



## *Aspidistra synpetala* and *A. pulchella*, Two new species of *Aspidistra* (Asparagaceae) from Guangxi, China

Chun-Rui LIN<sup>1</sup>, Bing-Mou WANG<sup>2</sup>, Jing LIU<sup>1</sup> and Yan LIU<sup>1,\*</sup>

1. Guangxi Institute of Botany, Guangxi Zhuang Autonomous Region and Chinese Academy of Sciences, 541006, Guilin, China; email: chunruilin@tom.com

2. Panyu Central Hospital, 511400, Guangzhou, China.

\*Corresponding author's email: gxibly@163.com

(Manuscript received 12 November 2018; accepted 22 January 2019; online published 27 February 2019)

**ABSTRACT:** Two new species, *Aspidistra synpetala* and *A. pulchella*, from the limestone areas in Guangxi, southern China, are described and illustrated. *A. synpetala* is similar to *A. longganaensis* in the shape of the flower, but differs by the papyraceous leaves, secondary veins prominently, the perigone subsphaeroidal, lobes basally with explanate, connect, white appendage; stigma upper surface purple, slightly convex. *A. pulchella* resembles to *A. guangxiensis*, but mainly differs by the perigone tube depressed urceolate, stigma disc-shaped, ca. 20 mm in diameter, 5–6 mm thick, the central part slightly convex with 5 (or 4) radial, purplish red, bifurcate stripes.

**KEY WORDS:** *Aspidistra synpetala*; *A. pulchella*; Asparagaceae; Guangxi; China.

### INTRODUCTION

*Aspidistra* Ker Gawl. is the largest genus of Asparagaceae with over 170 presently known species, it is native to eastern and southeastern Asia, the center of distribution and differentiation for the genus is Guangxi and northern Vietnam. The floral structure of *Aspidistra*, especially the stigma, is the most important taxonomic character because of its great variation. Recent investigating limestone plants in southwestern Guangxi, China, near the border with northern Vietnam, we collected *Aspidistra* specimens and these plants were brought into cultivation in Guilin Botanical Garden. After consulting herbarium specimens and relevant literature on *Aspidistra* (Liang & Tamura 2000, Li 2004, Tillich 2008, 2014, Lin *et al.* 2013, 2015a, 2015b, Liu *et al.* 2011, Averyanov *et al.* 2016, 2018, Averyanov & Tillich 2017, Vislobokov *et al.* 2014, 2016, Xu *et al.* 2017, Luo *et al.* 2018, Nong *et al.* 2018, Huang *et al.* 2018), two more novelties discovered recently in southwestern Guangxi are described and illustrated below

