

Erythranthe szechuanensis (Phrymaceae): a new addition to Indian Flora

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Abstract: *Erythranthe szechuanensis* (Y.Y.Pai) G.L.Nesom (Phrymaceae), hitherto known only from China and Nepal is reported for the first time from India in Arunachal Pradesh. Detailed description, distribution, and photographs are provided to facilitate its easy identification.

Keywords: Arunachal Pradesh, Eastern Himalaya, *Mimulus*, West Kameng

Introduction

Phrymaceae comprises 15 genera and about 220 species (Stevens, 2001 onwards; Liu *et al.* 2020, Zhao *et al.*, 2022; Nesom, 2023) widely distributed in the Americas, Sub-Saharan Africa, Madagascar, South to East and Southeast Asia, Australasia and some Pacific Islands. The species-rich genera of Phrymaceae are *Erythranthe* Spach (122 spp., Nesom, 2023) and *Diplacus* Nuttall (54 spp., Liu *et al.*, 2020). These genera were for 90 years combined into the genus *Mimulus* in the tribe Mimuleae in the Scrophulariaceae, long recognised in a broad sense, but they were separated in the publication of a revised conspectus of the family (Barker *et al.*, 2012) based on molecular studies (Olmstead & Reaves 1995; Beardsley & Olmstead 2002; Beardsley & Barker 2005; Tank *et al.*, 2006). The genus *Erythranthe* distributed in Himalaya to far eastern Russian, North and Central America, western and southern South America to northwestern Venezuela (Nesom, 2023; POWO, 2023), In India

it comprises three species in eastern Himalayan region; *Erythranthe inflata* (Miq.) G.L.Nesom, *E. nepalensis* (Benth.) G.L.Nesom and *E. procerata* (A.L.Grant) G.L.Nesom. (Garg *et al.*, 2020). The members of the genus *Erythranthe* are annual or perennial herbs with prostrate to decumbent or erect stems. All species prefer a terrestrial or semi-aquatic habitat. Stems are terete or 4-angled with or without glandular hairs. Leaves are petiolate or sessile, often glandular-punctate, venation basal to suprabasal acrodromous. Flowers are apparently solitary or axillary in bracteate, corymboid or racemose groupings. Fruiting pedicels are usually distinctly longer than calyces. Fruiting calyces are erect or nodding, tube midveins weakly to strongly angled or wing-angled. Corollas are deciduous, limbs strongly to weakly bilabiate or nearly regular. Stamens are 4, with 2-celled anthers. Ovaries with 2-locules and having axile placentation (Barker *et al.*, 2012).

During a floristic survey in the West Kameng district of Arunachal Pradesh, first author found one population of a species belongs to the genus *Erythranthe*, which upon examination using taxonomic and floristic works covering the region (Bentham, 1835; Clarke, 1883; Garg *et al.*, 2020; Barker *et al.*, 2012; Nesom, 2012; Rajbhandari & Chhetri, 2022) was found to be quite distinct from known Indian species. The specimens were identified as *Erythranthe szechuanensis* (Y.Y.Pai) G.L.Nesom., which is previously known only from China and Nepal.

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Upon collection, the specimens underwent meticulous processing, including the creation of mounted herbarium-sheets. This process adhered to the established methodologies outlined by Jain and Rao (1977). The herbarium specimens are deposited in ARUN (acronyms follow Thiers 2024 [continuously updated]). A detailed description, distribution and color photographs (Fig.1) are provided.

Taxonomic treatment

Erythranthe szechuanensis (Y.Y.Pai) G.L.Nesom, *Phytoneuron* 39: 40. 2012. *Mimulus szechuanensis* Y.Y.Pai, *Contr. Inst. Bot. Natl. Acad. Peiping* 2: 119. 1934. *Type*: CHINA, **Szechwan**, Mt. Omei, Omeihsien, c. 1676–1828 m, 08.10.1928, *W.P. Fang* 2646 (iso PE [PE00031329 digital image!], E [E00088055 digital image!]).

Fig. 1

Perennial herbs, 10–30 cm tall. Stems erect, quadrangular, narrowly 4-winged sparsely villous rooting from nodes less branched, sparsely pubescent. Leaves opposite, epetiolate or shortly petiolate (c. 0.2–1 cm), pubescent; lamina ovate to ovate-triangular, 2–3.5 × 1.3–2.2 cm, eglandular, green above, green or reddish green below, pinnately veined, slightly villose on vein, base cuneate, apex acute, margin few toothed, teeth tip blunt. Flowers axillary, solitary in upper leaf axils; pedicel pubescent, 1–1.5 cm long, exceeding the calyx in fruit, 1.5–2.2 cm long; bracteoles absent. Calyx cylindrical, distinctly asymmetric, 0.8–1.1 cm long in flower, c. 2 cm long in fruit, 0.6–0.8 mm broad, ciliate, 5-dentate, narrowly winged, the winged ribs slightly villose, apex apiculate, the lobes spine-like, with the upper the largest. Corolla zygomorphic, bilabiate, glabrous outside, deep yellow to golden yellow with a red-dotted mouth and throat; tube c. 3 cm, yellow to golden yellow, much longer than calyx, on the lower side inside forming a palate of two rounded longitudinal ridges extending onto the base of the lower lip covered by yellow clavate hairs glabrous otherwise; lips otherwise glabrous on inner face, the lower lip forward directed, as long as the reflexed upper lip. Stamens 4, didynamous,

appressed to adaxial side of corolla, attached near base of corolla tube, the posterior (adaxial) stamens c. 0.7 cm long, the anterior (abaxial) stamens c. 1.2 cm long; filaments yellow, puberulent; anthers deeply included in corolla tube, glabrous, white. Ovary cylindrical, c. 0.4 cm long, c. 0.15 cm wide, light green; style filiform, c. 0.9 cm long, white; stigma bilamellate, c. 0.1 cm long, white, apically fringed. Capsules narrowly ellipsoid, 0.8–1.2 cm long, included in the persistent calyx, somewhat compressed, thin walled. Seeds numerous, ovoid, golden yellow to brown, glabrous to few haired, seed coat almost smooth, but obscurely reticulate in macroscopic view.

