

## *Henckelia khasiana*, a new species of Gesneriaceae from India

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**Abstract.** A new species of *Henckelia* (Gesneriaceae) is here described and illustrated. It is morphologically most similar to *H. oblongifolia* but differs in having lanceolate calyx lobes, two prominent longitudinal flaps on the inner surface of the corolla tube, bilobed stigma and tomentose capsules. A detailed description of the new species with colour photographs, affinities and a comparison with related species is given. Based on the present data, the new species is provisionally assessed as Critically Endangered (CR) according to IUCN Red List Categories and Criteria.

**Keywords.** Conservation status, East Khasi Hills, Mawsynram, Meghalaya, taxonomy.

**Resumen.** Se describe e ilustra una nueva especie de *Henckelia* (Gesneriaceae). Esta nueva especie es similar a *H. oblongifolia*, de la que se diferencia por tener lóbulos del cáliz lanceolados, dos láminas longitudinales prominentes en la superficie interna del tubo de la corola, estigma bilobulado y cápsulas tomentosas. Se proporciona una descripción detallada de la nueva especie y fotografías en color de sus principales órganos. Sobre la base de los datos actuales, se evalúa provisionalmente como en Peligro Crítico (CR) de acuerdo con las categorías y criterios de la Lista Roja de la IUCN.

**Palabras clave.** Estado de conservación, East Khasi Hills, Mawsynram, Meghalaya, taxonomy.

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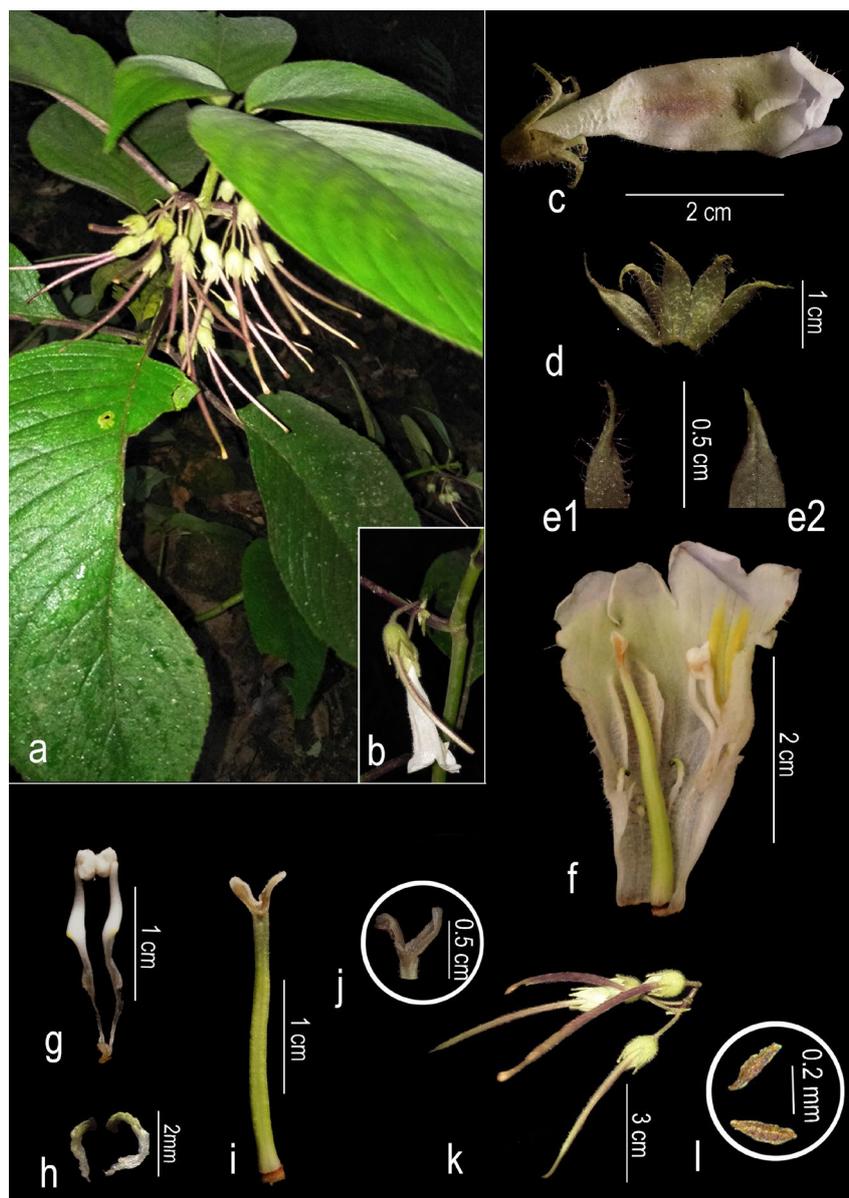
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### INTRODUCTION