### TAXONOMIC TREATMENT

*Aspidistra synpetala* C. R. Lin & Yan Liu, *sp. nov.*

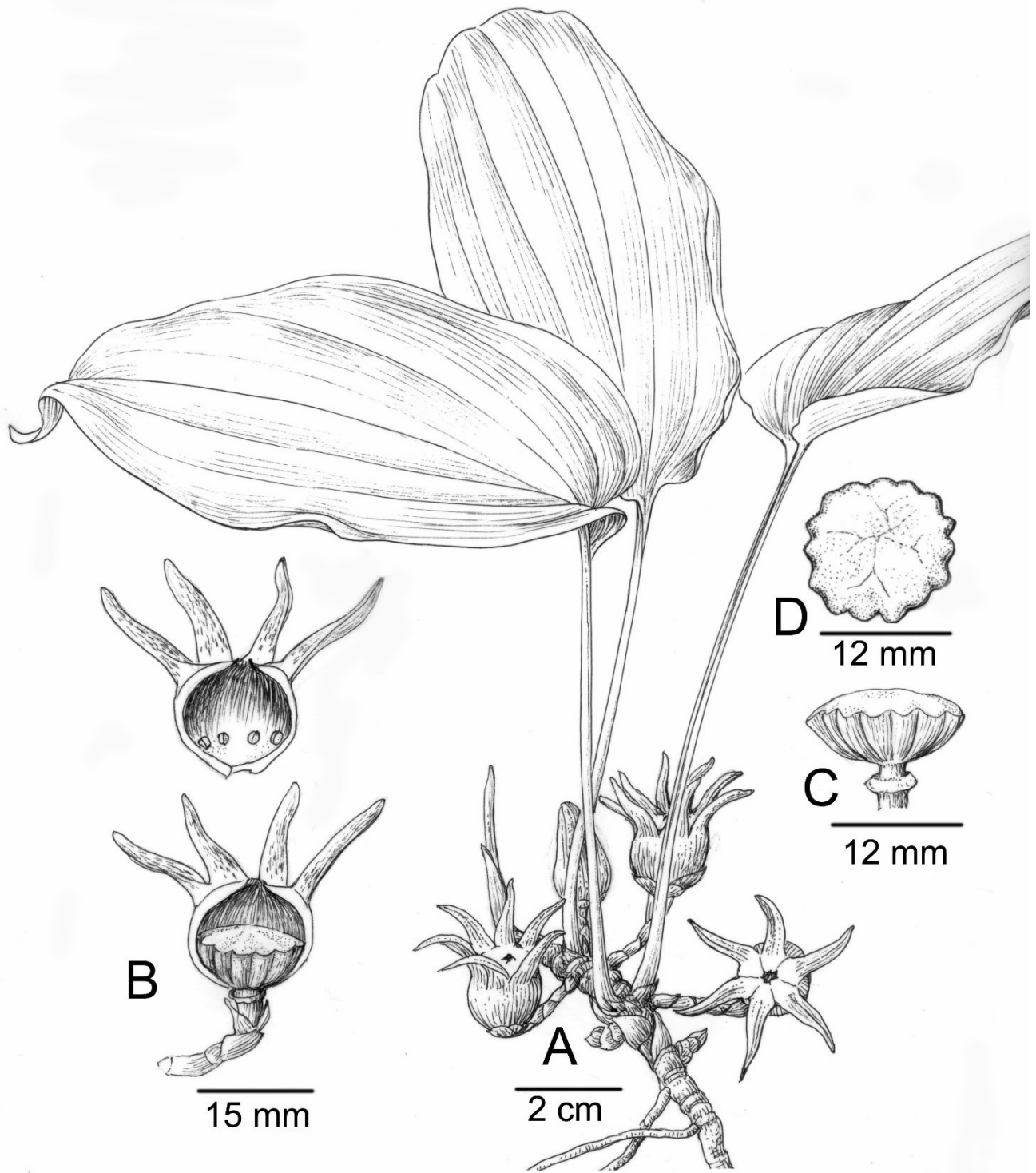
**Figs. 1 & 2**

**Type:** China. Guangxi Zhuang Autonomous Region, Lingyun County, Sishuihe Provincial Natural Reserve, limestone mountains, rar, 24°23'18.93"N, 106°35'25.83"E, alt. 652 m a.s.l., 2 May 2012, Chun-Rui Lin 1035 (holotype: IBK, isotype: IBK).

