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Pothos vietnamensis sp. nov. (Araceae–Pothoideae–Potheae) from Vietnam

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Pothos vietnamensis V. D. Nguyen & P. C. Boyce is described and illustrated from northern Vietnam as a new species of the *Pothos* supergroup, and it is compared with the two most similar species: *P. kerrii* and *P. pilulifer* to which *P. vietnamensis* is comparable by having a very small fertile portion (< 5 mm diameter) on the spadix. Ecology, habitat, population size and conservation status are also discussed.

Pothos, with about 57 species (Govaerts and Frodlin 2002), are subtropical and tropical vines and hemi-epiphytes distributed from Madagascar to western Oceania (east to Vanuatu), and China (north to Hubei) to Australia (south to eastern Queensland and eastern New South Wales). The highest number of species and greatest morphological diversity occurs in Indomalesia.

In recent years, taxonomic accounts for *Pothos* for Thailand (Boyce 2000, 2012), Indochina (Boyce 2000, Boyce and Nguyen 1995), and China (Li and Boyce 2010), have created a solid platform from which to engage in further studies.

The first comprehensive account for Indochina was Gagnepain (1942), treating 12 species, 11 recorded for Vietnam. Of these *P. balansae* Engl., *P. cathcartii* Schott and *P. yunnanensis* Engl. are now included in *P. chinensis* (Raf.) Merr. Nguyen (2005) erroneously listed *P. angustifolius* Engl. as occurring in Vietnam. Thus, Vietnam has 10 species excluding the one described here.

In 2009 the first author carried out fieldwork in Van Ban district, Lao Cai province during which a distinctive *Pothos* was encountered at about 550 m a.s.l. The combination of characteristics of this species, including a very small fertile portion on the spadix, made it apparent that this plant matched none of the recognized species from Indochina, but material was insufficient to enable formal description. Subsequently during fieldwork in 2014 in Quan Ba district, Ha Giang province, the first author encountered the same distinctive *Pothos* climbing on small to medium trees in closed evergreen forest at about 1100 m a.s.l. on Tung Vai mountain. This second discovery provided confirmation that it was a new species. In this paper we are describing this distinctive new species as *Pothos vietnamensis* sp. nov.

Key to *Pothos* species in Vietnam

1. Petiole flattened, wing-like …… 2
   – Petiole not flattened and wing-like …… 10
2. Peduncle more or less erect …… 3
   – Peduncle reflexed on stem …… *P. scandens*
3. Fertile part of spadix globose or ovate …… 4
   – Spadix cylindrical, elongate …… 9
4. Fertile part of spadix < 5 mm diameter …… 5
   – Spadix > 7 mm diameter …… 7
5. Peduncle less than 5 mm long, completely obscured by cataphylls …… *P. pilulifer*
   – Peduncle more than 2 cm long, with only the base of peduncle obscured by cataphylls …… 6
6. Spadix stipitate; fertile part globose, up to 5 mm diameter …… *P. kerrii*
   – Spadix sessile; fertile part ovate or slightly cylindrical, only 3.0–3.5 mm in diameter …… *P. vietnamensis*
7. Spadix globose …… *P. gigantipes*
   – Spadix elliptic, ovate or obovate …… 8
8. Peduncle short; spadix elliptic or slightly ovate …… *P. chinensis*
   – Peduncle long; spadix obovate …… *P. grandis*
9. Spadix stout cylindrical; petiole much shorter than leaf lamina …… *P. dzui*
   – Spadix slender cylindrical; petiole longer than leaf lamina …… *P. repens*

Figure 1. *Pothos vietnamensis* sp. nov. (A) plants in habitat, (B) older stems; note rough epidermis, (C) mature plant; note the lateral fertile stems, (D) flowering shoot with two post anthesis inflorescences. All from Nguyen Van Du 401. Photographs by Nguyen Van Du.

