

## Two new records in the Linderniaceae for Thailand

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**ABSTRACT.** *Lindernia hyssopioides* (L.) Haines and *Vandellia diffusa* (L.) Wettst. are newly recorded from Thailand. These taxa are described and illustrated, and a provisional conservation status for each species is given.

**KEY WORDS:** *Lindernia*, Linderniaceae, new record, Scrophulariaceae *s.l.*, Thailand.

### INTRODUCTION

An update of *Lindernia s.l.* is recognised based on analyses of molecular data within Linderniaceae. *Lindernia s.l.* was separated into six genera viz. *Bonnaya*, *Craterostigma*, *Lindernia s.str.*, *Linderniella*, *Torenia s.l.* (*T. crustacea* group) and *Vandellia* (Fischer et al., 2013). Twenty-two species of *Lindernia s.l.* were recorded for Flora of Thailand (Yamazaki, 1990; Chuakul, 1999). In the course of our revision in this family, some specimens were identified as *L. hyssopioides* (L.) Haines and *V. diffusa* (L.) Wettst. These taxa represent new records for Thailand.

### TAXONOMIC TREATMENT

***Lindernia hyssopioides*** (L.) Haines, Bot. Bihar Orissa 4: 635. 1922; Alston, Handb. Fl. Ceylon 6: 214. 1931; Santapau, J. Bombay Nat. Hist. Soc. 49(1): 38. 1950; Li, Quarterly J. Taiwan Mus. 14(1&2): 9. 1961; Tsoong & Ku, Fl. Reipub. Popul. Sin. 67(2): 150, fig. 15. 1979; Cramer in Dassanayake & Fosberg, Rev. Handb. Fl. Ceyl. 3: 414. 1981.— *Gratiola hyssopioides* L., Mant. Pl. 2: 174. 1771. Type: Herb. LINN. No. 30.6 (lectotype **LINN!**, <http://linnean-online.org/252/>, designated by Liang et al., 2012). Figs. 1, 3A–C & Map 1.

Small annual herbs, 5–27 cm tall; stem stout, erect, diffuse or ascending with rooting at nodes,

glabrous, pubescent at nodes. *Leaves* sessile, distinctly 3-nerved from base; lamina narrowly ovate to ovate-lanceolate, glabrous, 7–12 mm long, 3–5 mm wide, apex acute, base truncate, margin entire or sometime with 1–2 pairs of inconspicuous teeth. *Flower* solitary and axillary; pedicel glabrous, 1.2–3.5 cm long. *Calyx* deeply 5-lobed almost to the base; lobes linear to lanceolate, glabrous, 2–4 mm long, apex acute to acuminate. *Corolla* white-mauve with purple on lower lip, 9–12 mm long; upper lip emarginate, apex obtuse, 2–2.5 mm wide; lower lip 3-lobed, lobes ovate, 5–7 mm wide. *Stamens* 4, 2 posterior fertile, arising at upper lip, filaments straight, ca. 2 mm long; 2 anterior stamens arising at lower lip with clavate spur, 1.5–2 mm long with villous hairs along the corolla tube. *Capsule* turbinate, 4–7 mm long, 1.5–2 mm in diam., longer than calyx, apex acute, with persistent style. *Seeds* numerous, fusiform or cylindric, 0.37–0.45 mm long, 0.20–0.26 mm diam., yellow, reticulate.

Thailand.— NORTHERN: Chiang Mai (Pha Mon village, Doi Inthanon, Chom Thong), alt. 1,198 m, 18°33'59.2"N, 98°33'18.9"E, 12 Oct. 2013, P. Sutthisaksopon 191 (**BKF, KKU**).

Distribution.— India, Nepal, Sri Lanka, China, Indo-China, Indonesia.

Ecology.— Open and wet places in paddy fields; at 800–1,200 m altitude.

