



## *Stemona namkhunensis* (Stemonaceae), a new species from Eastern Thailand

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**ABSTRACT:** *Stemona namkhunensis* Chatan & Promprom, a new species from the East of Thailand, is described and illustrated. It is morphologically similar to *S. collinsiae* Craib but clearly differs in the characteristic of the petiole, lamina, tepal, stamen, pistil, simple and pedunculated flower, and lacking bract. A morphological description, distribution, ecology, etymology, vernacular name, preliminary conservation status, and photographs are provided. A key to species of the erect species in Thailand is presented.

**KEY WORDS:** Erect species, new species, *Stemona collinsiae*, taxonomy, Ubon Ratchathani Province.

### INTRODUCTION

*Stemona* Lour. is a flowering plant genus in the family Stemonaceae. It consists of about 20 species, distributed in China and Japan, through eastern Malesia to Australia (Duyfjes and Inthachub, 2011). The characteristics of the *Stemona* are erect or twining or trailing herbs, tuberous roots, basal nerve leaves, the anther attached to the base of long connective outgrowth, basal placentation with numerous ovules. So far, eleven species were recognized in Thailand (Duyfjes and Inthachub, 2011).

During the plant exploration in 2018–2020, unfamiliar specimens of the genus *Stemona* were collected from Ubon Ratchathani Province, Eastern Thailand. After carefully studying the morphological characters of these specimens, consulting relevant literature, and comparing its morphology with similar species, we found that it did not match any known species and clearly represents an undescribed species. The most similar species chosen for comparison is *S. collinsiae* Craib. They share similar morphological characters, including erect and glabrous herb, alternate leaves, long tepal (more than 15 mm long), inner tepals larger than outer tepals, and the absence of thecal appendage.

We could confirm that it is a new species belonging to the genus *Stemona*, namely *S. namkhunensis* Chatan & Promprom.

### MATERIALS AND METHODS

The fields worked in 2018–2020 were done in the East and Northeast of Thailand by the authors. During the trips, the author collected the *Stemona* plants with tuberous roots, shoots, and fruits for making herbarium specimens and two living individuals for planting in the author's home garden in Kantharawichai District, Maha Sarakham Province, Thailand. The critical examination

of these plants was performed by comparison with the relevant literature (i.e., Gagnepain (1934), Hooker (1894), Telford (1986), Duyfjes (1993), Chuakul (2000), Inthachub (2008), Inthachub *et al.* (2010), Duyfjes and Inthachub (2011), De Wilde and Duyfjes (2019) and Ji and Duyfjes (2000)).

We compare the morphological characters of the new species with the protologues, and the syntypes of the most similar species (*S. collinsiae* Craib) kept in K (*D.J. Collins131*: K000292137, K000292138, K000292139) and BM (*D.J. Collins131*: BM000958206). A similar species was chosen by using the guideline from the taxonomic literature (i.e., Gagnepain (1934), Hooker (1894), Telford (1986), Duyfjes (1993), Chuakul (2000), Inthachub (2008), Inthachub *et al.* (2010), Duyfjes and Inthachub (2011), De Wilde and Duyfjes (2019) and Ji and Duyfjes (2000)). Also, the other plant specimens kept in the main herbaria in Europe (BM, K, and P), Taiwan (TAI) and Thailand (BK and BKF) were consulted.

The morphological description is based on both herbarium specimens and field observations. Terminology used here follows Inthachub *et al.* (2010), Duyfjes and Inthachub (2011) and De Wilde and Duyfjes (2019). All the dissections and measurements of floral parts were taken under a stereomicroscope using a micrometer or ruler.

### TAXONOMIC TREATMENT

*Stemona namkhunensis* Chatan & Promprom, *sp. nov.*

**Figs. 1 & 2**

**Type:** THAILAND. Ubon Ratchathani Province, Nam Khun, 14°26'34.3"N 104°52'19.4"E, 380 m elevation, 14 July 2020, *W. Chatan 3086* (holotype BKF!; isotype BK!, TAI!).

