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# The genus *Aspidistra* Ker Gawl. (Asparagaceae/Ruscaceae) in Thailand

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ABSTRACT. The genus *Aspidistra* is restricted to SE Asia, Japan and China, with about 90 species. In Thailand three species occur naturally: *A. sutepensis* K.Larsen, endemic to N Thailand, *A. subrotata* Y.Wan & C.C.Huang, and *A. longifolia* Hook.f. with wider distributions. *Aspidistra elatior* Blume can be found in cultivation. A key to the above species with a description of the native Thai species is given. One new variety is described: *A. subrotata* Y.Wan & C.C.Huang var. *angustifolia* Phonsena.

KEY WORDS: *Aspidistra*, Ruscaceae, Thailand.

## INTRODUCTION

*Aspidistra* is one of many genera which were formerly included in the large family Liliaceae. Following recent morphological and molecular studies, this family has been split up into a number of smaller families. Conran & Tamura (1998) placed *Aspidistra* in Convallariaceae, a family name antedated by Ruscaceae if *Ruscus* is included within the same family (Rudall et al, 2000; APG II, 2003; Tillich, 2005). Baker (1875), in an extensive treatise of the 'order' Liliaceae, treated *Aspidistra* as a tribe of the suborder (family) Asparagaceae, characterized by berry-like fruits and the latest molecular rearrangements of the petaloid monocots place the genus back into an expanded Asparagaceae (Mabberley, 2008, APG III, 2009). The genus *Aspidistra* consists of over 100 mostly narrowly circumscribed species. All have a creeping, thin or rather thick rootstock (rhizome), with conspicuous erect papery or leathery leaves; the inflorescences are lateral and consist of one flower borne terminally on a short peduncle (scape) with a few scale-like bracts. Flowers are leathery or fleshy, hermaphrodite, campanulate or urceolate, with 4–10 perianth segments (perigone) which are for the greater part fused; the stamens, as many as the perianth segments, are short and usually inserted below the mushroom-shaped stigma; the ovary is 3- or 4-locular, with few ovules in each locule; the fruit is a berry, either with one seed, or, as in Thailand, with few or several seeds. Flowering and fruiting in *Aspidistra* is cryptic, close to the ground and partly subterranean, often under leaf litter.

The genus *Aspidistra* has its main centre of diversity in China (Liang & Tamura, 2000, ca 50 species) and north-eastern Indochina. In the latter area, mainly Vietnam, many new species were discovered recently and described by Tillich (2005), and Tillich et al. (2007), increasing the total number of species to about 90. For Thailand the only described species was *A. sutepensis* K.Larsen (1961), but in the Bangkok Forest Herbarium (BKF) and in other herbaria there were collections belonging to the genus *Aspidistra* clearly representing a different species. Sterile specimens of this second taxon were determined by Larsen (1961) as *A. longifolia* Hook.f., a species described from Assam.

During taxonomic work on *Aspidistra* in Thailand the incompletely known *A. sutepensis* was found in both flowering and fruiting states in November 2007 on the west flank of Doi Inthanon National Park, so its description can be amplified here. In addition, in 2008 the first author found a third species of *Aspidistra* flowering in Phu Luang Wildlife Sanctuary, clearly belonging to *A. subrotata*

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Y.Wan & C.C.Huang, described previously from S China and later also found in northern Vietnam.

Remarkably, the genus recently was found in northern peninsular Malaysia, namely the newly described species *A. larutensis* W.J.de Wilde & A.Vogel (2006), which is placed in synonymy with *A. longifolia* in this paper (see paragraphs below). This is the southernmost known record of the genus and is the first record for the genus in Malesian area.

During a visit by the authors to Kaeng Krachan National Park, Phetchaburi province, a long-leaved sterile *Aspidistra* growing in tufts on the slope descending to the Tho Thip Waterfall was found. These plants were monitored and checked frequently by the first author, resulting in herbarium collections with flowers and fruits in 2007 and 2008; plants were also cultivated. Older herbarium collections of what is obviously the same species are also known from peninsular and northern Thailand. In February 2008 a further population of the same species was discovered in Khao Soi Dao Wildlife Sanctuary in southeastern Thailand. Only one faded flower was seen, and later on one young fruit in another locality in that area. The Kaeng Krachan and Khao Soi Dao collections most closely resemble *A. larutensis* and are considered here to be the same species, although somewhat different in general habit i.e. with broader leaves of a lighter green colour, and longer pedunculate flowers. (Table 1).