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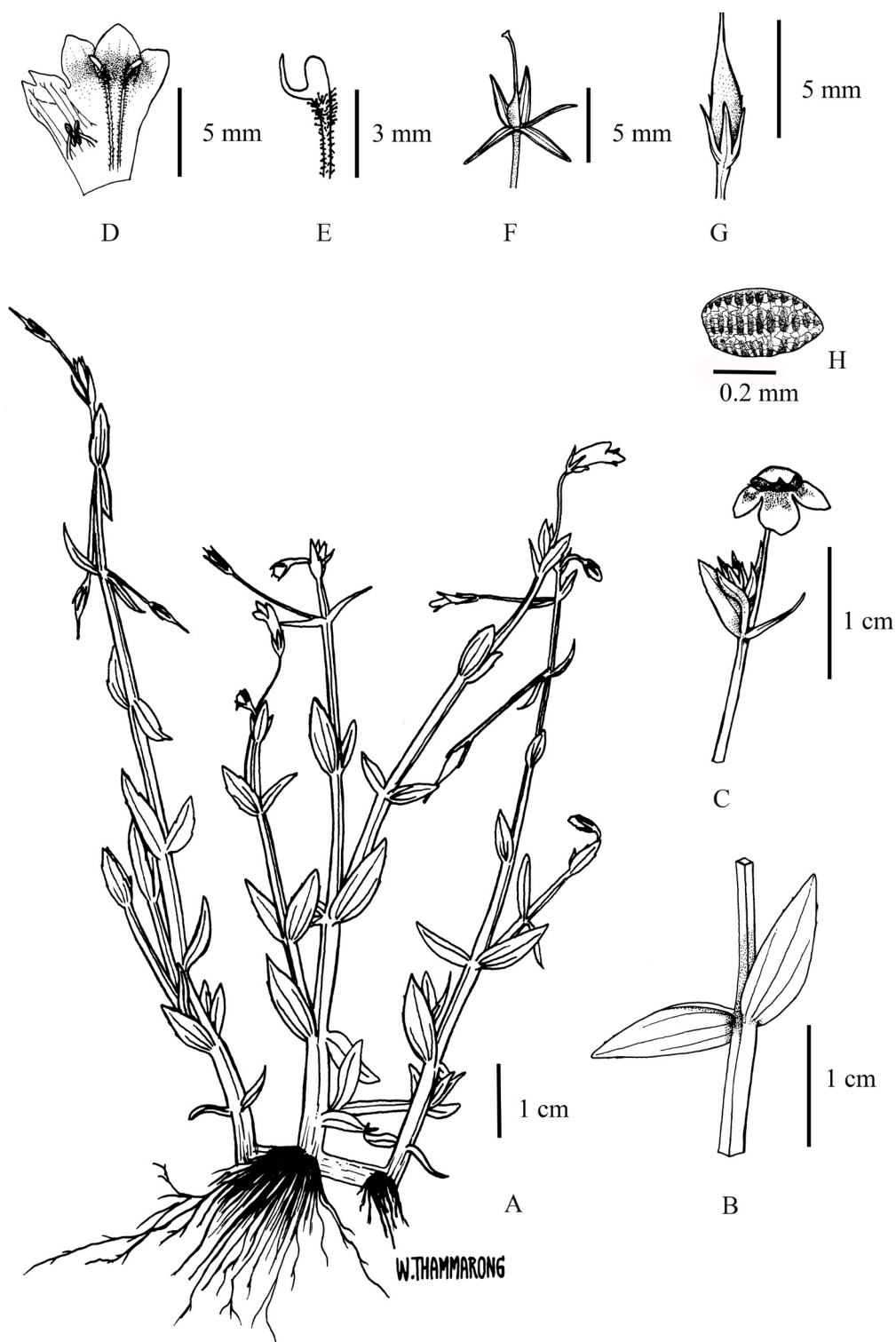


Figure 1. *Lindernia hyssopioides* (L.) Haines: A. habit; B. stem & leaf; C. flower at front view; D. flower; E. staminode; F. calyx & ovary; G. fruit; H. seed. All from P. Sutthisaksopon 191. Drawn by W. Thammarong.

