Two new species and one new variety of *Aspidistra* (Asparagaceae: Nolinoideae) from southern Vietnam

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ABSTRACT. Two new species and one new variety of *Aspidistra* Ker-Gawl. (Asparagaceae: Nolinoideae) from southern and central Vietnam, *A. ventricosa* Tillich & Škorničk., *A. mirostigma* Tillich & Škorničk., and *A. connata* Tillich var. *radiata* Tillich & Škorničk., are described and illustrated here.

Keywords. Asparagaceae, *Aspidistra*, Convallariaceae s. str., Nolinoideae, Ruscaceae s.l., Vietnam

Introduction

The genus *Aspidistra* Ker-Gawl. (Asparagaceae: Nolinoideae – formerly also placed in Convallariaceae and in Ruscaceae) ranges from Assam (India) in the west to southern Japan in the east, and from central China southwards to the Malay Peninsula. Its centre of diversity is in southeast China (Guangxi Province) and adjacent northern Vietnam (Tillich, 2005). The number of known species continues to grow as the Indochinese floristic region is better explored. Currently more than 100 species are recognised (Tillich & Averyanov, 2012) of which many were first reported from Vietnam only in the last decade (Bogner & Arnautov, 2004; Bräuchler & Ngoc, 2005; Tillich, 2005, 2006, 2008; Tillich et al., 2007; Tillich & Averyanov, 2008, 2012; Averyanov & Tillich, 2012, 2013, submitted; Tillich & Leong-Škorničková, 2013; Vislobokov et al., 2013). Forty-three *Aspidistra* species are currently known from Vietnam (Tillich, 2014). During recent joint expeditions conducted by the Vietnam National Museum of Nature and Singapore Botanic Gardens, we discovered yet another three taxa confirmed to be new to science by the second author.

In line with collecting practices as outlined by Tillich (2005), the spirit conserved flowers are part of the type specimens. These are labelled in conformity with ICN Art 8.3. (McNeill et al., 2012). The type specimens are also accompanied by colour

photo documentation of important characters including the flower dissection. The terminology follows Beentje (2012) and the standard *Aspidistra* works cited above.

Aspidistra ventricosa Tillich & Škorničk., **sp. nov.**
Aspidistra ventricosa is similar to *A. cryptantha* Tillich (Tillich et al., 2007), but differs in the larger perigone (c. 17 mm in diam. with c. 6 mm apical opening versus 6–7 mm in diam. and 2–3 mm apical opening in *A. cryptantha*) and in the position of the anthers, which are positioned basally at the margins of a flat fleshy base (compared to anthers positioned halfway along tube in *A. cryptantha*).
TYPE: Vietnam, Ninh Thuận Province, Bình Tiên District, Công Hải Commune, Núi Chúa National Park, 11°46′44.8″N 109°10′44.5″E, 97 m asl, 31 Oct 2013, *Jana Leong-Škorničková, Nguyễn Quốc Bình, Aung Thame & Edward Ong JLS-2581* (holotype SING, including a flower in liquid collection; isotypes M, VNMN. (Fig. 1, 2)