The genus *Henckelia* Spreng. (Gesneriaceae, Didymocarpoideae) was originally established by Sprengel (1817), but subsequently sunk into the synonymy of *Didymocarpus* Wall. It was later resurrected by Weber & Burt (1998) to include c. 180 species worldwide. Later on, it was remodelled to include only the members of *H. sect. Henckelia*, *Chirita* sect. *Chirita* Buch.-Ham. (excluding the species under *Damrongia* Kerr ex Craib), and the monospecific genus *Hemiboeopsis* W.T.Wang, excluding the species of *H. sect. Loxocarpus* (R.Br.) A. Weber & B.L.Burt, *Didymanthus* (C.B. Clarke) A. Weber & B.L.Burt, *Heteroboaea* (Benth.) A. Weber & B.L.Burt and *Glossadenia* A. Weber & B.L.Burt (Weber & al. 2011; Middleton & al. 2013). According to recent estimates *Henckelia* has 71 species distributed from India, Sri Lanka, Myanmar, Nepal, Bhutan, Southern China, Northern Vietnam, Northern Laos and Northern Thailand, of which approximately 50% are found in India (Manudev & al. 2012; Middleton & al. 2013; Sukumaran & Kumar 2014; Ranasinghe & al. 2016; Sinha & Datta 2016; Möller & al.

2017; Krishna & Lakshminarasimhan 2018; Sirimongkol & al. 2019; Bin & al. 2019; Cai & al. 2019; Borah & al. 2019; Kanthraj & al. 2020; Janeesha & Nampy 2020; Taram & al. 2020; Singh & al. 2020).

The authors while revising the taxonomy of the family Gesneriaceae in India, came across some interesting specimens of *Henckelia* from Mawsynram in East Khasi Hills district of Meghalaya. Critical examination of the specimens at various herbaria (ARUN, ASSAM, BM, CALI, E, K) and the study of relevant literature revealed that they were morphologically close to *H. oblongifolia* (Roxb.) D.J.Middleton & Mich.Möller in having caulescent habit, axillary inflorescence with dichotomously branching peduncles, persistent calyx and corolla with yellow lines on the throat; but they also differed in other characters related to the nature and pubescence of leaves, calyx and corolla, fusion of anthers, structure and colour of staminodes, shape of stigma, among others. Differences that will be discussed below led us to describe, on the basis of the mentioned specimens, a new species.



**Fig. 1.** *Henckelia khasiana* Nampy & Akhil sp. nov.: **a**, habit; **b & c**, flower; **d**, calyx; **e**, calyx lobe outer (left) and inner (right) surfaces; **f**, corolla split open showing longitudinal flaps; **g**, stamens; **h**, staminodes; **i**, pistil; **j**, stigma; **k**, capsules; **l**, seeds. [based on Nampy & Vishnu 156840].

## MATERIALS AND METHODS

The new species is described on the basis of field observations and the examination specimens of *Henckelia* collected in India, including types at ARUN, ASSAM, BM, CAL, CALI, E, K, MA (acronyms following Thiers, 2020 continuously updated). Herbarium specimens were prepared following the procedure by Forman & Bridson (1989). Specimen images and species names were all checked from JSTOR Global Plants (<http://plants.jstor.org>), Tropicos (<http://www.tropicos.org>) and the International Plant Names Index (<http://www.ipni.org>). Pro-

tologues and relevant literature were examined and the description was prepared following Stearn (1992). Photographs of the plants in the field were taken with an  $\alpha$ -55 DSLR Camera (Sony, Japan) and those of floral parts with a stemi 508 stereomicroscope (Zeiss, Germany) attached to an Axiocam 105 colour camera. A distribution map was created using the maps from d-maps.com (<https://d-maps.com/index.php?lang=en>). The provisional conservation threat assessment followed IUCN Categories and Criteria (IUCN 2019).