Vernacular.— Waeo wilai si inthanon (แฉ่ววิไลศรีอินทนนท์).

IUCN Conservation status.— Although this species is found in rice paddies at high altitudes which are under threat from agricultural activities, its wide distribution worldwide warrants a conservation status of Least Concern (LC, rating in IUCN, 2012).

Notes.— *Lindernia hyssopioides* resembles *L. parviflora* (Roxb.) Haines but differs in having stout stems, ensiform calyxes without a dark line at the calyx rib, and larger and white-mauve flowers with purple markings.

***Vandellia diffusa* L.**, Mant. Pl.: 89. 1767.— *Lindernia diffusa* (L.) Wettst. in Engler & Prantl, Nat. Pflanzenfam. 4, 3b: 79. 1891. Type: Virgin Islands, St Thomas Island, D.D.Browne s.n., (holotype Herb. LINN. No. 795.3 LINN!, <http://linnean-online.org/6844/>), mentioned by Edmondson (1978). Figs. 2, 3D–E & Map 1.

Small herbs covered with short white-hirsute hairs; stems creeping or ascending, rooting at nodes. *Leaves* pinnately-nerved; petioles 2–5 mm long; lamina broadly ovate to suborbicular, 10–23 mm long, 8–20 mm wide, apex obtuse to rounded, base rounded, margin denticulate. *Flower* solitary and axillary; pedicel 2–3 mm long. *Calyx* 5-lobed, divided as long as or slightly longer than calyx tube; lobes narrowly lanceolate to linear, apex acute to acuminate. *Corolla* white or cream (pink-maroon vide Maxwell 86-1067), 7–8 mm long; upper lip ovate, apex obtuse, entire to sub-emarginate; lower lip broadly 3-lobed; lobes rounded, 4–5 mm wide. *Stamens* 4, fertile; posterior filaments straight, anterior filaments geniculate, curved, ca. 2.5 mm long, gibbous at base, throat moderately papillose inside. *Capsule* fusiform or oblong-ellipsoid, 8–12.5 mm long, 2–3.5 mm diam., longer than calyx. *Seeds* numerous, brown or reddish brown, shortly cylindric or ovoid, ca. 0.45–0.55 mm long, 0.35–0.45 mm diam., scrobiculate.