Rhizomatous herb up to 50 cm tall. ***Rhizome*** epigeous, with very short internodes, 5–10 mm diam., with many swollen roots (up to 7 mm in diam). ***Leaves*** crowded, cataphylls deep purple when young, ribbed, up to 10 cm long; petiole up to 35 cm long, stout, stiff, ventrally with a furrow, deeper in apical part, shallower towards the base, basal 5–7 mm swollen; blade elliptic to ovate, slightly unequal, 15–25 × 4.5–9 cm, apex acute to attenuate, base obtuse to attenuate, mid-green, semi-glossy above, slightly lighter beneath with strongly protruding midvein, secondary veins visible but not prominent, margin very minutely serrate towards apex, making the margin somewhat sharp to touch. ***Peduncle*** up to 3.5 cm long, semi-erect, white, with 6 scales, 3 subtending the flower (white with purple tinge) and 3 along the scape (white). ***Perigone*** upright, tube urceolate, deep purple internally and externally, c. 17 mm in diameter, with nearly flat, fleshy base, distal opening c. 6 mm; lobes 6, triangular, reflexed, in a single whorl, upper surface finely verrucose, each with three sharp ridges, lobes c. 4–5 mm long, 5–6 mm wide at base. ***Stamens*** 6, inserted at base of the tube, completely covered by stigma; anthers on short white filaments, anther thecae c. 1 mm long; pollen bright yellow. ***Pistil*** table shaped; style cylindrical, c. 2 mm long, cream-coloured; stigma more or less circular, c. 15 mm in diameter, the upper surface is rough with projections, cream-coloured with purple tinge, the lower surface is smooth, its cream-coloured centre is star-shaped with 6 larger and 6 alternating smaller tips (see comment below), margin richly tinged with purple. ***Fruit*** almost spherical, 1.7–2 cm diam., green with purple tinge, more or less smooth at base, with irregular protrusions on the upper half; seeds 6, wedge-shaped, light brown.

Habitat and phenology. Aspidistra ventricosa is a fairly common species, occurring between 90–350 m in the understorey of semi-arid forest and growing among shrubby vegetation on stony slopes. Flowering in September–October, fruiting October–November.

Fig. 1. *Aspidistra ventricosa* Tillich & Škorničk. **A.** Habit. **B.** Flower. **C.** Fruit. **D.** Rhizome and basal part of the plant showing young purple cataphylls. **E.** Basal part of the plant with flower rising from the rhizome. From type *JLS-2581*. (Photos: Jana Leong-Škorničková)