Flowering & fruiting: Flowering from August to September, fruiting from September to October.

Habitat & ecology: The plants grow on the road sides, in evergreen broadleaved forests, at an elevation of c. 1900m.

Distribution: China, Nepal, India (Arunachal Pradesh, West Kameng).

Specimens examined: INDIA, **Arunachal Pradesh**, West Kameng, Mandla, 27°19' 19.52' N & 92°15' 27.89' E, 1895 m, 20.09.2023. *K. Chowlu* 41412 (ARUN).

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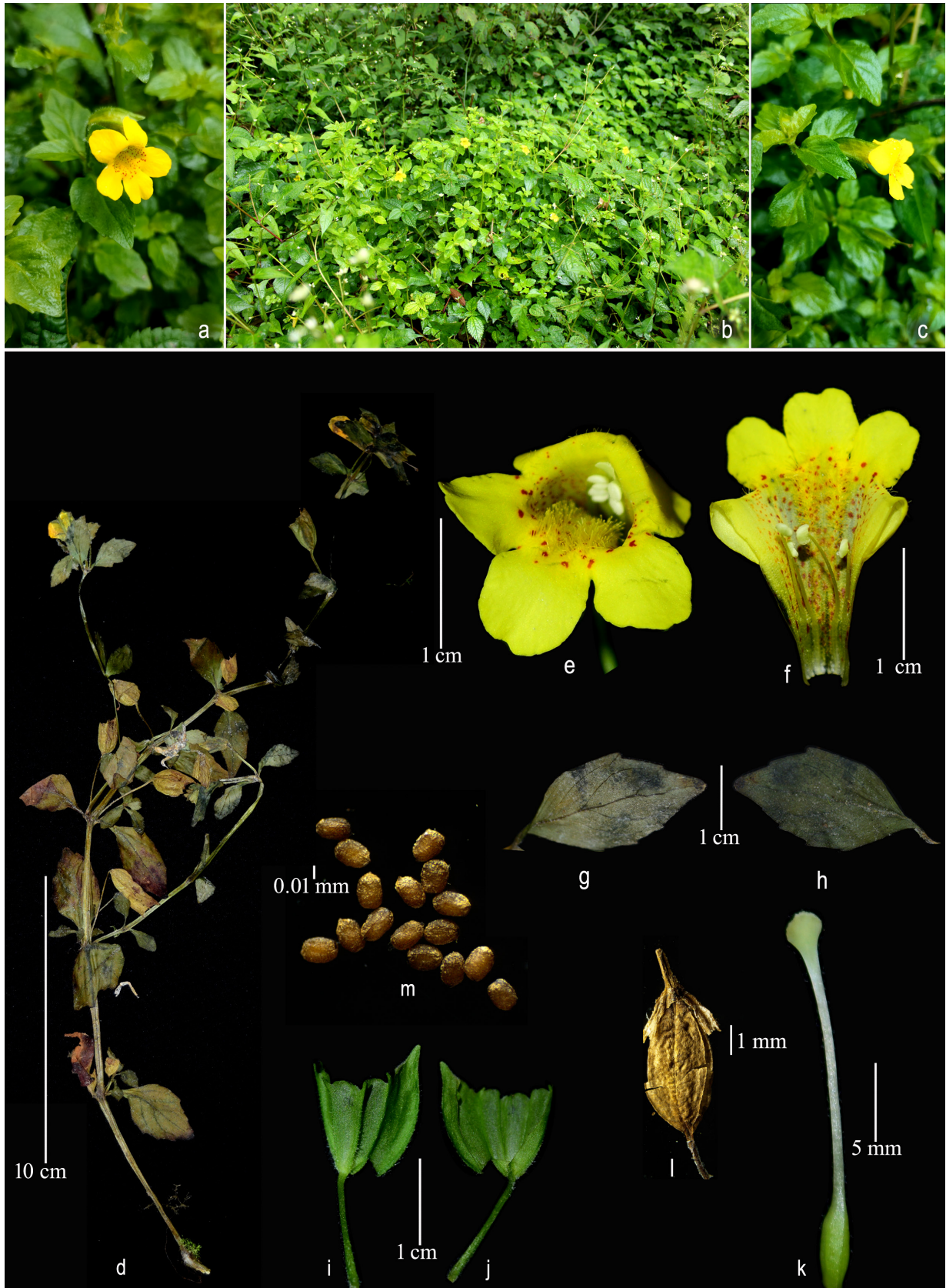


Fig.1. *Erythranthe szechuanensis* (Y.Y.Pai) G.L.Nesom.: **a–c.** Habit; **d.** Shoot with flowers; **e.** Flower–front view; **f.** Corolla split open–view from inside; **g.** Leaf–adaxial surface; **h.** Leaf–abaxial surfaces; **i & j.** Artificially opened calyx, views from outside and from inside; **k.** Gynoecium; **l.** Dehiscent capsule; **m.** Seeds (Photos by K.Chowlu & A.Shenoy).

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