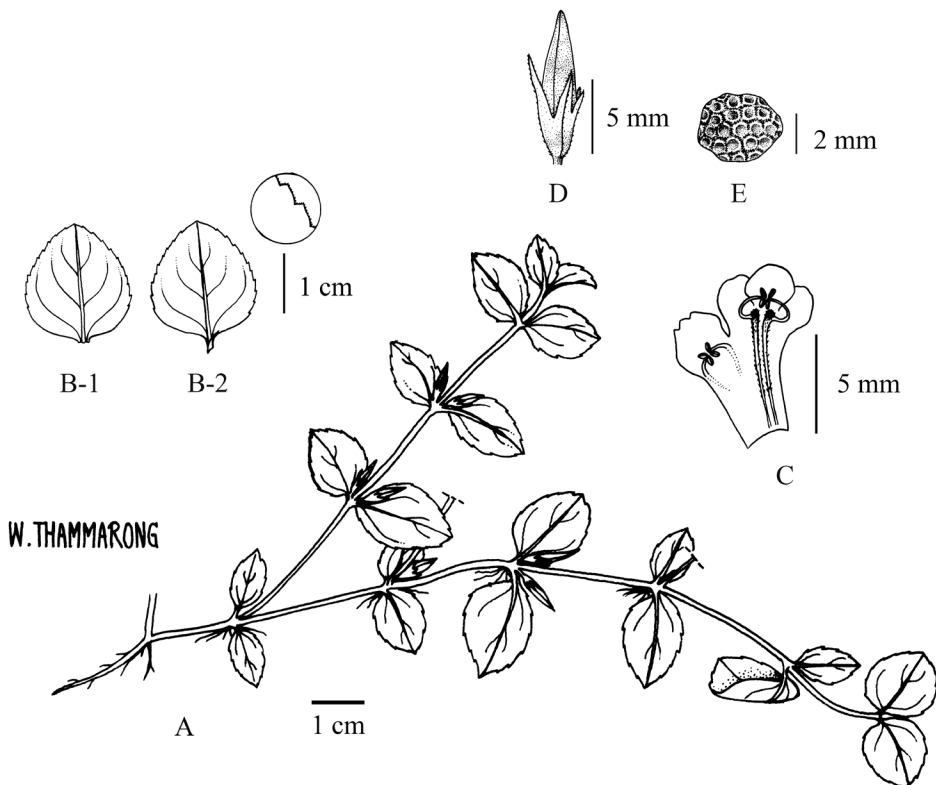


Figure 2. *Vandellia diffusa* L.: A. habit; B. leaf, B-1. abaxial leaf, B-2. adaxial leaf; C. flower; D. fruit; E. seed. All from J.F. Maxwell 86-1067. Drawn by W. Thammarong.

Thailand.— PENINSULAR: Yala (Betong, Yarom, Ban Ramong), alt. 50 m, 15 Dec. 1986, *J.F.Maxwell* 86-1067 (**BKF, CMU, L, PSU**).

Distribution.— Mexico, West Indies, Bolivia, Peru, Brazil, Uganda, Tanzania, Madagascar, India, Peninsular Malaysia, Singapore, Java.

Ecology.— Open places in paddy fields, sandy alluvium, along streams, wet meadows and disturbed areas; at 50–100 m altitude.

Vernacular.— Waeo wilai si yala (แคววไลศรียะลา).

IUCN Conservation status.— This species is currently known only from Ban Ramong, Yarom subdistrict, Betong district, Yala province. Actually *V. diffusa* is a widespread species that it is not well-known in Southeast Asia most likely due to misidentification of the species under other species names. The conservation of this species is unclear, so a conservation status of Data Deficient (DD, rating in IUCN, 2012) is appropriate.



Map 1. Distribution map of new records of Linderniaceae in Thailand; the closed square (■) indicates the location of *L. hys-sopioides* in Chiang Mai province, the closed circle (●) indicates the location of *V. diffusa* in Yala province.

Notes.— *Vandellia diffusa* resembles *Craterostigma nummulariifolium* (D.Don) Eb. Fisch., Schäferh. & Kai Müll. (= *Lindernia nummulariifolia* (D.Don) Wettst.) but it differs in its white, hirsute hairs, ascending, longer petioles, shorter pedicels, solitary and axillary flowers, narrowly lanceolate to linear calyx lobes. This species is generally found in lowland areas. The specimen, *Maxwell* 86-1067 was originally determined as *L. sessiliflora* (Benth.) Wettst., a name which was placed in synonymy under *L. nummulariifolia* by Ghazanfar et al. (2008). However, the identification of this specimen was incorrect and it is undoubtedly *V. diffusa*. The first author has studied both herbarium specimens and living plants and found that *V. diffusa* has white or cream corolla, not pink-maroon as on the label of *Maxwell* 86-1067.

## ACKNOWLEDGEMENTS

This work was financially supported by Thailand Research Fund through the Royal Golden Jubilee Ph.D. Program (Grant No. PHD/0098/2552) and Khon Kaen University. We would like to thank directors, curators and staff of AAU, BCU, BK, BKF, BM, BO, C, CMU, E, K, KKU, L, P, PSU, QBG and Biology Herbarium at Chiang Mai University for making their collections and library resources available. The first author wishes to thank Srinakharinwirot University for supporting his Ph.D. study. We are also grateful to Mr. Woranart Thammarong for the two line drawings.