**Diagnosis:** The most similar species of *Stemona namkhunensis* Chatan & Promprom is *S. collinsiae* Craib because they share similar morphological characters,



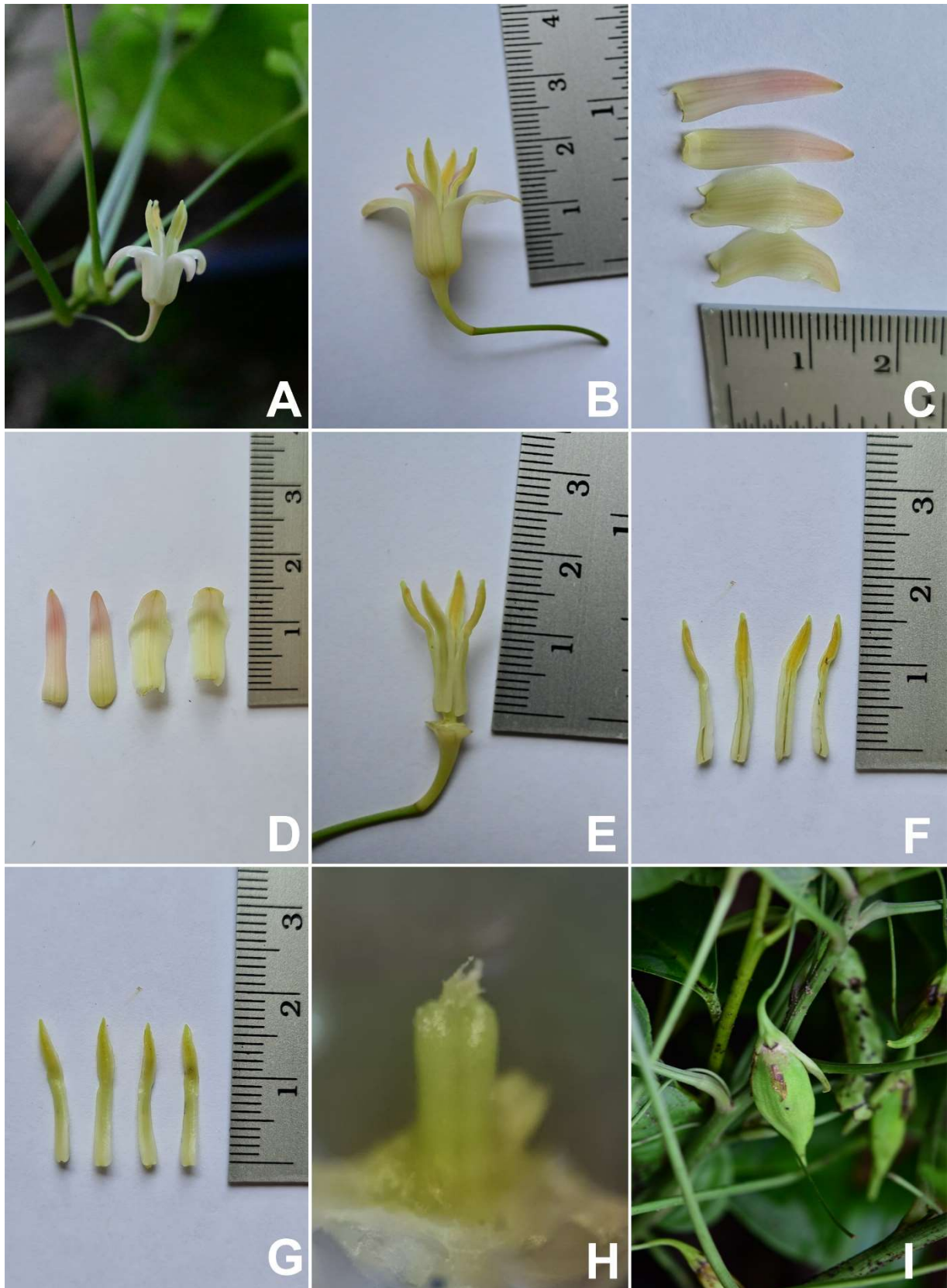
**Fig 1.** *Stemona namkhunensis* Chatan & Promprom sp. nov. **A.** Habits and Habit in the field, **B.** Habit in the author's home garden, **C.** Roots. Photos by: Wilawan Promprom.

including erect and glabrous herb, alternate leaves, long tepal (more than 15 mm long), inner tepals larger than outer tepals, and the absence of thecal appendage.