The study of *Aspidistra* in herbaria is hampered because the fleshy flowers are difficult to examine when reconstituted. Therefore, living plants, including those in cultivation, should be examined for their floral characters. When determined with the keys to the species in Liang & Tamura in Flora of China (2000) and Tillich (2005) respectively, *A. larutensis* appears to resemble the Chinese species *A. yingjiangensis* L.J.Peng (1989) from Yunnan (which differs in possessing a purple rather than white stigma and yellowish blotched leaves) and especially *A. hainanensis* W.Y.Chun & F.C.How (1977); a species recorded for Hainan, Guandong and Guangxi provinces and depicted in Liang & Tamura (2002, Fig. 282: 1–4). According to the key and photos in Tillich (2005), our material also approaches *A. foliosa* Tillich from C Vietnam, the latter with smaller flowers, 9–10 mm in diam., as well as possibly *A. linearifolia* Y.Wan & C.C.Huang (1987, Fig. 3).

*Aspidistra* can be divided into 2 groups, viz. plants with solitary leaves, inserted on the rhizome and spaced by long internodes, mostly with broad, ovate-oblong leaves, and plants with 2–5 tufted

Table 1. Comparison of characters of *Aspidistra larutensis* from peninsular Malaysia (cultivated), and *Aspidistra* from Kaeng Krachan NP. L=length, W=width.

| | *Aspidistra larutensis* (cultivated) | *Aspidistra* (Kaeng Krachan NP) |
|---|---|---|
| Rhizome diam. | 5–10 mm | 10–11 mm |
| Leaves | 3–6-tufted | 2- or 3-tufted |
| Leaf L by W (including pseudopetiole) | 30–90 by 2–3 cm | 40–65 by 3–5 cm |
| Perianth tube L by W | 1–1.2 by 1–1.2 cm | 1.2–1.5 by 1.4–1.7 cm |
| Perianth colour | purple | purple, lobes sometimes green at apex |
| Peduncle (scape) length | 0.5 –1 cm long | 2–3 cm long |
| Bract colour, length | green, 4–8 mm long | whitish, 6–10 mm long |
| Anther L by W | ca 3 by 4 mm | ca 3 by 3 mm |
| Pistil length (including stigma) | nearly as long as the tube, ca 8 mm long | reaching to about halfway up the tube, ca 7 mm long |
| Ovary L by W | ca 3 by 3 mm | ca 2 by 2 mm |

leaves, formed as a flush after a dormant period, with narrowly elliptic to linear leaves. Other important criteria in the division of *Aspidistra* are whether the perianth is distinctly campanulate or urceolate, and the number of perianth lobes, viz. 4–6 or 5–8(–10); see further Li et al. (2000).

Tillich's key (2005) to the species claimed to cover nearly all of the then known *Aspidistra* species, but he acknowledged that two species were omitted as he considered them to be inadequately described because of the unavailability of open flowers. These two species were *A. longifolia* Hook.f. (1892) from the tufted leaf group and *A. sutepensis* K.Larsen (1962) from the group with more widely spaced leaves. The vast majority of the now known species (about 70 out of 85) were described after 1962 (Tillich, 2005; Tillich et al., 2007). However, the two names mentioned above are both valid, older names, which need to be considered within a complete overview of the genus.

Based on the description for *A. longifolia* there appears to be no difference between it and the Thai collections with lanceolate leaves, so we here place them into that taxon. However, there are some differences in general habit between specimens of *A. larutensis* and those from Thailand, i.e. from Kaeng Krachan NP and of other localities when cultivated side by side. This can be explained by assuming that local *Aspidistra* populations represent clones of uniform plants, each clone conserving its characteristics against those of remote populations, but the differences do not merit specific distinction and the clones should be regarded as belonging to a single species. In order to acknowledge some differences, including those seen when growing side by side in cultivation, one could provisionally accept varieties or forms, but pending more decisive information we have refrained from naming intra-specific variants.

