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Erythrina calcicola sp. nov. (Fabaceae) from Thailand

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ABSTRACT

In the context of an ongoing survey of the limestone ecosystem in Phu Khiao-Nam Nao Forest Complex in Thailand, we describe and illustrate a new species, *Erythrina calcicola* Tetsana & Poopath. Morphologically, it is particularly similar to *E. stricta* Roxb. which is distributed in mainland Southeast Asia, but differs in the shape and size of the leaflets, size of the flowers and fruits, and shape of the calyx and the standard blade. Currently, *E. calcicola* is only known from Tham Pha Sawan temple, Loei province, northeastern Thailand.

KEYWORDS: Phaseoleae, *Erythrina*, limestone, northeastern Thailand, conservation status.

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INTRODUCTION

The tropical and subtropical genus *Erythrina* L. (Fabaceae) belongs to tribe Phaseoleae in subfamily Papilionoideae (Legume Phylogeny Working Group, 2017) and comprises a total of ca 110 tree or shrub species, often with thorny stems, tri-foliolate leaves, and red or orange flowers which appear after the leaves have fallen (Adema, 1996). Estimates of species richness in various parts of mainland Southeast Asia and neighboring islands include 7 species in India (Hooker, 1876), 3 species in Nepal (Hara & Williams, 1979), 4 species and 2 varieties in China (Sa & Gilbert, 2010), 5 in Cambodia, Laos and Vietnam (Thuân, 1979) and 6 in the Malesian region (Adema, 1996). For Thailand, Niyomdham (1992) recorded 5 species.

Field exploration in the limestone ecosystem in Phu Khiao-Nam Nao Forest Complex (Loei province, northeastern Thailand), has accumulated important information about plant species of this area. During field trips in the region from 2015 to 2017, an unknown *Erythrina* species was collected at Tham Pha Sawan temple. Comparison with species recorded from other parts of tropical Asia did not lead to a convincing match, and we describe the population from Tham Pha Sawan temple as a new species here.

DESCRIPTION

Erythrina calcicola Tetsana & Poopath, **sp. nov.**

Similar to *E. stricta* Roxb., but distinguished by the shape of the leaflets, flowers and fruits; leaflets tri-lobed, rarely unlobed (unlobed in *E. stricta*), calyx cup-shaped or campanulate (spathaceous in *E. stricta*), standard ovate (elliptic-lanceolate in *E. stricta*) and fruits cylindric-oblong and constricted between the seeds (strap-like and not constricted between the seeds in *E. stricta*). Type: Thailand, Loei, Pha Khao district, Tham Pha Sawan temple, 500 m, 23 Mar. 2017, *Tetsana, Hemrat, Suwannachart & Kiewbang 1274* (holotype: **BKF!**; isotypes **BKF!**, **SING!**). Figs. 1–2.

Tree, 7–12 m tall, trunk straight. *Bark* smooth to slightly rough, thorns scattered, greyish-brown to light brown, 0.5–1 cm long. *Stipules* triangular-lanceolate, 3–4 mm long, caducous. *Leaves* tri-foliolate, membranous or herbaceous, young leaflets densely covered with simple hairs, glabrescent; petiole 4–6.5 cm long, rachis 2–3 cm long, with a few thorns; petiolules 0.4–0.6 cm long; terminal leaflet rhomboid, 2.5–4.5 × 3–5.5 cm, apex rounded, tri-lobed, rarely unlobed, base cuneate, secondary veins 4–6(–7) pairs; lateral leaflets obliquely rhomboid, 2.5–4.5 × 2–4.5 cm, apex round, tri-lobed,

