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269. AMYDRIUM ZIPPELIANUM

Araceae

Peter Boyce

The genus *Amydrium* Schott contains five species of creeping and climbing aroids occurring from Myanmar to Papua New Guinea. It displays considerable vegetative diversity; the leaves range from entire in *A. humile* Schott to pinnately divided and perforated in the case of *A. medium* (Zoll. & Moritzi) Nicolson, while the stature varies from slender forest-floor creepers like *A. humile* to huge climbers such as *A. zippelianum* (Schott) Nicolson, the species depicted here.

Schott (1863) established the genus *Amydrium* based on a single species, *A. humile*, which is a creeper or weak climber with cordate leaves, native to southern Thailand and West Malesia. Engler (1908) published a new genus, *Epipremnopsis*, for two Malesian species that he believed to be allied to another Asian genus, *Anadendrum* Schott; recognition of *Epipremnopsis* continued for 60 years until Nicolson (1968) showed it to be congeneric with *Amydrium*. In the past, opinion has differed as to the correct

placement of *Amydrium*; a position in subfamily *Pothoideae*, in subfamily *Monsteroideae*, or even an intermediate position, have all found favour. However, current opinion, taking into account new data concerning vegetative and floral anatomy (Carvell, 1989), places *Amydrium* in the subfamily *Monsteroideae*, allied to other Asian genera such as *Epipremnum*.

Two robust, pinnate-leaved species of *Amydrium* are currently recognized: *A. hainanense* (Ting & Wu ex H. Li, Y. Shiao & S.L. Tseng) H. Li and *A. zippelianum*. The former, described from the island of Hainan, China, was recorded recently for the first time in northern Vietnam (Boyce, pers. obs.). A third species, *A. magnificum* Engl., was maintained until recently but is here treated as a synonym of *A. zippelianum*, following Hay (1990); the characters used to distinguish between the two – a smooth petiole and sessile spadix in *A. magnificum*, scabrate petiole and stipitate spadix in *A. zippelianum* – are inconsistent.

CULTIVATION. *Amydrium zippelianum* grows well in a warm, brightly lit but not sunny position. The specimens grown under glasshouse conditions in the botanic gardens at Kew and Munich are planted in large beds and allowed to clamber over surrounding landscape features. The beds are filled with an open-textured yet moisture-retentive soil mix of equal parts coir, sphagnum moss and coarse grit. Water is given freely throughout the year with a weekly liquid feed applied to the terrestrial and aerial roots and the foliage. The Munich plant is considerably older than that at Kew and it flowers and fruits regularly. Although *A. zippelianum* is not a high climber, it is a considerably robust plant when planted out in a bed. A plant confined to a pot with a moss-covered pole for support is significantly smaller and less vigorous and, like the SWISS-CHEESE PLANT (*Monstera deliciosa* Liebm.), makes an ideal house-plant.

Propagation is by means of stem cuttings, by naturally occurring or induced layers or by seed but, in most instances, cuttings will provide the readiest means of increase. Sections of stem 10–15 cm long can, after removal or considerable reduction of the size of the leaves, be placed on a seed tray filled with an open, humus-rich soil mix in a propagator at a minimum temperature of 22° C. Rooting should take place in about two weeks and new growth should begin from the nodes in about one month. Once growing strongly the stem can be cut into pieces, each bearing a rooted portion, and potted individually. After a period of re-establishment the plants can be

Amydrium zippelianum ANN FARRER

treated in the same manner as mature specimens. The plant illustrated was collected by Josef Bogner (B.169) on Mt Bulusan, Luzon.

Amydrium zippelianum (Schott) Nicolson in Blumea 16: 126 (1968). Type: 'New Guinea', *Zippel* s.n. (L 898!, L 894!, W Schott's Icones Aroideae 2977!).

Rhaphidophora zippeliana Schott in Miquel, Ann. Mus. Bot. Lugd.–Bat. 1: 129 (1863).

Pothos miniata Zipp. ex. Miq. in Miquel, Ann. Mus. Bot. Lugd.–Bat. 1: 130 (1863), *nom. superfl. pro. Rhaphidophora zippeliana* Schott.

Epipremnum asperatum Engl. in Bull. Soc. Tosc. Ortic. 4: 270 (1879). Type (lectotype to be selected from): Papua New Guinea, Fly River, 1876, *d'Albertis* s.n. (FI!); Moluccas, Ternate, Aequi Conora, Sept. 1874, *Beccari* P.M. s.n. (FI!).

