

Three New Species of *Typhonium* (Araceae) from Vietnam

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ABSTRACT

Three new species of *Typhonium* (*T. bachmaense*, *T. lineare* and *T. penicillatum*) are described from Vietnam.

INTRODUCTION

Fieldwork by the second author in cooperation between the Institute of Ecology and Biological Resources (IEBR) and the Royal Botanic Gardens, Kew for a forthcoming account of the Araceae of Vietnam yielded living plants of three hitherto undescribed *Typhonium* species. The plants were subsequently grown and flowered in Hanoi and in the Leiden Botanical Garden (Netherlands). The number of *Typhonium* species for the Vietnamese flora now amounts to nine. However, based on species richness in neighboring countries, particularly Thailand, this number is likely to be a significant underestimate of the actual number of *Typhonium* species in Vietnam. The plates in this paper are prepared from photos by the first author.

1. *Typhonium bachmaense* Nguyen V. D. & Hett., **sp. nov.**, singulariter combinatione spatheae limbi anguste lanceolati laminarum admodum pedatarum delimitata. Typus: Vietnam, Thua Thien, Hue, Bachma N.P., 1200 m. alt., 12 March 1997, V. D. Nguyen 171 (holotypus HN; isotypus L). Figs. 1–2.

Underground part a short tuberous rhi-

zome, branching frequently, 1–3 cm long, 0.7–1.5 cm in diam. Leaves one or two; petiole smooth, slender, 15–28 cm long, 3–4 mm in diam., green to violet-brown; lamina fully pedate; central leaflet sessile, elliptic to elliptic-lanceolate, 8.5–10 cm long, 1.5–4 cm in diam., acuminate, upper surface dark green; lateral leaflets petiolulate. Peduncle white or pinkish, subterranean, 0.5–2 cm long, ca. 2 mm in diam.; spathe 11–23 cm long; base and limb separated by a strong constriction; base globose, 0.7–1.5 cm long, 0.7–1.5 cm in diam., outside glossy dark brown, the base creamish with reddish brown dots, inside as outside, limb lanceolate, ca. 10–ca. 21 cm long, 1.2–2.7 cm in diam. at the base, gradually narrowing to the top, strongly twisted and folded, top acute, outside glossy dirty dark brownish green, inside dull dirty dark brown, slightly transparent and sometimes with darker spots. Spadix slightly longer than spathe, 12–24 cm long; female zone conical, 1–3 mm long, 3–6 mm in diam. at the base, 1–2 mm at the top, flowers congested; sterile zone 0.8–1.2 cm long, lower part densely covered with staminodes, remainder naked, smooth; male zone cylindrical, top and base oblique, 2–7 mm long, 4–5 mm in diam., flowers congested; appendix stipitate (stipe 1–3 mm long, brown), narrowly elongate conical to filiform, 10–22 cm long, 4–5 mm in diam. at the base, base expanded, truncate, top acute, surface smooth or with a few shallow grooves,



Fig. 1. *Typhonium bachmaense*. Inflorescence.



Fig. 2. *Typhonium bachmaense*. Inflorescence, spathe cut away to reveal spadix.

brown to yellowish brown, smelling of cow-dung at female anthesis. Ovaries elongate or lageniform, angulate, 1–1.5 mm long, 0.7–1 mm in diam., unilocular, uni-ovulate, transparently white; stigma sessile, disciform, 0.3–0.4 mm in diam., 0.1 mm high, verrucate, red. Staminodes elongate-clavate, top dilated and flattened and curved downwards, ca. 5 mm long, 0.8 mm in diam., reddish purple, the top pale yellow to whitish. Stamens pale pink, pores apical, elongate.

Habitat—Not recorded.

Etymology—The species epithet refers to Bachma N.P., from whence the type originated.

Notes—A number of species with a narrowly lanceolate spathe limb and filiform appendix have been described in *Typhonium*. *Typhonium bachmaense* is the only species hitherto known possessing this character combination in addition to a fully pedate leaf. The inflorescence generally

resembles that of *T. filiforme* Ridl. (Thailand and West Malaysia) but the latter has a clearly conical spathe base, thicker staminodes, the latter being entirely curvate. The leaf of *T. filiforme* is undivided and triangular-hastate.

2. *Typhonium lineare* Hett. & V. D. Nguyen, **sp. nov.**, inflorescentia ei *T. huensis* similis sed illa spathae basis conicioris staminodia breviora foliorum laminae deltoidea ad trilobata haud lobis linearibus gaudet. Typus: Vietnam, Binh Thuan, Tuy Phong Distr., Cana, along Highway 1 at tip of Cana promontory, 20 May 1998, *Boyce & V. D. Nguyen 1333* (holotypus HN, spirit coll.). Figs. 3–6.

