

Aspidistra pentagona (Asparagaceae, Convallarioideae), new species from northern Vietnam

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Abstract

This paper continues the publication of *Aspidistra* species newly discovered in the flora of Vietnam. It includes an illustrated description of *A. pentagona*, found in northern parts of the country. Detailed analytical color illustrations, data on morphology and ecology, phenology, tentative relationships, distribution, and expected conservation status are provided for the discovered species.

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Research

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This paper continues the publication of *Aspidistra* species newly discovered in the flora of Vietnam. It includes an illustrated description of *A. pentagona*, found in northern parts of the country. Detailed analytical color illustrations, data on morphology and ecology, phenology, tentative relationships, distribution, and expected conservation status are provided for the discovered species.

Keywords: Flora of Indochina, new taxa, plant diversity, plant taxonomy

Introduction

The genus *Aspidistra* Ker-Gawler (1822, p. 628) is widely distributed in mainland tropical and subtropical Southeast Asia. This genus of flowering plants has been one of the fastest-increasing in terms of species number over the previous two decades. The recent comprehensive fundamental treatment of the genus (Tillich 2023) listed 209 species with a number of subspecies and varieties. Nonetheless, the global inventory of this group appears to be far from complete. Here we continue the publication of one more new species of the genus discovered in northern Vietnam, in addition to many more species of this genus already discovered in this area (Tillich 2023). Observations and measurements of morphological features were made on living cultivated plants grown from seedlings collected in nature. Detailed analytical photos of plant parts compiled into a plate were made from living plants prior to the preparation of the type herbarium specimens. The formal, illustrated descriptions of the new species are presented below. The type image and all photos

are available in the database of the Herbarium of Komarov Botanical Institute of the Russian Academy of Sciences, “Herbarium LE” (<https://en.herbariumle.ru/>), for free access.

Aspidistra pentagona , *sp. nov.* (Fig. 1)

Diagnosis

The new species differs from the most closely related *Aspidistra superba* and all its relatives in having a pentagonal callus on the stigma and very large petaloid ventral appendages of the perigone lobes, forming a dome almost completely hiding the stigma.

Type: Vietnam, herbarium specimen prepared from cultivated plant on 19 April 2023 by *L. Averyanov VR161* (holotype: LE1170563 <https://en.herbariumle.ru/?t=occ&id=170373>; photos of fresh plant parts used for the type specimen preparation LE01124126 <https://en.herbariumle.ru/?t=occ&id=169838>) originally collected in Ha Giang Province, Quan Ba District, Bat Dai Son Nature Reserve, Can Ty Commune, Dau Cau 1 Village, around point 23°05'26.3"N 105°01'03.0"E, 1100–1150 m a.s.l., karstic, highly eroded mountains composed of solid marble-like limestone, primary evergreen broad-leaved humid forest on steep rocky slopes near mountain tops, terrestrial rhizomatous herb in shady place, rare, 14 April 2018, *L. Averyanov, Nguyen Sinh Khang, Chuong Quang Ngan, T. Maisak, VR 161* .

Paratype: Vietnam, Ha Giang Province, Quan Ba District, Bat Dai Son Nature Reserve, Can Ty Commune, Dau Cau 1 Village, around point 23°05'26.3"N 105°01'03.0"E, 1100–1150 m a.s.l., karstic, highly eroded mountains composed of solid marble-like limestone, primary evergreen broad-leaved humid forest on steep rocky slopes near mountain tops, terrestrial rhizomatous herb in shady place, rare, 14 April 2018, *L. Averyanov, Nguyen Sinh Khang, Chuong Quang Ngan, T. Maisak, VR 161* , sterile plant (LE01054091 <https://en.herbariumle.ru/?t=occ&id=4418>).

Etymology

The species name refers to the prominent pentagonal callus on the stigma disc.

Description

Herb terrestrial, perennial, rhizomatous, (40)60–90 cm tall. **Rhizome** terete, epigeous to hypogeous, creeping, plagiotropic, (12)14–20(24) cm long, (8)10–12(14) mm in diameter, simple or few branched; densely nodal, almost naked, with (4)5–6(7) distant erect leaves; each annual sympodium 1-leaved, with few thick, dull yellowish roots. **Cataphylls** 3–4(5), convolute, tubular, herbaceous, dark dirty violet, to dark reddish brown, (4)5–8(10) cm long, early disintegrating, withered, and completely disintegrating before anthesis. **Leaves** petiolate; petiole grassy green, rather rigid, erect, straight, (25)30–55(65) cm long, 5–6 mm wide, distinctly inflated at the base to 7–8 mm in diameter (when fresh), channeled adaxially, naked; leaf blade upright, arcuate, or almost horizontal, ovate to broadly elliptic, almost round at the base, acuminate to shortly attenuate at the apex, (15)20–30(35) cm long, (8)10–14(16) cm wide, uniformly dark glossy green, with prominent midvein on the lower surface and many conspicuous secondary veins at both sides. **Flowers** solitary, pedunculate, not widely opening, ovoid to broadly ovoid in outline, 2.2–2.6 cm long, 1.6–1.8 cm wide, placed perpendicularly to the ground. **Peduncle** white, speckled with reddish brown, 2.5–3.5 cm long, 2–3 mm in diameter, horizontally directed, distally ascending, with 6–7 bracts, entire or sometime splitting at the apex; 1–2 bracts placed at the base and 1 bract at the middle of the peduncle are small, tubular, papyraceous to scarious, whitish or purplish, sparsely speckled with purple, 5–8 mm long and wide (being flattened); 4(5) bracts placed at the apex of the peduncle, densely adpressed to the flower base, they are light green, heavily marked with purple brown, ovate to broadly ovate, 1–1.4 cm long, (1)1.2–1.8(2) cm wide (being flattened), concave, blunt or roundish at the apex. **Perigone tube** (except perigone lobes) broadly urceolate, (1)1.1–1.2(1.3) cm long, 1.6–1.8 cm in diameter, with 10 lobes; outside smooth, light greenish, heavily mottled with red brown; inside smooth, glossy, dark purple violet to almost black, obscurely 20-ridged. **Perigone lobes** subsimilar, erect, narrowly triangular, attenuate, and blunt at the apex, fleshy, with narrow thin scarious margins, 14–16 mm long, 8–9 mm wide; outside smooth, reddish brown; inside