*Aspidistra longifolia* should thus be regarded as a widespread and variable species, with scattered local populations ranging from Assam, through Thailand southward to northern peninsular Malaysia, eastward to Hainan, Guangxi and Guangdong in China. It most likely also occurs in Yunnan, where it is represented by named local variants such as *A. yingjiangensis*, a form with yellow speckled leaves and a purplish stigma (Fig. 1). The species description of *A. longifolia* as presented below is based exclusively on Thai materials.

## TAXONOMIC TREATMENT

KEY TO SPECIES OF *ASPIDISTRA* IN THAILAND

1. Leaves tufted, nearly linear, blade gradually passing into a barely demarcated pseudopetiole; flowers 5- or 6-lobed **1. A. longifolia**

1. Leaves solitary on rhizome, either widely spaced or closely set, blade either sublinear or narrowly elliptic, with a distinctly demarcated pseudopetiole; flowers (6–)8–9-lobed

2. Leaves solitary on rhizome, but usually closely set (originally from the Osumi Islands, Japan, now widely cultivated as an ornamental) **A. elatior** Blume

2. Leaves solitary (or in pairs), widely spaced on the rhizome

3. Stigma ± flattened apically **3. A. sutepensis**

3. Stigma hemispherical apically **2. A. subrotata**

**1. Aspidistra longifolia** Hook.f., Fl. Brit. Ind. 6: 326. 1892; K.Larsen, Dansk Bot. Ark. 20: 41. 1961.— Lectotype, here designated: Assam, *Griffith* 5887 (**K**, barcode K000099916; isolectotype **K**, barcode K000099915).— *A. hainanensis* W.Y.Chun & F.C. How, Fl. Hainanica 4: 114, 533. 1977.— Type: Hainan, *How* 70382 (**IBSC**, not seen).— *A. yingjiangensis*, L.J.Peng, Acta Bot. Yunnan. 11 (2): 173. 1989.— Type: Yunnan, *Peng* 87-3 (**KUN**, not seen).— *A. larutensis* W.J. de Wilde & A.Vogel, Folia Malaysiana 6 (3–4): 126. 2006, **syn. nov.**— Type: Peninsular Malaysia, Perak, *Vogel* 960183 (holotype **KEP**; isotypes **BKF**, **K**, **L**, **SING**).— *A. lurida* auct. non Ker Gawl.: J.G. Baker, J. Linn. Soc. 14: 579. 1875, p.p., for the *Griffith* specimens only. Figs. 1, 3 A–D.

Perennial (sub)glabrous herb, in dense clumps. Rhizome on the surface or partially subterranean, 8–11 mm in diam., few-branched, with dense scales and 2–4 tufted ensiform leaves at the end of short lateral branches, roots numerous,

thick. Leaves long-lanceolate, pseudopetiole gradually passing into leaf blade, both together 40–70 by (1.5–)2–4.5(–5.3) cm, apex acute, margin finely serrate towards apex; pseudopetiole 5–20 cm long. Scape solitary, but sometimes a few close together, decumbent, 0.5–3 cm long; bracts 2–4, pale green or colourless, broadly ovate, subobtuse, 5–10 mm long, the apical 2 largest, embracing base of floral tube. Perianth campanulate (sometimes slightly urceolate), fleshy-leathery, adaxially completely purple-black (lobes sometimes green at apex); tube 1–1.5 by 1–1.7 cm; lobes 5 or 6, subtriangular, 7–8 mm long, at base 7–8 mm wide, erect but ultimately recurved, apex obtuse, adaxially with 4 obtuse smooth ribs, extending down halfway into the tube; stamens 6, inserted just below halfway the tube (positioned lower than the stigma), anthers subsessile, broadly ovate, 2–3 by ca 3 mm; pistil including stigma reaching to about halfway the tube, 7–8 mm long, ovary narrow, 2–3 mm long and wide, style short, gradually widening into a broad mushroom-shaped, convex, fleshy, stigma 8–10 mm in diam., shallowly 3 (or 4)-lobed, creamy white, contrasting with the purple-black perianth lobes and concealing the perianth-tube, purple-black (maroon) inside. Fruits whitish, dirty greenish tinged, globose, 2–3.5 cm in diam., smooth or occasionally with some low sharp tubercles ca 1 mm, at apex with irregular 4–6 mm wide flattened stigma trace; fruiting scape 1–5 cm long. Seeds 5–10, (sub)globose, flattened where pressed against other seeds, ca 10 mm in diam., whitish.