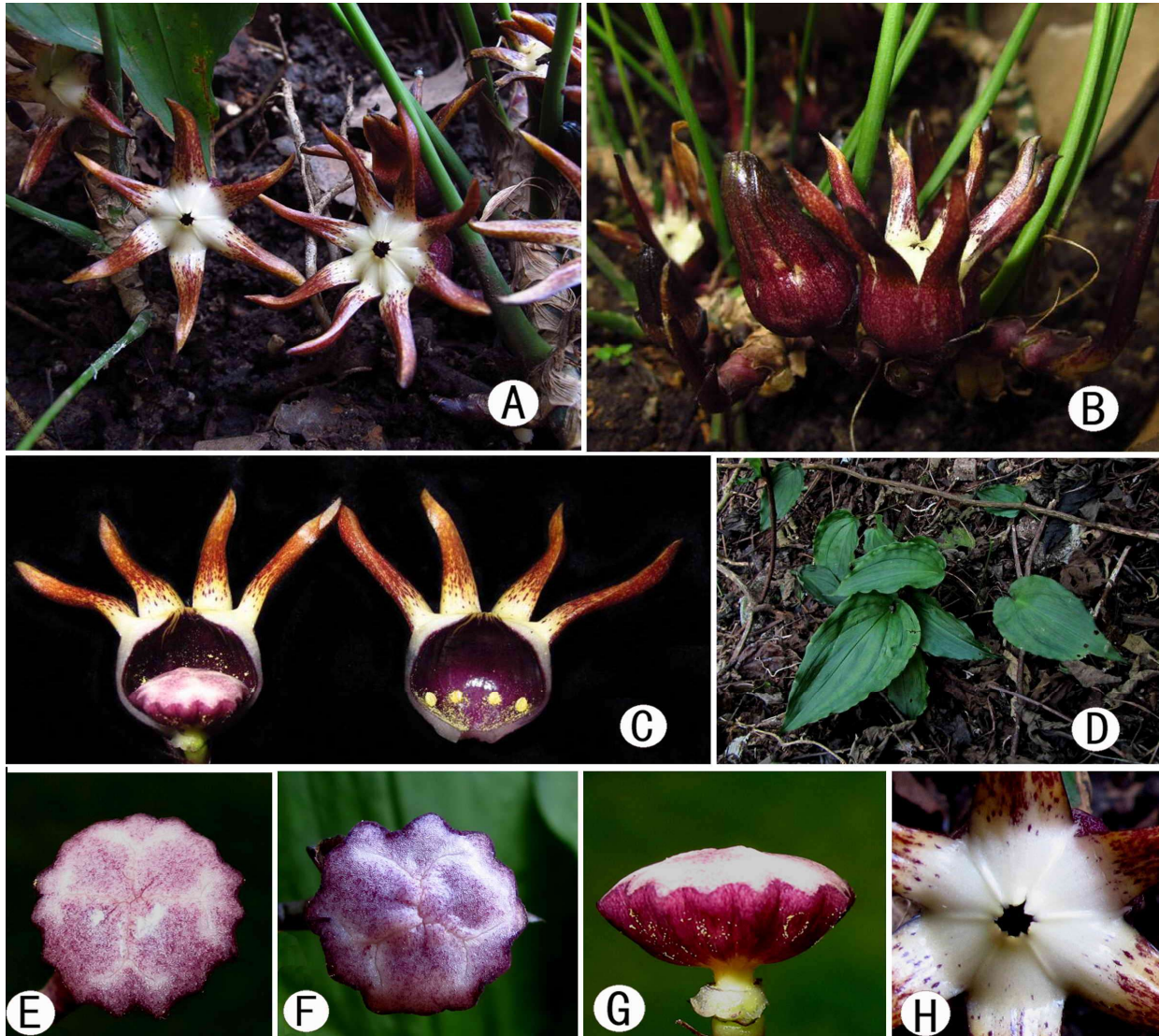
**Diagnosis:** *Aspidistra synpetala* C.R. Lin & Yan Liu resembles to *A. longganaensis* C.R. Lin, Y.S. Huang & Yan Liu (2015a: 377) in the shape of the flower, but is

distinguishable by leaves papyraceous (vs. pachyphyllous), secondary veins prominently (vs. hardly visible), the perianth tube subsphaeroidal (vs. campanulate), lobes appendage connect (vs. unconnect), apex explanate (vs. incurved), stigma  $\phi$  10–14 mm (vs. 8–11 mm), upper surface purple (vs. white), slightly convex (vs. concave).

Herbs perennial, evergreen, rhizomatous. Rhizome creeping, subterete, 4–6 mm thick, nodes dense. Roots numerous. Vaginal leaves 4–5, purple-red, 1–6 cm long, enveloping base of petiole, becoming black-brown when dry. Leaves solitary, 1–2 cm apart; petiole stiff upright, 10–18 cm long, 2–3 mm thick, adaxially sulcate; leaf blade usually broadly ovate to ovate oblong, papyraceous, 10–15 cm long, 4.5–7 cm wide, green, base broadly suborbicular, inequilateral, apex acuminate, margin entire, mid vein strongly prominent on abaxial surface, each half of lamina with 3–4 prominent secondary veins. Peduncle erect or declining, purple, 1–3 cm long, with 5–7 bracts, bracts gradually wider from base to top of peduncle, the distal ones at base of perigone broadly ovate, purplish red, 10–13 mm long, ca. 10 mm wide, apex obtuse. Flower solitary; perigone subsphaeroidal, fleshy, deeply 6 (or 8) lobed apically; lobes explanate, subequal, purplish red, ovate-lanceolate, 12–15 mm long, 4–5 mm wide at base, lobes basally with an adaxial, connect, white appendage, appendages the bases explanate protruding horizontally over tube opening and reducing the opening to 1.5–2 mm; tube 10–14 mm long, 12–16 mm in diameter, purplish red. Stamens 6 (or 8), opposite to lobes, inserted at ca. 3 mm from the base of perianth tube, positioned conspicuously lower than stigma; anthers ovate, subsessile, yellow, ca. 1 mm long and ca. 1 mm wide. Pistil 5–6 mm long, ovary



**Fig. 1.** *Aspidistra synpetala* C.R. Lin & Yan Liu : **A.** Flowering plant; **B.** Flower with half of perianth removed showing stamens and pistil; **C.** Pistil; **D.** Stigma apical view. Drawn by W. H. Lin from the holotype.



