

Torenia maculata (Linderniaceae), a new record for Thailand

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ABSTRACT

Torenia maculata, is a newly recorded species for Thailand. A description, illustrations and comments on its ecology and distribution are provided.

KEYWORDS: *Lindernia*, Linderniaceae, *Torenia*, Thailand.

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INTRODUCTION

Molecular studies in the family Scrophulariaceae have indicated that the genera in the family are not all monophyletic. Olmstead *et al.* (2001) divided the former Scrophulariaceae into several distinct families, e.g. Orobanchaceae or Plantaginaceae (then called Veronicaceae). The Linderniaceae was established as a new family by Ramanzadeh *et al.* (2005, see also Fischer *et al.*, 2013). Shared characteristics of the family Linderniaceae are the distinctively geniculate, zig-zag shaped or spurred anterior filaments where the geniculations mostly have a knob- or club-shaped outgrowth covered with glandular hairs (Rahmanzadeh *et al.*, 2005; Fisher, *et al.*, 2013). A total of eight Thai genera in the former Scrophulariaceae (Yamazaki, 1990) are now placed in the family Linderniaceae, namely, *Artanema* D. Don, *Legazpia* Blanco, *Lindernia* All., *Picria* Lour., *Pierranthus* Bonati, *Schizotorenia* T. Yamaz., *Scolophyllum* T. Yamaz. and *Torenia* L. Nine species of *Torenia* in Thailand were recognized by Yamazaki (1990). Following the treatment of Linderniaceae by Fischer *et al.* (2013), several species of *Lindernia* in Thailand were placed in the genus *Torenia* (i.e., *T. crustacea* (L.) Cham. & Schltdl., *T. dictyophora* (P.C. Tsoong) Eb. Fisch., Schäferh. & Kai Müll., *T. molluginoides* (Benth.)

Eb. Fisch., Schäferh. & Kai Müll., *T. oblonga* (Benth.) Hance, *T. pierreanoides* (T. Yamaz.) Eb. Fisch., Schäferh. & Kai Müll. and *T. udawnensis* (T. Yamaz.) Eb. Fisch., Schäferh. & Kai Müll.). *Torenia* is closely related to the genus *Vandellia* L. but differs in its ovate leaves with distinctly pinnate venation, ovary without short scabrid hairs at the upper part, septicidal capsule which does not usually exceed the calyx. During field work aimed at producing a taxonomic revision of the family Scrophulariaceae *s.l.* in Thailand, we found a new record of *Torenia*, *T. maculata* (Bonati) Y.F. Deng in Si Sa Ket province, north-eastern Thailand. This species is morphological similar to *T. udawnensis* and *T. oblonga* (Table 1).

TAXONOMIC TREATMENT

Torenia maculata (Bonati) Y.F. Deng, Phytotaxa 438(2): 156. 2020.— *Lindernia maculata* Bonati in Lecomte, Fl. Indo-Chine 4: 414. 1927. Type: Cochinchine, Bù Dôp, province de Thudaumot, 21 Nov. 1919, *Poilane* 797 (lectotype **P** [P00586610!], designated by Y.F. Deng (2020); isolectotype **P** [P00586609!]. Fig. 1A–E.

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— *Vandellia pierreana* Bonati, Bull. Soc. Bot. France 55: 538. 1908.— *Lindernia pierreana* (Bonati) Bonati in Lecomte, Fl. Indo-Chine 4. 415: 1927, non *Torenia pierreana* Bonati. Type: Indo-Chine, year 1869, *Pierre s.n.* (lectotype **P** [P00586608!], designated by Y.F. Deng (2020); isolectotypes **P** [P00586606!, P00586607!].

— *Vandellia ligulata* T.Yamaz., J. Jap. Bot. 28: 37. 1953.— *Lindernia ligulata* (T.Yamaz.) Philcox, Taxon 19: 649. 1970. Type: Vietnam, Tonkin (Tonking), Dran, 14 June 1921. *B. Hayata s.n.* (**TI**).