Thailand.— NORTHERN: Chiang Rai [fl. 3

Figure 1. Distributions of *Aspidistra longifolia* Hook.f. (black dots, open circle localities from assumed synonyms outside Thailand), *A. subrotata* Y.Wan & C.C.Huang (squares) and *A. sutepensis* K.Larsen (triangles).

Jan. 1974, *Charoenphol* (*Chaleonphol*) 527 (**BKF**, **L**); Doi Tung, fl. buds 13 Oct. 2009, *Phonsena* 6442 (**BKF**); same locality, fl. 12 Dec. 2009, *Phonsena, Duyfjes & de Wilde* 6495 (**BK**, **BKF**, **L**, **QBG**)]; Phitsanulok [Phu Hin Rong Kla NP, fr. & st. 14 June 2009, *Phonsena* 6385 (**BK**, **BKF**, **L**); same locality, fl. 6 Dec. 2009, *Phonsena, Duyfjes & de Wilde* 6479 (**BK**, **BKF**, **KKU**, **L**)]; NORTH-EASTERN: Phetchabun (Loei, sic) [Nam Nao NP, st. 28 Oct. 1984, *Murata, Phengklai, Mitsuta, Yahara, Nagamasu & Nantasan* T-51696 (**BKF**); same locality, fr. 15 May 2009, *Phonsena* 6369 (**BKF**)]; SOUTH-WESTERN: Phetchaburi [Kaeng Krachan NP, fl. 3 Jan. 2007, *Phonsena, Banchong & Patthum* 5314 (**BKF**, **BK**, **L**); same locality, fr. 24 May 2008, *Phonsena* 5989 (**BK**, **BKF**, **L**); same locality, fr. 10 Feb. 2008, *Phonsena & Chusithong* 5861 (**BKF**); same locality, fr. 23 April 2008, *Phonsena & Chusithong* 5948 (**BK**, **BKF**, **L**); same locality, fr. 26 June 2008, *Phonsena* 6076 (**BK**, **BKF**, **L**); same locality, fr. 20 Jan. 2009, *Phonsena* 6352 (**KKU**, **QBG**)]; SOUTH-EASTERN: Chanthaburi [Khao Soi Dao WS, st. 26 Jan. 2008, *Phonsena, Chusithong, Chausook & Loetsombunsuk* 5803 (**BKF**); same locality, st. 26 Jan. 2008, *Phonsena, Chusithong & Chausook* 5807 (**BKF**); same locality, one dried fl. 28 Jan. 2008, *Phonsena, Chusithong & Chausook* 5840 (**BKF**); same locality, st. 28 Jan. 2008, *Phonsena, Chusithong & Chausook* 5844 (**BKF**); same locality, fr. 13 July 2008, *Phonsena* 6136 (**BKF**)]; PENINSULAR: Ranong [Khao Phota Luang Kaeo (Phuket, Kao Pawta Luang Keo), fl. 29 Nov. 1974, *Geesink et al.* 7723, (**BKF**, **L**); Khao Phota Chong Dong (Kao Pawta Chong Dong), st. 22 Jan. 1929, *Kerr* 16807 (**BK**)]; Pattani [Khao Kala Khiri, fl. Buds 3 April 1928, *Kerr* 15004 (**BK**, **L**)].

Distribution.— India (Assam, type), China (Yunnan, Guangxi, Guangdong, Hainan), northern peninsular Malaysia.

Ecology.— In scattered, dense clumps in dry evergreen forest, and in lower montane rain forest in shade places on good soil, on shale, at 500–1600 m altitude. Flowering and fruiting: October–June.

Vernacular.— Nang laeo khao (นางแลวเขา) (The name is given by the first author).

Notes.— The fruits as described here are fully expanded but not yet mature. They are of a hard consistency, the inside is whitish, the outside whitish for the part sunken into the soil, the portion emerging from the soil is dirty greenish, tinged purplish; the seeds are creamy-whitish. Fully ripe, decaying fruit have not yet been observed. Possibly the seeds ripen darker brown. How the seeds are dispersed is likewise unknown.