Underground part a short, tuberous rhizome, to 2 cm long, to 2 cm in diam., producing small globose offsets annually. Petiole of mature leaves 10–28 cm long, 2–3 mm in diam., smooth, base very pale whit-



Fig. 3. *Typhonium lineare*. Flowering plant.

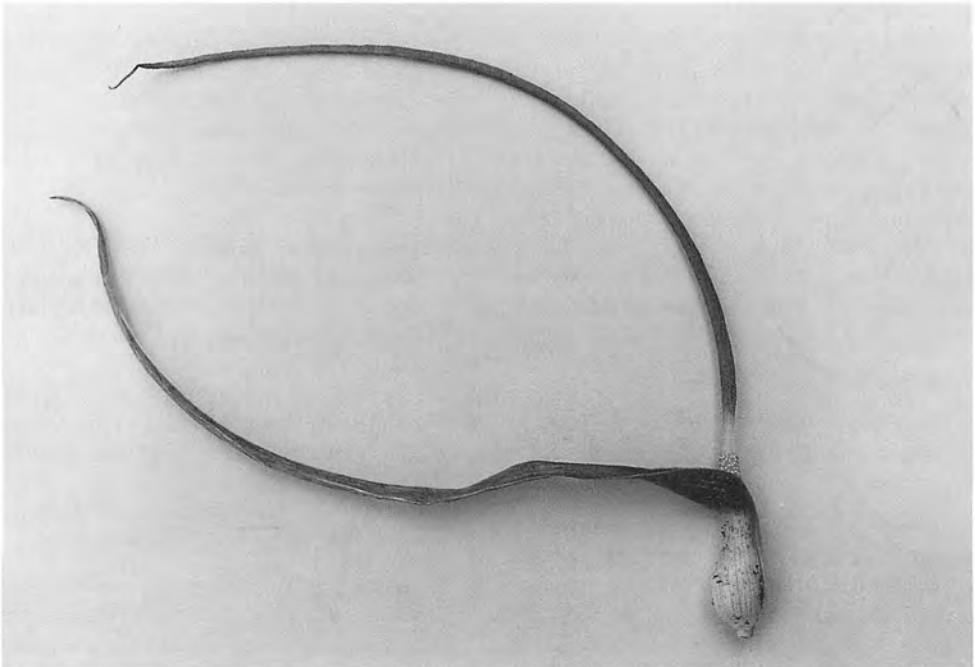


Fig. 4. *Typhonium lineare*. Inflorescence.



Fig. 5. *Typhonium lineare*. Inflorescence, spathe cut away to reveal spadix.



Fig. 6. *Typhonium lineare*. Habit.

ish pink with short, brownish striations, remaining part uniformly green; lamina of mature leaves pedatisect, with up to 7 segments, all linear or linear-lanceolate, upper surface green, slightly glossy, lower surface pale green, anterior segment 14–20 cm long, 3–12 mm in diam., acute, posterior segments 13–17 cm long, carrying 3 or 4 lobes, first seasonal and juvenile leaves trisect. Inflorescence appearing after the leaves, short peduncled; peduncle 5–7 mm long, ca. 2 mm in diam., whitish with short, reddish striations; spathe to ca. 17 cm long, basal part separated from the limb by a constriction, convolute, elliptical, to 1.8 cm long, to 0.8 cm in diam., outside whitish gray with blackish gray veins, striations and dots, inside dark reddish pink, limb at anthesis horizontal, linear, ca. 12–16 cm long, ca. 1 cm in diam. at the base, acute, outside pale gray with dense, dark reddish brown striations, inside dark reddish to brownish pink or pale dirty greenish with pale brown margins. Spadix as long as spathe or slightly shorter,

to ca. 17 cm long; female part slightly conic, 3–4 mm long, 6–8 mm in diam., flowers congested; sterile interstice above female part ca. 10 mm long, basally with a dense whorl of staminodes, remainder smooth; male part cylindrical, ca. 8 mm long, ca. 2 mm in diam., flowers congested; appendix filiform, stipitate, to ca. 15 cm long, ca. 3 mm in diam. just above the base, smooth, acute, stipe whitish, remainder brown or golden yellow. Ovaries obovate, 1–1.5 mm long, 0.5–1 mm in diam., angulate in cross-section, white; stigmas sessile, annulate, ca. 0.7 mm in diam., ca. 0.2 mm high, reddish. Staminodes in a dense whorl, subulate or fusiform, 1–2 mm long, variously directed, apex often hooked, white or yellow, acute. Stamens pink.

Etymology—The species epithet refers to the linear lobes of the leaves, giving the entire plant a grassy appearance.