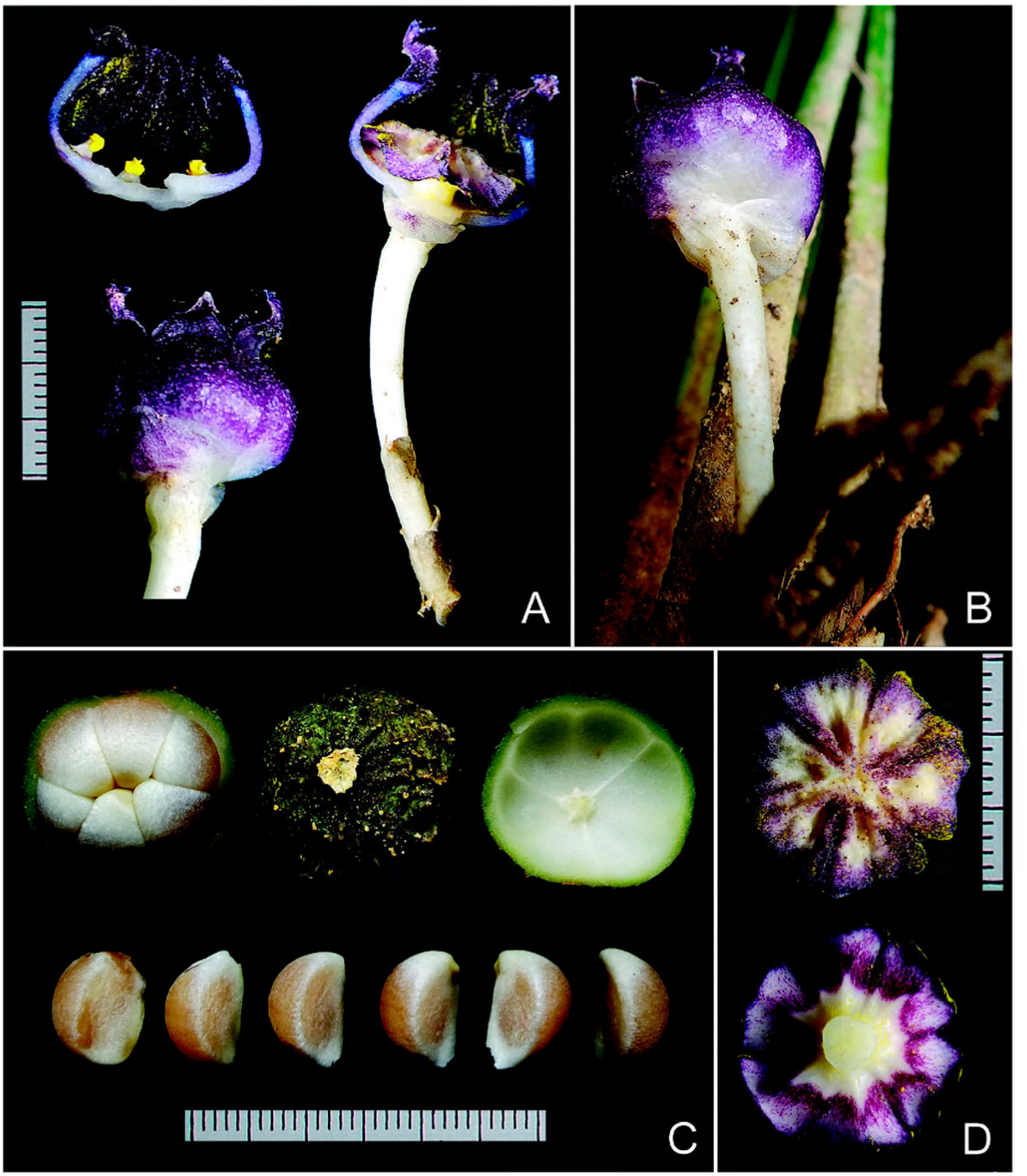

Fig. 2. *Aspidistra ventricosa* Tillich & Škorničk. **A.** Dissection of the flower (scale in mm). **B.** Detail of basal part of the flower showing subtending bracts. **C.** Dissection of fruit. **D.** Detail of stigma (top and bottom view). From type *JLS-2581*. (Photos: Jana Leong-Škorničková)

Distribution. So far known only from the type locality where it is locally abundant.

Etymology. The specific epithet denotes the shape of the flower.

Notes. The morphology described above for the stigma indicates that it is composed of three broad lobes, each lobe consisting of two sublobes. The larger star tips point to the 6 sublobes, the smaller tips to the incisions between lobes and sublobes, respectively.

Aspidistra ventricosa differs from *A. cryptantha* in the features outlined in the diagnosis, as well as in habitat and ecological requirements. *Aspidistra cryptantha* is so far known only from the type locality in Cao Bằng Province in northern Vietnam where it occurs in remnants of evergreen forests on limestone mountains at 600–800 m asl.

Aspidistra connata Tillich var. ***radiata*** Tillich & Škorničk., **var. nov.**

The new variety differs from the type variety in the lobes which open upon maturity compared to the type variety where the lobes remain connate until senescence of the flower. The flowers of *Aspidistra connata* var. *radiata* are larger, with the bowl-shaped base of the perianth c. 1.8–2 cm diam. (3.5–5 cm when lobes are open), compared to *A. connata* var. *connata* with the bowl-shaped base of the perianth 1 cm diam. (2–3 cm when lobes are open).

TYPE: Vietnam, Ninh Thuận Province, Ninh Hải District, Vĩnh Hải Commune, trek from Kiền Kiền village to Núi Chúa peak, 11°44′09.4″N 109°07′06.8″E, 595 m asl, 1 Nov 2013, *Jana Leong-Škorničková, Nguyễn Quốc Bình, Aung Thame & Edward Ong JLS-2594* (holotype SING, including flowers in liquid collection; isotypes M, VNMN, both including flowers in liquid collection). (Fig. 3, 4)

