensis M. Hotta is an obligate rheophyte; *F. mixta* (Ridl.) M.Hotta a terrestrial mesophytic herb.

Distinguishing Characteristics

Furtadoa is evidently very closely related, and quite possibly congeneric, with *Homalomena* but differs by the unistaminate staminate flowers which except at the distal-flowers on the spadix are each associated with an overtopping pistillode, and basal placentation.

Notes

Sumateran *Homalomena monandra* M.Hotta approaches *Furtadoa*, especially *F. mixta*, in possessing mono-staminate staminate flowers, but lacks the pistillode associated with each staminate flower, and has parietal placentation typical of *Homalomena*.

Literature

1981

Hotta, M. 1981. A new genus of the family *Araceae* from West Sumatra. *Acta Phytotax. Geobot.* 32 (5–6): 142–146.

2001

Mori, Y. & H. Okada. 2001. Reproductive biology and pollen flow of a rheophytic aroid, *Furtadoa sumatrensis* (Araceae) in the Malesian wet tropics. *Plant Syst. Evol.* 227: 37–47.

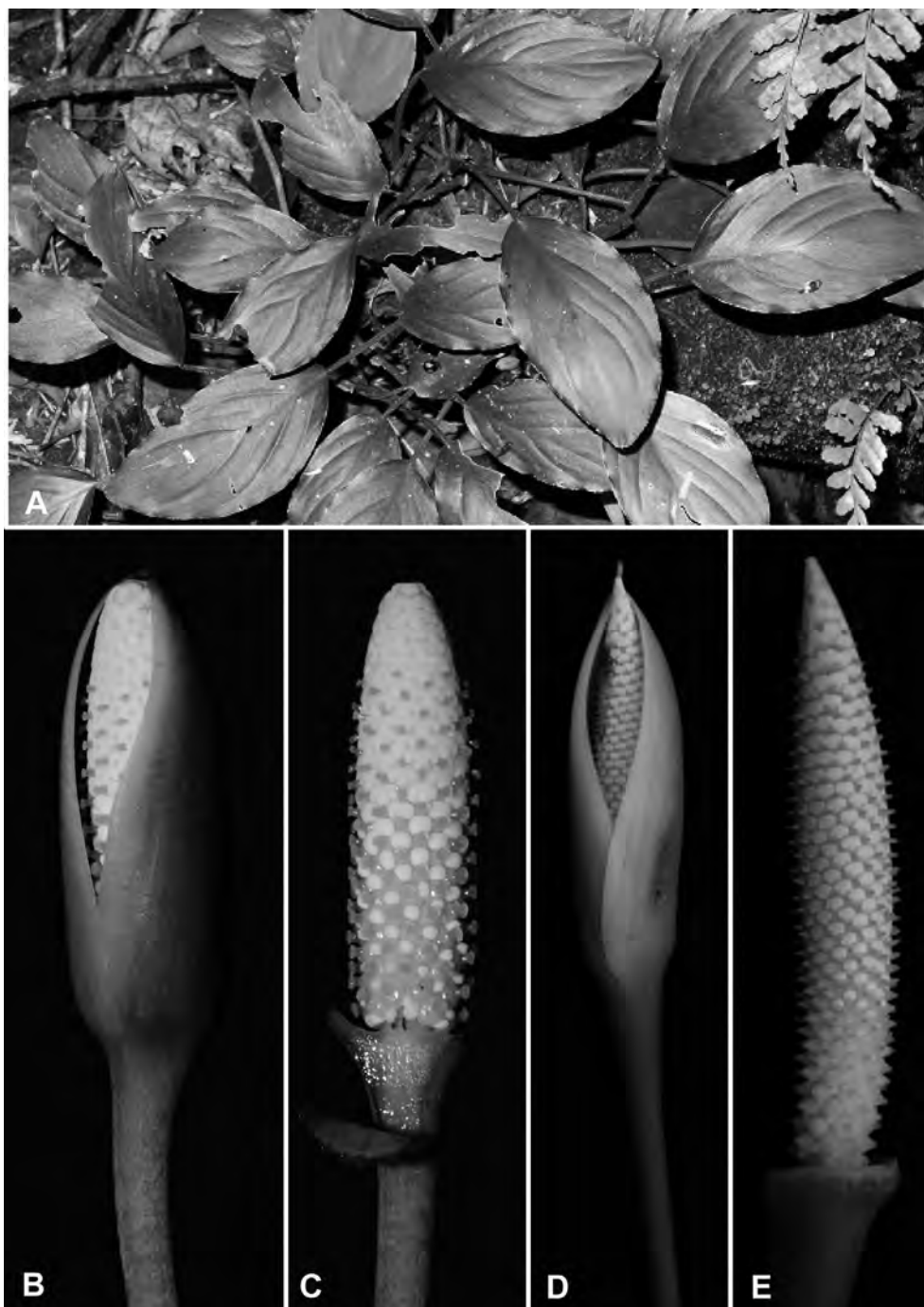


Fig. 22. *Furtadoa sumatrensis* M.Hotta. **A.** Plants in habitat. **B.** Inflorescence at pistillate anthesis. **C.** Spadix at pistillate anthesis. *Furtadoa mixta* (Ridl.) M.Hotta. **D.** Inflorescence at pistillate anthesis. **E.** Spadix at pistillate anthesis.

Galantharum P. C. Boyce & S. Y. Wong, *Aroideana* 38E-2: 24–30. Fig. 23.

Taxonomy & Distribution

One species endemic on Borneo. **One species in the FM region.**

Ecology

Galantharum is rheophytic on exposed riverside rocks and boulders under open perhumid lowland forest.

Distinguishing Characteristics

Galantharum superficially resembles species of the genus *Hottarum* (which occurs in the same clade), and also *Piptospatha* (which, excluding the Type species, *Piptospatha insignis* N.E.Br.) fall in a quite separate clade. *Galantharum* is distinguished by the inflorescences acutely nodding (peduncle deflexed ca. 170°) and smelling powerfully of benzaldehyde (almond oil), staminate flowers with the thecae pores embedded in deep pits (a characteristic it shares with *Hottarum*) and the white spathe limb with the rostrum and interior base cherry-red spathe.

Literature

2015

Boyce, P. C. & Wong S. Y. 2015. Studies on Schismatoglottideae (Araceae) of Borneo XXXXVIII: *Galantharum*, a new genus of the *Piptospatha* Clade. *Aroideana* 38E-2: 24–30.

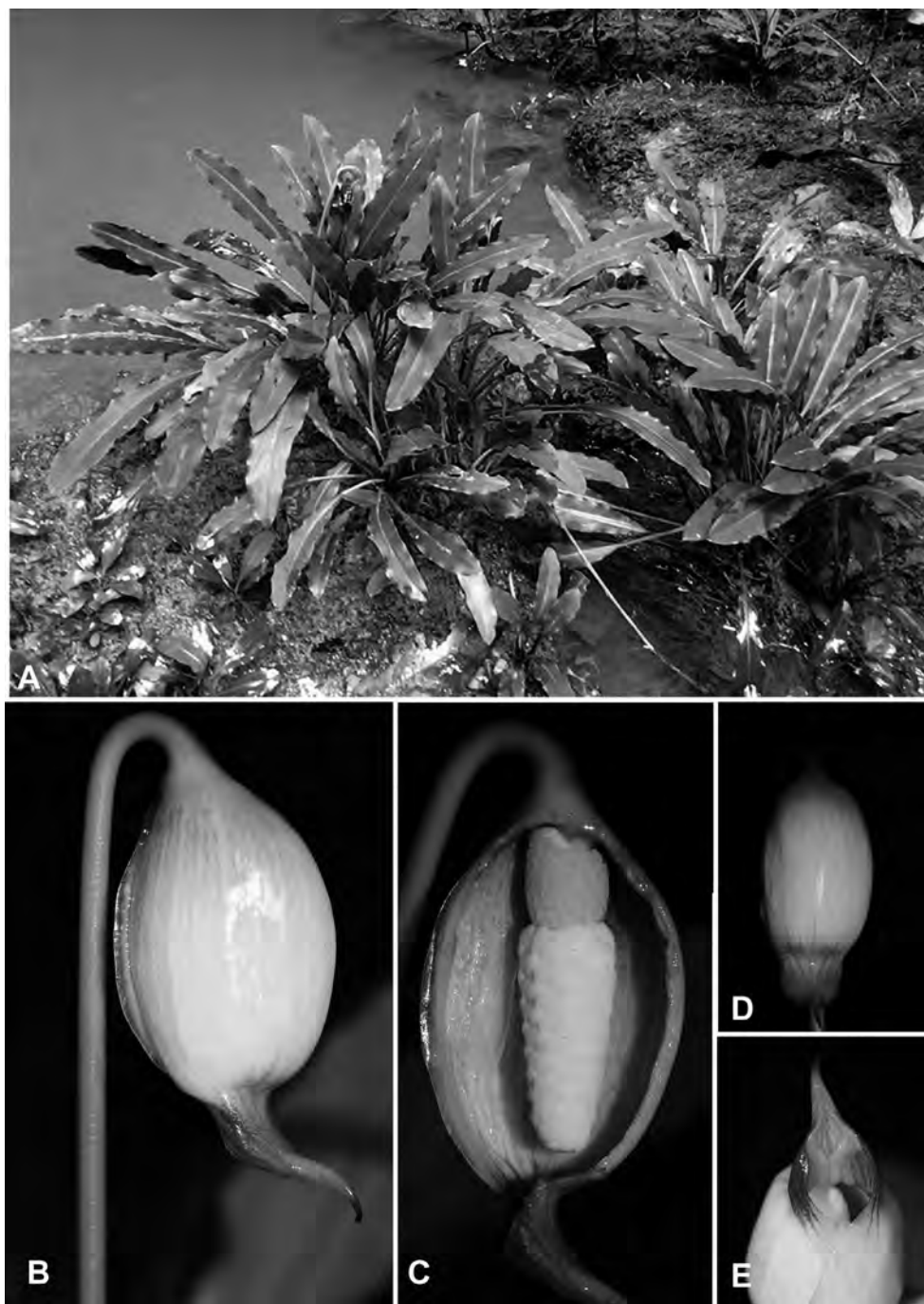


Fig. 23. *Galantbarum kishii* P.C.Boyce & S.Y.Wong. A. Plants in habitat. B, D & E. Inflorescence at pistillate anthesis. C. Spadix at pistillate anthesis.

Hapaline Schott, *Gen. Aroid.* 44. 1858; Mayo et al., *The Genera of Araceae* 216, Pl. 68, 121D. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 55–58, Pl. 30. 2010. Fig. 24.

Taxonomy & Distribution

Eight species ranging from Myanmar to China (Yunnan) and south through Thailand and Peninsular Malaysia to Brunei. **Three species in the FM region.**

Ecology

Low to mid-elevation ever-wet, perhumid or seasonally dry broadleaf evergreen or deciduous tropical forest (the last not in the FM region). Most species are limestone obligates although Bornean *Hapaline celatrix* P.C.Boyce is restricted to shales.

Distinguishing Characteristics

Hapaline species all have small white inflorescences, the spathe occasionally tinged green or greyish pink. Staminate flowers are fused into peltate synandria, with the synconnectives massively enlarged and with the thecae inserted on the lower margin of the connective tissue.

Literature

1996

Boyce, P. C. 1996. *Hapaline* (Araceae: Aroideae: Caladieae). *Kew Bull.* 51(1): 63–82.

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Boyce, P. C. & S. Y. Wong. 2008. *Hapaline celatrix* (Araceae: Caladieae) – A New Record for Sarawak, Malaysian Borneo. *Gard. Bull. Singapore* 60(1): 31–36.

2012

Wong S. Y. & P. C. Boyce. 2012. The Infructescences of *Hapaline appendiculata* Ridl *Newslett. Int. Aroid Soc.* 34(1): 16–17.

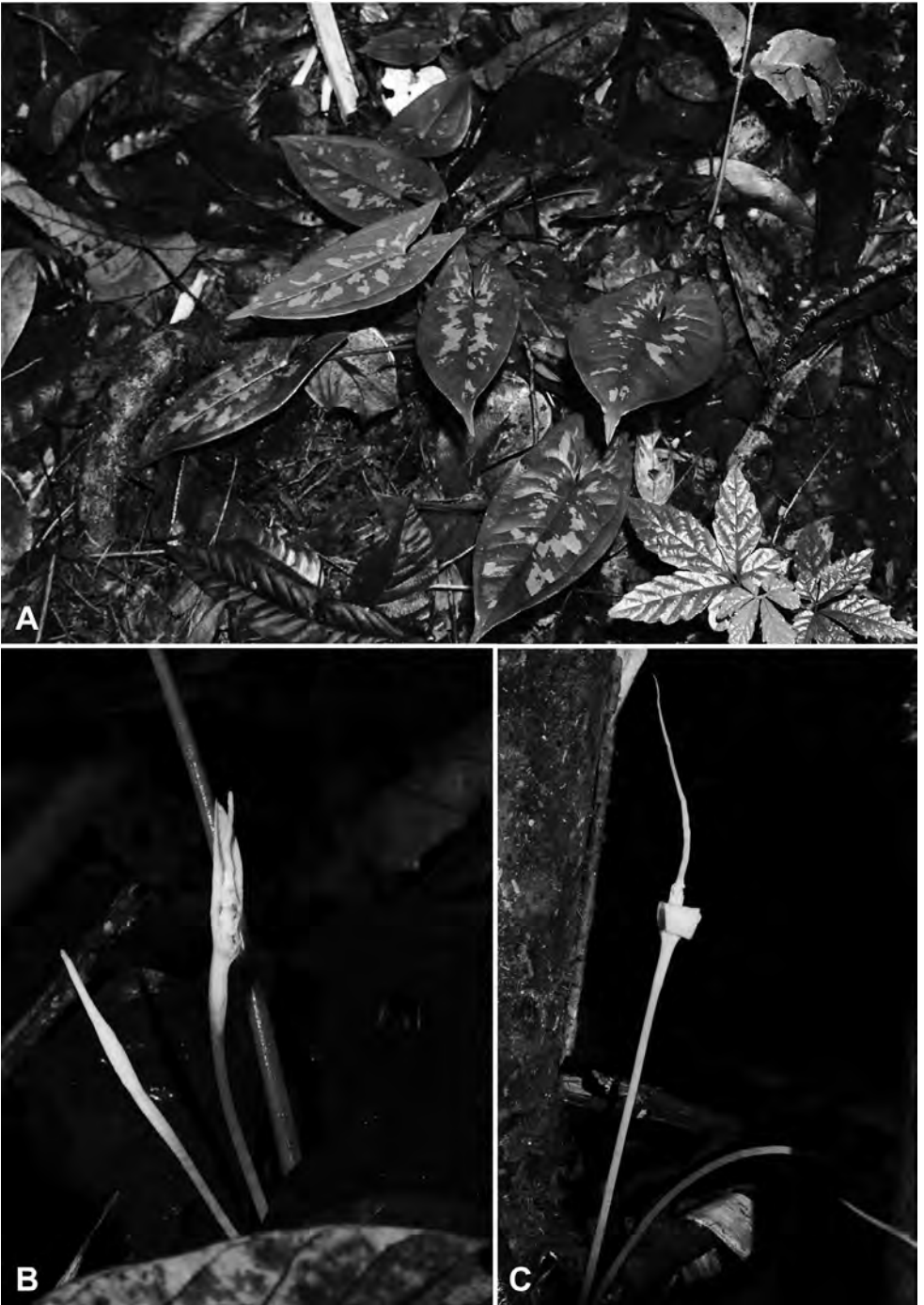


Fig. 24. *Hapaline celtrix* P.C.Boyce. **A.** Plants in habitat. **B.** Inflorescence at staminate anthesis. *Hapaline appendiculata* Ridl. **C.** Inflorescence at staminate anthesis.

Hestia S. Y. Wong & P. C. Boyce, *Bot. Stud. (Taipei)* 51: 250. 2010; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 43–45, Pl. 20. 2010. Fig. 25.

Taxonomy & Distribution

As currently defined *Hestia* comprises one species disjunct between the Malay Peninsula, where it is known to only from Perak, and Borneo, where it occurs in numerous but widely scattered localities in Sarawak and Brunei. Many of the scattered populations on Borneo are individually vegetatively distinctive but florally indistinguishable. **One species in the FM region.**

Ecology

On raised podsols in swampy areas in *kerangas* formations within lowland and hill perhumid broadleaf tropical forest.

Distinguishing Characteristics

A very distinctive genus easily recognized by the rather numerous nodding inflorescences on relatively very long slender wiry peduncles. There is only a weak constriction present between the lower spathe and upper spathe, and the orifice of the lower spathe is open during fruiting. The entire non-pistillate portion of the spadix often dries and adheres to the spathe limb with the whole combined unit shedding.

The sole described species has vegetative modules that readily disarticulate from the deep-seated rhizome. The function of the disarticulation in this podsol-obligated species is not clear, but it is speculated that it may be an adaptation to fire resistance in a highly fire-prone habitat. Perhaps enabling the shoot unit to be destroyed in some way prevents damage to the main perennating system.

Notes

Hestia longifolia (Ridl.) S.Y.Wong & P.C.Boyce was long placed in *Schismatoglottis*, although highly distinct by vegetative morphology and in the form of the inflorescences. Molecular work by Wong (Wong *et al.*, 2010) demonstrated without doubt that *S. longifolia* was misplaced in *Schismatoglottis*, and also distinct from all other genera in the Schismatoglottideae.

Literature

2010

Wong S. Y. & P. C. Boyce. 2010. Studies on Schismatoglottideae (Araceae) of Borneo IX: A new genus, *Hestia*, and resurrection of *Apoballis*. *Bot. Stud. (Taipei)* 51: 249–255.