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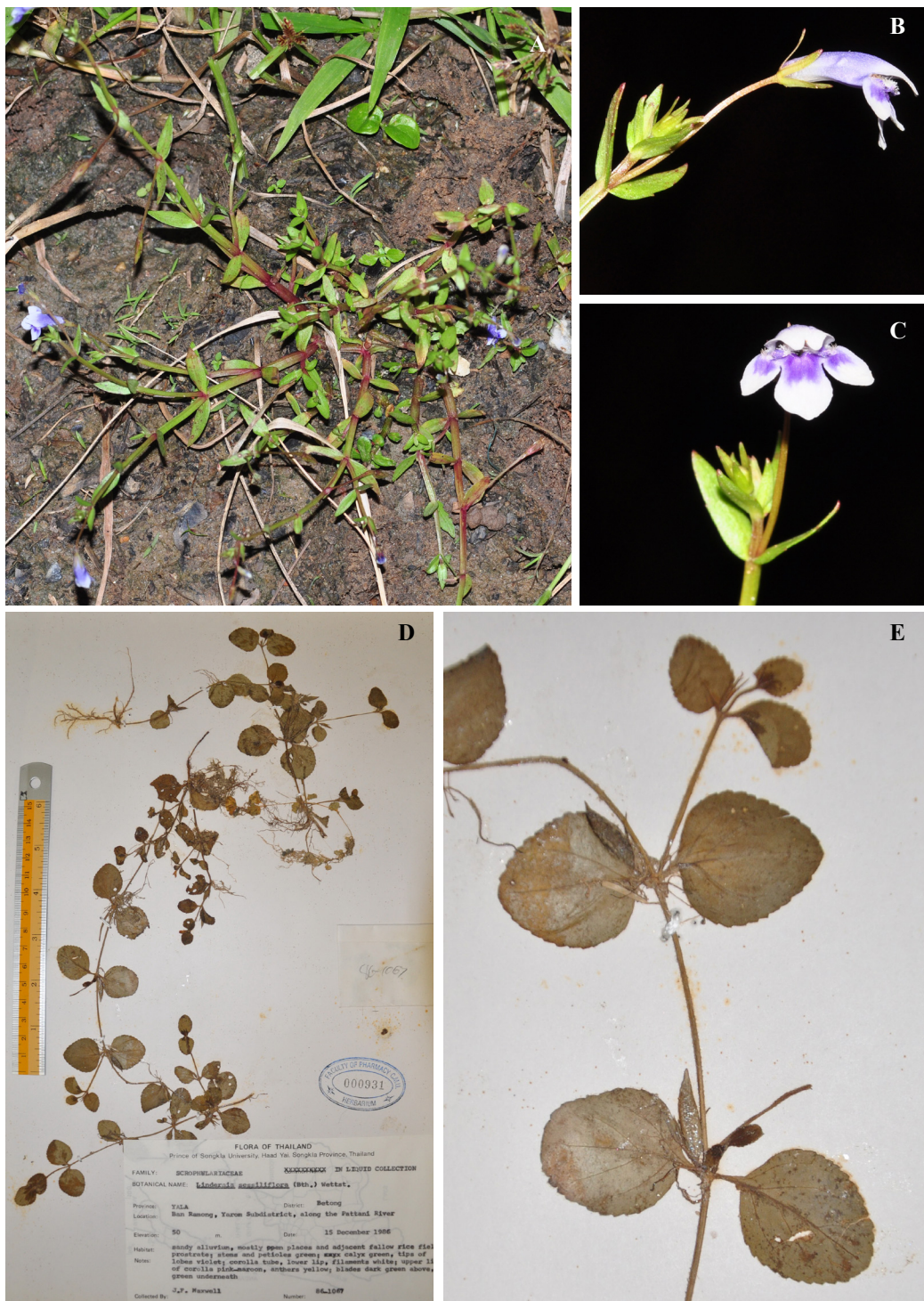


Figure 3. *Lindernia hyssopioides* (L.) Haines: A. habit, B. flower in side view, C. flower in front view; *Vandellia diffusa* (L.) Wettst. (J.F.Maxwell 86-1067): D. habit, E. leaves & capsules.

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