dirty brown to almost black, near the base, there is a large, broadly oblong dull yellowish outgrowth (appendage) streaked with reddish brown and slightly broadening at the apex; five large petaloid appendages are 4.5–5.5 mm long, 3.5–4 mm wide and strongly down curved, alternating with five smaller, more or less horizontally spreading ones; outgrowths of all lobes overlap and form a dome above stigma. **Stamens** 10; anthers sessile, broadly ovate to hemispherical, (1.5)1.6–1.8(1.9) mm long and wide, adpressed to the almost flat perigone tube base, with pollen sacs oriented upwards; pollen bright yellow. **Pistil** mushroom-shaped, with peltate stigma in the form of a massive, thick disc; ovary white, inconspicuous; style white, cylindrical, very short, 1.2–1.4 mm tall, 4.5–5 mm in diameter. **Stigma** large, fleshy, circular, (1.6)1.7–1.8(1.9) cm in diameter; below white, dark purple violet to almost black near the margin, distinctly 20-ribbed; the margin dark violet to almost black, 3–4 mm thick, with 20 prominent ribs; above white, more or less flat with raised black margin and prominent, fleshy pentagonal callus, heavily marked with dark purple; pentagonal callus starfish-shaped, 8–9 mm in diameter with 5 shortly triangular sagittate, conduplicate lobes (1.8)2(2.2) mm long, (3.3)3.4–3.6(3.7) mm wide, emarginate at the apex, from each apex are running to the margin two spreading, indistinctly bifurcate whitish ribs with small purple elevations. **Fruits** unknown.

Habitat and phenology

Perennial, terrestrial, rhizomatous herb. Primary broad-leaved humid evergreen forests on highly eroded mountains composed of solid marble-like limestone at elevations of 1100–1150 m a.s.l., commonly on steep rocky slopes near mountain tops. Flowers in culture in April.

Distribution

Vietnam, Ha Giang Province (Quan Ba District, Bat Dai Son Nature Reserve). Endemic.

Conservation status

Only a few immature plants of this very rare species were found in a single location in the Bat Dai Son Mountains, which currently belong to the Bat Dai Son Nature Reserve. According to available data, its area of occupancy (AOO) is surely less than 10 km², with no mature individuals observed. Taking into consideration the wide deforestation in the area and the progressive decline of habitat quality, the conservation status of this species may be preliminarily assessed as Critically Endangered (CR B1a,b(iii,iv,v)+2a,b(iii,iv,v), C2a, D) following the formal criteria proposed by IUCN (2022).

Similar species and notes

Our plant belongs to the group of species with petioles naked at the base, a discoid stigma with a thick ribbed margin, and perigone lobes bearing a ventral appendage hanging above the stigma. The most typical species of this group are *Aspidistra chunxiuensis* C. R. Lin & Yan Liu (2015: 163), *A. daxinensis* M. F. Hou & Yan Liu (2009: 371), *A. quangxiensis* S. C. Tang & Yan Liu (2003: 480), *A. latistyla* F. Y. Mo, C. R. Lin & Yan Liu (2021: 73), *A. longipetala* S. Z. Huang (1986: 273), *A. ovatifolia* Yan Liu & C. R. Lin in Lin, C. R. et al. (2014: 287), *A. patentiloba* Y. Wan & Xiao H. Lu in Wan, Y. (1989: 99), and *A. superba* Tillich (2005: 323). Among these species, our plant is easily recognizable for its large, prominent pentagonal callus on the upper surface of the stigma and the very large petaloid ventral appendages of the perigone lobes, which form a dome almost completely hiding the stigma. The species represents an integral element of primary limestone forests typical for N Vietnam and SE China, as outlined in the modern plant geography of Indochina as the South Chinese Floristic Province (Averyanov et al. 2003). In this regard, it can be expected to be found in Southeast China.

Funding –

Author contributions

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Data availability statement

Data available from the Herbarium LE Database <<https://en.herbariumle.ru/?t=occ&id=4418>>, <<https://en.herbariumle.ru/?t=occ&id=170373>>, <<https://en.herbariumle.ru/?t=occ&id=169838>>

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FIGURE

Figure 1. *Aspidistra pentagona* sp. nov. (A) flowering plant, (B) rhizome and base of petioles, (C) base of petiole, (D) flattened leaves and flowers, (E) flowers, side view, (F) flattened scape bracts, (G) intact flower, side view, (H) flower, frontal view, (I) flower, view from below, (J) sagittal section of the flowers and intact pistil, (K) sagittal section of the flower, pistil removed, (L) flattened perigone lobes, (M) perigone lobe and section of perigone, adaxial surface and side view, (N) base of perigone tube with stamens, view from above, (O) half-base of perigone with stamens, side view, (P) stigma, view from above, (Q) central callus of the stigma, (R) stigma, view from below, (S) stigma, side view. All photos,