**Fig. 2.** *Aspidistra synpetala* C.R. Lin & Yan Liu : **A-B.** Flowers; **C.** Flower with half of perianth removed showing stamens and pistil; **D.** Habit; **E.** Stigma apical view (6-merous); **F.** Stigma apical view (8-merous); **G.** Pistil; **H.** Perianth lobes appendage connect.

inconspicuous, style short, cylindrical, 1–2 mm long, stigma enlarged, bowl-shaped, purple, glabrous, 4–6 mm thick, 10–14 mm in diameter, upper surface slightly convex, with 3 (or 4) radial, bifurcate lines from center to margin, its margin bent upwards, with 12 (or 16) longitudinal ribs, abaxially white. Flowering from April to May.

**Etymology:** The name of the new species relates to the connected appendage of the perianth lobes basally that explanate protruding horizontally over tube opening and reducing the opening to 1.5–2 mm.

**Distribution and ecology:** This new species is currently known only from type locality in Lingyun County, northwestern Guangxi, China. It grows on shaded rocky limestone slopes, together with species like *Polygala wattersii*, *Alchornea trewioides*, *Paraboea*

*rufescens*, *Cryptolepis buchananii*, *Iodes cirrhosa*, *Dischidia chinensis*, *Hemiboea subcapitata*, *Caryopteris aureoglandulosa*, *Clematis apiifolia* and *Asarum geophilum*.

**Paratypes:** China. Guangxi Zhuang Autonomous Region, Cultivated in the Guilin Botanical Garden, from the same source as the holotype, 22 Apr 2018, C. R. Lin, 1087 (IBK).

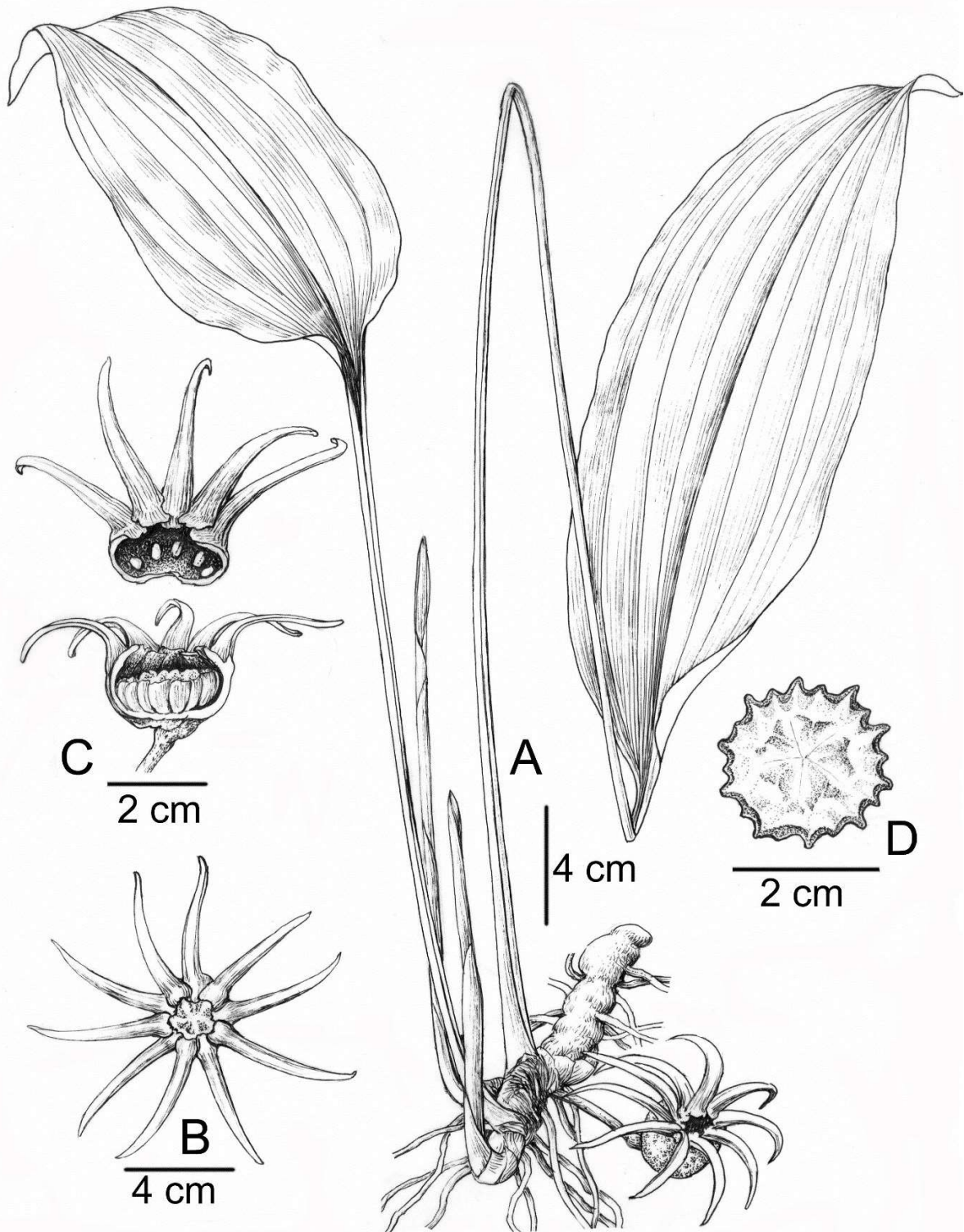
***Aspidistra pulchella*** B. M. Wang & Yan Liu, *sp. nov.*