*Aspidistra longifolia* was described from a collection by *Griffith* s.n. found in Upper Assam, in the Mishmi hills. In the K Herbarium there is one Griffith-collection of this species: *Griffith* 5887, 2 duplicates, annotated East Bengal, "Mishmee", the sheet with barcode K000099916 has been chosen as the lectotype.

**2. Aspidistra subrotata** Y.Wan & C.C.Huang, Guihaia 7: 223, photo 5. 1987; S.Yun Liang & M.N.Tamura, Fl. China 24: 244. 2000.— Type: China, Guangxi, *Huang & Wan* 12263 (holotype **GXMG**; isotype **GXSP**, not seen, but photo 5 of the type seen as cited above). Figs. 1, 4 A –I.

Perennial glabrous herb, with diffuse habit. Rhizome subterranean, ca 8 mm in diam., with scales, leaves solitary, (not widely) spaced, rarely two close together, cataphylls at base of petiole ca 10 cm long, roots copious, thick. Leaves sublinear (resembling those of *A. longifolia*) or narrowly elliptic, with or without paler, often white, blotches, at base narrowed into the pseudopetiole, 20–30(–40) by 2–7.5 cm, apex attenuate, acute; secondary veins few or several (raised above in var. *crassinervis*); pseudopetiole (5–)10–25(–40) cm long, narrow. Scape solitary, erect or ascending, 2–7 cm long, with (1 or) 2, 0.5–1 cm long, spaced, scale-like appressed bracts, and apically with 1 or 2 bracts appressed to the perianth, pale. Perianth outside dirty pinkish, inside purple or purplish-red, carnose and brittle, widely campanulate, base narrowly rounded, lobes spreading into a star, 4–5 cm in diam.; lobes 8, in one row, narrowly triangular-oblong, subobtuse, adaxially 2-ridged, 1.5–2 cm long; stamens 8, inserted about halfway in shallow, disk-shaped tube (Fig. 4C); anthers subsessile, filaments ca 2 mm long, anthers curved, 2.5–3 mm long; ovary small, stigma large, hemispherical or somewhat elongated, emerging from the tube, 1.5–2 by 1.5 cm, off-white, often with pink-lilac irregular blotches. Fruits elongate-globose, ca 4 by 3.5 cm, (3 or) 4 (or 5) -locular, dirty purplish-

greenish, with irregularly striate-grooved surface and some short spines or wartlets. Seeds (unripe) several, subglobose, 4–5 mm in diam.

Thailand.— NORTH-EASTERN: Loei (Phu Luang WS, see varieties below).

Distribution.— China (W & S Guangxi); N Vietnam.

Ecology.— Scattered or gregarious in open dry evergreen forest with bamboos and lower montane scrub on and below the top area of Phu Luang sandstone mountain, at 700–1480 m altitude. Flowering and fruiting: August–December.

Vernacular.— Nang laeo phu (นางแลวภู) (The name is given by the first author).

Notes.— The Thai material of *A. subrotata* has flowers with a diameter of 4–5 cm; that from China and Vietnam ca 5 cm in diam. Furthermore the diversity in leaf shape, with the blades lanceolate as well as elliptic and leaves with a smooth upper surface as well as with raised nerves above, mixed in one population, is remarkable and not known from other species. The abundance of plants all over the area enabled us to search for examples of different leaf shapes on the same rhizome, but none were found. Plants with narrow leaves or with broad leaves with a smooth surface or with broad leaves and raised nerves were not found inter-connected with their rhizomes.

A formal distinction of varieties, useful for later ecological studies, can be made.

KEY TO THE VARIETIES

1. Leaf linear-lanceolate, (1–) 2–2.5 cm wide — **b.** var. **angustifolia**
1. Leaf narrowly elliptic, 4–7 cm wide
2. Upper surface of leaf with raised nerves — **c.** var. **crassinervis**
2. Upper surface of leaf smooth, nerves not raised — **a.** var. **subrotata**

**a.** var. **subrotata**

Leaf 4–7 cm wide, nerves not raised above.