It differs from *S. collinsiae* Craib in having distinctly pulvinate petiole (vs. indistinct one), wider lamina with slightly fewer in a number of the vein (vs. smaller one with somewhat greater in number), Simple flower with no bract, and always with long peduncle (vs. inflorescence with bracts and peduncle, sometimes sessile inflorescence present near stem base), slightly narrower tepal, i.e., width and length ratio 1: 3.33–4.25 (vs. slightly wider one, i.e., width and length ratio 1: 2.0–3.6). Narrowly lanceolate to slightly linear stamen, ovate-cylindrical ovary, conspicuous stigma with retuse apex with two groups of hair (vs. narrowly lanceolate stamen and ovate ovary with inconspicuous and glabrous stigma).

**Description:** Erect herb. Stem terete, ca 30–70 cm high, unbranched or branched near stem base, glabrous, internode up to 10 cm long, up to 0.6 mm diam. Leaves simple, alternate; petioles dark red to reddish-green when young and green when mature, 8–12 cm long, terete, glabrous, base pulvinate and pale green; lamina dark red when young, pale to moderately green when mature, very widely ovate or broadly ovate, 5–13 × 5–9 cm, apex acuminate, based cordate and the two auricles not

overlapped, margin entire, glabrous on both surface; venation basal, nerves 9 or 11, distinctly raised on the lower surface, sunk on the upper surface; scale-like leaves present near the stem base, oblong-lanceolate, boat-shaped, 9–13 × 2–3 mm, apex acuminate, base truncate, margin entire, glabrous on both surface. Flower simple, on an axil of a normal leaf or rarely on an axil of the scale-like leaf near stem base. Peduncle articulate, 2.5–4.8 cm long, terete, straight or curved, pale green, glabrous; the persistent peduncle left after articulation 2.0–3.9 cm long. Bracts absent. Tepals 4, reflexed, pinkish-green or reddish-green and except for the greenish to yellowish near the base; outer tepals 2, narrowly lanceolate, 17–20 × 4–6 mm, width and length ratio 1: 3.33–4.25, apex acute, nerves 5–7; inner tepals obovate or slightly oblong, 17–20 × 6–9 mm, width and length ratio 1: 2.0–3.6, apex slightly rounded with a short mucro, nerves 7–9. Stamen 4, white, narrowly lanceolate to slightly linear, 15–18 mm long; anthers 5–7 mm long, ca 1.5 mm wide, apex acute, thecae dorsally attached to the base of long petal-like outgrowth of the connective; the outgrowth of the connective 5–6 mm long, ca 2 mm wide; appendix of thecae absent; filaments narrowly oblong, ca 1 mm long. Ovary superior, ovate-cylindrical, 1.0 × 0.5–1.0 mm; style absent; stigma conspicuous, retuse with two groups



**Fig. 2.** *Stemona namkhunensis* Chatan & Promprom. **A. & B.** Flowers, **C. & D.** tepals (adaxial and abaxial sides, respectively), **E.** Androecium, **F. and G.** stamens (adaxial and abaxial sides, respectively), **H.** Gynoecium, **I.** Young fruit. Photos by: Wilawan Promprom.