— *Torenia bonatii* Eb.Fisch., Schäferh. & Kai Müll., Willdenowia 43: 231. 2013, *nom. illeg.*

Small herb. *Stem* creeping, decumbent, rooting and shooting at the nodes, quadrangular, 0.9–1.4 mm in diam, glabrous. *Leaves* sessile or sub-sessile, chartaceous, ovate, 9–15 × 5–10 mm, apex acute, sometimes obtuse in small leaves, base obtuse,

margin serrate with somewhat mucronate teeth, glandular-punctate on both surfaces, pinnately veined. *Flowers* solitary, 2–5-fascicled, axillary; pedicel slender, 0.8–1 cm long, hispid; bracts filiform, linear-lanceolate or leaf-like, 1–15 mm long. *Calyx* tubular, 5 mm long, 5-lobed; lobes divided for ¼ to ½ of calyx tube length, apex acute to acuminate, densely hirsute. *Corolla* 13–14 mm long, whitish-purple or pink with yellow blotch on lower lip; upper lip obtuse, occasionally slightly emarginate, 3 mm wide, apex rounded; lower lip broadly 3-lobed, 10–12 mm wide, apex rounded. *Stamens* 4, all fertile; posterior filaments straight, ca 1.2 mm long, thecae 1.2–1.5 mm long; anterior filaments curved, clavate spur arising near the base, 0.8–1 mm long; thecae ca 1.2 mm long. *Ovary* superior, ellipsoid, slightly oblique, glabrous; style 9–10 mm long, slender, erect, glabrous, often persisting until capsule dehisces; stigma 2-lobed, flat, deltoid, broadly ovate to

Table 1. Morphological comparison of *Torenia maculata* and allied species.

	<i>T. udawnensis</i>	<i>T. oblonga</i>	<i>T. maculata</i>
Habit	creeping or stoloniferous	erect, branched, often ascending	creeping, decumbent with rooting and shooting at the nodes
Petiole	1–4 mm long	1–12 mm long	sessile or sub-sessile (less than 1 mm long)
Leaf shape	ovate, obovate, orbicular or elliptic	ovate, rhomboid, elliptic or lanceolate	ovate
Flowers	solitary or racemose	solitary or racemose	solitary, 2–5-fascicled
Pedicels	1–4.5 cm long	0.2–6.5 cm long	0.8–1 cm long
Bracts	linear-lanceolate or leaf-like	leaf-like to lanceolate, 4–12 mm long	filiform, linear-lanceolate or leaf-like
Calyx:			
shape	tubular with broadly winged	tubular with narrowly winged	tubular with narrowly winged
size	lobes divided ½	lobes divided ½	lobes divided of ¼ to ½
Corolla:			
size	10–15 mm long	11–15 mm long	13–14 mm long
color	mauve or lilac with violet blotch on lower lip	reddish purple with white blotch on lower lip	whitish-purple or pink with yellow blotch on lower lip
Capsule:			
character	shorter than calyx lobes	shorter than calyx lobes	as long as the calyx
size	3–5 × 2–3 mm	3.8 × 3 mm	4–5 × (1.4–) 2–3 mm
shape	ovoid or ellipsoidal	ovoid to subglobose	ellipsoid

rounded, $0.7-0.8 \times 0.5-0.8$ mm. *Capsule* ellipsoid, 4–5 mm long, (1.4–)2–3 mm diam., as long as the calyx. *Seeds* numerous, broadly ovoid to subglobose, 0.4–0.6 mm long, 0.3–0.5 mm diam, scrobiculate, with alveolated endosperm (bothrospermous).

Distribution.— Vietnam.

Habitat.— In open places on bare sandy meadows, open grassy localities in association with

grasses, small herbs and shrubs from 200–600 m elevation. Fig. 1F.

Phenology.— Flowering and fruiting September–December.

Vernacular.— Wao mayura si sa ket (แวมยูราศรีสะเกษ; given here by the first author).