Thailand.— NORTH-EASTERN: Loei [Phu Luang WS, fl. 12 Sept., 2008, *Phonsena, Chusithong, & Chausook* 6232 (L); same locality, fl. 12 Sept. 2008, *Phonsena, Chusithong, & Chausook* 6240 (**BK**, **BKF**, **KKU**, **L**); same locality, fl. 12 Sept. 2008, *Phonsena, Chusithong, & Chausook* 6241 (**BKF**, **KKU**); same locality, fl. & fr. 15 Nov. 2008, *Phonsena, Duyfjes & de Wilde* 6334, (**BK**, **BKF**, **L**); same locality, fl. & fr. 16 Nov. 2008, *Phonsena, Duyfjes & de Wilde* 6339, (**BK**, **BKF**, **L**)].

Distribution.— China.

Ecology.— In Thailand as for the species.

**b.** var. **angustifolia** Phonsena, **var. nov.** A varietate typica foliis 2–2.5 cm latis differt.— Typus: Thailand, Phu Luang WS, *Phonsena, Duyfjes & de Wilde* 6333, (holotype **BKF**; isotypes **BK**, **K**, **L**).

Leaf lanceolate (1–) 2–2.5 cm wide, nerves not raised above.

Thailand.— NORTH-EASTERN: Loei [Phu Luang WS, fl. 12 Sept. 2008, *Phonsena, Chusithong, & Chausook* 6231 (**BK**, **BKF**, **KKU**, **L**); same locality, fl. & fr. 15 Nov. 2008, *Phonsena, Duyfjes & de Wilde* 6333 (**BK**, **BKF**, **K**, **L**); same locality, fl. & fr. 15 Nov. 2008, *Phonsena, Duyfjes & de Wilde* 6336 (**BK**, **BKF**, **L**)].

Distribution.— Endemic.

**c.** var. **crassinervis** (Tillich) Phonsena, **stat. nov.**— *Aspidistra subrotata* Y.Wan & C.C.Huang subsp. *crassinervis* Tillich, Feddes Repert. 116 (2005) 322, Fig. 3L.— Type: North Vietnam, Tillich 4461 (**M**, not seen).

Leaf 4–7 cm wide, with raised nerves above.

Thailand.— NORTH-EASTERN: Loei [Phu Luang WS, fl. 15 Nov. 2008, *Phonsena, Duyfjes & de Wilde* 6335 (BKF, L)].

Distribution.— Vietnam; in Thailand as for the species.

**3. Aspidistra sutepensis** K.Larsen, Dansk Bot. Ark. 20: 41. 1961.— Type: Chiang Mai, Doi Suthep, Sept. 1958, *Larsen* 4929 (holotype **C**, not seen).— Figs. 1, 2, 3E–I.