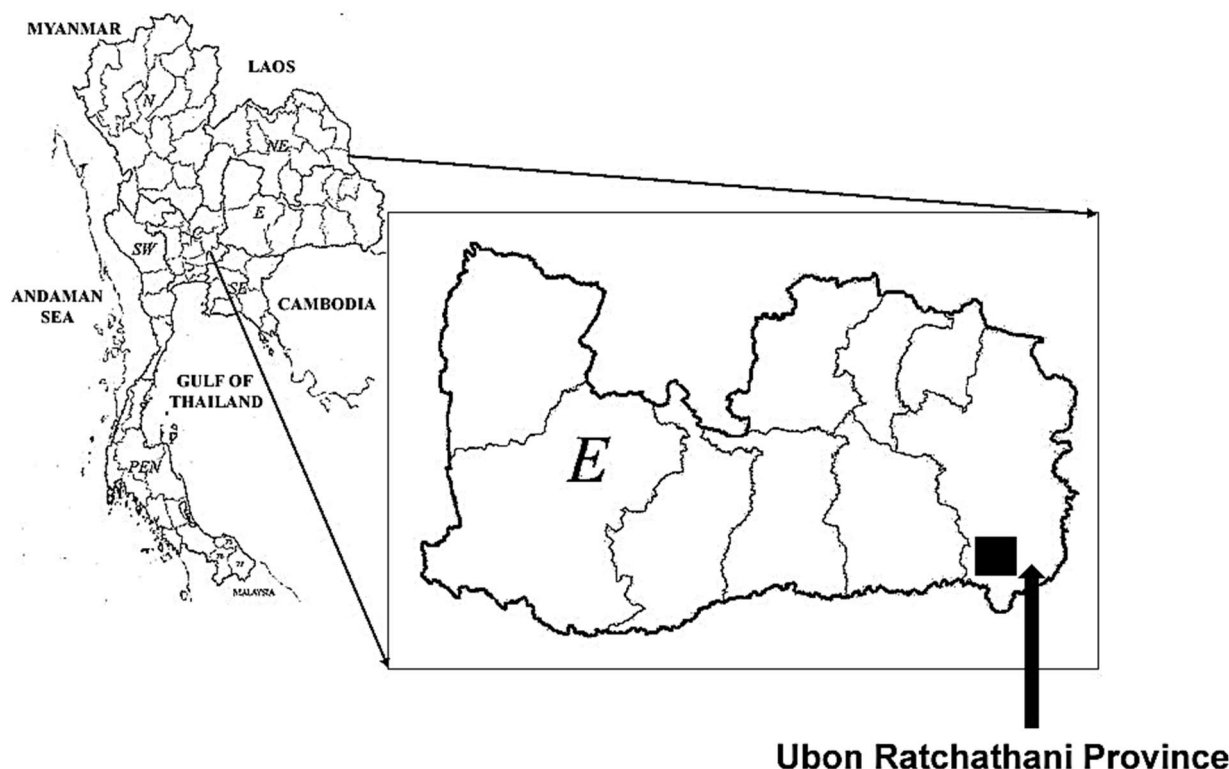


Fig.3. Distribution of *Stemona namkhunensis* Chatan & Promprom sp. nov. (■) in Nam Khun District, Ubon Ratchathani Province, Thailand.

of hairs; ovule 2–3, ovoid, basally attached. Fruits capsular, 15–20×7–8 mm, beak 3–5 mm long, opening with two valves, 2–3 seeds. Seed oblong, apex acuminate 5–6×2.5–3.5 mm, brown, claw 1.5–2.0 mm long; beak 2.0–2.5 mm long, aril present.

**Distribution:** Eastern Thailand, Nam Khun District, Ubon Ratchathani Province. It is found only in a single location, with less than 50 individuals.

**Ecology:** This species was found on sand soil or humus under semi-shade, at 380 m alt. Flowering and fruiting from March to August.

**Etymology:** The epithet refers to Nam Khun District, Ubon Ratchathani Province, where the type was collected.

**Vernacular name:** Non Tai Yak Phum.

**Conservation status:** *Stemona namkhunensis* is endemic to Thailand and currently known only from the type locality. Base on IUCN Standards and Petitions Committee (2020), it is assessed here as Critically Endangered (CR) under the IUCN categories and criteria B2ab(iv). The criterion B2 was chosen because its Area of Occupancy is <math><10\text{ km}^2</math>. The criterion "a" was selected because it is known to exist at only a single location, with only one subpopulation. Criterion b(iv) was chosen because it exists at only a single location.