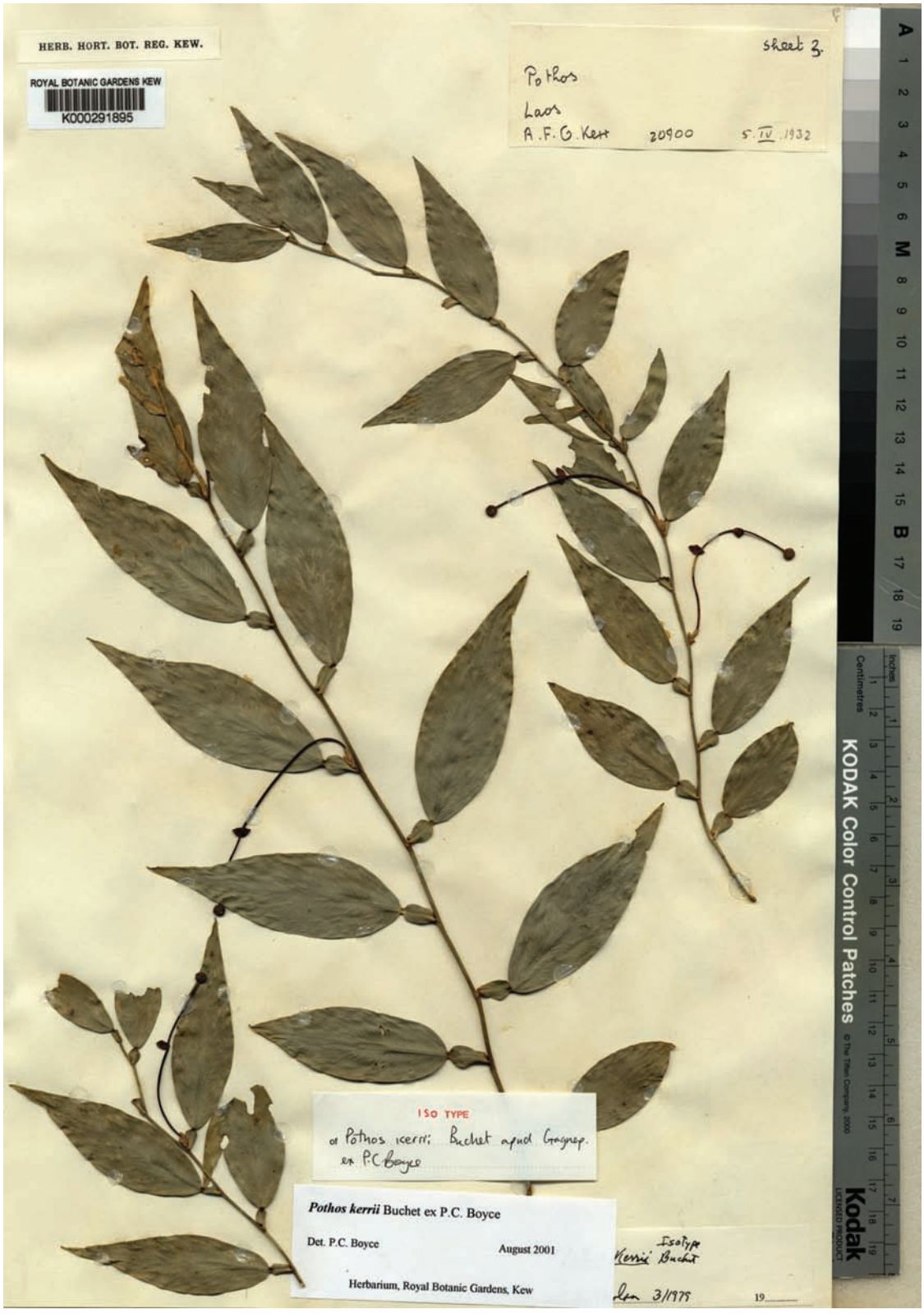

Figure 2. *Pothos kerrii.* Kew isotype shows small spadix with a long stipitate.

10. Peduncle 1.5–5.0 cm long; spathe lanceolate, 2.5–10.0 × 1–4 cm; spadix sessile ……. *P. lancifolius*
– Peduncle 10–19 cm long; spathe triangular, 6–9 × 1.5–2.0 cm; spadix stipitate …… *P. touranensis*

***Pothos vietnamensis* V. D. Nguyen & P. C. Boyce sp. nov. (Fig. 1)**

A species most similar to *P. kerrii* with respect to the long peduncle and small (max ca 5 mm in diameter) fertile part of

Figure 3. *Pothos pilulifer.* Paris isotype shows small spadix with a long peduncle.

the spadix, but differing by the sessile spadix. Also reminiscent of *Pothos pilulifer*, but differentiated by a long peduncle with short cataphylls at the base (vs very short peduncle covered by long cataphylls).