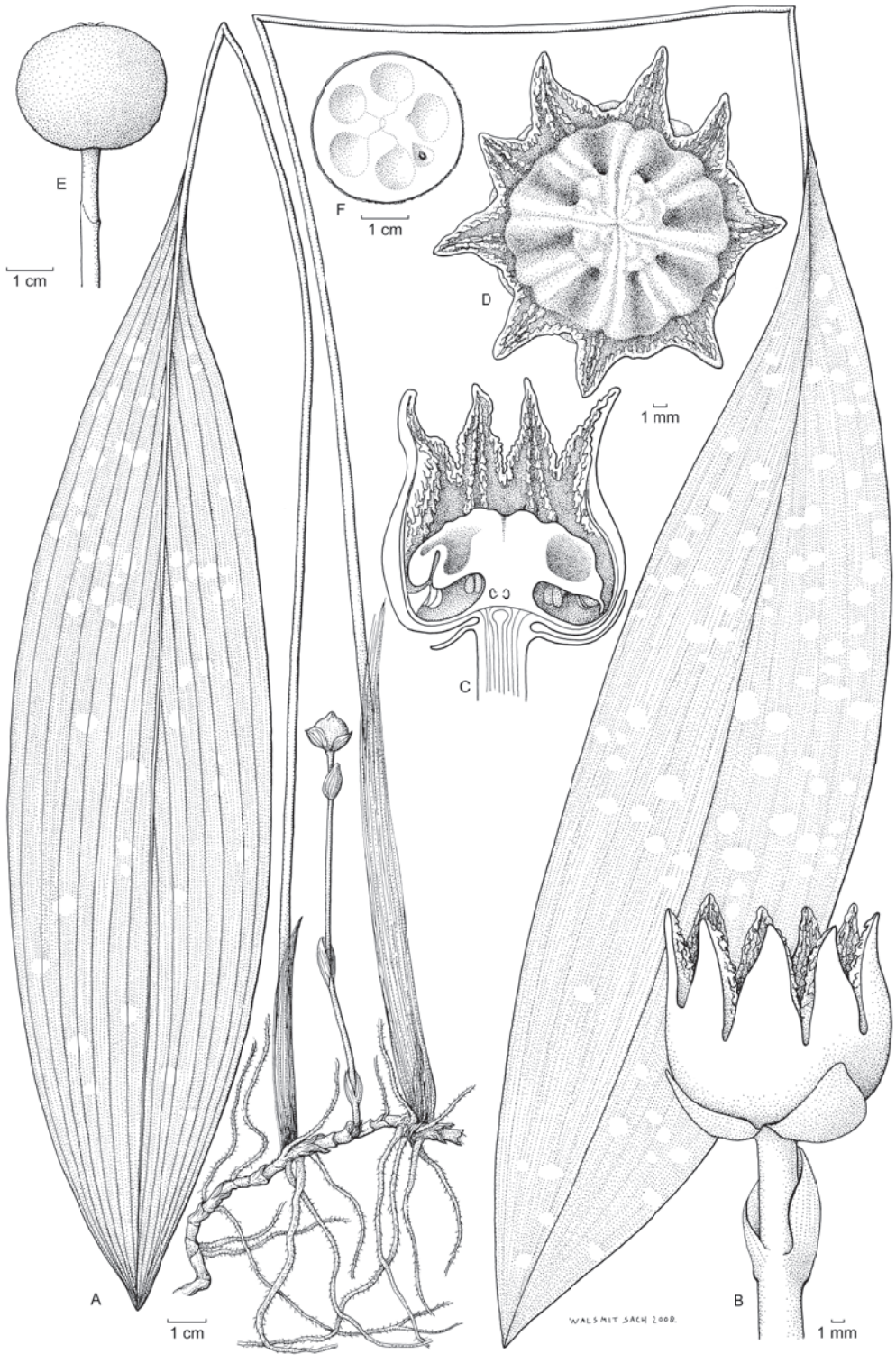


Figure 2. *Aspidistra sutepensis* K.Larsen: A. rootstock with two leaves and one scape bearing one flower; B–D. flower; side view, longitudinal section, and seen from above respectively; E, F. fruit; side view and cross section showing seeds. A–F: All from *Phonsena et al*. 5668. Drawn by Anita Walsmit-Sachs.


Figure 3. *Aspidistra longifolia* Hook.f.: A. habit; B, C. flowers, seen from above and longitudinal section respectively; D. ripe fruit & seeds.— *Aspidistra sutepensis* K.Larsen: E. habit; F. flowers & fruits; G, H. flower seen from above and lateral view respectively; I. fruit. Photographed by P. Phonsena (A, C, D, E) and D. Chusithong (B, F, G, H, I).


Figure 4. *Aspidistra subrotata* Y.Wan & C.C.Huang: A. Flowers & fruit; B, C. flowers seen from above in lateral view and longitudinal section respectively; D. fruit; E. fruit, cross section.— *Aspidistra subrotata* Y.Wan & C.C.Huang var. *angustifolia* Phonsena: F. habit.— *Aspidistra subrotata* Y.Wan & C.C.Huang var. *subrotata*: G. habit; H. leaves with white blotches.— *Aspidistra subrotata* Y.Wan & C.C.Huang var. *crassinervis* (Tillich) Phonsena: I. leaves. Photographed by P. Phonsena (C, D, E, H, I) and D. Chusithong (A, B, F, G).