Epipremnum magnificum Engl. in Bull. Soc. Tosc. Ortic. 4: 270 (1879). Type (lectotype Nicolson, 1968): Sulawesi, Penisola SE a Lepo-Lepo presso Kandari, July 1874, *Beccari* P.S. s.n. (lectotypes B!, FI!); Papua New Guinea, Andai, 1872, *Beccari* P.P. 563 (syntype FI! & spirit no. 100 FI!).

Epipremnum zippelianum (Schott) Engl., Bot. Jahrb. Syst. 1: 182 (1880).

Rhaphidophora warburgii Engl., Bot. Jahrb. Syst. 37: 116 (1905). Type: Philippines, Luzon, 1888, *Warburg* s.n. (B!).

Epipremnum elmerianum Engl. in Engler, Das Pflanzenr. 37 (IV.23B): 66 (1908). Type: Philippines, Lyete, near Palo, Jan. 1906, *Elmer* 7295 (B!, BO, G!, K!, PNH†).

Epipremnum philippinense Engl. & K. Krause in Engler, Das Pflanzenr. 37 (IV.23B): 137 (1908). Type (lectotype to be selected from): Philippines, Luzon, Tayabas prov., Lucban, May 1907, *Elmer* 7623 (B!, PNH†), Elmer 9253 (B†, PNH†).

Epipremnum luzonense K. Krause, Bot. Jahrb. Syst. 45: 659 (1911). Type: Philippines: Luzon, Laguna prov., near Paete, July 1909, *Ramos* PNH 10051 (PNH†).

Epipremnum mampuanum Alderw. in Bull. Jard. Bot. Buitenzorg sér. 3, 1(5): 378 (1920). Type: Sulawesi, Mt. Mampoe, *van Vuuren* sub. *Alderwerelt* 251 ex. cult. Bogor Bot. Gard. (BO).

Epipremnopsis magnifica (Engl.) Alderw. in Bull. Jard. Bot. Buitenzorg sér. 3,4(2): 330 (1922).

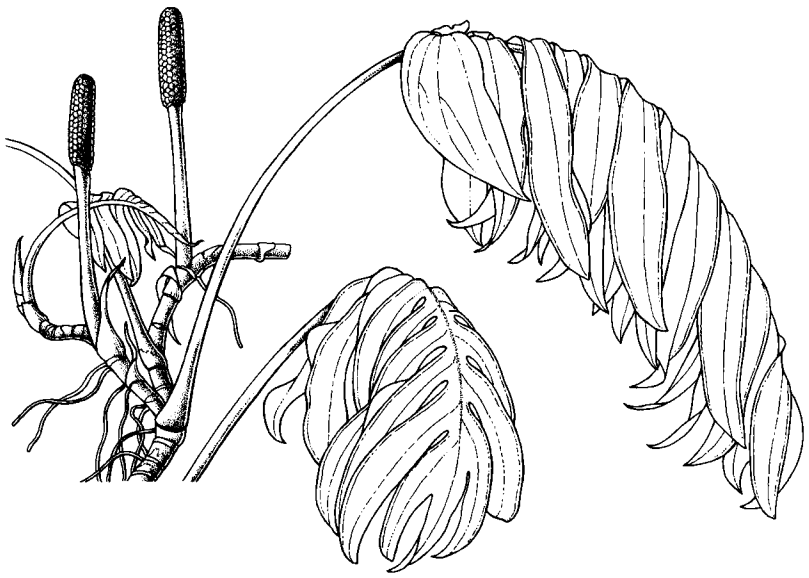
Epipremnopsis zippeliana (Schott) Alderw. in Bull. Jard. Bot. Buitenzorg sér. 3,4(5): 378 (1920).

Amydrium magnificum (Engl.) Nicolson, Blumea 16: 125 (1968).

[*Epipremnum miniatum* Elmer ex Merr. in Leafl. Philipp. Bot. 10(133): 3622 (1938) *sine descr. latin.*; Elmer, Enum. Philipp. Fl. Pl. 1: 177 (1923) *nomen.* Type: Philippines, Luzon: Sorsogon prov., Irosin (Mt. Bulusan), Oct. 1915, *Elmer* 14522 (K!, PNH†, US); Philippines, Luzon: Sorsogon prov., Irosin (Mt. Bulusan), Nov. 1915, *Elmer* 15113 (K!, US); Philippines, Luzon: Sorsogon prov., Irosin (Mt. Bulusan), June 1916, *Elmer* 16422 (K!, PNH†, US)].