Rhizomatous herb up to 40 cm tall. ***Rhizome*** epigeous, with very short internodes, c. 7 mm diam., with numerous rigid roots, velamen visible on young roots. ***Leaves*** few at the actively growing apex of the rhizome, cataphylls light green, weakly ribbed, up to 10 cm long; *petioles* up to 30 cm long, stout, stiff, ventrally with a furrow, deeper in apical part, shallower towards the base, base swollen; blade elliptic, slightly unequal, up to 30 × 8 cm, apex acute, base asymmetrical, cuneate to attenuate, mid-green or sometimes with white blotches, glossy above, slightly lighter beneath with strongly protruding mid-vein, secondary veins visible but not prominent. ***Peduncle*** up to 4 cm long, or flowers subsessile, semi-erect to erect, white, with 6 cream to light green scales, 3 subtending the flower and 3 along the scape. ***Perigone*** upright, divided almost to the base, with almost flat, widely bowl-shaped, fleshy base, c. 1.8–2 cm diam., internally white, externally red-purple; perigone including lobes 35–50 mm diam.; lobes 8 (rarely 9 or 10), arranged in two whorls (two whorls are clearly visible only in late bud stage and are rather inconspicuous once the lobes open), lobes c. 2–2.5 cm long, 4–8 mm wide at base, narrowly triangular with blunt apex and revolute margins, internally deep purple-red, finely verrucose, externally light greenish, mottled with red-purple, glabrous. ***Stamens*** 8(–10), inserted near the base of the tube, completely covered by stigma; anthers on short white filament, anther thecae bean-shaped,