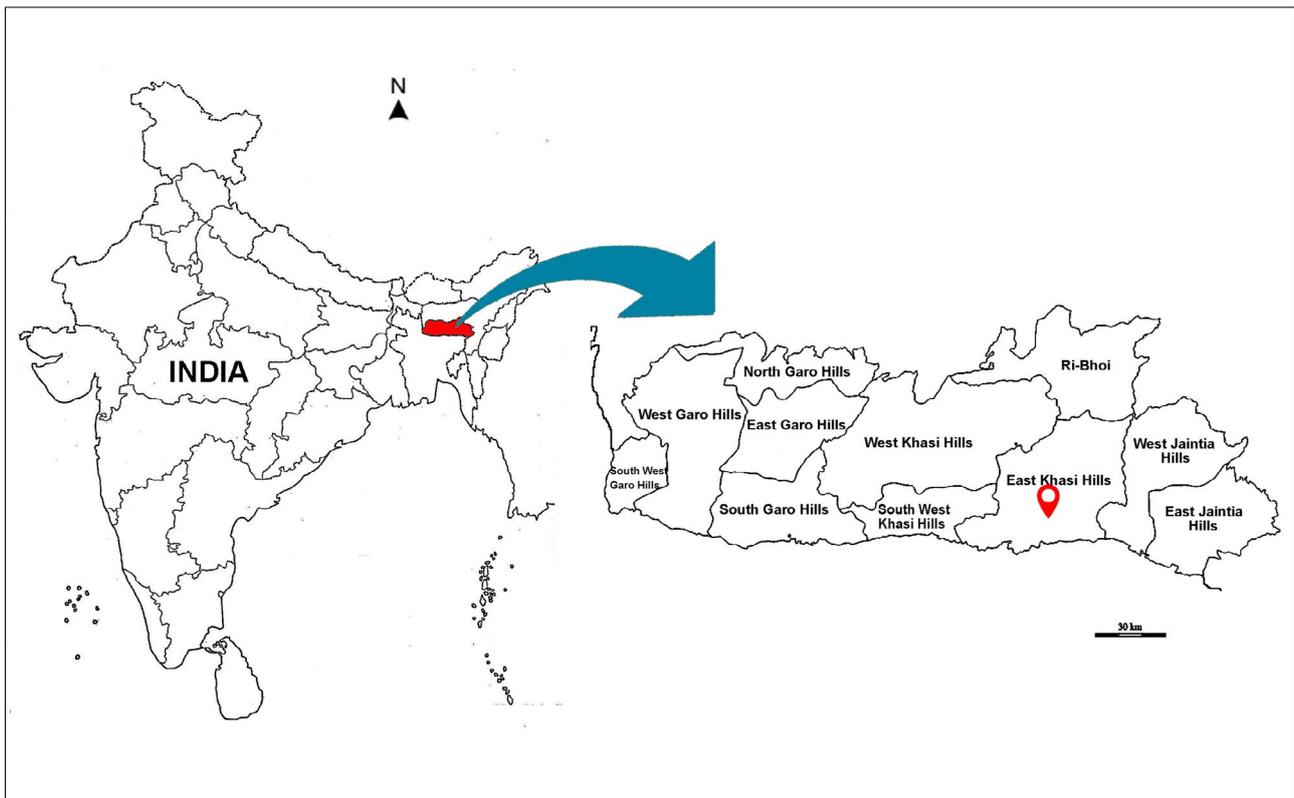


Fig. 2. Map showing the only known locality of *Henckelia khasiana* Nampy & Akhil sp. nov. in the Meghalaya state, India.

## RESULTS AND DISCUSSION

*Henckelia khasiana* Nampy & Akhil, sp. nov. Type: India. Meghalaya: East Khasi Hills district, Mawsynram, 25°18'33"N, 91°34'53"E, 1366 m, 8 Oct. 2017, Nampy & Vishnu 156840 (holotype: CALI!; isotypes: MA!, CAL!). Fig. 1.

It is similar to *Henckelia oblongifolia* (Roxb.) D.J.Midleton & Mich.Möller because of its general appearance, flower colour and yellow lines on the corolla throat, but differs in the shape of the calyx lobes (lanceolate vs. deltoid), the corolla tube (two prominent longitudinal flaps on the inner side vs. without longitudinal flaps), the stigma (bilobed vs. obdeltoid) and capsules (tomentose vs. pubescent).

Herbs perennial, caulescent. Stems erect, terete, tomentose, up to 1 m tall; internodes 2.5–6 cm long. Leaves simple, opposite, anisophyllous; petioles 2–9 cm long, terete, purple to brown, tomentose. Lamina 12–22 × 6–10 cm; ovate to widely ovate, dark green above, pale green beneath, pubescent and sparsely gland-dotted above, villous along the nerves and densely gland-dotted beneath; narrowly acute to acuminate at apex; oblique at base, serrulate at margins; lateral veins 8–12 on each side of midrib, arcuate. Cymes usually 2 or rarely 1 from the axil of distal