**Notes:** *Stemona namkhunensis* Chatan & Promprom is similar to *S. collinsiae* Craib, a plant found in Lao and Thailand (Duyfjes and Inthachub, 2011). They are erect

plant, organ surface glabrous, tepal up to 20 mm length, all leaf alternate with cordate base, an absence of thecal appendage, and the larger inner tepals than the outer ones. The new species is easily distinguished from the latter by some morphological characters as below.

The new species has distinctly pulvinate petiole (vs. indistinct in *S. collinsiae* Craib), the lamina is wider with slightly fewer in a number of vein numbers (vs. smaller with slightly greater in number found in *S. collinsiae* Craib). A simple flower with no bract and always with long peduncle found in the new species (vs. inflorescence with bracts and peduncle found in *S. collinsiae* Craib, sometimes sessile inflorescence present near stem base), the tepal of the new species is slightly narrower, i.e., width and length ratio 1: 3.33–4.25 (vs. slightly wider, i.e., width and length ratio 1: 2.0–3.6 found in *S. collinsiae* Craib). Narrowly lanceolate to slightly linear stamen, ovate-cylindrical ovary, conspicuous stigma with retuse apex with two groups of hair found in the new species (vs. narrowly lanceolate stamen and ovate ovary with inconspicuous and glabrous stigma found in *S. collinsiae* Craib).

The identification key for erect species of *Stemona* in Thailand is constructed by modifying the key from the Flora of Thailand (Duyfjes and Inthachub, 2011) as presented below, and details of the differences between *Stemona namkhunensis* Chatan & Promprom and *S. collinsiae* Craib are shown in Table 1.

**Table 1.** Significant morphological differences among *Stemona namkhunensis* Chatan & Promprom and *Stemona collinsiae* Craib.

Characters	<i>S. namkhunensis</i> Chatan & Promprom	<i>S. collinsiae</i> Craib
Petiole	Base distinctly pulvinate	Petiole base indistinctly pulvinate
Lamina	Very widely ovate, broadly ovate, 5–13 × 5–9 cm, 9 or 11-veined	Broadly or narrowly ovate or lanceolate, 11–15 × 5–11 cm, 11–15 (17)-veined
Flower	Simple	1–8 flowers on each inflorescence
Peduncle	Present in all flower	Present in all flowers except for sessile flowers near the stem base
Bracts	Absent	Present, ca. 1 mm long
Tepals	Width and length ratio 1: 3.33–4.25; outer tepals narrowly lanceolate, apex acute; inner tepals obovate- or slightly oblong, apex slightly rounded with a short mucro	Width and length ratio 1: 2.0–3.6; outer tepal lanceolate, apex acute; inner tepal narrowly ovate, apex obtuse-acute without short mucro
Stamen	Narrowly lanceolate to slightly linear, 15–18 mm long	Narrowly lanceolate, 11–17 mm long
Pistil	ovate-cylindrical, 1.0 × 0.5–1.0 mm; stigma conspicuous, retuse with two groups of hairs	Ovary ovate, ca. 1.5 × 1.0 mm; stigma inconspicuous, glabrous

### Key to erect species of *Stemona* in Thailand

- 1a. Tepals smaller, 6–15 mm long; leaves with cuneate, round, truncate, or subcordate lamina base ..... 2
- 1b. Tepals larger, more than 15 mm long; leaves with distinctly cordate lamina base ..... 3
- 2a. Thecal appendage absent ..... *S. cochinchinensis*
- 2b. Thecal appendage present ..... *S. rupestris*
- 3a. Flowers simple with distinct peduncle; bract absent ... *S. namkhunensis*
- 3b. Flowers on inflorescence, pedunculate, sometimes the lowermost ones sessile; bract present ..... 4
- 4a. Basal inflorescence sessile, pedunculate towards stem apex; petaloid connective outgrowth broader, ca. 1.5 mm wide ..... *S. collinsiae*
- 4b. All inflorescence pedunculate; petaloid connective outgrowth narrower, less than 1 mm wide ..... *S. burkillii*

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