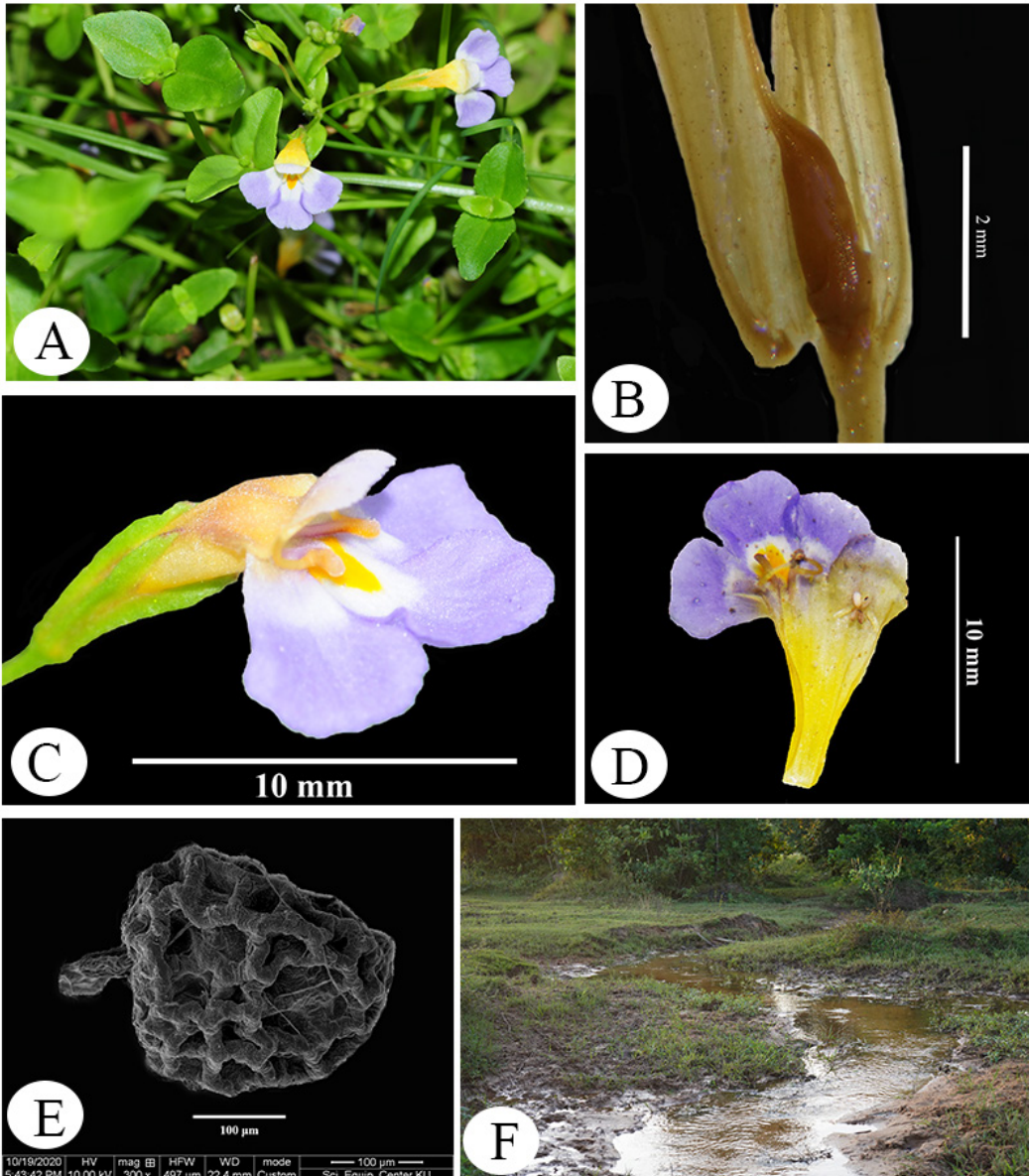


Fig. 1. *Torenia maculata* (Bonati) Y.F.Deng: A. Habit; B. Ovary; C. Lateral view of flower; D. Opened flower; E. SEM micrograph of seed; F. Habitat. Photos by P. Sutthisaksopon.

Notes.— This species is relatively similar to *T. udawnensis* and *T. oblonga* but differs from them in having sessile leaves, narrowly lanceolate calyx lobes and solitary flower, 2–5-fascicles in the leaf-axils (Table 1). It is currently known only from one locality in Si Sa Ket province, in agricultural and populated areas.

When Fischer *et al.* (2013) transferred *Lindernia pierreana* to *Torenia*, they found the epithet *pierreana* has been used in the name *Torenia pierreana* Bonati for another species from Thailand and Cambodia. Thus, they proposed a new name *Torenia bonatii*. However, the name was published is illegitimate because it is a superfluous name for *Torenia maculata* (Y.F. Deng, 2020). Nevertheless, the original material of *Lindernia maculata* Bonati comprises two sheets and F.Y. Deng's use of holotype is an error to be corrected to lectotype. The species is still a new record for Thailand under the new name, *T. maculata*.

Additional specimens examined.— EASTERN: Si Sa Ket [Ban Don Out, Rung Subdistr., Kantharalak Distr., 13 Oct. 2017, *Sutthisaksopon* 574 (**BK**, **BKF**, **K**); *ibid.*, 22 Nov. 2019, *Sutthisaksopon* 715 (**BK**, **BKF**, **K**)].

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