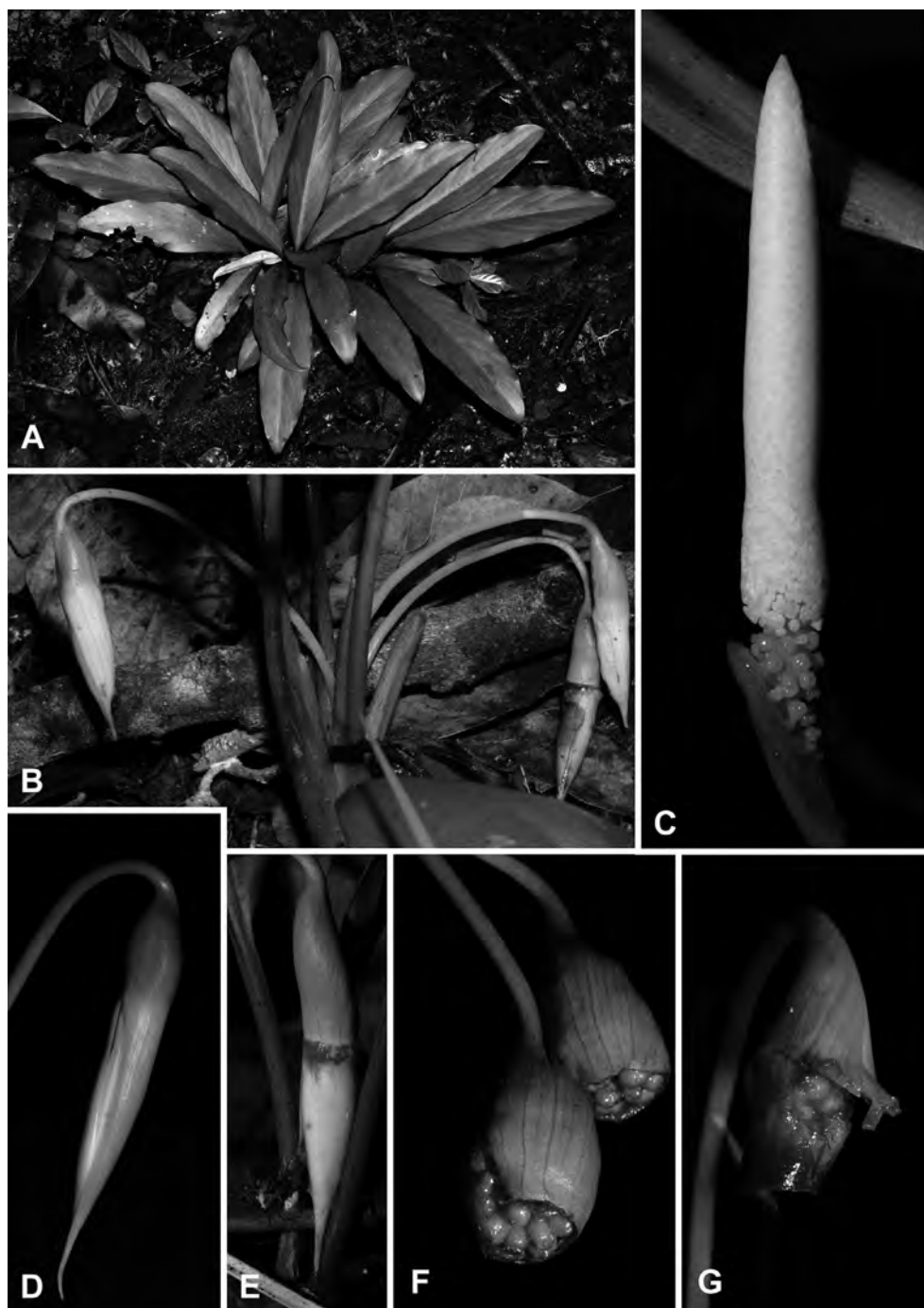


Fig. 25. *Hestia longifolia* (Ridl.) S.Y.Wong & P.C.Boyce. **A.** Plant in habitat. **B.** Inflorescences at pistillate (left), staminate (upper right) and post-anthesis (lower right). **D.** Spadix. **E.** Inflorescence post-anthesis. **F.** Infructescences. **G.** Fruits.

Holochlamys Engl., Malesia 1: 265 (1883). Fig. 26.

Taxonomy & Distribution

One species occurring on New Guinea extending to the Bismarck Archipelago. **One species in the FM region.**

Ecology

Riverine lowland forest, often seemingly occurring as a facultative rheophyte.

Distinguishing Characteristics

When not flowering plants of *Holochlamys* much resemble those of the closely related *Spathiphyllum*. Flowering *Holochlamys* are immediately distinguished by the inflorescences carried down among the leaves (not on a lengthened peduncle clear of the foliage), by the spathe limb merely loosening at anthesis (as opposed to spreading flat), and later deliquescent-marcescent and adhering to the developing infructescence, later still decomposing-fibrous (vs. persisting and becoming photosynthetic). *Holochlamys* has 1-locular ovaries with a basal placenta whereas *Spathiphyllum* has the ovary 2–4-locular with an axile placenta.

Literature

1990

Hay, A. 1990. *Aroids of Papua New Guinea* (CRI: 10). Madang: Christensen Research Institute.

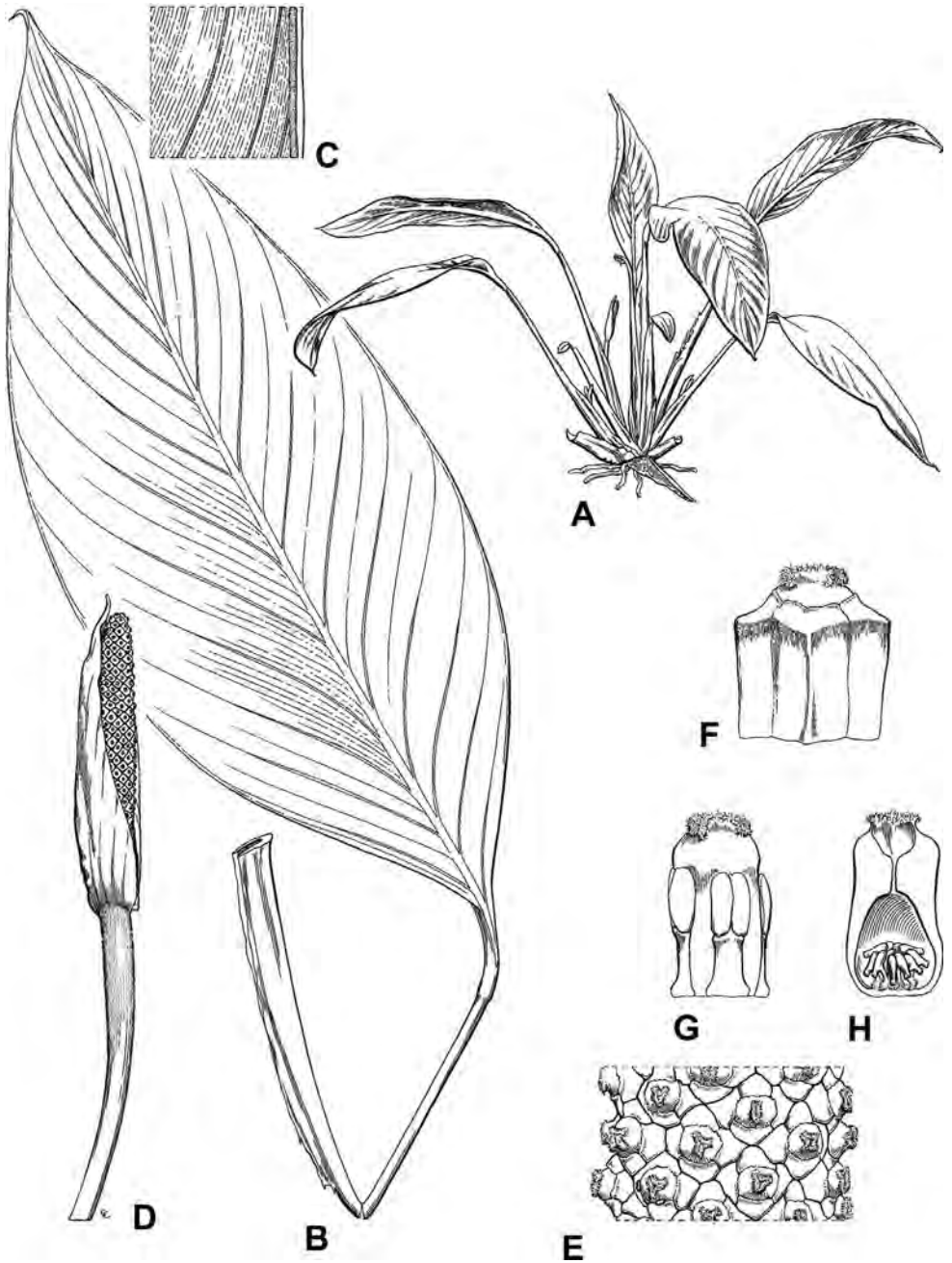


Fig. 26. *Holochlamys beccarii* (Engl.) Engl. **A**. Habit. **B**. Leaf. **C**. Detail of leaf blade venation. **D**. Inflorescence, lower portion of peduncle removed. **E**. Detail of spathe. **F**. Flower. **G**. Flower, perigone removed. **H**. Gynoecium, longitudinal section. © Trustees of the Royal Botanic Gardens, Kew. Used with permission. Original artwork by Eleanor Catherine.

Homalomena Schott in H.W.Schott & S.L.Endlicher, *Melet. Bot.*: 20. 1832; Mayo et al., *The Genera of Araceae* 177–180, pl. 47i-ii & 117A. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 31–33, Pl. 12–15. 2010. Figs. 27–29.

Taxonomy & Distribution

More than 300 species, with less than half of formally described, occurring from NE India to southern China eastwards to the Solomon Islands and south to Jawa, with known centers of diversity in Sumatera, Borneo and New Guinea, and probably Sulawesi. **At least 300 species in the FM region, with only ca. 130 described to date.**

Ecology

Primarily understory herbs in lowland ever-moist to ever-wet, or less often perhumid, tropical or subtropical lowland broadleaf forest, but also reaching mid-montane zone; sometimes rheophytic, seldom helophytic, occasionally relictual in regrowth and along road cuttings.

Distinguishing Characteristics

Homalomena comprises minute to very large clumping, tufted, rarely creeping, and very rarely climbing mostly strongly aromatic herbs with cordate to lanceolate leaves. Inflorescences generally open for only a few hours before closing again and then soon becoming pendulous with the spathe persisting, and occasionally becoming brightly colored, around the developing infructescence.

Literature

1912

Engler, A. 1912. Araceae-Philodendroideae-Philodendreae-Homalomeninae und Schismatoglottidinae. In: A. Engler (ed.), *Das Pflanzenreich* 55(IV. 23Da): 1–134.

1922

Alderwerelt van Rosenburgh, C. R. W. K. van. 1922. New or noteworthy Malayan Araceae II. *Bull. Jard. Bot. Buitenzorg* III, 4: 163–229

Alderwerelt van Rosenburgh, C. R. W. K. van. 1922. New or noteworthy Malayan Araceae III. *Bull. Jard. Bot. Buitenzorg* III, 4: 320–347.

1925

Ridley, H. N. 1925. *Flora of the Malay Peninsula*, vol. 5: 102–110. Reeve & Co., London.

1932

Furtado, C. X. 1939. Notes on some Indo-Malaysian *Homalomena* species. *Gard. Bull. Str. Settle.* 10: 183–238.

1967

Hotta, M. 1967. Notes on Bornean plants II. *Acta Phytotax. Geobot.* 22: 153–162.

1982

Hotta, M. 1982. On the differentiation of subtribes *Homalomeninae* and *Schismatoglottidinae* (Araceae) in Malesia. *Acta Phytotax. Geobot.* 33: 127–139.

1985

Hotta, M. 1985. New species of the genus *Homalomena* (Araceae) from Sumatra with a short note on the genus *Furtadoa*. *Gard. Bull. Singapore* 38 (1): 43–54.

1986

Hotta, M. 1986. Species list and cited specimens of the genus *Homalomena* (Araceae) in Malesia. In M. Hotta, (ed.), *Diversity and dynamics of plant life in Sumatra* 2: 73–120.

1993

Hotta, M. 1993. *Homalomena monandra*, a new species of aroid from West Sumatra. *Acta Phytotax. Geobot.* 44 (2): 93–96.

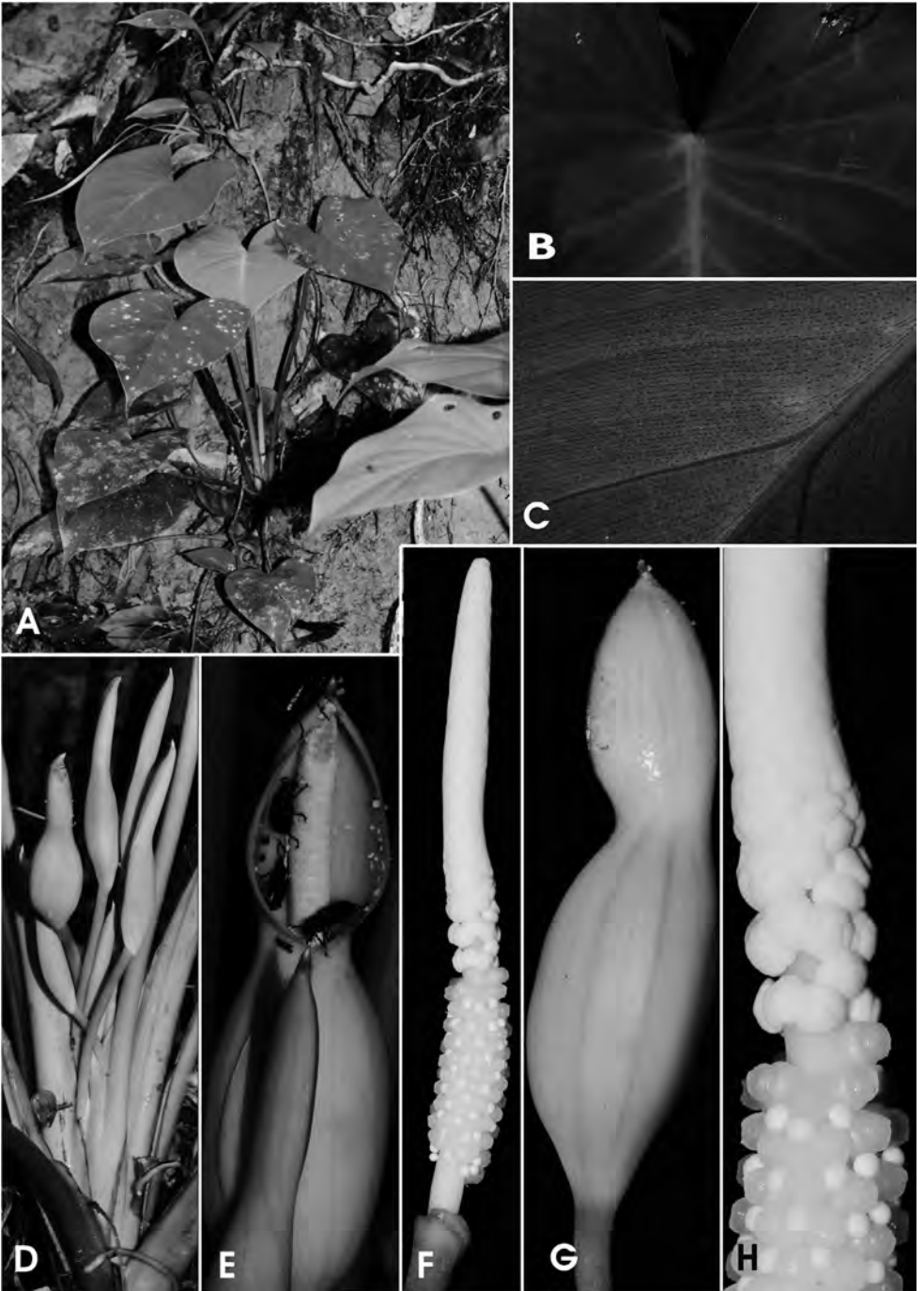


Fig. 27. *Homalomena wongii* S.Y.Wong & P.C.Boyce. **A.** Plant in habitat. **B.** Leaf blade. **C.** Adaxial surface of leaf blade. **D.** Immature inflorescences. **E.** Inflorescence at pistillate anthesis. **F.** Spadix at pistillate anthesis. **G.** Detail of the lower spathe. **H.** Spadix interstice.

1994

Boyce, P. C. 1994. New species of Araceae from Brunei. *Kew Bull.* 49(4): 793–801.

1999

Hay, A. 1999. A revision of *Homalomena* Schott (Araceae–Homalomeneae) in New Guinea, the Bismarck Archipelago and Solomon Islands. *Blumea* 44: 41–71.

2002

Hay, A. & C. Herscovitch. 2002. Two Remarkable New West Malesian *Homalomena* (Araceae) Species. *Gardens' Bull. Sing.* 54:171–178.

2007

Bogner, J. 2007. A new *Homalomena* species (Araceae) from Sumatera. *Fol. Malesiana* 8(1): 11–15.

2008

Boyce, P. C. & S. Y. Wong. 2008. Studies on Homalomeneae (Araceae) of Borneo I: Four new species and speculation on informal species groups in Sarawak. *Gard. Bull. Singapore* 60(1): 1–29.

2009

Boyce, P. C. & S. Y. Wong. 2009. Studies on Homalomeneae (Araceae) of Borneo IV: *Homalomena* specimens in the Herbarium Beccarianum–Malesia (FI–B) of the Museo di Storia Naturale – Sezione Botanica “F. Parlatore” dell’Università di Firenze. *Webbia* 64(2): 169–173.

2010

Baharuddin S. & P. C. Boyce. 2010. Studies on Homalomeneae (Araceae) of Borneo V: A new species and new supergroup record of *Homalomena* from Sabah, Malaysian Borneo. *Tropical Life Sciences Research* 21(2): 89–94.

Baharuddin S. & P. C. Boyce. 2010. Studies on Homalomeneae (Araceae) of Peninsular Malaysia I: *Homalomena asmae*, a new species from Perak. *Acta Phytotax. Geobot.* 60(3): 163–166.

Boyce, P. C., S. Y. Wong & B. A. Fasihuddin. 2010. Studies on Homalomeneae (Araceae) of Borneo II: The Homalomena of Nanga Sumpa (Batang Ai) – Novel & pre-existing taxa, and notes on Iban Usages. *Gard. Bull. Singapore* 61(2): 269–317. 163–166.

Tung L. S., S. Y. Wong & P. C. Boyce. 2010. Studies on Homalomeneae (Araceae) of Borneo VI: *Homalomena giamensis*, a new species from Sarawak, Malaysian Borneo, with notes on its pollination. *Aroideana* 33: 201–211.

2011

Baharuddin S. & P. C. Boyce. 2011. Studies on Homalomeneae (Araceae) of Peninsular Malaysia V: *Homalomena wallichii*, Refound After More Than 190 years. *Aroideana* 34: 24–29.

Hoe Y. C., S. Y. Wong, P. C. Boyce, Wong M. H. & Chan M. K. Y. 2011. Studies on Homalomeneae (Araceae) of Borneo VII: *Homalomena debilicrista* a new species from Sarawak, Malaysian Borneo, with observations on its pollination. *Plant Div. Evol.* 129(1): 77–87.

Hoe Y. C., S. Y. Wong, P. C. Boyce, Wong M. H. & Chan M. K. Y. 2011. Studies on Homalomeneae (Araceae) of Borneo XI: *Homalomena matangae*, a new species from Sarawak, Malaysian Borneo. *Webbia* 66(2): 143–148.

Kurniawang, A., Ni Putu Sri Asih, B. Adjie & P. C. Boyce. 2011. Studies on the Araceae of Sulawesi I: New taxa of *Schismatoglottis* and *Homalomena*, and a preliminary checklist and keys for Sulawesi. *Acta Phytotax. Geobot.* 61(1): 40–50.

Kurniawang, A., Ni Putu Sri Asih, B. Adjie & P. C. Boyce. 2011. Studies on Homalomeneae (Araceae) of Borneo IX: A new species of *Homalomena* Supergroup Chamaecladon from Kalimantan Timur, Indonesian Borneo. *Aroideana* 34: 30–36.