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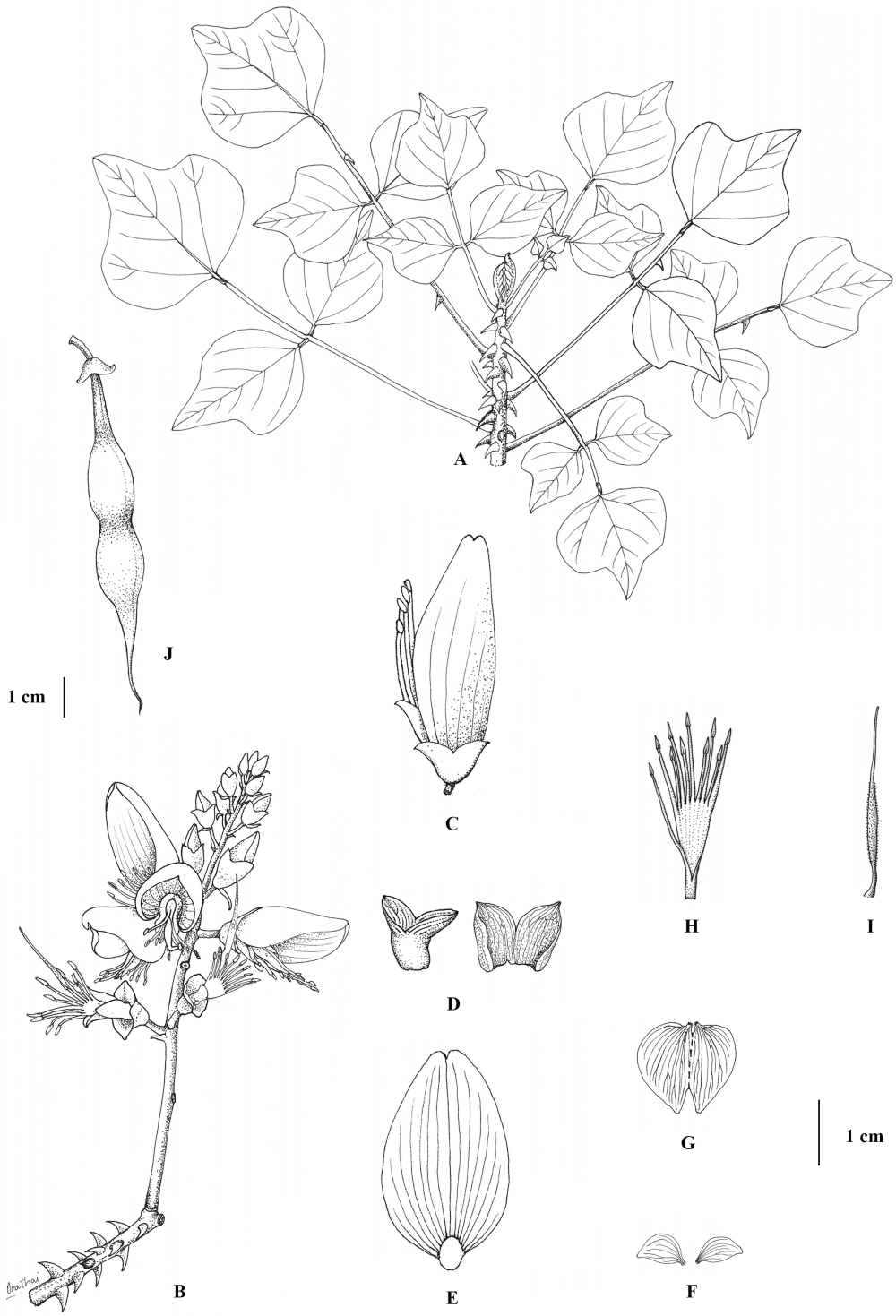

Figure 1. *Erythrina calcicola* Tetsana & Poopath: A. habit; B. inflorescence; C. flower; D. calyx and dissected calyx; E. standard; F. wings; G. keels; H. diadelphous stamens; I. pistil; J. pod. All from *Tetsana et al. 1274*. Drawn by O. Kerdkaew.

rarely unlobed, base cuneate, secondary veins 3–4 pairs. Inflorescences axillary, erect, pseudoracemes, 10–20 cm long, dense, 15–20-flowered; peduncle and rachis terete, reddish-brown, usually densely covered with simple hairs; floral bracts caducous. *Flowers* without any distinct scent, 3.5–4 cm long; calyx cup-shaped or campanulate, 2-lobed, brownish-green, 0.7–0.8 cm long; standard ovate, bright red, 3–3.5 × 2–2.3 cm; wings obliquely obovate, reddish-green, 0.5–0.6 × 0.3–0.4 cm; keels obliquely ovate, reddish-green, 1.2–1.3 × 0.6–0.8 cm; stamens 10, diadelphous, (2.1–)2.5–2.8 cm long; pistil suboblong, 2.8–3 cm long, ovary covered with long appressed hairs, style slightly glabrous; ovules ca 3. *Pods* cylindric-oblong, 5–10 × 0.8–1 cm, acuminate, constricted between the seeds, densely covered with simple hairs; seeds 1–2(–3), glossy, ellipsoid or bean-shaped, 1.2–1.5 × 0.5–0.7 cm.