Holotype: Lao Cai province, Van Ban district, Liem Phu Commune, 22°5′8.52″N, 104°3′5.44″E, ca 550 m a.s.l, 14 Sep 2009, Nguyen Van Du 401 (holotype: HN, K).

Etymology
The specific epithet refers to Vietnam where this species was found.

Description
Root climbing hemi-epiphytic vine, medium-sized, slender, homeophyllous, to 5 m high. Eocaul not observed. Juvenile shoot stem to 4–5 mm wide, square in cross-section; internodes 1.5–8.0 cm long; base obscured by cataphylls; epidermis dark brown, prominently roughened; cataphylls oblong triangular, 2–3 cm long, ca 8 mm wide, the outermost one with two keels, pale green with violet veins. Mature sterile shoot stem 4–5 mm in diameter, sub-quadrangular in cross section; internodes 0.5–5.5 cm long, the lower-most usually shorter than upper ones; epidermis dark green, rough; feeding roots arising from lower portions of stems, 30–200 cm long, branched; climbing roots arising from nodes, 3–4 cm long. Fertile shoot stem quadrangular in cross section, 1.0–1.2 cm wide; internodes 1.4–2.0 cm long. Leaves distichous, abundant at shoot tips, older portions of stems becoming naked with prominent nodes; petiole flattened, narrowly cuneiform, 1–3 cm long, acute at base, cordate at apex, occasionally rounded, with a small apical articulation and solitary inconspicuous intra-marginal veins arising from the base; blade oblong lanceolate, 4.5–11.0 cm long, 0.9–1.9 cm at widest point, rounded at base, acuminate at apex, adaxially dark green, abaxially light grey-green; primary lateral veins on each side of the mid-rib traversed by one or more intra-marginal vein running ± from the base and from about midway along the midrib to the apex, or first to the distal margins and then to the apex. Inflorescence arising from an axil, solitary; peduncle slender, straight, 2.0–2.5 cm long, pale green to light brown-green, basally with several ca 5 mm long green or brown cataphylls; spathe broadly ovate in outline (spreading), 3 mm long, ca 6 mm wide at base, concave-cymbiform, at anthesis opening at base, not completely opened at apex, with caudate tip, exterior dull green or light brown. Spadix ovoid, occasionally cylindrical-ovoid, sessile, 3–5 × 3 mm, yellowish green, aging light brown, covered with black ring anthers. Flowers bi-sexual, perigoniate; tepals 6 (3 + 3), 1–2 mm long; filaments flattened, slender; anthers elliptical, small; ovaries ovate, slightly concaved into 3-lobes, or 3-angled, 1.2 mm long, ca 1 mm in diameter at widest point; stigma punctiform; style conical, short, stout. Fruits as berries, ovoid to globose, apex concave, green with a black dot in the middle.

Distribution
Pothos vietnamensis is currently known only from Vietnam (Lao Cai and Ha Giang provinces), although the proximity to the Chinese border makes it highly probable that the species also occurs in southern China (Yunnan).

Ecology
Pothos vietnamensis forms terrestrial creeping colonies when juvenile, later climbing on small trees under degraded seasonally dry evergreen hill forest between 500–1100 m a.s.l.

Conservation status
In the forest of Liem Phu (Van Ban district, Lao Cai province) the first author counted about 20 individuals of *Pothos vietnamensis* occurring scattered over an area of 5 km^2. In the forest of Thang village (Tung Vai commune, Quan Ba district, Ha Giang province), observation of the species population was hampered by heavy rain. However, two individuals were found on the way up, at ca 1100 m a.s.l.

Pothos vietnamensis occurs in unprotected degraded forests and at present is known only as small populations in two places in Vietnam. At present the plant is not exploited although the long-term prospects for the forest are highly uncertain. Based on the criteria of IUCN (2012), *Pothos vietnamensis* should be asessed as 'Vulnerable' (VU).

Notes
Vietnam has three species of *Pothos* supergroup *Pothos* (sensu Boyce and Hay 2001) with a small fertile portion to the spadix: *P. kerrii* (Fig. 2), *P. pilulifer* (Fig. 3), and *P. vietnamensis*.

Additional specimen examined (paratype)
Ha Giang province, Quan Ba district, Tung Vai commune, Thang village, 23°4′4.97″N, 104°52′23.70″E, ca 1100 m a.s.l., 15 Mar 2014, Nguyen Van Du – Tran Van Tien 03 (HN).

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