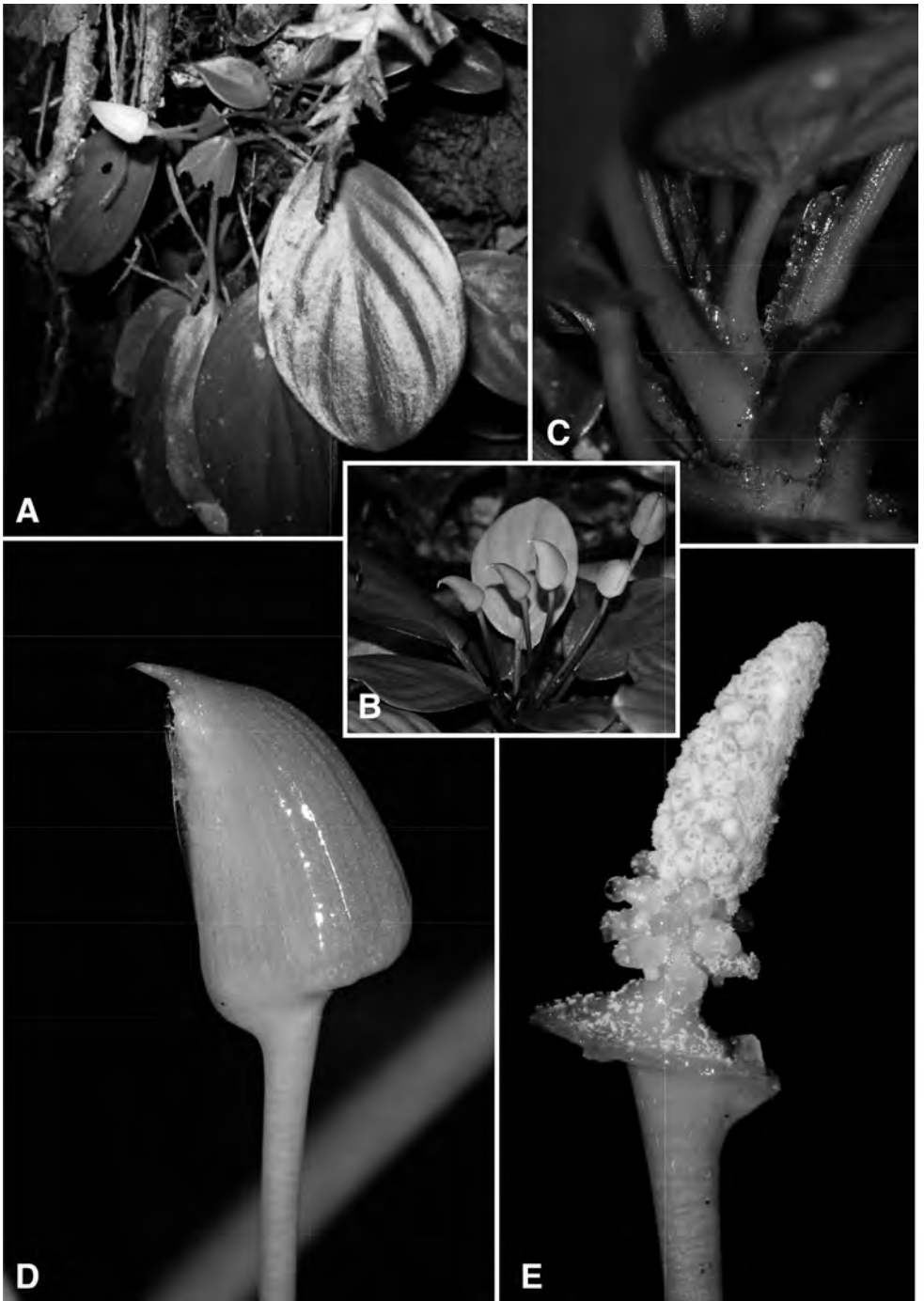


Fig. 28. *Homalomena bypsiantha* P.C.Boyce & S.Y.Wong. **A.** Plant in habitat. **B.** Plant in cultivation. **C.** Petiolar sheath. **D.** Inflorescence at staminate anthesis. **E.** Spadix at staminate anthesis.

- Ng K. K., Ahmad Sofiman, P. C. Boyce & Wong S. Y. 2011. Studies on Homalomeneae (Araceae) of Borneo VIII: Delimitation of additional informal suprageneric taxa for Sundaic *Homalomena*. *Webbia* 66(1): 21–28.
- Ng K. K., P. C. Boyce & Ahmad Sofiman O. 2011. Studies on Homalomeneae (Araceae) of Peninsular Malaysia II: An historical and taxonomic review of the genus *Homalomena* (excluding *Chamaecladon*). *Gard. Bull. Singapore* 62(2): 277–289.
- Wong S. Y. & P. C. Boyce. 2011. Studies on Homalomeneae (Araceae) of Borneo X: Two new *Homalomena* species from Brunei, and a new Informal Species Complex for Supergroup Cyrtocladon. *Webbia* 66(2): 133–141.
- Wong S. Y., P. C. Boyce & B. A. Fasihuddin. 2011. Studies on Homalomeneae (Araceae) of Borneo III: The helophytic *Homalomena* of Sunda. *Gard. Bull. Singapore* 62(2): 313–325.
- Zulhazman, H., P. C. Boyce & M. Mashhor. 2011. Studies on Homalomeneae (Araceae) of Peninsular Malaysia III: *Homalomena kualakobensis*, a new species from Kelantan. *Acta Phytotax. Geobot.* 61(1): 35–39.

2012

- Ni Putu Sri Asih, A. Kurniawan & P. C. Boyce. 2012. Studies on Homalomeneae (Araceae) of Borneo XII – *Homalomena tirtae*, a new species from Kalimantan Timur, Indonesian Borneo, and notes on the *Homalomena Borneensis* Complex. *Willdenowia* 42: 241–246.
- Wong S. Y. & P. C. Boyce. 2012. Studies on Homalomeneae (Araceae) of Sumatera I: *Homalomena hysiantha*, a distinctive new species of the Chamaecladon Supergroup. *Webbia* 67(2): 147–150.
- Zulhazman, H., M. Mashhor & P. C. Boyce. 2012. Studies on Homalomeneae (Araceae) of Peninsular Malaysia IV: *Homalomena stongensis*, a remarkable new species endemic to Gunung Stong, Kelantan. *Gard. Bull. Singapore* 64(2): 525–529.

2013

- Boyce, P. C. & S. Y. Wong. 2013. Studies on Homalomeneae (Araceae) of Sumatera II: *Homalomena limnogenia*, a novel species from Pulau Belitung, and the first record of colonial helophytism in the *Homalomena* Chamaecladon Supergroup. *Webbia* 68(2): 77–79.
- Wong S. Y., Y. C. Hoe, L. S. Tung & P. C. Boyce. 2013. Studies on Homalomeneae (Araceae) of Borneo XIII – New Species of *Homalomena*. *Aroideana* 36: 8–29.
- Wong S. Y., P. J. Tan, K. K. Ng, Ahmad Sofiman O., H. B. Lee, B. A. Fasihuddin & P. C. Boyce. 2013. Phylogeny of Asian *Homalomena* (Araceae) based on the ITS Region Combined with Morphological and Chemical Data. *Syst. Bot.* 38(3): 589–599.

2014

- Boyce, P. C. & S. Y. Wong. 2014. Studies on Homalomeneae (Araceae) of Borneo XVI: Three new shale-obligated *Homalomena* species. *Webbia* 69(1): 59–67.
- Boyce, P. C. & S. Y. Wong. 2014. Studies on Homalomeneae (Araceae) of Borneo XV – A novel limestone-obligated *Homalomena* from SW Sarawak, Malaysian Borneo. *Aroideana* 37: 38–43.
- Boyce, P. C. & S. Y. Wong. 2014. Studies on Homalomeneae (Araceae) of Borneo XIV – A new rheophytic species of *Homalomena* from Sarawak, Malaysian Borneo. *Aroideana* 37: 33–37.
- Wong S. Y. & P. C. Boyce. 2014. Studies on Homalomeneae (Araceae) of Borneo XVIII: *Homalomena prolixa* and *Homalomena scutata*, two new species of doubtful affinity. *Willdenowia* 44: 279–285.
- Wong S. Y. & P. C. Boyce. 2014. Studies on Homalomeneae (Araceae) of Borneo XVII: Two new species of granite-restricted *Homalomena* from NW Sarawak. *Webbia* 69(1): 69–74.



Fig. 29. *Homalomena cowleyae* P.C.Boyce & S.Y.Wong. **A & B.** Plants in habitat. **C.** Emerging inflorescences. **D.** Inflorescences at staminate anthesis. **E.** Spadix at pistillate anthesis.

Hottarum Bogner & Nicolson, *Aroideana* 1: 72 (1979, “1978”); Mayo et al., *The Genera of Araceae* 187. 1997. Fig. 30.

Taxonomy & Distribution

Two species endemic on Borneo. **Two species in the FM region.**

Ecology

Hottarum is rheophytic on shaded riverside rocks and boulders under open perhumid lowland forest.

Distinguishing Characteristics

Hottarum resembles species of the genus *Piptospatha* by having the staminate flowers with the thecae pores embedded in deep pits (a characteristic it shares with *Galantharum*), and the white spathe limb with the rostrum and interior base cherry-red spathe. Inflorescences of *Hottarum* are odourless, whereas those of *Galantharum* are powerfully fragrant. The spadix of *Hottarum* terminates in an appendix composed of sterile staminate flowers while *Galantharum* is fertile to the tip.

Literature

2000

Bogner, J. & A. Hay. 2000. Schismatoglottideae in Malesia II – *Aridarum*, *Bucephalandra*, *Phymatarum* and *Piptospatha*. *Telopea* 9(1): 183–193, Fig. 1–3.



Fig. 30. *Hottarum eborinum* P.C.Boyce & S.Y.Wong. **A.** Plants in habitat. **B.** Inflorescence at pistillate anthesis. **C.** Spadix at pistillate anthesis. **D.** Post-anthesis inflorescence. Image A © Mike Lo. Used with permission.

Lasia Lour. *Fl. Cochinch.* 1:64, 81. 1790; Mayo et al., *The Genera of Araceae* 138, pl. 26 & 112A. 1997; Boyce et al., *The Araceae of Borneo*, *Aroideana* 33: 29, Pl. 10. 2010. Fig. 31.

Taxonomy & Distribution

Two species; one—*Lasia spinosa* (L.) Thwaites—widespread in tropical Asia from India to New Guinea, the other (*Lasia concinna* Alderw.) endemic to the Kapaus river valley, Borneo.

Ecology

Lowland freshwater swamp forest margins, sometimes persisting in seasonally flooded pasture and *padi* where often maintained as a vegetable—*paku longkan*—with the newly emerging shoots being picked and fried with *belacan* (shrimp paste).

Distinguishing Characteristics

Lasia is a genus of clumping or colonial stoloniferous herbs with a thick prickly creeping or unarmed erect stem and prickly (*Lasia spinosa* (L.) Thwaites) or smooth (*Lasia concinna* Alderw.) fruits. The prickly petioles carry either sagittate to hastate-sagittate (the latter mainly in juveniles) to deeply simply to 4× pinnatifid leaves. The spathe is notably thick and somewhat spongy and either twisted and opening basally (*L. spinosa*) or straight and opening terminally (*L. concinna*). *Lasia spinosa* is widespread, as well as being variable in habit, from erect and clump-forming to somewhat decumbent and colonial via the production of long stolons, with leaves varying from simple hastate to pinnatifid. By comparison *L. concinna* appears to be restricted to the Kupuas river valley in Kalimantan (Indonesian Borneo) with the widely separated populations remarkably morphologically stable.

Literature

1988

Hay, A. 1988. *Cyrtosperma* (Araceae) and its Old World allies. *Blumea* 33: 427–469.

1997

Hambalii, G. G. & M. Sizemore. 1997. The rediscovery of *Lasia concinna* Alderw. (Araceae: Lasioideae) in West Kalimantan. *Aroideana* 20(1): 37–39.



Fig. 31. *Lasia spinosa* (L.) Thwaites. **A.** Flowering plant. **B.** Ripe infructescence with spinulose berries. *Lasia concinna* Alderw. **C.** Mature leaf. **D.** Inflorescence at pistillate anthesis. **E.** Ripe infructescence with smooth berries.

Nephtytis Schott, *Oesterr. Bot. Wochenbl.* 7: 406. 1857; Mayo et al., *The Genera of Araceae* 216–218, Pl. 69, 122A. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 33, Pl. 31. 2010. Fig. 32.

Taxonomy & Distribution

Six species with a disjunction of five species in tropical West Africa, and one species in NE Borneo. **One species in the FM region.**

Ecology

Lowland riverine (alluvial-depositional) perhumid broadleaf evergreen tropical forest.

Distinguishing Characteristics

The leaf of *Nephtytis bintuluensis* A. Hay, Bogner & P. C. Boyce resembles that of *Cyrtosperma merkusii* and simple-leaved forms of *Lasia spinosa*. *Nephtytis bintuluensis* is distinguished by the smooth (not armed) petioles and scattered, solitary (not clustered multiple) leaves.

Notes

Nauheimer et al. (2012b) has *Nephtytis bintuluensis* falling out from the rest of the otherwise tropical West African genus (and indeed from the clade in which *Nephtytis* otherwise occupies), and instead grouping in a separate clade with the Asian genera *Aglaonema* and *Aglaodorum*, implying (based on the considerable disparity of the species of these genera with *N. bintuluensis*), that *N. bintuluensis* represents a new genus.

Literature

1994

Hay, A., J. Bogner & P. C. Boyce. 1994. *Nephtytis* Schott (Araceae) in Borneo: A new species and new generic record for Malesia. *Novon* 4(4): 365–368.

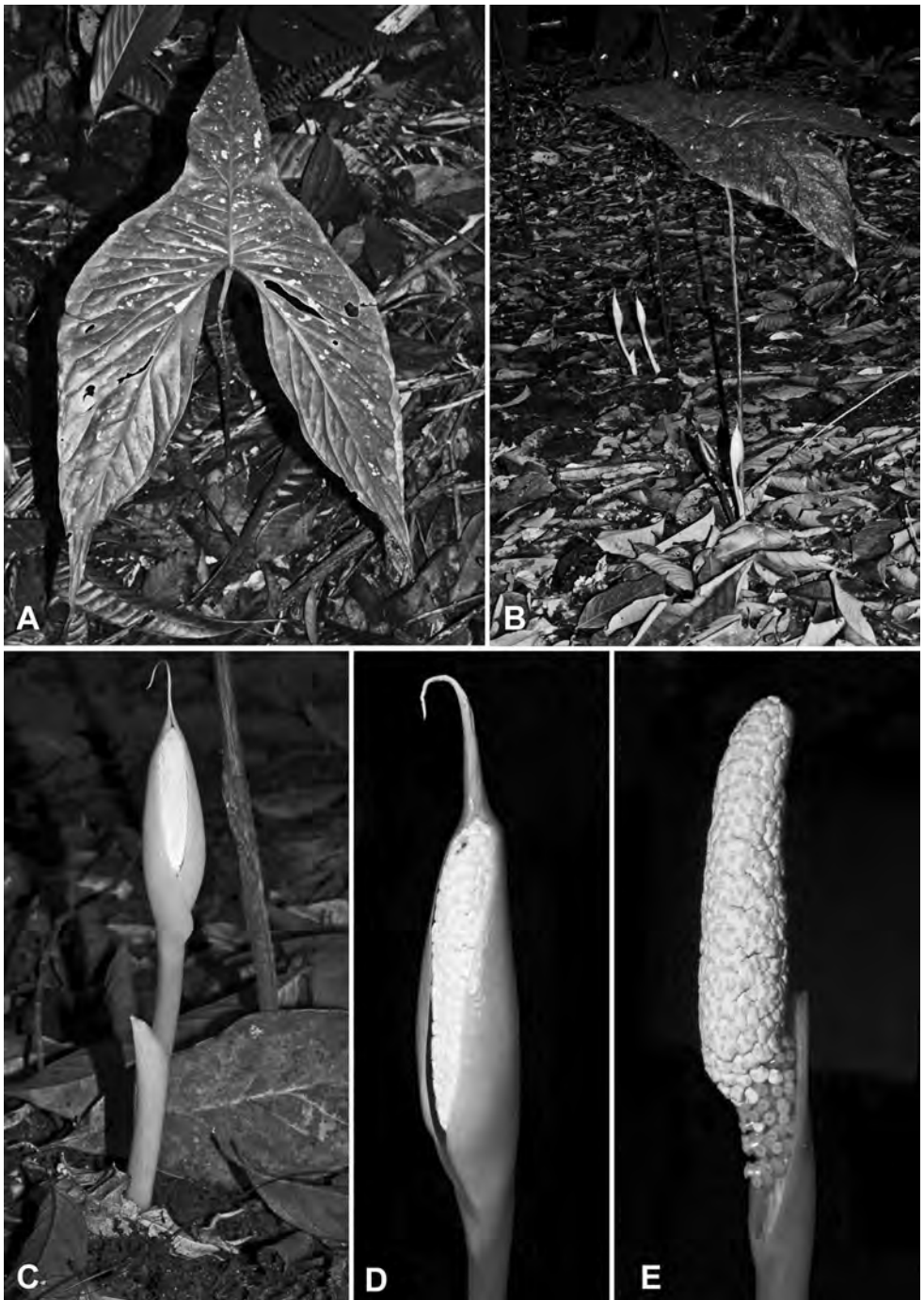


Fig. 32. *Nephthytis bintuluensis* A.Hay, Bogner & P.C.Boyce. **A.** Plant in habitat. **B.** Flowering plants. Note scattered leaves. **C & D.** Inflorescence at pistillate anthesis. **E.** Spadix at pistillate anthesis.

Ooia S. Y. Wong & P. C. Boyce, *Bot. Stud. (Teipei)* 51: 545. 2010; Boyce et al., The Araceae of Borneo, *Aroideana* 33: 45, Pl. 21. 2010. Fig. 33.

Taxonomy & Distribution

About 10 species, of which seven not yet described, all endemic to Borneo. **About 10 species in FM region.**

Ecology

Obligate rheophytes, often lithophytic, along streams and by waterfalls in lowland to lower montane perhumid to ever-wet broadleaf tropical forest. Most species are geologically confined.

Distinguishing Characteristics

Ooia is unique by the persistence of the entire spadix axis through to fruit maturation and dispersal, with the axis remaining fresh and the spent flowers sloughing away. Most of the spathe of *Ooia* species is persistent late into fruit development at which point the extreme top margin and associated rostrum are shed enlarging the spathe orifice to allow spent flowers to be shed from the persistent spadix and later to enable the mature fruits, which decompose at full ripeness, to be washed from the spathe by means of water turbulence.