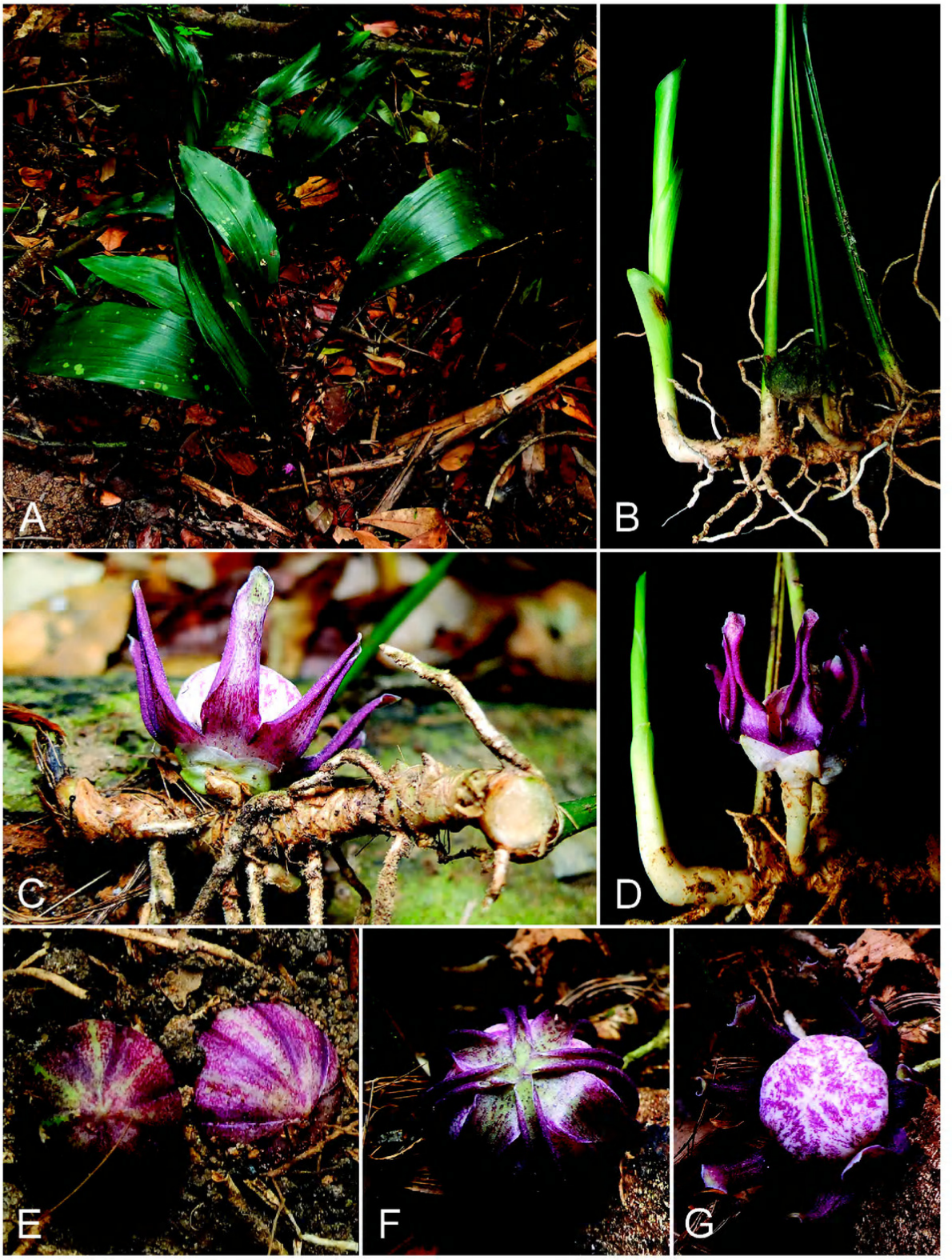

Fig. 3. *Aspidistra connata* Tillich var. *radiata* Tillich & Škorničk. **A.** Habit. **B.** Detail of cataphyll. **C.** Flower arising directly from rhizome (sessile; in side view). **D.** Flower on a peduncle (side view). **E.** Young flower bud. **F.** Flower bud just before anthesis. **G.** Fully open flower. From type *JLS-2594*. (Photos: Jana Leong-Škorničková)