**Figs. 3 & 4A–E**

**Type:** China. Guangxi Zhuang Autonomous Region, Daxin County, Xialei Village, limestone mountains, rare, 22°53'43.26"N, 106°45'11.7"E, alt. 380 m a.s.l., 15 May 2014, B. M. Wang 140503 (holotype: IBK).

**Diagnosis:** The new species resembles *Aspidistra guangxiensis* S.C. Tang & Yan Liu (2003:480) (Fig. 4F–





**Fig. 3.** *Aspidistra pulchella* B.M. Wang & Yan Liu: **A.** Flowering plant; **B.** Flower apical view; **C.** Flower with half of perianth removed showing stamens and pistil; **D.** Stigma apical view. Drawn by W. H. Lin from the holotype.

**Table 1.** Morphological comparison between *Aspidistra pulchella* sp. nov., *A. guangxiensis* and *A. chunxiuensis*.

| Characters       | <i>Aspidistra pulchilla</i>  | <i>A. guangxiensis</i>                               | <i>A. chunxiuensis</i>   |
|------------------|--|--|--|
| Leaf             | 18–25 × 7.5–10 cm  | 6–20 × 7–8 cm  | 20–32 × 9–11 cm  |
| Perianth tube    | 10–12 mm long, 22–25 mm in diam.   | ♂ 10–20 mm   | 10–12 mm long, 35–38 mm in diam.   |
| Perianth lobes   | 10 (8), 30–35 mm long  | 6 (8), 20–30 mm long                                 | 12, 30–35 mm long  |
| Pistil           | disc-shaped, ♀ ca. 20 mm   | bowllike, ♀ 10–15 mm                                 | disc-shaped, ♀ ca. 30 mm   |
| Stigma adaxially | slightly convex with 5 (4) radial, purplish red, bifurcate stripes at center | slightly concave, with 3 (4) purple ridges at center | flat, with 6 radial, purplish red, 4-fork-tipped lines from center to margin |



**Fig. 4.** *Aspidistra pulchella* B.M. Wang & Yan Liu (A–E): A. Flower; B. Stigma apical view (10-merous); C. Stigma apical view (8-merous); D. Flower dissected, showing stamens; E. Flower with half of perianth removed showing stamens and pistil; *A. guangxiensis* S.C. Tand & Yan Liu (F–H): F. Flowers, G. Stigma apical view (6-merous); H. Stigma apical view (8-merous); *A. chunxiuensis* C.R. Lin & Yan Liu (I): I. Flower.