Literature

2010

Wong S. Y. & P. C. Boyce. 2010. Studies on Schismatoglottideae (Araceae) of Borneo XI: *Ooia*, a new genus and a new generic delimitation of *Piptospatha*. *Bot. Stud. (Teipei)* 51: 543–552.

2013

Wong S. Y. & P. C. Boyce. 2013. Studies on Schismatoglottideae (Araceae) of Borneo XXXII: *Ooia paxilla*, a new dwarf obligate rheophyte from Kalimantan Utara *Webbia* 68(2): 87–89.

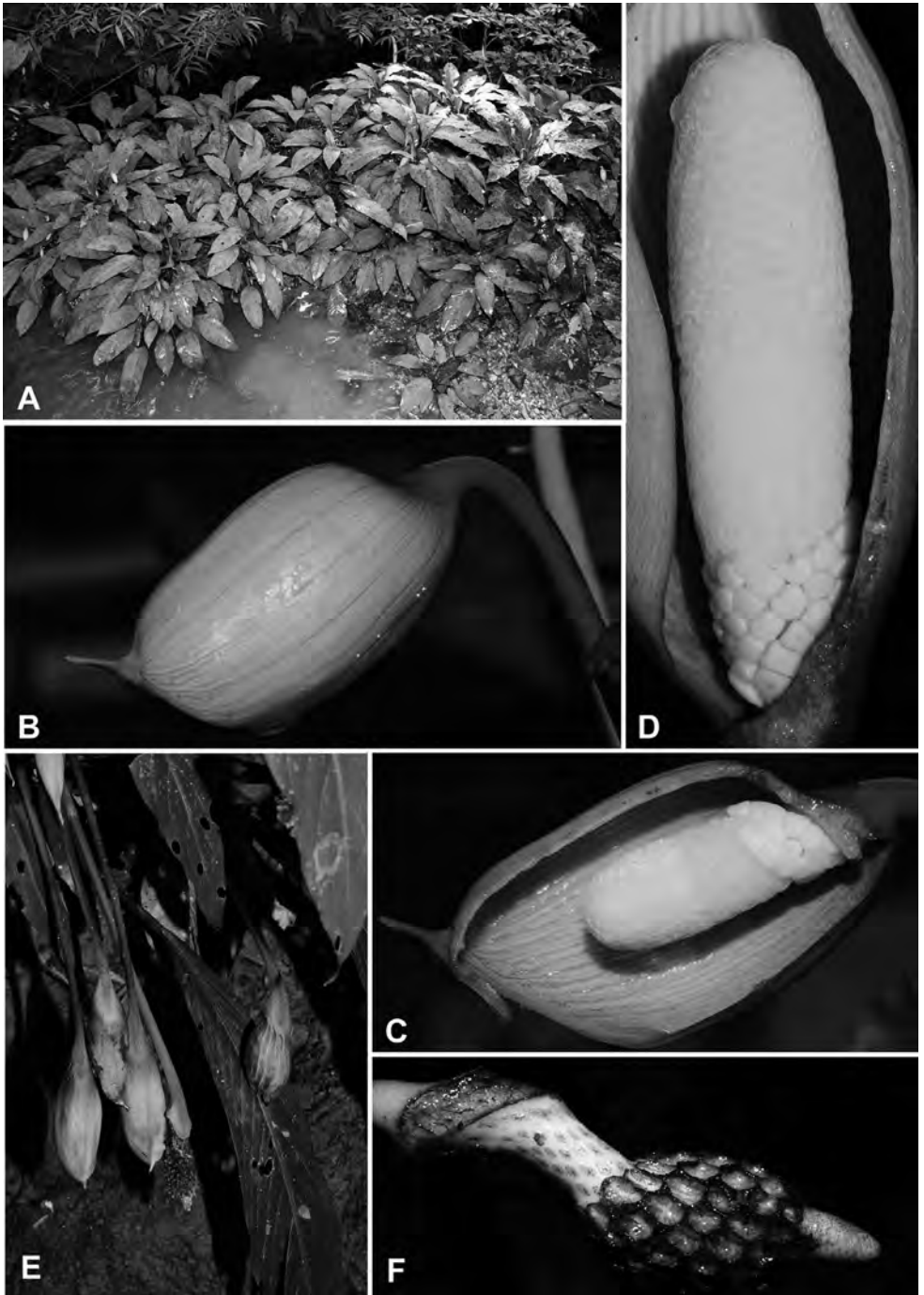


Fig. 33. *Ooia secta* P.C.Boyce & S.Y.Wong. **A.** Plants in habitat. **B.** Inflorescence at pistillate anthesis. **C & D.** Spadix at pistillate anthesis. **F.** Infructescence post fruit-dispersal.

Pedicellarum M.Hotta *Acta Phytotax. Geobot.* 27:61 1976; Mayo et al. *The Genera of Araceae* 100, Pl.6 & 108B. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 19. 2010. Fig. 34.

Taxonomy & Distribution

One species, restricted to NW Borneo. **One species in the FM region.**

Ecology

Primary to disturbed secondary lowland to hill perhumid evergreen broadleaf tropical forest, usually on ridges.

Distinguishing Characteristics

Pedicellarum is evidently very closely similar to species of *Pothos*, especially those of the *Goniurus* Supergroup, although distinguishable by the stipitate receptacle to the flowers and the cup-like structure formed by the fused tepals.

Literature

1976

Hotta, M. 1976. Notes on Bornean Plants III: *Pedicellarum* and *Heteroaridarum*, two new genera of the aroids. *Acta Phytotax Geobot.* 27: 61–65.

1984

Nicolson, D. H. 1984. A second collection of *Pedicellarum* (Araceae) 7(2): 56–57.

2001

Boyce, P. C. & A. Hay. 2001. A taxonomic revision of Araceae tribe Potheae (*Pothos*, *Pothoidium* and *Pedicellarum*) for Malesia, Australia and the tropical Western Pacific. *Telopea* 9(3): 449–571.



Fig. 34. *Pedicellarum paiei* M.Hotta. **A.** Plant in habitat. **B.** Detail of leaf blade undersurface. **C.** Inflorescence at staminate anthesis.

Phymatarum M. Hotta, *Mem. Coll. Sci. Kyoto Imp. Univ., Ser. B, Biol.* 32(1):29. 1965; Mayo et al., *The Genera of Araceae* 189, Pl. 53, 118C. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 45–47, Pl. 22. 2010. Fig. 35.

Taxonomy & Distribution

A single species restricted to NC Borneo. **One species in the FM region.**

Ecology

Obligate rheophyte on muddy or sandy river banks and eyots in lowland everwet broadleaf forest, occasionally becoming the dominant terrestrial herb species in logged-over areas and along margins of freshwater swamp forest.

Distinguishing Characteristics

Phymatarum differs from *Schismatoglottis* by possessing unistaminate flowers that are distinctly warty, and with the long-horned thecae, and seeds with a long micropylar appendage. Other unistaminate-flowered Schismatoglottideae are *Bucephalandra*, and two groups of *Aridarum* species. The recently described *Schismatoglottis persistens* (Wong & Boyce 2014) is highly reminiscent of *Phymatarum* in the sterile state, but readily differentiated by lacking the above mentioned floral characteristics.

Literature

2000

Bogner, J. & A. Hay. 2000. Schismatoglottideae in Malesia II – *Aridarum*, *Bucephalandra*, *Phymatarum* and *Piptospatha*. *Telopea* 9(1): 198–200.

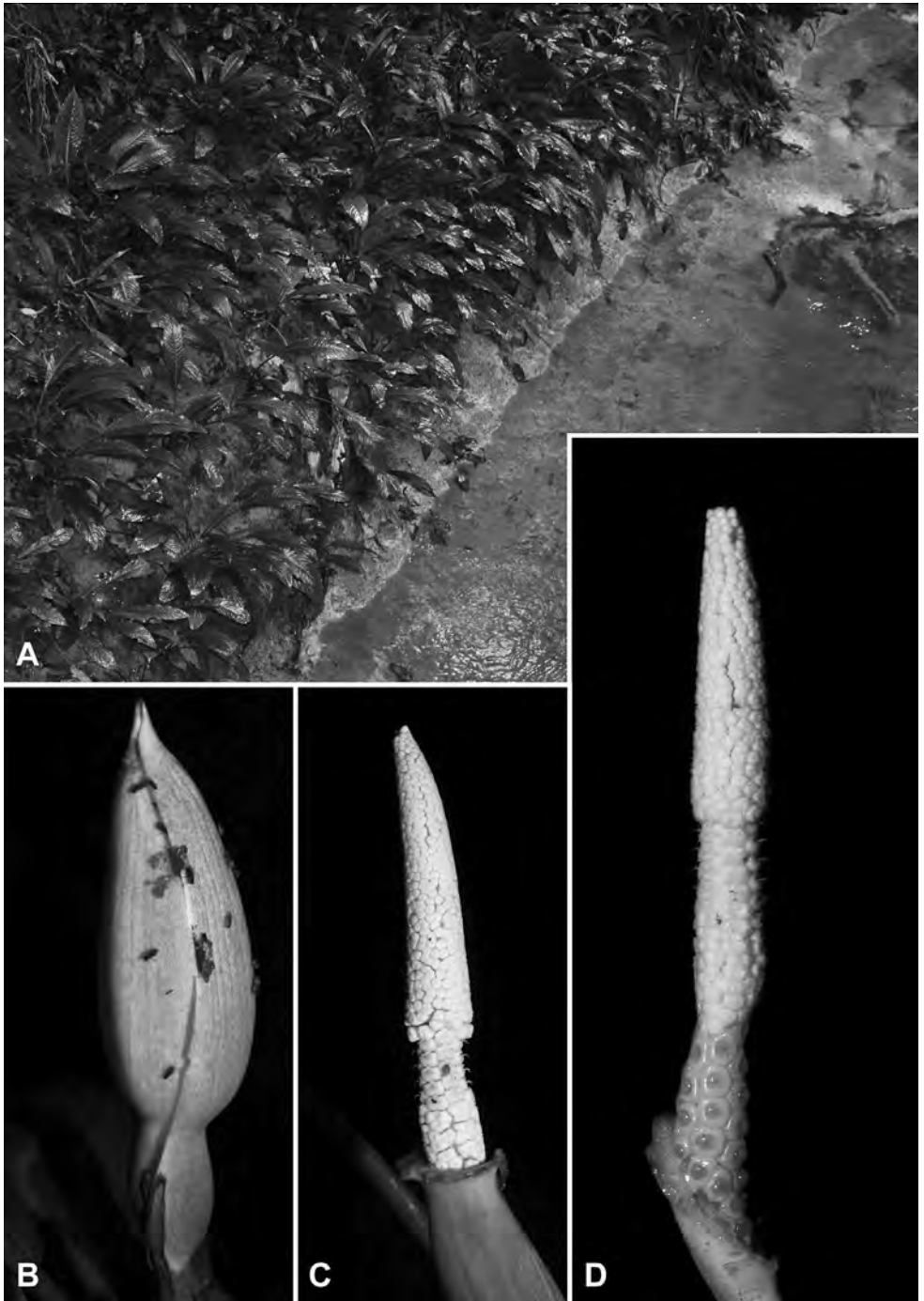


Fig. 35. *Phymatarum borneense* M.Hotta. **A.** Plants in habitat on a muddy river bank. **B.** Inflorescence at pistillate anthesis. **C.** Inflorescence at staminate anthesis. **D.** Spadix at pistillate anthesis.

Pichinia S.Y.Wong & P.C.Boyce, *Gardens' Bull. Sing.* 69(2): 297–304. 2010; Boyce et al., The Araceae of Borneo, *Aroideana* 33: 47, Pl. 23. 2010. Fig. 36.

Taxonomy & Distribution

One species endemic on Borneo. **One species in the FM region.**

Ecology

Obligate lithophyte on Karst limestone blocks under ever-wet lowland evergreen broadleaf tropical forest.

Distinguishing Characteristics

The distichous arrangement of the leaves of *Pichinia* is unique in the Tribe Schismatoglottideae. In nature the plants grow horizontally out from vertical or near-vertical surfaces with the fan leaves favoring a litter-trapping ability.

Notes

Based on molecular analyses *Pichinia* occupies an isolated position in the tribe Schismatoglottideae and is conceivably a relict species from an otherwise extinct lineage.

Literature

2010

Wong S. Y. & P. C. Boyce. 2010. Studies on Schismatoglottideae (Araceae) of Borneo X: *Pichinia*, a new genus from Sarawak, Malaysian Borneo. *Gard. Bull. Singapore* 61(2): 541–548.



Fig. 36. *Picinia disticha* S.Y.Wong & P.C.Boyce. **A.** Plant in habitat on Karst limestone. **B.** Leaf blade undersurface. **C.** Detail of the leaf arrangement. **D.** Inflorescence at staminate anthesis. **E.** Inflorescence at very late pistillate anthesis. **F.** Spadix at early staminate anthesis. **G.** Young infructescences.

Piptospatha N.E.Br., *Gard. Chron.*, n.s., 1879(1): 138–187; Mayo et al., *The Genera of Araceae* 184–187, Pl. 50, 117D. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 47, Pl. 24. 2010. Fig. 37–38.

Taxonomy & Distribution

About 12 species, three in West Malaysia, southern Thailand, and the Riau Archipelago, the remainder endemic on Borneo. **About 12 species in the FM region.**

Ecology

Obligate rheophytes along streams and by waterfalls in lowland to lower montane perhumid to ever-wet tropical broadleaf forest. Most species are obligate to specific geologies, notably granite and limestone.

Distinguishing Characteristics

Piptospatha is defined by the shedding spathe limb, erect splash cup, parietal placentation, fruits either fused into a syncarpium (most) or free but cohering, and the presence of micropylar appendage on the seed. Most species have a pink to reddish spathe, although West Malaysian and southern Thai *Piptospatha perakensis* (Engl.) Engl. and Bornean *P. nivea* P.C.Boyce, S.Y.Wong & Sahal have a white spathe limb.

As currently circumscribed (Wong & Boyce 2010) *Piptospatha* is polyphyletic, with the highly distinctive Type species, *Piptospatha insignis*, occurring in its own subclade in a lineage comprised of the subclades for two groups of species currently assigned to *Aridarum Bakoa*, *Fenestratarum*, *Galantharum*, and *Hottarum*. The remainder of *Piptospatha* is separated into a clade comprising the Bornean species and another non-sister clade for the species occurring in the west of Sunda.

Literature

2000

Bogner, J. & A. Hay. 2000. Schismatoglottideae in Malesia II – *Aridarum*, *Bucephalandra*, *Phymatarum* and *Piptospatha*. *Telopea* 9(1): 201–219, Figs. 4–6.

2009

Wong S. Y., P. C. Boyce & J. Bogner. 2009. Studies on Schismatoglottideae (Araceae) of Borneo VIII: A review of the *Piptospatha elongata* Group in West Sarawak. *Gard. Bull. Singapore* 61(1): 221–238.

2010

Wong S. Y. & P. C. Boyce. 2010. Studies on Schismatoglottideae (Araceae) of Borneo XI: *Ooia*, a new genus and a new generic delimitation of *Piptospatha*. *Bot. Stud. (Taipei)* 51: 543–552.

2011

Wong S. Y., J. Bogner & P. C. Boyce. 2011. Studies on Schismatoglottideae (Araceae) of Borneo XIV: *Piptospatha marginata* resurrected and observations on *Piptospatha*, notably for the Rejang drainages. *Webbia* 66(1): 29–32.

2012

Boyce, P. C. & S. Y. Wong. 2012. The Araceae of Indomalaya I: *Piptospatha* N. E. Br. *Aroideana* 35: 3–23.

Wong S. Y. & P. C. Boyce. 2012. The Araceae of Indomalaya II: *Piptospatha* N. E. Br. *Malayan Nat. J.* 64(1): 9–32.



Fig. 37. *Piptospatha insignis* N.E.Br. **A.** Plants in habitat. **B & C.** Inflorescence at pistillate anthesis. **D.** Inflorescence at pistillate anthesis. **E.** Staminate flower zone. Images A–C © Mike Lo. Used with permission.

Wong S. Y. & P. C. Boyce. 2012. Schismatoglottideae of Borneo XIX – *Piptospatha pileata*, a remarkable new species from Kalimantan Timur, Indonesian Borneo. *Willdenowia* 42: 247–253.

2013

Boyce, P. C. & S. Y. Wong. 2013. Studies on Schismatoglottideae (Araceae) of Borneo XXXI – *Piptospatha insignis* re-found. *Newslett. Int. Aroid Soc.* 35(2): 6–8.

Boyce, P. C. & S. Y. Wong. 2013. Studies on Schismatoglottideae (Araceae) of Borneo XXIX – *Piptospatha manduensis* – the ultimate aroid calciphile? *Aroideana* 36: 98–103.

Boyce, P. C. & S. Y. Wong. 2013. *Piptospatha teijsmanii* (Araceae: Schismatoglottideae), a new species from Kepulauan Riau, Indonesia. *Webbia* 68(2): 81–86.

Boyce, P. C. & S. Y. Wong. 2013. Studies on Schismatoglottideae (Araceae) of Borneo XXIII: *Piptospatha colata* and *P. deceptrix*, taxonomic novelties from Borneo. *Gard. Bull. Singapore* 65(1): 7–17.

Wong S. Y. & P. C. Boyce. 2013. Studies on Schismatoglottideae (Araceae) of Borneo XXV – A diminutive new *Piptospatha* from Sabah. *Webbia* 68(1): 3–5.

2014

Boyce, P. C., S. Y. Wong & A. Sahal. 2014. Studies on Schismatoglottideae (Araceae) of Borneo XXXIV: *Piptospatha nivea*, a new species from Kalimantan Tengah, Indonesian Borneo. *Aroideana* 37E(2):50–55.