Thailand.— NORTH-EASTERN: Loei [Pha Khao district, 500 m, 23 Mar. 2017, *Tetsana et al. 1274* (fl. & fr.) (**BKF!**, **SING!**); ibid., 30 Mar. 2015, *Poopath et al. 1014* (fr.) (**BKF!**)].

Figure 2. *Erythrina calcicola* Tetsana & Poopath in its natural habitat at Tham Pha Sawan temple, northeastern Thailand. A. habitat; B. bark; C. thorny branches; D. leaf arrangement; E–G. inflorescences and flowers in various views; H. pods; I. immature seed. Photos by N. Tetsana, 23 March 2017.

Distribution.— Endemic to northeastern Thailand, known only from the cited localities.

Ecology.— Limestone hills, ca 500 m, usually on hilltops rather than the steep cliff sides.

Phenology.— Flowering: February–March; fruiting: March–April.

Vernacular.— Thong lang hin pun (ทองหลางหินปูน).

Etymology.— The specific epithet, *calcicola* (limestone), refers to the habitat.

IUCN conservation assessment.— This new species is only known from an area < 500 km^2 in Loei province at Tham Pha Sawan temple, and thus may be threatened by local construction projects and tourist activities. We therefore suggest the conservation assessment 'Vulnerable' (VU B2ab(iii)) (IUCN, 2001).

Notes.— The differences between the new species and *E. stricta* are outlined in Table 1. The Tham Pha Sawan temple and adjoining Pha Ngam Forest Park, Huai Lao waterfall Forest Park and Phu Pha Man National Park form a large isolated massive limestone hill complex in the middle part of northeastern Thailand. It is possible that *Erythrina calcicola* may be endemic to this narrow area, which is similar to a number of other newly described species, e.g., *Cycas petrae* A.Lindstr. & K.D.Hill (Lindstrom & Hill, 2003), *Spatholirion calcicola* K.Larsen & S.S.Larsen (Larsen & Larsen, 2003), *Impatiens ruthiae* Suksathan & Triboun (Suksathan & Triboun, 2009), *Dracaena jayniana* Wilkin & Suksathan (Wilkin *et al.*, 2012), *Arisaema nonghinense* Klinrat. & Yannawat (Klinratana *et al.*, 2014), *Toona calcicola* Rueangr., Takane & Suddee (Rueangruea *et al.*, 2015), *Dischidia kerrii* Kidyoo & Suddee (Kidyoo & Suddee, 2016).

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Table 1. Morphological differences between *Erythrina calcicola* sp. nov. and *E. stricta*. Information on the former is based on specimens cited in this study and on in situ examination of additional individuals in Tham Pha Sawan temple. Information on *E. stricta* is based on Roxburgh (1832), Adema (1996), and Sa & Gilbert (2010).

Character	*E. calcicola*	*E. stricta*
leaflet shape	rhomboid, obliquely rhomboid	broadly triangular, rhomboid, broadly reniform-oblate
leaflet outline	tri-lobed, rarely unlobed	unlobed
leaflet size (cm)	2.5–4.5 × 2–5.5	7–19 × 7–24.5
petiole length (cm)	4–6.5	12–15
flower length (cm)	3.5–4	5
calyx shape	cup-shaped, campanulate	Spathaceous
standard shape	ovate	elliptic-lanceolate
standard size (cm)	3–3.5 × 2–2.3	3–4.5
fruit shape	cylindric-oblong/ constricted between the seeds	strap-like/ not constricted between the seeds
fruit size (cm)	5–10 × 0.8–1	7–12 × 0.7–1.5

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