Perennial glabrous herb, with diffuse habit. Rhizome subterranean, laxly much-branched, ca 5 mm in diam., with dense imbricate scales in two rows and solitary large green leaves, 4–10 cm spaced, the petiole at base enveloped by fibrous remnants of cataphylls to 10 cm long; roots mostly inserted near the nodes. Leaves oblong-lanceolate, (20–)30–35 by (5–)7–10 cm, with or without scattered, paler, yellowish-green blotches 0.5(–1) cm in diam., base narrowed into the pseudopetiole, apex attenuate, acute; secondary veins numerous, 1–2 mm spaced; pseudopetiole 15–40 cm long, 3–5 mm wide, with prominent longitudinal veins. Scape solitary (1–4 per shoot), erect (or ascending), 3–10 cm long, bearing 2 or 3 0.5–1 cm long, spaced, scale-like bracts and 2 further pale, broadly ovate bracts of the same size at the base of the flowers. Perianth outside at base pale dirty creamy-brownish, in upper half and inside purplish-red, carnose, subcampanulate (to slightly urceolate), 1.5–2 by 1.5–2 cm, base broadly rounded, lobes 8–9, in one row, valvate in bud, outside smooth, inside with 2 blunt ridges, suberect, ca 10 mm long, at apex slightly recurved; stamens 8–9, inserted in the tube below the stigma, anthers subsessile, 3–3.5 mm long; pistil 7–8 mm long, stigma peltate, 1.2–1.5 cm in diam., red(-brown) with white triangular blotches above, ovary ca 5 mm long and wide. Fruit borne at apex of erect fruiting scape 5–10 cm long, situated just below soil surface, creamy, tinged bright purplish-red towards apex, slightly depressed globose, ca 2.5 by 3–4 cm, smooth with withered stigma at apex. Seeds 5–6, subglobose, 8–10 mm in diam., pale.

Thailand.— NORTHERN: Chiang Mai [Doi Inthanon NP, fl. buds 29 Sept. 1996, *Bygrave* 119 (**K**); same locality, fl. buds 8 Sept. 2008, *Phonsena* 6228 (**BKF**, **L**); same locality, fl. & fr. 17 Nov. 2007, *Phonsena, Duyfjes, de Wilde & Chusithong* 5668 (**BK**, **BKF**, Herbarium of Khao Hin Son Botanic Garden, **L**); same locality, fl. 1 Oct. 2005, *Tillich* 5081 (**BKF**, **MSB**); same locality, st. 10 Dec. 1984, *Yahara & Nagamasu* T-50053 (**BKF**, **KYO**, **L**); same locality, st. 15 Oct. 1979, *Shimizu, Toyokuni, Koyama, Yahara & Santisuk* T-18791 (**BKF**); Doi Ang Khang, fl. 13 Dec. 2009, *Phonsena, Duyfjes & de Wilde* 6508 (**BKF**); Doi Suthep, fl. buds 15 Nov. 1914, *Kerr* 3466 (**K**); same locality, st. 11 Sept. 1958, *Sørensen et al.* 4918 (**BKF**, **C**, **L**); same locality, Sept. 1958, *Larsen* 4929 (holotype **C**); same locality, fl. & immature fr., 5 Nov. 2005, *Maxwell* 05-635 (**L**); same locality, fl. 8 Dec. 2009, *Phonsena, Duyfjes & de Wilde* 6486 (**BK**, **BKF**, **L**, **QBG**)].

Distribution.— Endemic.

Ecology.— Lower montane oak forest and lower montane pine-oak forest, at 1400–1710 m altitude. Flowering and fruiting: October–December.

Vernacular.— Nang laeo (นางแลว), nang laeo doi (นางแลวดอย), thao luem mai thao (เต่าลืมไม้เท้า) (Chiang Mai).

Uses.— It is believed by hill tribes in Chiang Mai that a tonic of this plant relieves back and waist pains.

Notes.— Species with broad leaf base and narrow petiole, described before 1961, and similar to *A. sutepensis* are: *A. elatior* Blume (1834, originally a local endemic of Japan), and *A. lurida* Ker Gawl. (1822, rather widespread in China). The latter in particular could prove to be identical to *A. sutepensis*, but the precise relationships between these three species need further study.

The pale, dirty purplish-pink, open flowers show up in the field as a star with irregular-papillose surface (Fig. 3G). In the centre is the shallowly (3–) 4(–5)-grooved circular stigma with, at the periphery, 8 (or 9) triangular whitish slit-like invaginations, alternating with the perianth lobes. These slits are quite deep (see Fig. 2), and may serve as access points for pollinators. Similar deep invaginations occur in the upper stigmatic surface of *A. elatior* where they serve as access points for pollinating amphipods and collembola as well as a range of other invertebrates (Lawrence, 1955; Kato, 1995; Conran & Bradbury, 2007); however, thus far no floral infauna have been recorded for *A. sutepensis*.

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