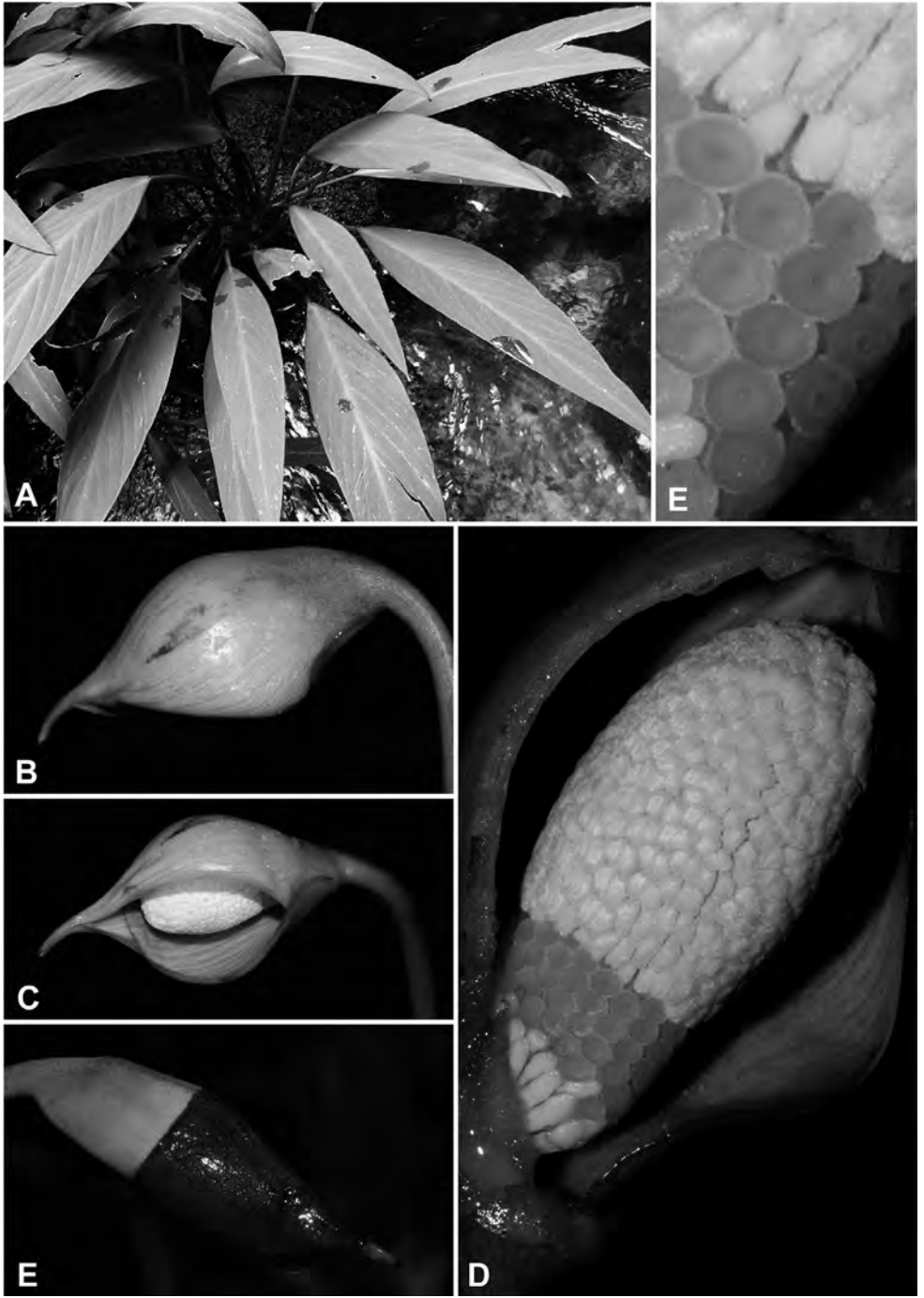


Fig. 38. *Piptospatha teijsmannii* P.C.Boyce & S.Y.Wong. **A.** Plants in habitat. **B & C.** Inflorescence at pistillate anthesis. **D.** Spadix at pistillate anthesis. **E.** Inflorescence post-anthesis.

Pistia L., *Sp. Pl.*: 963. 1753; Mayo, Bogner & Boyce, *Genera of Araceae* 286–288, Pl. 105 & 130C. 1997. Fig. 39.

Taxonomy & Distribution

One species occurring pantropically. **One species in the FM region.**

Ecology

Floating aquatic on slow moving or still water, often in roadside ditches and old monsoon drains.

Distinguishing Characteristics

The rosette of densely pubescent leaves free-floating on the surface of water is diagnostic.

Literature

See Mayo et al. (1997).

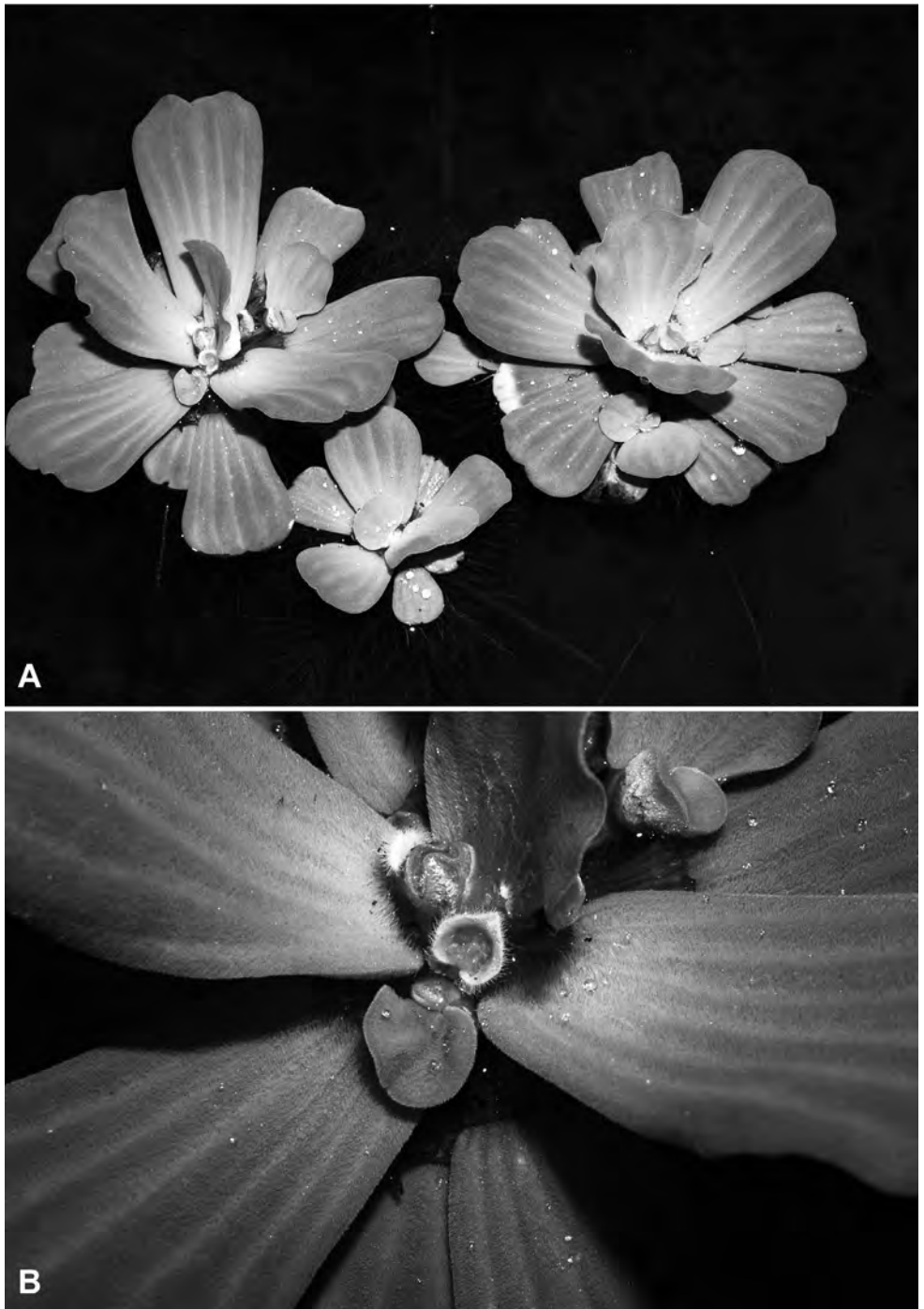


Fig. 39. *Pistia stratiotes* L. A & B. Flowering plant.

Podolasia N. E. Br., *Gard. Chron.*, n.s., 1882(2):70. 1882; Mayo et al., *The Genera of Araceae* 138, Pl. 26 & 112A. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 29–31, Pl. 11. 2010. Fig. 40.

Taxonomy & Distribution

One species occurring disjunctly in Sumatera, Peninsular Malaysia, and Borneo. **One species in the FM region.**

Ecology

Lowland perhumid peat-swamp forest, usually on raised peat deposits (podzols) subject to seasonal inundation, less often on damp sub-ridgetop kerangas.

Distinguishing Characteristics

The richly colored spathe and spadix becoming bicolored as staminate anthesis progresses are diagnostic. The spadix begins white, and remains white through pistillate anthesis. At the onset of staminate anthesis (which proceeds from the tip to the base of the spadix) the individual flowers turn to deep purple as staminate anthesis proceeds. By the end of anthesis and throughout fruit development, the spadix is deep purple.

Podolasia may be distinguished vegetatively by the short, distinct, unarmed internodes, the persistent leaf bases (often decaying into tough fibres), though which adventitious roots emerge, and by the downward-pointing petiole prickles. The fruits are also characteristic, being relatively very large (their length considerably exceeding the diameter of the spadix), individually distinct berries exserted well clear of the tepals. *Podolasia stipitata* is very sporadic in distribution throughout its range, although it is frequently locally abundant.

Literature

1988

Hay, A. 1988. *Cyrtosperma* (Araceae) and its Old World allies. *Blumea* 33(2): 463–465.



Fig. 40. *Podolasia stipitata* N.E.Br. **A.** Plants in habitat. **B.** Inflorescence at staminate anthesis. **C.** Detail of spadix base at end of anthesis. **D.** Submature infructescence nearing maturity.

Potboidium Schott, Oesterr. Bot. Wochenbl. 7: 70. 1857; Mayo et al., *The Genera of Araceae* 100–103, pl. 7 & 1997. Fig. 41.

Taxonomy & Distribution

One species occurring in the Philippines, Sulawesi, Maluku, and on Lanyu Island (Taiwan). **One species in the FM region.**

Ecology

Primary to disturbed lowland to hill forest on a variety of substrates including clays and volcanic-derived soils.

Distinguishing Characteristics

Potboidium has functionally unisexual spadices arranged in sequentially maturing panicles. The structure of the fertile shoots is formed by the reduction of all the leaves of a leafy fertile shoot system to minute prophylls and cataphylls with the panicle-like synflorescence hence to be regarded as an aggregate structure. Interpretation of *Potboidium* inflorescences suggests that *P. lobbianum* is functionally dioecious. Staminate spadices have flowers with prominently visible anthers and an apparently sterile ovary. Pistillate spadices have flowers with a large unilocular fertile ovary and no stamens. Flowers of *Potbos* species are always bisexual with a trilocular ovary.

Although unique in the Araceae by the structure of the inflorescence system, in the Philippines *Potboidium lobbianum* is not infrequently collected as *Potbos cylindricus* C. Presl, a species with strikingly similar vegetative appearance there often occurring sympatrically with *Potboidium lobbianum*.

Literature

2001

Boyce, P. C. & A. Hay. 2001. A taxonomic revision of Araceae tribe Potheae (*Potbos*, *Potboidium* and *Pedicellarum*) for Malesia, Australia and the tropical Western Pacific. *Telopea* 9(3): 558–561, Fig. 51.

2013

Hoe Y. C. 2013. *Potboidium* – Neglected, But Not Forgotten? *Aroideana* 36: 123–128.

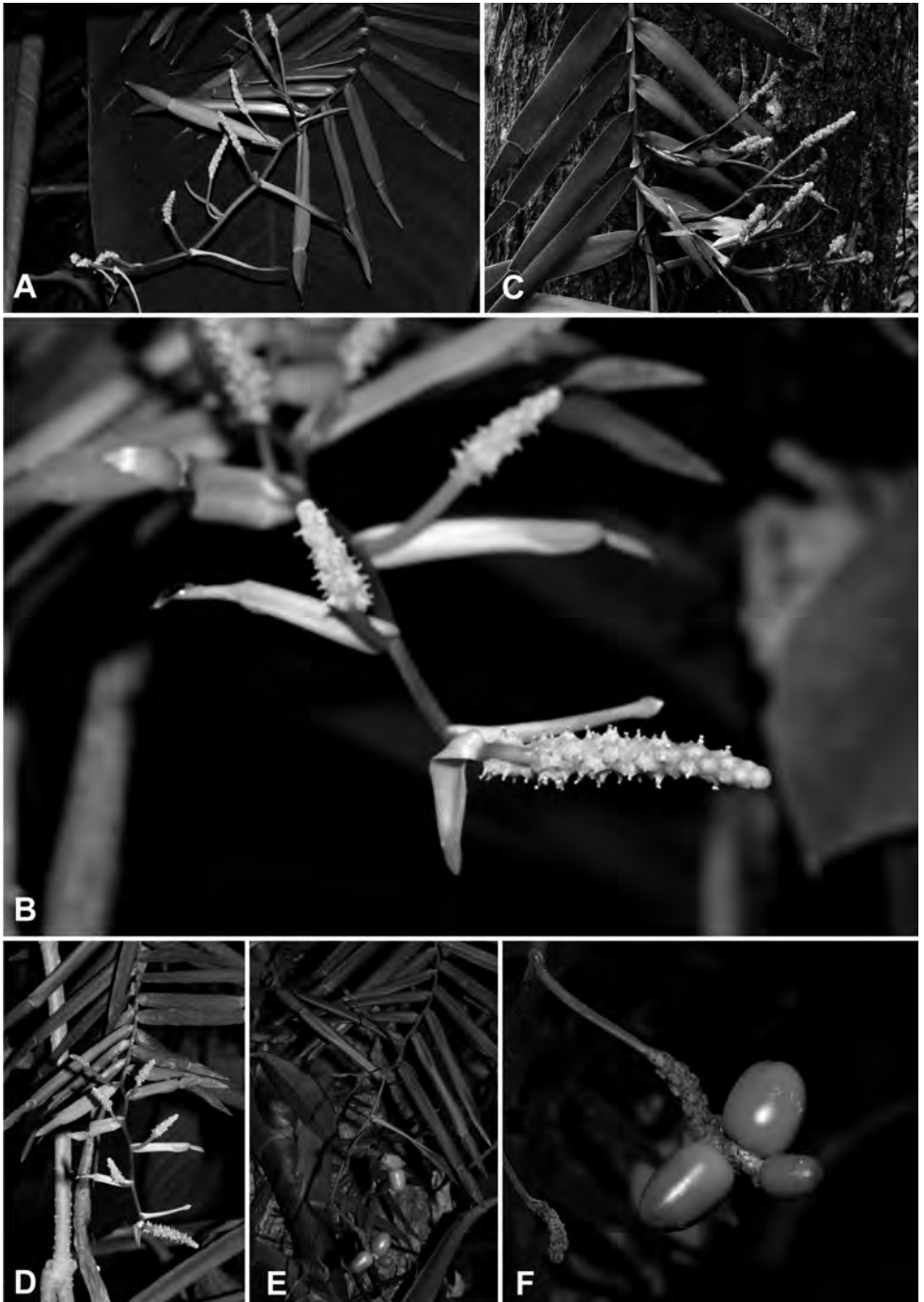


Fig. 41. *Potboidium lobbianum* Schott. **A & D.** Flowering branches. **B.** Pistillate inflorescences. **C.** Staminate plant. **E.** Fruiting plant. **F.** Developing and ripe fruits. Images A–B, D–E © David Scherberich; image C © Peter Pelsler. Used with permission.

Pothos L. Sp. Pl.: 968. 1753; Mayo et al., *The Genera of Araceae* 98–99, pl. 5 & 108A, 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 17–19, Pl. 2. 2010. Fig. 42–44.

Taxonomy & Distribution

Approximately 70 species distributed from Madagascar through to India, the subtropical eastern Himalayas, throughout subtropical and tropical Asia into the tropical western Pacific and tropical eastern Australia. **43 species in the FM region. The taxonomy of some still doubtful.**

Ecology

Primary to disturbed secondary lowland to upper hill perhumid evergreen broadleaf subtropical and tropical forest, often on slopes or ridges, less often in poorly drained valley bottoms, at least some species (e.g. *Pothos insignis* Engl., *P. ovatifolius* Merr., and *P. leptostachyus* Schott) are limestone obligates.

Distinguishing Characteristics

Pothos is divided into two subgenera: *Pothos* and *Allopothos*, with *Allopothos* further divided into two informal supergroups: Allopothos and Goniurus. Subgenus *Pothos* is distinguishable by the (leaf-) blade-like petiole, lacking an obvious sheath with the whole leaf resembling that of many *Citrus*. Subgenus *Allopothos* has a distinct petiole, sheathing for much of its length. The Allopothos supergroup has a spadix with congested flowers while the flowers of the Goniurus supergroup are scattered, with portions of the spadix axis clearly visible between individual flowers. Species of the Goniurus supergroup (notably *P. oliganthus* P.C.Boyce & A.Hay—see Boyce & Hay, 2001) are of interest as they appear to link the genera *Pothos* and *Pedicellarum*.

The juvenile shingling stages of most *Pothos* are all highly similar in genera appearance.

Literature

1994

Boyce, P. C. & A. D. Poulsen. 1994. Notes on *Pothos insignis* (Araceae: Pothoideae). *Kew Bull.* 49: 523–528.

1995

Hay, A. 1995. The genus *Pothos* L. (Araceae-Potheae) in New Guinea, Solomon Islands and Australia. *Blumea* 40: 397–419.

1998

Boyce, P. C. & A. Hay. 1998. Diversity in shoot architecture in *Pothos* (Araceae: Pothoideae): Observations towards a new infrageneric classification. Pp. 51–58 in J. Dransfield, M. J. E. Coode & D. A. Simpson (eds) *Plant Diversity in Malesia III. Proceedings of the Third International Flora Malesiana Symposium 1995*. (Royal Botanic Gardens: Kew).

2001

Boyce, P. C. & A. Hay. 2001. A taxonomic revision of Araceae tribe Potheae (*Pothos*, *Pothoidium* and *Pedicellarum*) for Malesia, Australia and the tropical Western Pacific. *Telopea* 9(3): 449–571. 2001



Fig. 42. *Pothos scandens* L. **A.** Sterile shoot. **B.** Reiterative branch from base of plant. **C.** Flowering shoot.