H) and *A. chunxiuensis* C.R. Lin & Yan Liu (2015b:163) (Fig. 4I) in the shape of the flower, but differs by the stigma disc-shaped, ca. 20 mm in diameter, 5–6 mm thick, the central part slightly convex with 5 (or 4) radial, purplish red, bifurcate stripes. A detailed comparison to distinguish among these species is presented in Table 1.

Herbs perennial, evergreen, rhizomatous. Rhizome creeping, subterete, 6–8 mm thick, nodes dense. Roots numerous. Vaginal leaves 5–6, purple-red, 2–13 cm long,

enveloping base of petiole, becoming black-brown when dry. Leaves solitary, 1–2 cm apart; petiole stiff upright, 16–38 cm long, 2–3 mm thick, adaxially sulcate; leaf blade usually broadly ovate to ovate-oblong, 18–25 cm long, 7.5–10 cm wide, green or sometimes with small white blotches, apex acuminate, base broadly cuneate to suborbicular, abruptly narrowed to petiole, inequilateral, margin entire, with prominent midvein on lower surface and 3–4 inconspicuous secondary veins at both sides.



Peduncle decumbent or declining, 4–6 cm long, with 5–6 bracts, bracts gradually wider from base to top of peduncle, two most distal bracts adjacent to perianth broadly ovate-cucullate, densely purplish red spotted, 16–20 mm long, 12–15 mm wide, apex acuminate. Flower solitary; perigone depressed urceolate, fleshy, deeply 10 (or 8) lobed apically; lobes explanate, subequal, ovate-lanceolate, 30–35 mm long, 5–7 mm wide at base, abaxially purplish red, adaxially yellow and purplish red mottled at base frequently, each lobe basally with an adaxial, odontoid appendage, appendages 4–5 mm long, 5–6 mm wide, with verrucose margin, the bases explanate protruding horizontally over tube opening and reducing the opening to 10–12 mm; tube 10–12 mm long, 22–25 mm in diameter, abaxially pale yellow densely with purplish red spots, adaxially blackish purple, and with 10 (or 8) keels running from base of stamens to mouth of perigone tube. Stamens 10 (or 8), opposite to lobes, subsessile, inserted at ca. 3 mm from base of perianth tube, anthers oblong, 2–3 mm long and 1–2 mm wide. Pistil ca. 10 mm long, ovary inconspicuous, style short, cylindrical, 2–3 mm long, ca. 1 mm in diameter, stigma enlarged, disc-shaped, ca. 20 mm in diameter, 5–6 mm thick, upper surface pale yellow, the central part slightly convex with 5 (or 4) radial, purplish red, bifurcate stripes, its margin purple-red and bent upwards, with 20 (or 18) longitudinal ribs, abaxially white. Flowering from May to June.

**Etymology:** The specific epithet refers to the beautiful flowers.

**Distribution and ecology:** This new species is currently known only from type locality in Daxin County, southwestern Guangxi, China, near the border with northern Vietnam. It grows on limestone rock crevices in seasonally evergreen forest at 380 m a.s.l.

**Note:** The new species *Aspidistra pulchella* could be a natural hybrid between *A. guangxiensis* and *A. chunxiuensis*, as evidences shown in morphological comparison among these three species (Table 1). Although these three species are all distributed in the southwest of Guangxi, China, but they have not been found growing together in the field at present, further more, there are no reports on natural hybridization of the genus *Aspidistra* currently. Therefore, whether the new species is natural hybrid remains to be further observed and tested.

**Paratypes:** China. Guangxi Zhuang Autonomous Region, Cultivated in the Guilin Botanical Garden, from the same source as the holotype, 17 May 2017, C.R. Lin & Yan Liu, 1109 (IBK).

## ACKNOWLEDGEMENTS

The authors are grateful to Mr. Wen-Hong Lin (IBK) for the drawings. This work was supported by funds from the National Natural Science Foundation of China (31760061) and by funds for the Development of international standard of traditional Chinese Medicine (GZYYGJ2017024).