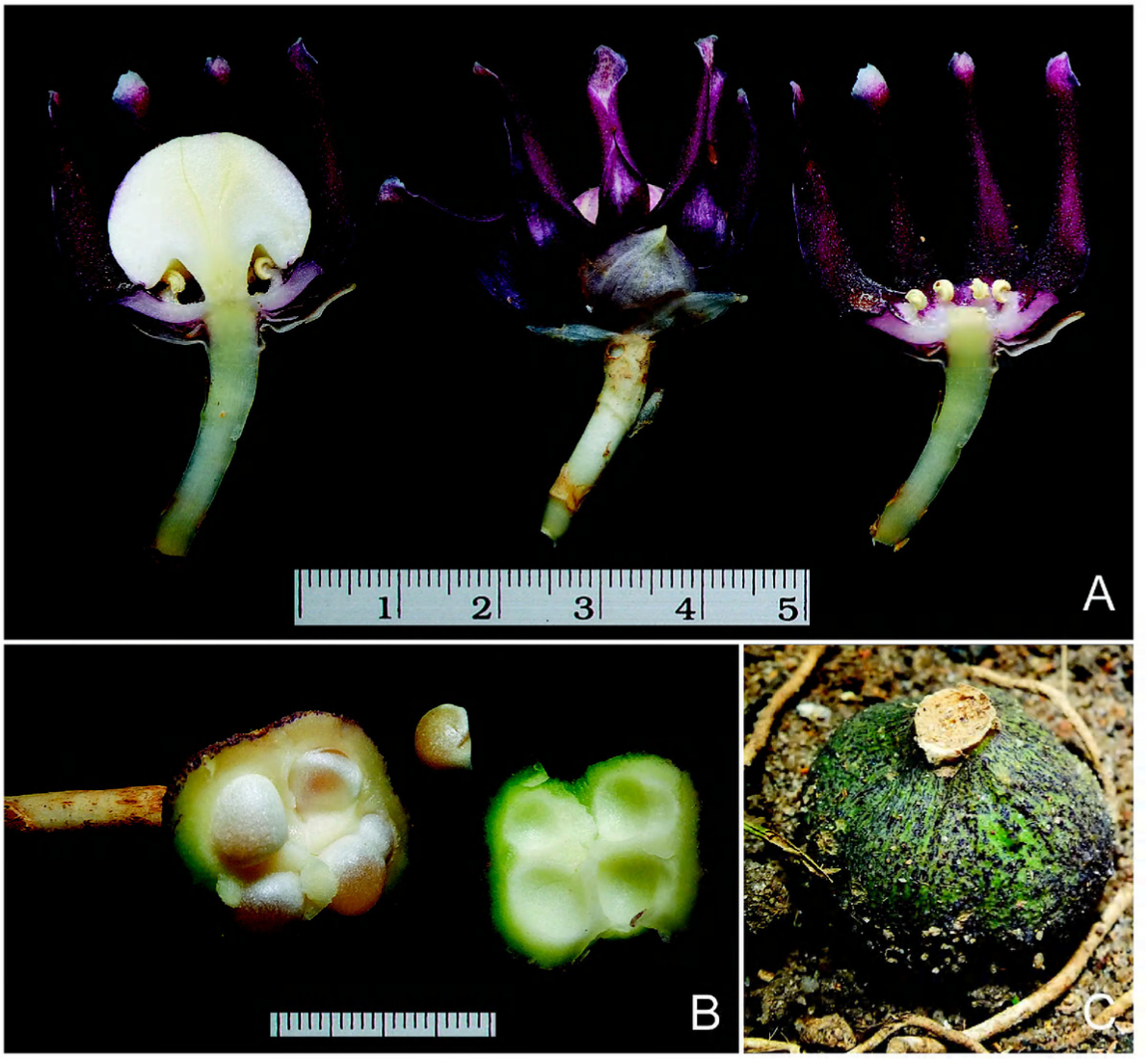

Fig. 4. *Aspidistra connata* Tillich var. *radiata* Tillich & Škorničk. **A.** Dissection of the flower & detail of the basal part of the flower (scale in mm). **B.** Dissection of fruit (scale in mm). **C.** Fruit. From type *JLS-2594.* (Photos: Jana Leong-Škorničková)

c. 2 mm long; pollen cream white. ***Pistil*** mushroom-shaped; style 4–5 mm long, cream-coloured; stigma dome-shaped, 15–20 mm in diameter, cream-coloured with purple mottling on the upper exposed side, cream-white on the lower side facing anthers. ***Fruit*** almost spherical, up to 2.3 cm diam., green with fine purple-black mottling, mildly irregularly verrucose; seeds c. 8, light brown.

Habitat and phenology. Abundant in lower montane broad-leaved evergreen forest at altitudes between 500–800 m. Flowering in October–November, fruiting observed at the end of October and estimated to continue to December.

Distribution. So far known only from the type locality where it is locally abundant.

*Etymology.*The varietal epithet denotes the radiating perigone lobes (compared to the connate lobes in *Aspidistra connata* var. *connata*).

Notes. In the late bud stage (Fig. 3E) *Aspidistra connata* var. *radiata* resembles the type variety (compare to Tillich, 2005, fig. 2C, D) but, unlike the latter, the petals of *Aspidistra connata* var. *radiata* open fully at maturity into a star-shaped flower, while the petals of *A. connata* var. *connata* remain connate until senescence. The petal margins of *Aspidistra connata* var. *radiata* are strongly revolute, while in those of *A. connata* var. *connata* only a narrow marginal strip is revolute.

The nominal variety of *Aspidistra connata* was described in 2005 from Central Vietnam and is known to occur in Gia Lai and Kon Tum Provinces, while *A. connata* var. *radiata* is so far known only from Ninh Thuận Province.