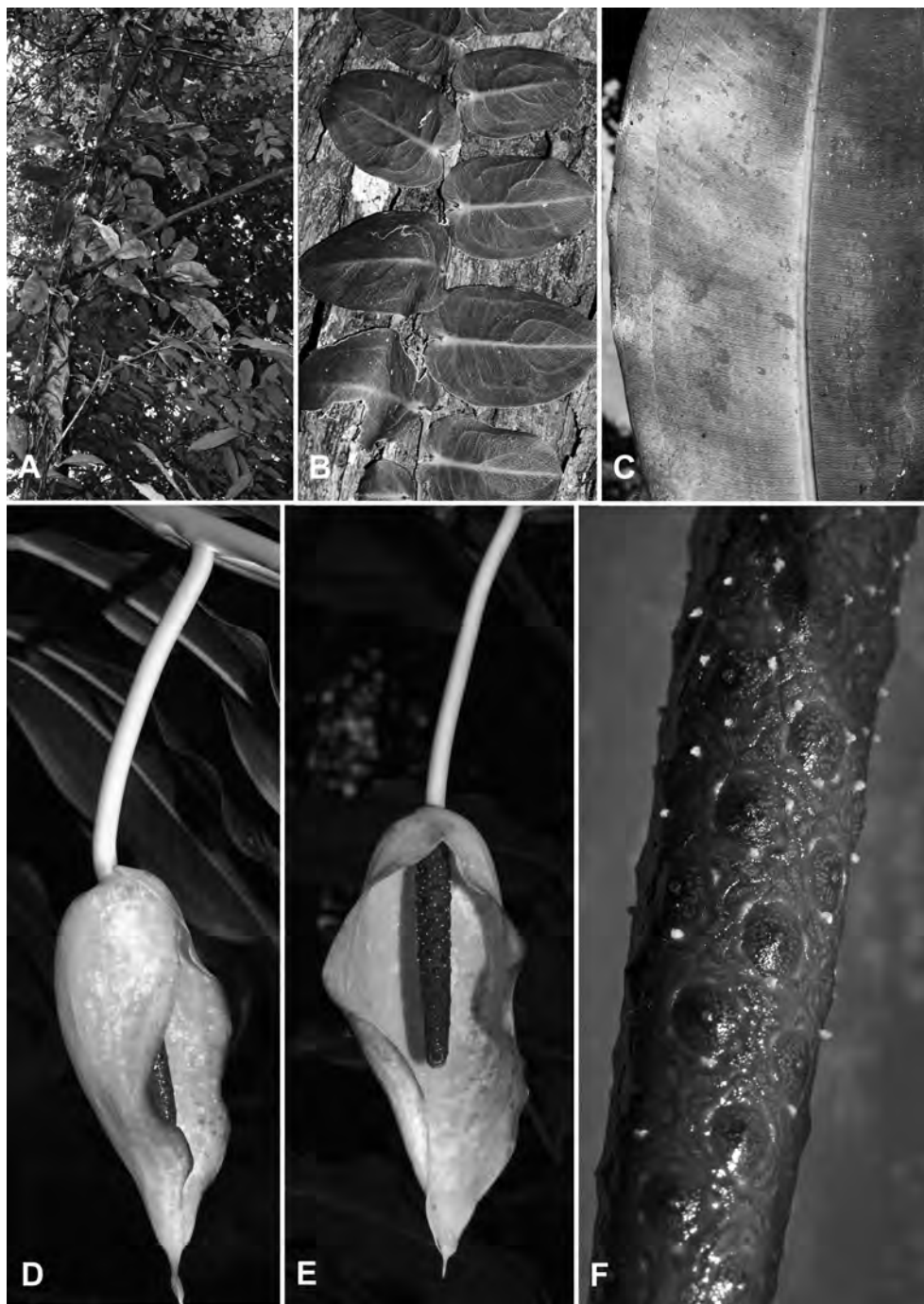


Fig. 43. *Pothos atropurpurascens* M.Hotta. **A.** Mature plant in habitat. **B.** Juvenile shingle stage. **C.** Detail of venation, adult leaf blade. **D & E.** Inflorescence at staminate anthesis. **F.** Detail of spadix, staminate anthesis.

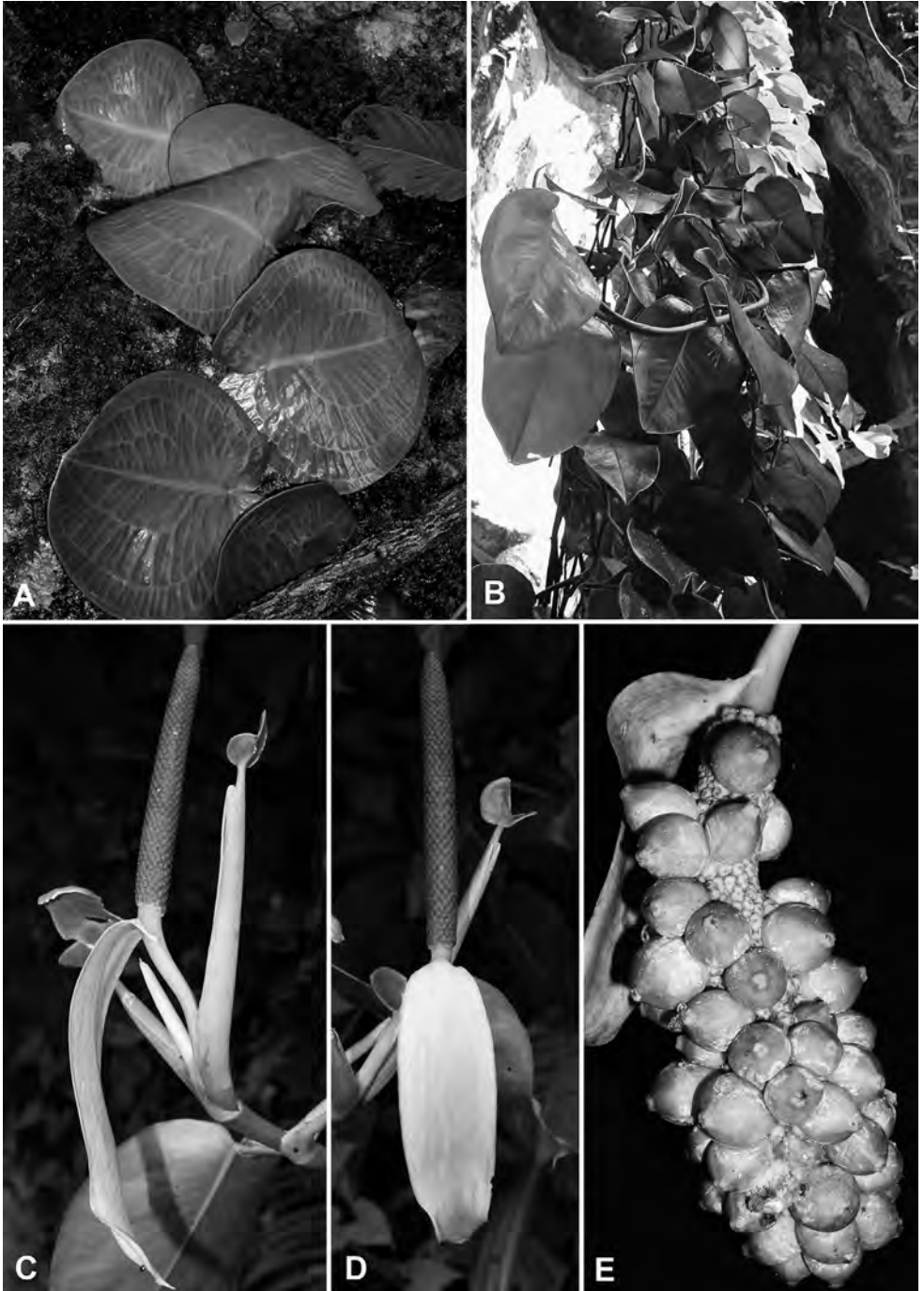


Fig. 44. *Potbos ovatifolius* Engl. **A.** Juvenile shingle stage. **B.** Mature branches. **C & D.** Inflorescence at late pistillate anthesis. **E.** Sub-ripe infructescence.

Remusatia Schott in H.W.Schott & S.L. Endlicher, Melet. Bot.: 18. 1832; Mayo, et al. *The Genera of Araceae* 280, Pl. 102 & 129D. Fig. 45.

Taxonomy & Distribution

Four species. Two (*Remusatia bookeriana* Schott and *R. pumila* (D. Don) H.Li & A.Hay) occurring from NE India to SW China; one (*Remusatia yunnanensis* (H.Li & A.Hay) A.Hay) found in SW China and Taiwan, and one (*Remusatia vivipara* (Roxb.) Schott) widespread in the subtropics and tropics of Africa, the Arabian Gulf, and continental Asia, extending to Jawa and Nusa Tenggara, Christmas Island, and north eastern Australia. **One species in the FM region.**

Ecology

Epiphytic, less frequently lithophytic, in evergreen and semi-deciduous seasonally dry forest.

Distinguishing Characteristics

The erect stolons covered with barbed bulbils are instantly diagnostic for this species the FM region. The large yellow inflorescences seem to be irregularly produced in the FM region.

Literature

1987

Li Heng. 1987. What is *Gonatantbus* (?) *ornatus* Schott (Araceae). *Aroideana* 10 (2): 23–26.

Li Heng. 1987. [A new combination in the genus *Remusatia* of *Araceae*], in Chinese. *Acta Phytotax. Sin.* 25 (5): 414–416.

1991

Li Heng. 1991. [On the typification of two species in the genus *Remusatia* (Araceae)], in Chinese. *Acta Bot. Yunnanica* 13 (2): 113–119.

1992

Li Heng. 1992. [Dormation (*sic*) of distribution area of *Remusatia* (Araceae) and its disjunction], in Chinese. *Acta Bot. Yunnanica, Suppl.* 5: 71–76.

Li Heng & A. Hay. 1992. [Classification of the genus *Gonatantbus*], in Chinese. *Acta Bot. Yunnanica* 14 (4): 373–378.

Li Heng & A. Hay. 1992. [Notes on the classification of genera *Remusatia* and *Gonatantbus* in *Araceae*], in Chinese. *Acta Bot. Yunnanica, Suppl.* 5: 27–33.

2012

Li Rong, Yi Tingshuang & Li Heng Li. 2012. Is *Remusatia* (Araceae) Monophyletic? Evidence from Three Plastid Regions. *Int. J. Mol. Sci.* 13: 71–83.



Fig. 45. *Remusatia vivipara* (Roxb.) Schott. **A.** Plants in habitat. **B.** Stolon with barbed bulblets. **C.** Inflorescence at staminate anthesis. **D.** Spadix at staminate anthesis. Images B–D © Alan Galloway, used with permission.

Rhaphidophora Hassk. *Flora* 25(2 Beibl. 1):11. 1842; Mayo, et al. *The Genera of Araceae* 118–121, pl. 15 & 109C; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 27–28, Pl. 6. 2010. Figs. 46–47.

Taxonomy & Distribution

About 100 species from wet tropical Africa, and throughout tropical South and South East Asia, perhumid and ever-wet subtropical and tropical Australia, and the tropical Pacific with extensions into the subtropical Himalaya, southern China, and the southernmost islands of Japan.

Ecology

Usually in well drained subtropical and tropical perhumid to ever-wet broadleaf subtropical and tropical forest at low to mid-montane elevations, rarely in peat swamp (*Rhaphidophora lobbii* Schott) or freshwater swamp forest (*Rhaphidophora minor* Hook. f.).

Distinguishing Characteristics

Superficially, species of *Rhaphidophora* are difficult to differentiate from species of *Scindapsus*. In ripe fruit the genera are readily distinguished by the shape and quantity of seeds per fruit—ellipsoid and numerous in *Rhaphidophora*, kidney-shaped and solitary in *Scindapsus*.

Notes

Many *Rhaphidophora* species large climbers, occasionally enormous, although three rheophytic species are known (*Rhaphidophora araea* P.C.Boyce, *R. beccarii* (Engl.) Engl, and *R. typha* P.C.Boyce), and several species attain only modest stature.

In some species groups the juvenile phases are remarkably different in appearance to the adult plants—in some instances so different that the juveniles have been described as species in another genus (e.g. *Pothos celatocaulis* Engl. described for the juvenile shingling phase of *R. korthalsii* Schott).

Literature

1993

Hay, A. 1993. *Rhaphidophora petrieana* - a new aroid liane from tropical Queensland; with a synopsis of the Australian Araceae-Monstereae. *Telopea* 5(2): 293–300.

1999

Boyce, P. C. 1999. The genus *Rhaphidophora* Hassk. (Araceae–Monsteroideae–Monstereae) in Peninsular Malaysia, and Singapore. *Gard. Bull. Singapore* 51: 183–256.

2000

Boyce, P. C. 2000. The genus *Rhaphidophora* Hassk. (Araceae–Monsteroideae–Monstereae) in the southern and western Indonesian archipelago. *Gard. Bull. Singapore* 52: 101–183.

Boyce, P. C. 2000. The genus *Rhaphidophora* Hassk. (Araceae–Monsteroideae–Monstereae) in the Philippines. *Gard. Bull. Singapore* 52: 213–256.

Boyce, P. C & J. Bogner. 2000. An account of neotenic species of *Rhaphidophora* Hassk. (Araceae–Monsteroideae–Monstereae) in Australia and New Guinea. *Gard. Bull. Singapore* 52: 89–100.

2001

Boyce, P. C. 2001. The genus *Rhaphidophora* Hassk. (Araceae–Monsteroideae–Monstereae) in Borneo. *Gard. Bull. Singapore* 53: 19–74.



Fig. 46. *Rhabdophora kortbalsii* Schott. **A.** Flowering plant in habitat. **B.** Shoot tips. **C.** Pre-adult plant with leaf blades smaller and less divided than of adult. **D.** Shingling stage of juvenile plant.

Boyce, P. C. 2001. The genus *Rhaphidophora* Hassk. (Araceae–Monsteroideae–Monstereae) in New Guinea, Australia and the tropical western Pacific. *Gard. Bull. Singapore* 53: 75–183.

2005

Boyce, P. C. 2005. A new species of *Rhaphidophora* Hassk. (Araceae: Monstereae) from Borneo. *Gard. Bull. Singapore* 57: 211–216.

2006

Boyce, P. C. 2006. *Rhaphidophora tenuis* (Araceae: Monstereae) Resurrected. *Gard. Bull. Singapore* 58(1): 1–5.

Boyce, P. C. 2006. *Rhaphidophora crassifolia* (Araceae: Monstereae): a new record for Sarawak and notes on the *Rhaphidophora* 'Hongkongensis' group in Borneo. *Gard. Bull. Singapore* 58(1): 19–24.

2010

Ahmad Sofiman O. & P. C. Boyce. 2010. Studies on Monstereae (Araceae) of Peninsular Malaysia II: *Rhaphidophora latevaginata*, newly recorded for West Malaysia. *Gard. Bull. Singapore* 62(1): 1–8.

Baharuddin S. & P. C. Boyce. Studies on Monstereae (Araceae) of Peninsular Malaysia I: *Rhaphidophora megasperma*, a new record for West Malaysia. *Tropical Life Sciences Research* 21(2): 1–6.

2012

Boyce, P. C., H. Zulhazman & M. Mashhor. 2012. Studies on Monstereae (Araceae) of Peninsular Malaysia IV: The enigmatic *Rhaphidophora corneri* refound after 75 years. *Gard. Bull. Singapore* 64(2): 281–288.



Fig. 47. *Rhabdophora megasperma* Engl. **A.** Plant in habitat. **B.** Leaf blade, abaxial. **C.** Synflorescence of one emerging inflorescence, one post anthesis (spathe black), and one young infructescence. **D.** Inflorescence at staminate anthesis. **E.** Infructescence.

Sauromatum Schott in H.W.Schott & S.L.Endlicher, Melet. Bot.: 17. 1832); Mayo, et al. *The Genera of Araceae* 263–265, Pl. 94 & 128B. Fig. 48.

Taxonomy & Distribution

Nine species distributed from NE India to SW China, and extending though Sumatera to Nusa Tenggara. **Two species in the FM region.**

Ecology

Understory of monsoonal lowland to mid-elevation forests.

Distinguishing Characteristics

Species now assigned to *Sauromatum* and *Typhonium* Schott have in recent decades seen the subject of taxonomic shuffling. Most recently (Cusimano et al. 2010) a combination of molecular analyses and the enabled polarization of otherwise difficult to determine characterizations produced a suite of reliable morphologies for circumscribing *Sauromatum*: (1) pedatisect leaf blades; (2) a lower spathe with fused margins, (3) clavate lower staminodes; and (4) upper staminodes that are differently shaped from the lower ones and/or represented by longitudinal ridges on the spadix interstice between the lower staminodes and the staminate flowers.

Literature

1994

Sriboonma, D., J. Murata & K. Iwatsuki. 1994. A revision of *Typhonium* (Araceae). *J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot.* 14: 255–313.

2000

Hettterscheid, W. L. A. & P. C. Boyce. 2000. A reclassification of *Sauromatum* Schott and new species of *Typhonium* Schott (Araceae). *Aroideana* 23: 48–55.

2010

Cusimano, N., M. D. Barrett, W. L. A. Hettterscheid & S. S. Renner. 2010. A phylogeny of the Araceae (Araceae) implies that *Typhonium*, *Sauromatum*, and the Australian species of *Typhonium* are distinct clades. *Taxon* 59(2): 439–447.



Fig. 48. *Sauromatum horsfieldii* Miq. **A & B.** Plant in habitat. **C.** Different colour morphs. **D.** Floral zones and staminodes of spadix. Images C–D © Wilbert L. A. Hetterscheid. Used with permission.

Schismatoglottis Zoll. & Moritz, *Syst. Verz.* 83. 1846; Mayo et al., *The Genera of Araceae* 182–184, Pl. 49i-iii, 117C. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 47–49, Pls 25 & 26. 2010. Figs. 49–51.

Taxonomy & Distribution

About 200 species, with many still undescribed, ranging from Sumatera to New Guinea and as far north as SW China. Borneo is a major centre of species diversity. **About 180 species in FM region, of which 118 are currently published.**

Ecology

Terrestrial, often on steep slopes, lithophytic, rheophytic, or rarely chasmophytic in lowland to lower montane perhumid to ever-wet tropical evergreen forest.

Distinguishing Characteristics

Schismatoglottis is currently defined by a spathe more-or-less constricted between the lower persistent and upper deciduous parts, staminate flowers lacking thecae horns, seeds without a micropylar appendage, and parietal placentation. Within these parameters lifeform is diverse, encompassing plants with either pleionanthic or (in aroids) rare hypaxanthic shoot modules, stoloniferous, colonial or clumping solitary mesophytes, clumping or solitary rheophytes and lithophytes, and gigantic pachycauls, the stems are variously elongated and creeping to erect or weakly climbing, to clumping and congested.

Notes

Schismatoglottis, and in particular the rheophytic species, is currently the focus of intense research using combined molecular and morphological/ecological studies (see Wong 2013 & Low et al. 2015 for an overview of numerous characteristics of the rheophytic adaptation). There is growing evidence that the genus, as circumscribed, is polyphyletic.