[*Epipremnum sorsogonense* Elmer ex Merr., Enum. Philipp. Fl. Pl. 1: 177 (1923) *sine descr. latin* Type: Philippines, Luzon: Sorsogon prov., Irosin (Mt. Bulusan), June 1916, *Elmer* 16422 (K!, PNH†, US)].

DESCRIPTION. *Robust low climber. Stem* to 3.5 cm thick, internodes to 6 cm long on fertile shoots although often considerably longer on foraging shoots, main stems climbing or prostrate, clinging and not giving rise to fertile free lateral shoots but plants often producing long slender terminal or lateral flagellae with reduced cataphylls (foraging shoots). *Roots* produced, often copiously, from stem nodes, robust, to 4 mm diam. *Leaves* to 125 × 90 cm, often considerably smaller in cultivation, lamina ovate-cordate in outline, pinnatisect often to the mid-rib, then the pinnae usually separated by a 1–4 cm naked axis, pinnae dropping, primary



Amydrium zippelianum. Fruiting branch showing pendent leaf pinnae. Drawn by Ann Farrer.

lateral veins pinnate, running into a prominent marginal vein, higher order venation reticulate. *Petioles* to 85 × 2 cm, geniculate apically and basally, channelled apically, petiolar sheath usually less than half as long as petiole, fibrous. *Inflorescence(s)* 1–8, produced at the tip of clinging stems, subtended by several quickly blackening, later decomposing dense-fibrous cataphylls; peduncle 3–23 × 0.75–1.5 cm, erect. *Spathe* to 17 × 12 cm (flattened out), broadly ovate, apiculate, reflexing at anthesis and then deciduous yellow, quickly blackening. *Spadix* to 8 × 2 cm, stipitate to sessile, sessile examples with a decurrent spathe and an adnate stipe, stipe 0–2 cm long, spadix yellow at anthesis then turning green and finally orange-red when ripe. *Flowers* bisexual, naked, arranged in a honeycomb pattern; stamens 4, filaments short, strap-shaped, length varying according to developmental stage, eventually equalling or overtopping the gynoecium, anthers shorter than the filaments, thecae ovoid, 1–3 mm long, extrorse, dehiscing by longitudinal slit; gynoecium 6–10 × 4–6 mm (width measured across the style) at anthesis, considerably larger at ripe fruit, obpyramidal, tetragonal, ovary 1–locular with a deeply intrusive basal septum, ovules 2, anatropous, funicle short, placenta near base of the septum, style broader than ovary, ± truncate, stigma small, vertically elongated. *Infructescence* to 22 cm × 5.5 cm when ripe, cylindrical; berries truncate apically, the rim of each stylar portion raised and eventually dehiscent to expose seeds embedded in soft, gelatinous pulp, infructescence orange-red when ripe; seed 1 × 0.6 cm, kidney-shaped, testa smooth, glossy, brown, embryo curved and partly green.

Distribution. Philippines, Sulawesi, Halmahera, Talaud Islands, Irian Jaya, Papua New Guinea. Often common.

Habitat. Primary lowland to lower montane rainforest, occasionally in regrowth or as a weed in plantations; sea level–1800m.

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270. LECANOPTERIS LOMARIOIDES
Polypodiaceae

R.J. Johns

Ants are common throughout the tropical rain forests and there are few situations where plants are not covered by ants scavenging for food. The advantages of the presence of ants on plants are numerous, including protection from herbivory, use as a source of food from stored vegetable matter and from excreta, and the removal of competing plants in the vicinity of the ant plant.

Some plants have evolved structures (often stems) which make them particularly suited to serve as 'ant houses'. The simplest adaptation would appear to be a hollow stem to which entry is gained by a passage through the outer layers. There are groups of plants however where the stems, or rhizomes, have developed into an intricate series of chambers adapted to particular functions associated with the life history of the ants. Specialist cavities exist for food storage, eggs, water, shelter etc., the plant thus functioning as a 'house'. The greatest specialization occurs in the family Rubiaceae where a highly specialist anatomy has evolved associated with the life cycles of both the ants and their hosts. These ant plants have been studied recently in great detail in a series of papers (Huxley, 1978; Huxley & Jebb, 1993).

Within the ferns a small group of species have developed complex rhizomes which are inhabited by several species of ants. These ferns, known collectively as the ant-ferns, show morphological and structural adaptations to their rhizomes which make them attractive as 'ant houses', the ants sheltering in cavities in the rhizomes or between the lower side of the rhizome and the host tree. The two genera of ant-ferns, occurring in tropical America and Malesia, are both members of the Polypodiaceae.