Aspidistra mirostigma Tillich & Škorničk., **sp. nov.**
Similar to *Aspidistra phanluongii* N.Vislobokov in shape and colour of the perigone tube, but differs in a pistil shape that is unique in the genus, and triangular yellow-green lobes with 4 keels (versus ligulate white lobes with two keels in *Aspidistra phanluongii*).
TYPE: Vietnam, Kon Tum Province, Kon Plông Dist., Xã Hiếu, 14°39'02.2"N 108°24'46.7"E, 1266 m asl, 25 Apr 2012, *Jana Leong-Škorničková, Nguyễn Quốc Bình, Trần Hữu Đăng, Eliška Záveská JLS-1571* (holotype SING, including a flower in liquid collection; isotype VNMN). (Fig. 5)

Rhizomatous herb up to 15–30 cm tall. ***Rhizome*** epigeous, horizontal to slightly ascending, with very short internodes, 3–5 mm diam., with numerous rigid roots. ***Leaves*** few (2–3) at the actively growing apex of the rhizome, cataphylls 3, dark maroon-purple, finely ribbed, up to 6 cm long; petioles up to 17 cm long, stout, stiff, ventrally with a shallow furrow, base swollen; blades lanceolate, slightly unequal, up to 12.5 × 4.5 cm, apex attenuate, base asymmetrical, obtuse, mid-green to dark green both sides, beneath with strongly protruding mid-vein and two secondary veins (one on each side of the midvein; clearly visible as depressions on upper surface), margin entire except very minutely serrate apex, making it somewhat sharp to touch. ***Peduncle*** 1–3 cm long, dark purple, with 3 dark purple scales along the scape and 2 scales (green with more or less rich dark purple tinge) subtending the flower. ***Perigone*** upright, tube urceolate, 13–15 mm diam. (at widest point), internally and externally deep purple (almost black); lobes 6 arranged in one whorl, triangular with blunt apex, c. 4 mm long, 4–5 mm wide at base, thick, suberect to slightly curving outwards, externally deep purple (almost black) with bright green margin, almost smooth, internally greenish-yellow, with 4 prominent ribs, the two median ones running down to lower third of tube, the submarginal ones fusing with the neighbouring rib of the adjoining lobe. ***Stamens*** 6, inserted near the base of the tube, completely covered by stigma; anthers sessile, anther thecae bean-shaped and arranged in v-shape, c. 2.5 mm long; pollen bright yellow. ***Pistil*** c. 12–14 mm diam., entire surface dark purple with