Literature

2000

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2003

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2006

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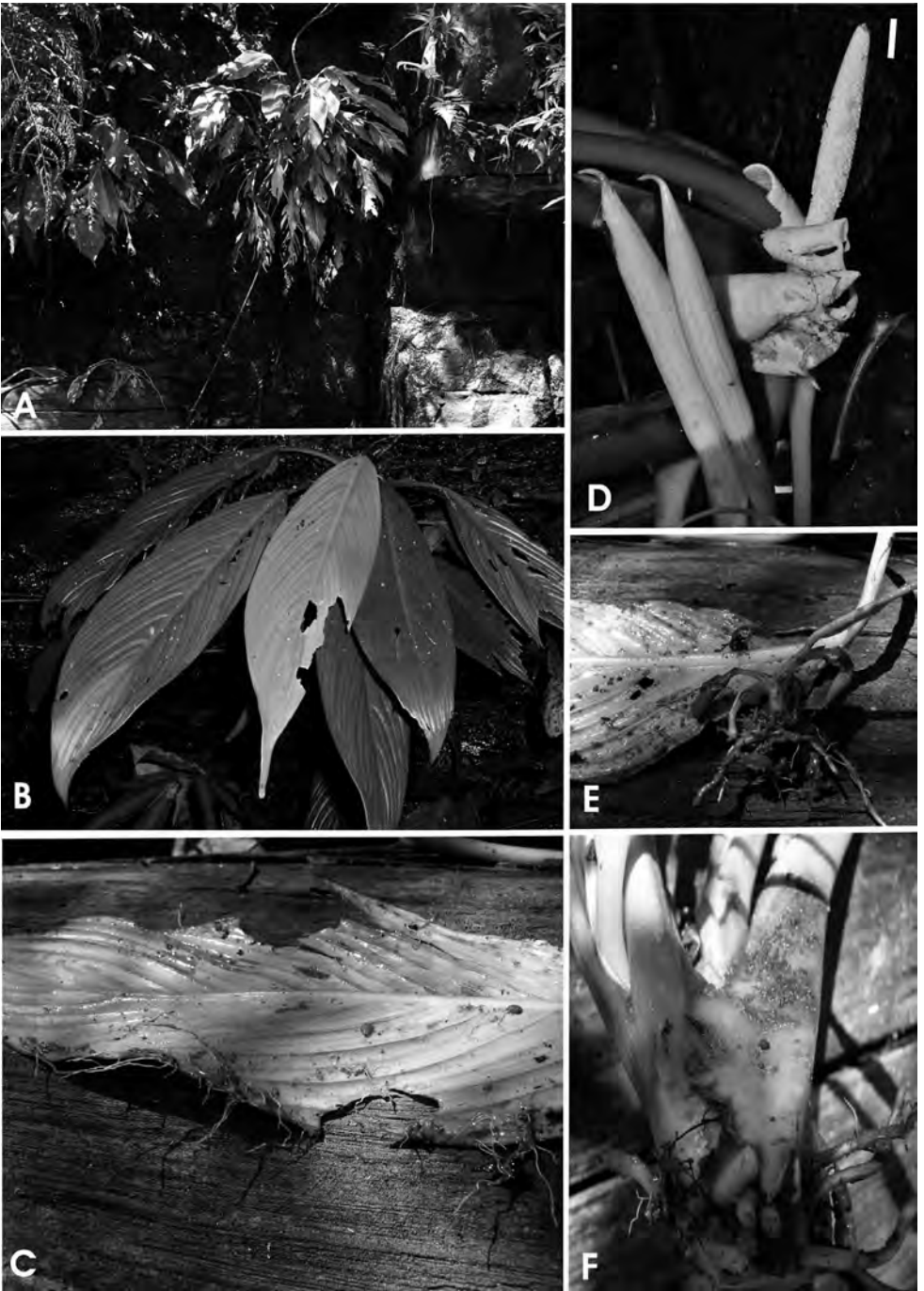


Fig. 49. *Schismatoglottis heterodoxa* S. Y. Wong. **A.** Plants in habitat. **B.** Leaf blades. **C & E.** Plantlets along margins of leaf blade. **D.** Inflorescences. **F.** New growth at the base of an already flowered shoot (i.e. modules hapaxanthic).

2008

Wong S. Y. & P. C. Boyce. 2008. Studies on Schismatoglottideae (Araceae) of Borneo III: *Schismatoglottis confinis*, a Putative Sister Taxon to *Schismatoglottis bauensis* from Sarawak, Malaysian Borneo. *Gard. Bull. Singapore* 60(1): 155–163.

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2012

Ting A. P. J., S. Y. Wong, J. Jamliah & P. C. Boyce. 2012. Phylogenetic study of *Schismatoglottis Nervosa* Complex (Araceae: Schismatoglottideae). *Gard. Bull. Singapore* 64(1): 211–219.

Ulrich, S., M. Hesse, D. Bröderbauer, S. Y. Wong & P. C. Boyce. 2012. *Schismatoglottis* and *Apoballis* (Araceae: Schismatoglottideae): A new example for the significance of pollen morphology in Araceae systematics *Taxon* 61(2): 281–292.

Wong S. Y. 2012. Studies on Schismatoglottideae (Araceae) of Borneo XXI: Two New Species of *Schismatoglottis calyprata* Group: *Schismatoglottis heterodoxa* and *Schismatoglottis ranchanensis*. *Willdenowia* 42: 255–260.

Wong S. Y., P. C. Boyce & S. L. Low. 2012. Studies on Schismatoglottideae (Araceae) of Borneo XVII: The *Schismatoglottis hottae* Complex, a new informal taxon, and three new species from Sarawak, Malaysian Borneo. *Gard. Bull. Singapore* 64(1): 257–269.

2013

Scherberich, D. & P. C. Boyce. 2013. Studies on Schismatoglottideae (Araceae) of Borneo XXVI – *Schismatoglottis scintillans*, a new species with horticultural potential from Sabah, Malaysian Borneo. *Willdenowia* 43: 87–90.

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Fig. 50. *Schismatoglottis asperata* Engl. A–C. Plants in habitat showing variation in leaf blade. D. Petiole ornamentation. E. Inflorescence at pistillate anthesis. F. Spadix at pistillate anthesis. G. Inflorescence at staminate anthesis.

2014

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- Wong S. Y. & P. C. Boyce. 2014. Studies on Schismatoglottideae (*Araceae*) of Borneo XXXIX: *Schismatoglottis persistens*, a new rhizomatous rheophytic species for the Multiflora Group. *Willdenowia* 44: 247–251.
- Wong S. Y. & P. C. Boyce. 2014. Studies on Schismatoglottideae (Araceae) of Borneo XXXX: *Schismatoglottis petradoxa* and *S. tseui*, new shale-obligate rheophytes of uncertain affinity. *Aroideana* 37E(2):17–25.
- Wong S. Y. & P. C. Boyce. 2014. Studies on Schismatoglottideae (Araceae) of Borneo XXXXV: The flowering and fruit development of *Schismatoglottis Tecturata*. *Aroideana* 37E(2): 56–68.

2015

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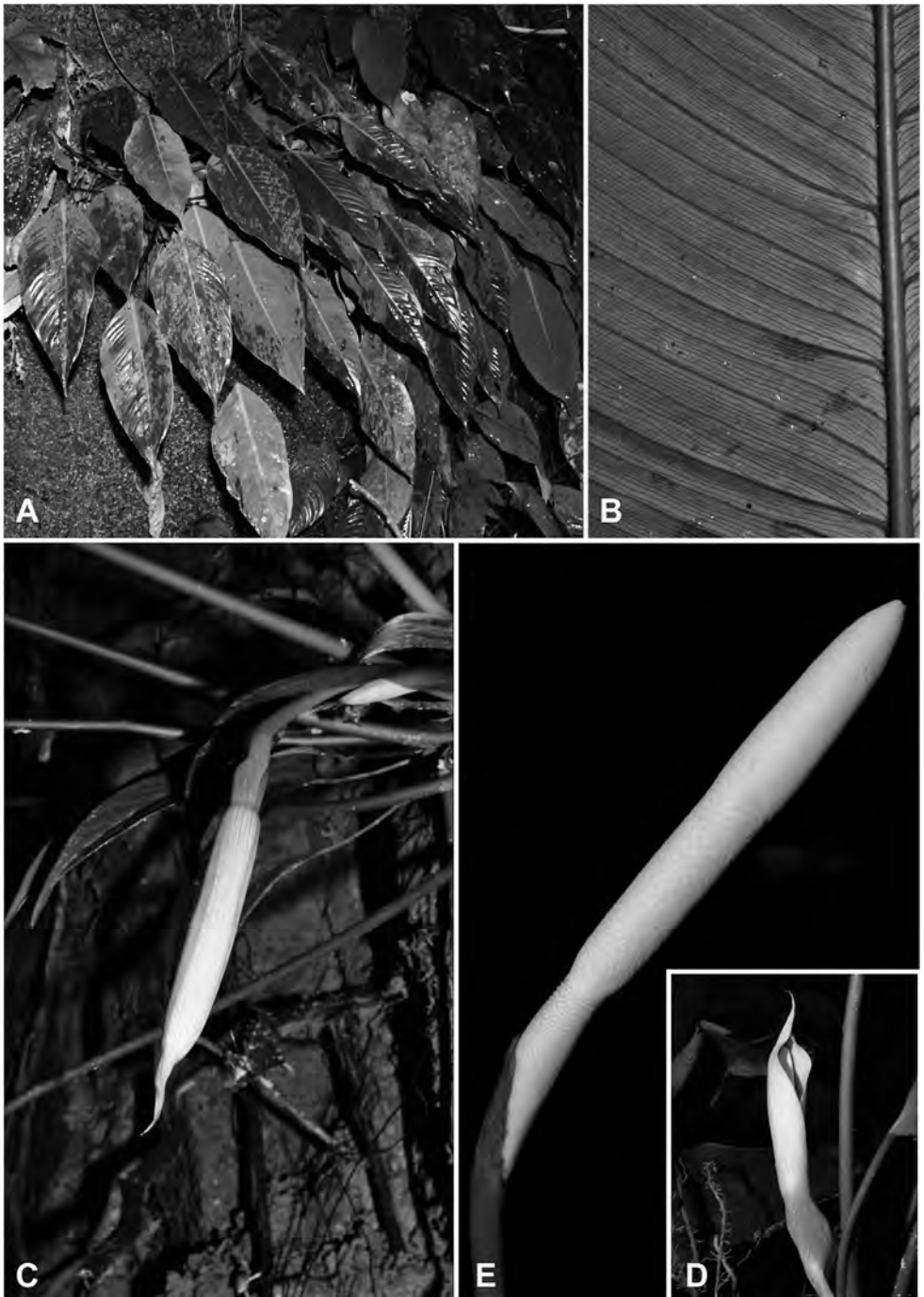


Fig. 51. *Schismatoglottis mayoana* Bogner & M.Hotta. **A.** Plants in habitat. **B.** Abaxial surface of leaf blade. **C.** Inflorescence, early pistillate anthesis. **D.** Inflorescence at pistillate anthesis. **E.** Spadix at pistillate anthesis.

Schottariella P. C. Boyce & S. Y. Wong, *Bot. Stud. (Taipei)*: 50:269. 2009; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 49–53, Pls 27 & 27. 2010. Fig. 52.

Taxonomy & Distribution

One species restricted to the drainages of the Kanowit river, Sarawak. **One species in the FM region.**

Ecology

Old secondary and fragments of primary lowland riparian evergreen moist forest on shales. *Schottariella* is rheophytic on vertical clay-loam riverbanks.

Distinguishing Characteristics

The unique combination of morphologies displayed by *Schottariella* is smooth thecae with a hyaline ridge that becomes erect into a needle-like projection at the onset of staminate anthesis, an unconstricted spathe, a spadix frequently with distal pistillodes and seeds lacking a micropylar appendage and carried on a basal placenta. Basal placentation also occurs in *Piptospatha* but seeds of that genus also have a pronounced micropylar appendage; *Piptospatha* differs from *Phymatarum* in having truncate stamens lacking a needle-like process.

Similar needle-like ‘unfolding’ thecae horns are found in *Aridarum zygoseum* S.Y.Wong, S.L.Low & P.C.Boyce, although in that species the ‘needle’ starts as appressed to the stamen connective tissue, and not part of it.

Notes

Schottariella is remarkable for the needle-like structures, tipped with a weakly peltate ovate-triangular flap, emerging from the thecae (one per theca) only at the onset of staminate anthesis. Such a structure emerging in this manner is unique in the family—in all other species such thecae structures are present from well before the inflorescence opens and are not topped with flaps of any sort. The very slender nature of these needle-like structures recalls those of *Phymatarum* although in that genus the structures are present well before the onset of pistillate anthesis; further the thecae of *Phymatarum* are notably verrucate (uniquely so in the tribe) while those of *Schottarum* are smooth. *Schottariella* shares basal placentation with *Phymatarum* but the ovules and seeds of *Schottariella* lack the characteristic micropylar appendage of *Phymatarum*.

The spadix with distal pistillodes in *Schottariella* is unique for the tribe; in all other Schismatoglottideae the terminal part of the spadix, an appendix, if present, is comprised of staminodes. We ascribe the distal organs as pistillodes based on observations of living plants where the highly distinctive pink pistils are clearly homologous with the structures forming the terminal part of the spadix and are quite different from the stipitate-clavate white staminodes associated with the pistils and the interstice between the staminate and pistillate flower zones.

Schottariella spathe limb senescence mechanics is unusual, although not unique, in the tribe by the spathe limb marcescent from the margins inwards and downwards and then, with the portion closest to the abscission layer still fresh, the spathe is shed. Similar (but probably not homologous) marginal marcescence occurs in the shoot-architecturally quite different *Schismatoglottis tectorata* (Schott) Engl. with only the margin marcescent and later shedding while the greater portion of the spathe is persistent, turning green and remaining more-or-less closed at the orifice and then shedding by abscission at the insertion of the peduncle by splitting and recurving basipetally at maturation of the fruits.



Fig. 52. *Schottariella mirifica* P.C.Boyce & S.Y.Wong. **A.** Plant in habitat on vertical clay river bank. **B–D.** Inflorescence at staminate anthesis.

The spathe during fruiting of *Schottariella* is also peculiar in that while it is almost certainly a splash-cup, the margins of the persistent lower margins do not form a level rim but instead are obliquely declined towards the convolutions such that the fruits/seeds are probably ejected forwards and away from the front of the cup rather than upwards and out as is known to be the instance in orthodox splash-cup dispersers, e.g. *Aridarum*. This view is further reinforced by the fruiting peduncle being arching/declinate thus presenting the lower spathe opening laterally or downwards rather than the peduncle being erect and the lower spathe held erect as is the situation in *Bucephalandra*, *Aridarum* and the *Piptospatha elongata* Group—all orthodox splash-cup dispersers.

Literature

2008

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2009

Boyce, P. C. & S. Y. Wong. 2009. *Schottariella mirifica* P.C. Boyce & S. Y. Wong: a new name for *Schottarum sarikeense* (Araceae: Schismatoglottideae) – an erratum. *Bot. Stud. (Teipei)*. 50:269–271.

2012

Boyce, P. C. & S. Y. Wong. 2012. Studies on Schismatoglottideae (Araceae) of Borneo XVIII: Additional observations on *Schottariella mirifica*. *Aroideana* 35: 24–28.

2014

Boyce, P. C. & S. Y. Wong. 2014. Studies on Schismatoglottideae (Araceae) of Borneo XXXVI – The Fruits of *Schottariella mirifica*. *Aroideana* 37E(1): 11–16.

Schottarum P. C. Boyce & S. Y. Wong, *Bot. Stud. (Taipei)* 49: 393 (2008). Fig. 53.

Taxonomy & Distribution

Two species restricted to central Sarawak. **Two species in the FM region.**

Ecology

Obligate rheophytes on exposed shale river banks in medium shade under moist or per-humid lowland forest.

Distinguishing Characteristics

The nodding whitish inflorescences, deep green leaf blades with the under surfaces much paler and with very fine and closely set darker lateral veins, and free ligular portion of the petiolar sheath, and fruits each with a few seeds on a basal placenta with dispersal occurring by longitudinal splitting and reflexing of the semi-pendent persistent lower spathe are together diagnostic for *Schottarum*. *Hottarum* (into which *Schottarum sarikeenensis* was originally placed) has an erect splash-cup, and *Schismatoglottis* has parietal placentation.

Notes

Schottarum was reduced to a synonym of *Schismatoglottis* owing to a typification error in Boyce & Wong (2008). *Schottarum* was recognised with *S. sarikeense* as the type. However, the protologue was wrongly applied and later the authors published the generic name *Schottariella* (Boyce & Wong 2009) as a replacement generic name for *Schottarum*, with *Schottariella mirifica* designated as Type, and the generic name *Schottarum* reduced to *Schismatoglottis* [= *Schismatoglottis sarikeensis* (Bogner & M.Hotta) A.Hay & Bogner]. Later Low et al. (2014) demonstrated *Schismatoglottis sarikeensis* and *S. josefii* A. Hay to be closely allied and molecularly and morphologically distinct from *Schismatoglottis* and any other published genus of Schismatoglottideae, resulting in the resurrection and expansion of *Schottarum*.

Literature

2014

Low S. L., S. Y. Wong & P. C. Boyce. 2014. *Schottarum* (Schismatoglottideae: Araceae) substantiated based on combined nuclear and plastid DNA sequences. *Pl. Syst. Evol.* 300(4): 607–617.

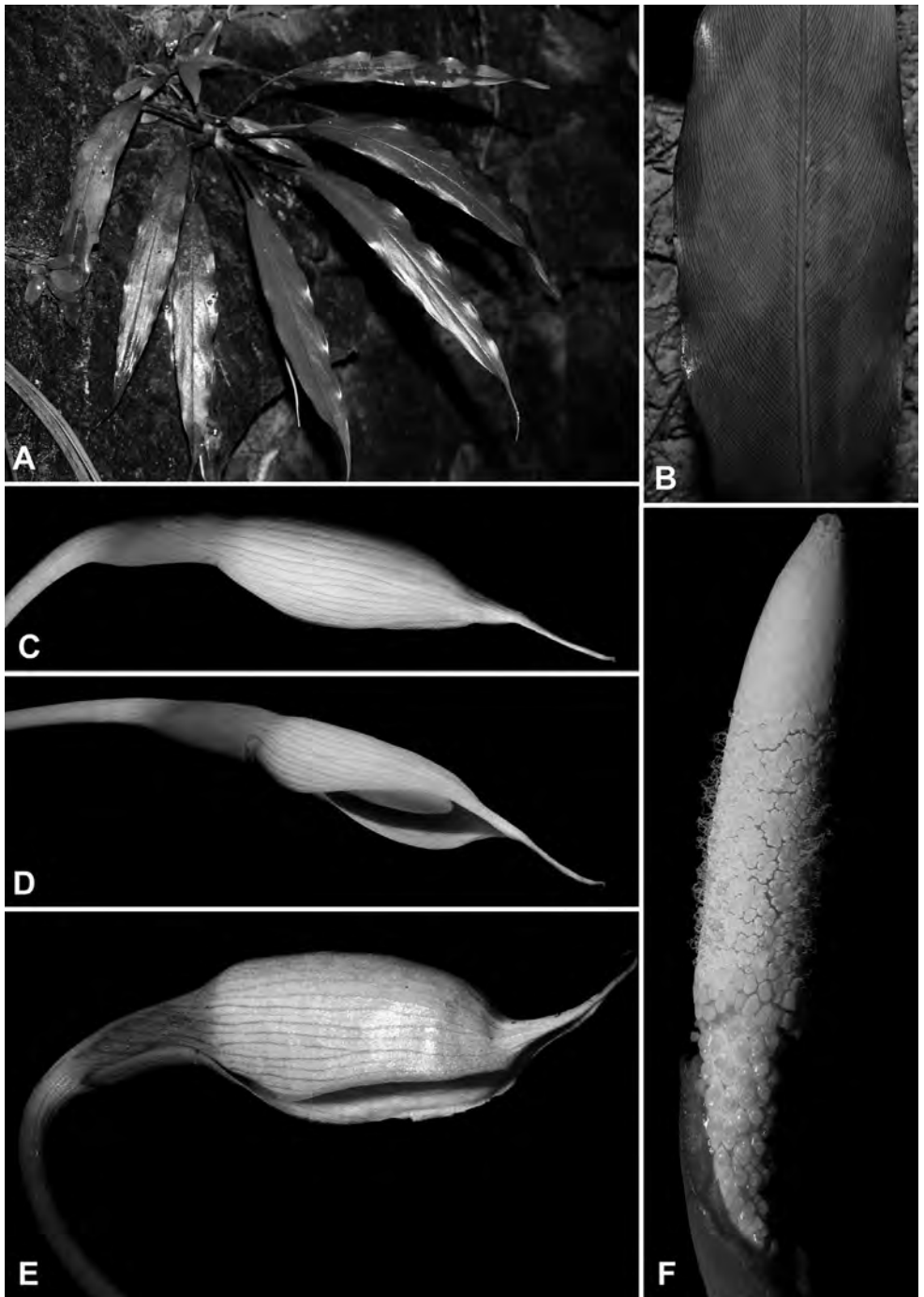


Fig. 53. *Schottarum sarikeense* (Bogner & M.Hotta) P.C.Boyce & S.Y.Wong. **A.** Plant in habitat. **B.** Abaxial surface of leaf blade. **C & D.** Inflorescence, early pistillate anthesis. **D.** Inflorescence at staminate anthesis. **E.** Spadix at staminate anthesis. **F.** Spadix at staminate anthesis.