Habitat—Seasonal deciduous thorn scrub on coarse white quartz sand over granite. In damp red-soil-filled pockets in shelter of rocks and boulders on quartz



Fig. 7. *Typhonium penicillatum*. Flowering plant.



Fig. 8. *Typhonium penicillatum*. Inflorescence, spathe cut away to reveal spadix.

sand outwash plain at foot of steep quartz-boulder strewn hillside. Sea level.

Additional material—Vietnam, Binh Thuan, Tuy Phong Distr., Cana, along Highway 1 at tip of Cana promontory, 20 May 1998, *Boyce & V. D. Nguyen 1333* (HN, L, K).

Notes—The inflorescence of *Typhonium lineare* is quite similar to that of *T. buense* V. D. Nguyen & Croat, both sharing the abruptly horizontally flexed spathe limb. *Typhonium buense* has a narrower, more conical spathe base and shorter and clavate staminodes, all pointing upwards, the leaves being deltoid to trilobate, with broadly triangular lobes.

3. *Typhonium penicillatum* V. D. Nguyen & Hett., **sp. nov.**, *Typhontio adnato* similis, sed staminodiis longis vermiformibus deorsum curvatis petiolo laevi foliis adultis pedatifidis differt. Typus: Vietnam, Binh Thuan, Tuy Phong Distr., Cana, along High-

way 1 at tip of Cana promontory, 20 May 1998, *Boyce & V. D. Nguyen 1332* (holotypus HN). Figs. 7–8.

Underground part a short, tuberous rhizome, to 4.5 cm long, to 2 cm in diam., to 3 cm high. Petiole slender or rather stout, 5–30 cm long, smooth, brown to dark brown; lamina highly variable, entire in juvenile plants, variously lobed in adult plants, juvenile leaves sagittate to cordate, 2–4 cm long, 1.5–3.5 cm in diam., adult leaves trilobed to pinnatifid with up to 5 lobes, central lobe oblong-ovate to elliptic, to 9 cm long, to 3.5 cm in diam., acuminate. Inflorescence appearing before the leaves, short peduncled; peduncle hidden in the soil, to ca. 2 cm long; spathe 6–9 cm long, base broadly depressed-globose or slightly elongate, sometimes laterally compressed, top and base truncated, separated from the limb by a conspicuous constriction, ca. 1.5–2 cm long, ca. 1.5 cm in diam., outside glossy gray with purple

punctations and darker gray veins, inside glossy purple, creamy at the constriction, limb elongate-triangular, 2.5–3 cm in diam., acute, top circinnately recoiling at anthesis, lateral margins at first horizontal, then reflexing, outside as base, inside at first rich purple, then turning dirty dark grayish brown. Spadix slightly shorter or longer than spathe, 5–9.5 cm long; female part conical, 4 mm long, 6 mm in diam. at the base; sterile part 1 cm long, lower 2.5 mm staminodial, rest largely smooth but with some scattered, downward pointing conically elongate epidermal cells, staminodes distinctly more numerous on the dorsal side of the axis than on the ventral side; male part cylindrical, 6 mm long, 4 mm in diam.; appendix very short stipitate (stipe 0.5 mm long, strongly obconical), 5–6 cm long, 1–2 mm in diam, elongate conical, thin, curving sigmoidally backwards just above the base and then erect again, base dilated, with or without a few conical lobes and slightly overarching the top of the male zone, surface largely smooth but with regularly scattered, conical epidermal cells, purple, top acute. Ovaries cylindrical to obovate, ca. 1 mm long, ca. 0.5 mm in diam., white with reddish punctations, truncated; stigma sessile, strongly penicillate with very long papillae. Staminodes

numerous, filiform, curved downwards, ca. 6 mm long, pale yellow, acute.

Habitat—Seasonal deciduous thorn scrub on coarse white quartz sand over granite. In damp red-soil-filled pockets in shelter of rocks and boulders on quartz sand outwash plain at foot of steep quartz-boulder strewn hillside. Sea level.

Etymology—The species epithet refers to the shape of the stigma.

Additional material—Binh Thuan, Tuy Phong Distr., Cana, along Highway 1 at tip of Cana promontory, 20 May 1998, *Boyce & V. D. Nguyen 1332* (HN, L, K).

Notes—*Typhonium penicillatum* shows a number of distinct similarities to *T. adnatum* Hett. & Sookchaloem (Thailand). These similarities are the broad spathe base, the sigmoidally curved spadix, the unequal distribution of the staminodes and the disciform expanded appendix base. *Typhonium adnatum* differs in having short, fusiform staminodes, a triangular hastate leaf lamina and a minutely hairy petiole.

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