## LITERATURE CITED

- Averyanov, L.V. and H.J. Tillich. 2016. *Aspidistra anomala*, *A. elegans* and *A. sinensis* spp. nov. (Asparagaceae, Convallariaceae s.s.) from China, Laos and Vietnam. Nord. J. Bot. **34**(2): 141-147.
- Averyanov, L.V., H.J. Tillich, X.M. Gou, H.Q. Bui and S.K. Nguyen. 2016. Three new species of *Aspidistra* (Convallariaceae) from Vietnam. Wulfenia **23**: 57-63.
- Averyanov, L.V., H.-J. Tillich, K.S. Nguyen and T.V. Maisak. 2018. *Aspidistra bella* (Asparagaceae), a new species from northern Vietnam. Phytotaxa **364**(2): 208-208.
- Huang, X.Y., K. Sosoulithanee, K. Fang, W.B. Xu, K. Sydara, K. Thepkaysone, R.C. Hu and C.R. Lin. 2018. *Aspidistra laongamensis* (Asparagaceae), a new species from Laos. Taiwania **63**(4):393-396.
- Ker Gawler, J.B. 1822. The Botanical Register 8. London, Printed for James Ridgway, Piccadilly, 277 pp.
- Li, G.Z. 2004 (ed.). The Genus *Aspidistra*. Guangxi Sci. Technol. Publ. House, Nanning.
- Liang, S.Y. and M.N. Tamura. 2000. *Aspidistra*. In: Wu, Z.Y. & Raven, P.H. (Ed.) Flora of China. Vol. 24. Science Press, Beijing & Miss. Bot. Gard. Press, pp. 240-250.
- Lin, C.R., Y. Liu, D.X. Nong, Y. Kono and C.I. Peng. 2013. *Aspidistra crassifila* (Asparagaceae), a new species from Guangxi, China. Bot. Stud. **54**(1): 43.
- Lin, C.R., Z.Q. Nong, Y.S. Huang, T. Mong and Y. Liu. 2015a. *Aspidistra longgangensis* sp. nov. (Asparagaceae) from limestone areas in Guangxi, China. Nord. J. Bot. **33**(3): 377-380.
- Lin, C.R., X.Y. Huang, B. Pan, W.B. Xu and Y. Liu. 2015b. Two new species of *Aspidistra* (Asparagaceae) from Guangxi, China: *A. chunxiuensis* and *A. longshengensis*. Phytotaxa **208** (2): 163-169.
- Liu, Y., Y. Kono, C.R. Lin, W.B. Xu, and C.I. Peng. 2011. *Aspidistra erecta* (Asparagaceae), a new species from limestone areas in Guangxi, China. Bot. Stud. **52**: 363-369.
- Luo, X.Y., W.F. Xu and S.Z. He. 2018. *Aspidistra qijiangensis* (Asparagaceae), a new species from Chongqing, China. Phytotaxa **360**(1): 74-76.
- Nong, D.X., X.Y. Huang, B.Y. Huang and H.Z. Lu. 2018. *Aspidistra cleistantha*, a new species of Asparagaceae from Guangxi, China. Phytotaxa **374**: 178-180.
- Tang, S.C. and Yan Liu. 2003. *Aspidistra guangxiensis* (Convallariaceae), a New Species from China. Novon **13**(4):480-482.
- Tillich, H.J. 2008. An update and improved determination key for *Aspidistra* Ker-Gawl. (Ruscaceae, Monocotyledons). Feddes Repert. **119**(5-6): 449-462.
- Tillich, H.J. 2014. The genus *Aspidistra* Ker-Gawl. (Asparagaceae) in Vietnam. Taiwania **59**(1): 1-8.
- Vislobokov, N.A., M.S. Nuraliev, A.N. Kuznetsov and S.P. Kuznetsov. 2016. *Aspidistra cylindrica* (Asparagaceae), a new species from southern Vietnam. Syst. Bot. **41**(1): 160-165.
- Vislobokov, N.A., D.D. Sokoloff, G.V. Degtjareva, C.M. Valiejoroman, A.N. Kuznetsov and M.S. Nuraliev. 2014. *Aspidistra paucitepala* (Asparagaceae), a new species with occurrence of the lowest tepal number in flowers of Asparagales. Phytotaxa **161**(4): 270-282.
- Xu, W.F., D.H. Lv, B. Wang and S.Z. He. 2017. *Aspidistra maguanensis* (Asparagaceae), a new species from Yunnan, China. Phytotaxa **312**(1): 147-149.