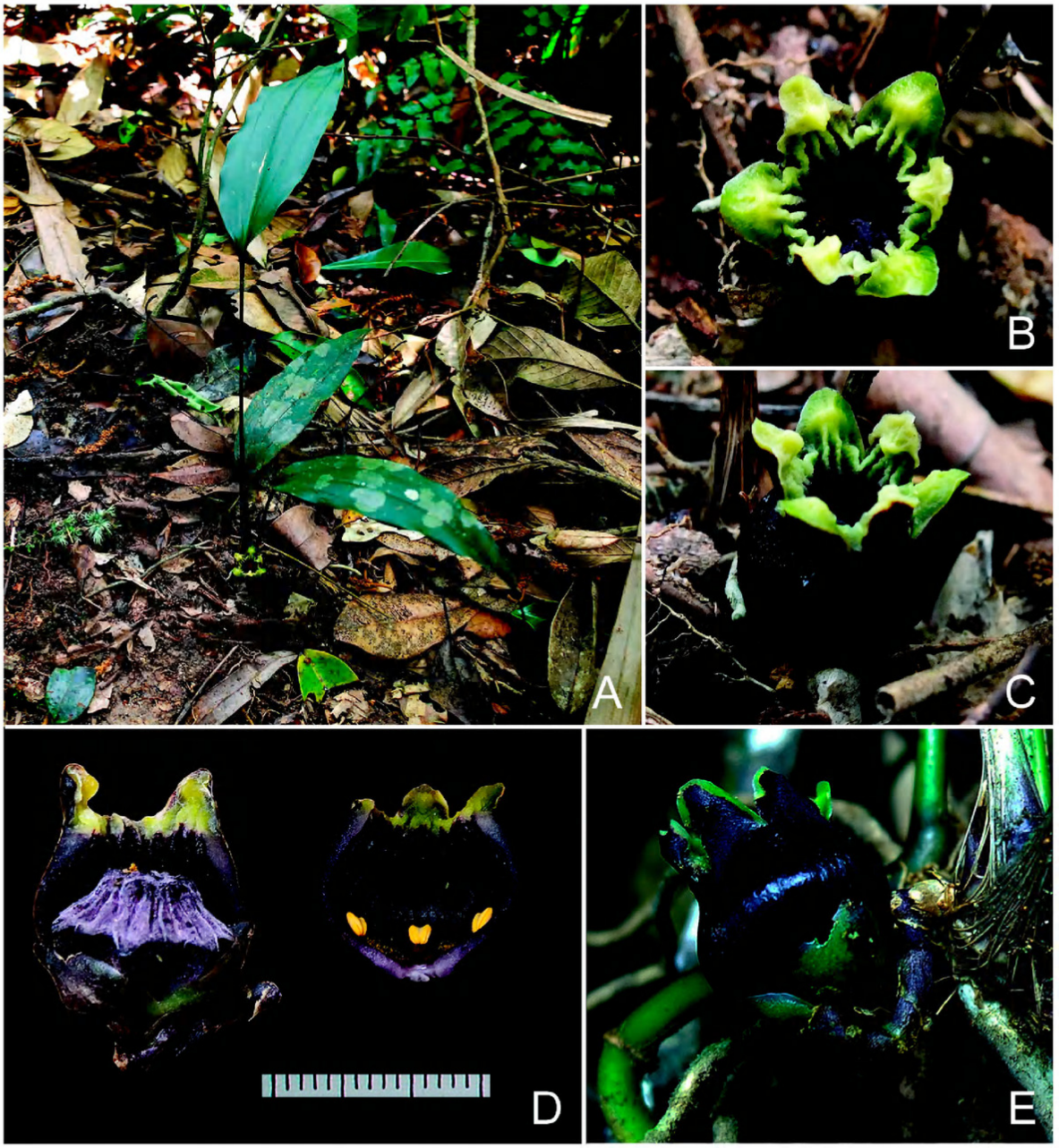

Fig. 5. *Aspidistra mirostigma* Tillich & Škorničk. **A.** Habit. **B.** Flower (top view). **C.** Flower (semi-side view). **D.** Dissected flower. **E.** Flower arising from rhizome (side view). From type *JLS-1571*. (Photos: Jana Leong-Škorničková)

velvety appearance; style inconspicuous; stigma subsessile, lower half obconical, with 6 prominent longitudinal ridges in contact with the tube wall, ending in 6 triangular teeth (in upper view), upper half a truncated cone with numerous longitudinal grooves. ***Fruit*** echinate (only a very young fruit seen).

Habitat and phenology. Aspidistra mirostigma grows in the undergrowth of primary montane broad-leaved evergreen forest at about 1260 m altitude. Flowering is in April–May, fruiting May–June.

Distribution. So far known only from the type locality where it is locally abundant.

Etymology. The specific epithet refers to the strange yet wonderful stigma with its unique shape and dark purple velvety surface.

Notes. Aspidistra mirostigma differs from *A. phanluongii* in the features outlined in the diagnosis, especially in its unique pistil shape. (Sub)sessile obconoid pistils are also known in *Aspidistra marginella* D.Fang & L.Zeng and *A. longanensis* Y.Wan from Guangxi Province in China. However, the stigma surface in *Aspidistra marginella* is slightly convex and smooth, the perigone lobes are linear (9 × 2 mm) and without keels. In *Aspidistra longanensis* the stigma surface is flat, with 4 central ovoid appendages, and the perigone lobes are 9–11 mm long with two indistinct basal keels and a basal 2–3-fid appendage.

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