Scindapsus Schott in H.W.Schott & S.L.Endlicher, *Melet. Bot.* 21 1832; Mayo et al. *The Genera of Araceae* 121, pl. 16 & 109D. 1997; Boyce et al., *The Araceae of Borneo. Aroideana* 33: 28–49, Pls 7 & 8. 2010. Figs. 54.

Taxonomy & Distribution

Perhaps as many as 60 species, with about half yet to be described, throughout tropical Asia from NE India though New Guinea to eastern Australia (Queensland). **Maybe more than 55 species in the FM region.**

Ecology

Usually in well drained subtropical and tropical perhumid to ever-wet broadleaf subtropical and tropical forest at low to mid elevations. Species of the Coriaceus Complex often occur in full sun in ridge-top *kerangas* forest.

Distinguishing Characteristics

Superficially, species of *Scindapsus* are difficult to differentiate from species of *Rhaphidophora*. In ripe fruit the genera are readily distinguished by the shape and quantity of seeds per fruit—kidney-shaped and solitary in *Scindapsus*; ellipsoid and numerous in *Rhaphidophora*.

Notes

There is no modern account for *Scindapsus* and many of the species are known only from fragmentary collections. The plants are variable in appearance, including colossal high-climbing primary hemiepiphytes (e.g. *S. latifolius* M.Hotta), almost shrubby secondary hemi-epiphytes (notably the *S. coriaceus* complex—in which many of the novel Malesian species occur), and perching litter-trapping epiphytes exemplified by species of the *S. beccarii* complex.

Literature

1908

Engler, A. & K. Krause. 1908. Araceae–Monsteroideae. In: A. Engler (ed.), *Das Pflanzenreich* 37(IV.23B): 4–139.

1920

Alderwerelt van Rosenburgh, C. R. W. K. van. 1920. New or noteworthy Malayan Araceae I. *Bull. Jard. Bot. Buitenzorg III*, 1: 359–389.

1922

Alderwerelt van Rosenburgh, C. R. W. K. van. 1922. New or noteworthy Malayan Araceae II. *Bull. Jard. Bot. Buitenzorg III*, 4: 163–229.

Alderwerelt van Rosenburgh, C. R. W. K. van. 1922. New or noteworthy Malayan Araceae III. *Bull. Jard. Bot. Buitenzorg III*, 4: 320–347.

1925

Ridley, H. N. 1925. *The Flora of the Malay Peninsula*, 5: 84–131.

1993

Boyce, P. C. 1993. A possible defence mechanism in *Scindapsus latifolius* (Araceae: Monsteroideae). *Aroideana* 16: 31–32.

1994

Bogner, J. & P. C. Boyce. 1994. *Scindapsus lucens* (Araceae: Monsteroideae), a new species related to *Scindapsus pictus*. *Kew Bull.* 49(4): 789–792.

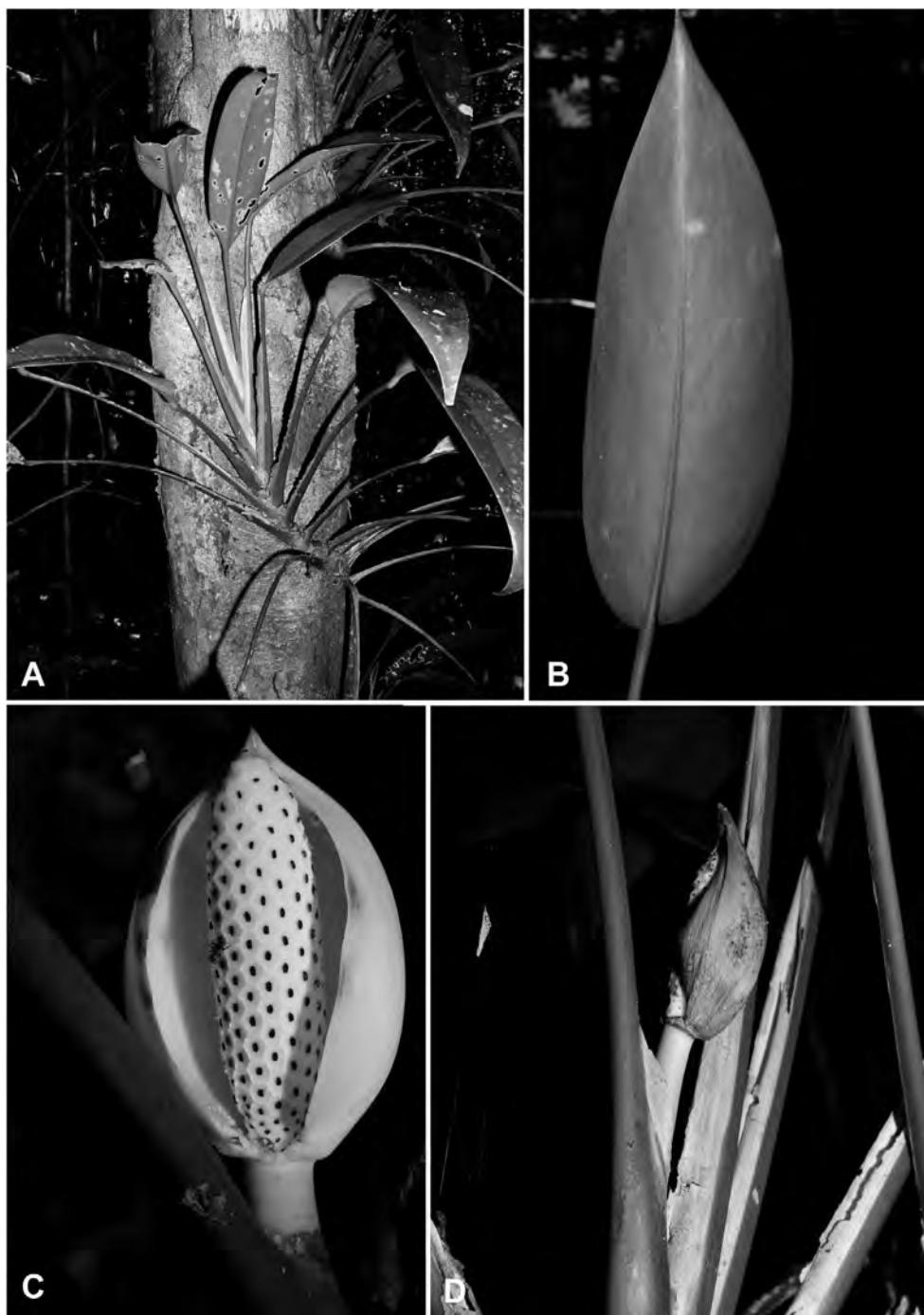


Fig. 54. *Scindapsus* sp. **Coriaceus Complex**. **A.** Plant in habitat. **B.** Undersurface of leaf blade. **C.** Inflorescence just before staminate anthesis. **D.** Post-anthesis inflorescence.

2010

Ahmad Sofiman O., P. C. Boyce & L. K. Chan. 2010. Studies on Monstereae (Araceae) of Peninsular Malaysia III: *Scindapsus lucens*, a new record for Malaysia. *Gard. Bull. Singapore* 62(1): 9–15.

In addition to the above, the following species have been described since the last monograph (Engler & Krause 1908).

1911

Scindapsus philippinensis K. Krause, *Bot. Jahrb. Syst.* 45: 660.

1912

Scindapsus schlecteri K. Krause, *Bot. Jahrb. Syst.* 49: 95.

1916

Scindapsus cuscuarioides Engl. & K. Krause, *Bot. Jahrb. Syst.* 54: 81. 1916.

1920

Scindapsus glaucescens (Engl. & K. Krause) Alderw., *Bull. Jard. Bot. Buitenzorg, III*, 1: 387.

1920.

Scindapsus javanicus Alderw., *Bull. Jard. Bot. Buitenzorg, III*, 1: 388. 1920.

Scindapsus mamilliferus Alderw., *Bull. Jard. Bot. Buitenzorg, III*, 1: 387. 1920.

1922

Scindapsus alpinus Alderw., *Bull. Jard. Bot. Buitenzorg, III*, 4: 228. 1922.

Scindapsus altissimus Alderw., *Bull. Jard. Bot. Buitenzorg, III*, 4: 346. 1922.

Scindapsus roseus Alderw., *Bull. Jard. Bot. Buitenzorg, III*, 4: 225. 1922

Scindapsus splendidus Alderw., *Bull. Jard. Bot. Buitenzorg, III*, 4: 226. 1922

Scindapsus suffruticosus Alderw., *Bull. Jard. Bot. Buitenzorg, III*, 4: 226. 1922

1926

Scindapsus longistipitatus Merr., *Philipp. J. Sci.* 29: 353. 1926.

1937

† *Scindapsus carolinensis* Hosok., *J. Jap. Bot.* 13: 194. 1937.

1945

† *Scindapsus machurei* (Merr.) Merr. & F. P. Metcalf, *Lingnan Sci. J.* 21: 5. 1945.

1966

Scindapsus latifolius M. Hotta, *Acta Phytotax. Geobot.* 22: 3. 1966.

1994

Scindapsus lucens Bogner & P. C. Boyce, *Kew Bull.* 49: 789. 1994.

2000

Scindapsus sumatranus (Schott) P. C. Boyce & A. Hay, *Telopea* 9(1): 170.

† Species absent from Flora Malesiana region.

Spathiphyllum Schott in H.W.Schott & S.L.Endlicher, Melet. Bot.: 22. 1832; Mayo et al., *The Genera of Araceae* 109–110, Pl. 9 & 108D. 1997. Figs. 55.

Taxonomy & Distribution

About 60 species, the majority Neotropical. **Three species in the FM region.**

Ecology

Evergreen mesophytes of more or less damp or wet sites in tropical forest, very occasionally climbing (*Spathiphyllum solomonense* Nicolson).

Distinguishing Characteristics

When not flowering most plants of *Spathiphyllum* and *Holochlamys* are almost indistinguishable. Flowering *Spathiphyllum* are immediately distinguished by the inflorescences on a lengthened peduncle clear of the foliage—although climbing *Spathiphyllum solomonense* is an exception—see Nicolson 1992), by the spathe limb spreading flat at anthesis (again, *S. solomonense* excepted), and persisting and becoming photosynthetic. *Spathiphyllum* has the ovary 2–4-locular with an axile placenta as compared with *Holochlamys* which has 1-locular ovaries with a basal placenta.

Notes

Nicolson (1992) notes that *Spathiphyllum solomonense* has fused tepals, like those of *Holochlamys* and *Spathiphyllum* section *Massowia*. *Holochlamys* is probably only a single variable species (Hay, 1990:71) only known from New Guinea, although there is a collection, purportedly from Sumatera, that appears to be *Holochlamys* but its indigenous presence on the island is by no means certain. *Spathiphyllum* Sect. *Massowia* has four species: *Spathiphyllum cannifolium* (Dryand. ex Sims) Schott of South America, *S. laeve* Engl. of Cocos Island, Costa Rica, and Panama, *S. schlechteri* of New Guinea, and *S. commutatum* Schott of the Philippines east to Bougainville but not in New Guinea.

Spathiphyllum has a distribution chorologically similar to that of *Heliconia* (Heliconiaceae-Zingiberales) with a large number of species in the Neotropics and a few in eastern Malesia extending to Maluku. It is likely that the *Spathiphyllum* species involved (all belonging to Sect. *Massowia*) represent a relict distribution.

Literature

1968

Nicolson, D. H. 1968. The genus *Spathiphyllum* in the east Malesian and west Pacific islands. *Blumea* 16: 119–121.

1992

Nicolson, D. H. 1992. *Spathiphyllum* sect. nov. *Chlaenophyllum* (Araceae). *Aroideana* 15: 19–21.

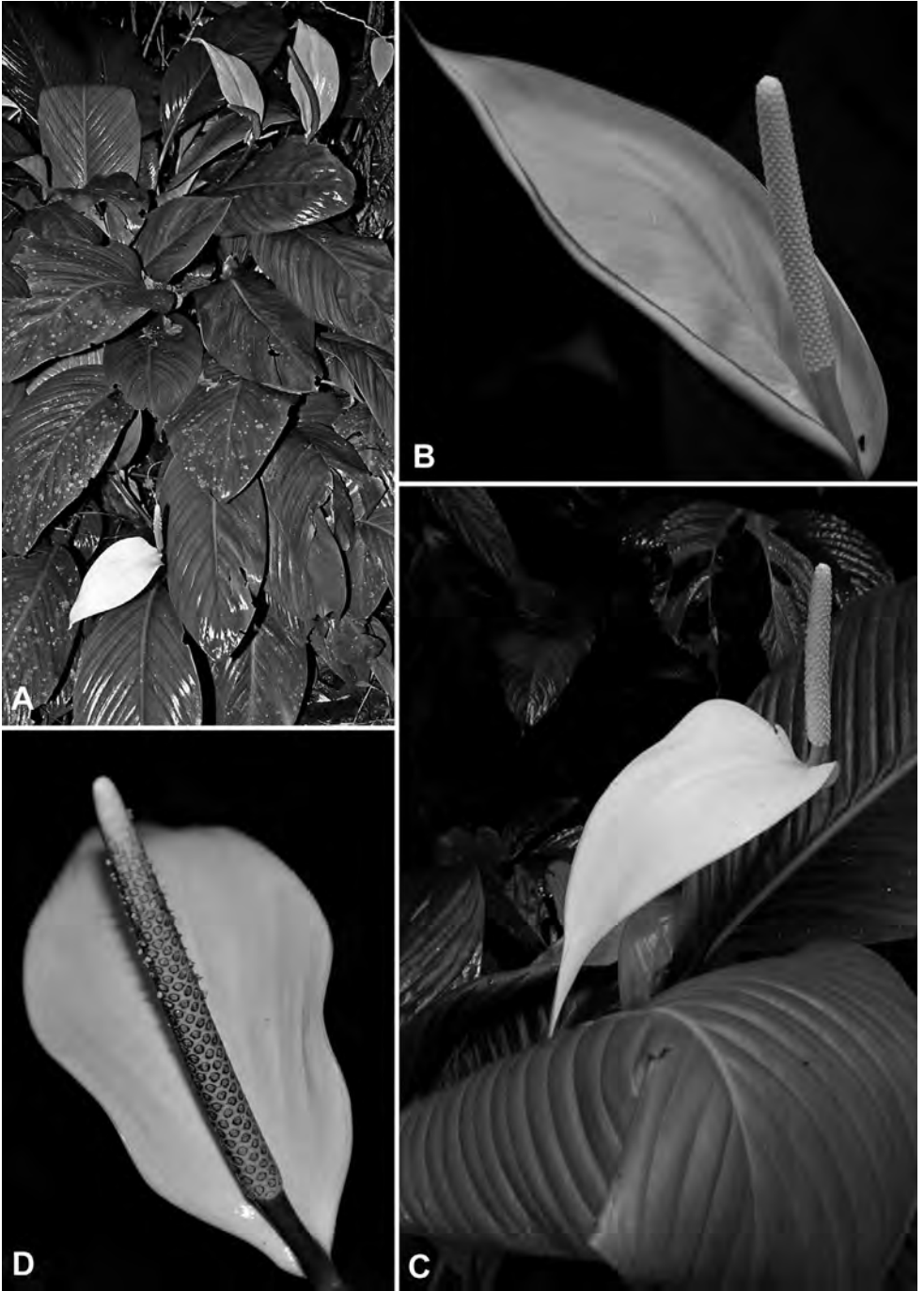


Fig. 55. *Spatbiphyllum commutatum* Schott. **A.** Plants in habitat. **B.** Recently opened inflorescence. **C.** Inflorescence, pistillate anthesis. **D.** Inflorescence at staminate anthesis.

Typhonium Schott, *Wiener Z. Kunst* 3: 72. 1829; Mayo et al. *The Genera of Araceae* 260–263, Pl. 93 & 128A. 1997; Boyce et al., *The Araceae of Borneo, Aroideana* 33: 62. 2010. Figs. 56.

Taxonomy & Distribution

In excess of 70 species occurring from India through much of subtropical and tropical Asia as far as southern Japan. Species diversity is greatest in areas with a strongly monsoonal climate. **Seven species in the FM region.**

Ecology

Understory of monsoonal lowland to mid-elevation forests, some species restricted to limestone.

Distinguishing Characteristics

Typhonium Schott is most similar to *Sauromatum* differing by simple to lobed leaf blades, by the free margins to the lower spathe, and by all staminodes of similar morphology (but beware *Typhonium flagelliforme* (Lodd.) Blume).

Literature

1981

Nicolson, D. H. & M. Sivadasan. 1981. Four frequently confused species of *Typhonium* Schott (Araceae). *Blumea* 27: 483–497.

1994

Sriboonma, D., J. Murata & K. Iwatsuki. 1994. A revision of *Typhonium* (Araceae). *J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot.* 14: 255–313.

2000

Hettterscheid, W. L. A. & P. C. Boyce. 2000. A reclassification of *Sauromatum* Schott and new species of *Typhonium* Schott (Araceae). *Aroideana* 23: 48–55.

2010

Cusimano, N., M. D. Barrett, W. L. A. Hettterscheid & S. S. Renner. 2010. A phylogeny of the Areae (Araceae) implies that *Typhonium*, *Sauromatum*, and the Australian species of *Typhonium* are distinct clades. *Taxon* 59(2): 439–447.



Fig. 56. *Typhonium trilobatum* (L.) Schott. **A.** Plant in habitat. **B.** Detail of lower spadix, pistillae flowers at base, staminate at the top; some staminodes removed. **C.** Lower spadix with staminodes intact. **D.** Developing infructescence. Images B–D © Willbert L. A. Hettterscheid. Used with permission.

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