leaves, 2–12 flowered; peduncles 1.2–2.5 cm long, terete, pubescent. Bracts 2, free, leaf-like, sessile, persistent, 0.3–0.5 × 0.1–0.2 cm, lanceolate, acuminate at apex, cuneate at base, ciliate at margins. Pedicels 1.8–3 cm long, terete, pubescent. Bracteoles 2, free, sessile, persistent, c. 0.6 cm long, linear, acuminate at apex, cuneate at base, ciliate at margins. Calyx 1.4–1.6 × 0.4–0.6 cm, lobed from above middle, pale green; tube c. 1 cm long; lobes c. 0.6 cm long, lanceolate, pilose outside with white hairs, glabrous inside, acuminate at apex, entire at margins. Corolla 4–4.5 cm long; tube c. 3.5 cm long, c. 1.5 cm broad at throat, with two longitudinal flaps along the length of tube on the upper surface; two yellow lines on the throat, densely eglandular hairy outside, sparsely inside; limb 2-lipped, c. 0.5 × 0.5 cm, ovate with rounded to obtuse apex. Stamens 2, filaments 0.9–1.2 cm long, inserted c. 1 cm from the base of corolla tube, geniculate, white with yellow markings on the knee, sparsely pubescent, attached to the anther at middle of dorsal surface; anthers cream coloured, thecae parallel, lobes c. 0.2 cm diam., fused face to face, villous near the connectives. Staminodes 3, two large c. 0.5 cm long, one small c. 0.2 cm long, curved, free, white but green at apex. Disc ring like; margin undulate, brown. Ovary c. 2 × 0.2

cm, cylindrical, slightly curved, green, glabrous; style c. 0.8 cm long, cylindrical, green, glandular pubescent, held between the flaps of upper corolla tube; stigma chiritoid, lower lip bilobed, cream, densely pubescent. Capsules 5–7 cm long, linear, tomentose, loculicidally dehiscent. Seeds numerous, c. 3 mm long, flat, fusiform, testa dark brown with a membranous margin all around.

*Distribution and habitat.*—Hitherto known only from the type locality (Fig. 2) in tropical evergreen forest at altitudes around 1300 m. It was found in relatively damp, shady areas along rivulets with dense understory.

*Phenology.*—Flowering and fruiting from September to November.

*Etymology.*—The specific epithet is derived from the floristically rich Khasi hills in Meghalaya, where the type locality Mawsynram is situated.

*Conservation status.*—*Henckelia khasiana* sp. nov. is known only from a single location in the type locality Mawsynram in East Khasi Hills district of Meghalaya. The area of occupancy is assumed to be less than 10 km<sup>2</sup>. It is under severe threat due to the expansion of highways and other developmental activities in the area. Further surveys in other likely areas are required to estimate the conservation status of the new species. Based on the available data, it is provisionally assessed as “Critically Endangered” (CR) according to the criteria B2ab(iii) of IUCN Red List Categories and Criteria (IUCN 2019).

*Notes.*—Among the species of *Henckelia* occurring in India, *H. khasiana* is most similar to *H. oblongifolia* but differs from the latter in several characters summarized in the diagnosis above and in Table 1.

**Table 1.** Morphological characters distinguishing *Henckelia khasiana* Nampy & Akhil sp. nov. from *H. oblongifolia* (Roxb.) D.J. Middleton & Mich. Möller.

Characters	<i>Henckelia khasiana</i>	<i>Henckelia oblongifolia</i>
Leaves	12–22 × 6–10 cm, lance-ovate to widely ovate, serrulate at margins, upper surface pubescent and sparsely gland-dotted, lower surface villous along the nerves and densely gland-dotted	6.5–20 × 3–9.5 cm, elliptic to ovate oblong, crenate to crenulate at margins, both surfaces tomentose, gland-dotted
Cymes	Usually 2, rarely 1 in the axils	Solitary in the axils
Calyx	1.4–1.6 × 0.4–0.6 cm; tube c. 1 cm long; lobes c. 0.6 cm long, lanceolate, pilose out, hairs white	0.8–1 × 0.7–0.9 cm; tube c. 0.6 cm long; lobes c. 0.3 cm long, deltoid, pubescent out, hairs claret coloured
Corolla	Eglandular pubescent with two yellow lines on the lower surface of throat and two longitudinal flaps on the inner surface distally	Glandular pubescent with two yellow foldings on the lower surface of throat, longitudinal flaps absent
Stamens	Filaments 0.9–1.2 cm long, geniculate, white with yellow markings on the knee, sparsely pubescent, attached to the anther on middle of dorsal surface; anthers villous near the connectives, theca parallel, lobes fused face to face	Filaments 1–1.3 cm long, fusiform, white, glandular pubescent, attached to the anther on entire dorsal surface; anthers glabrous, theca divergent, lobes fused apically
Staminodes	Curved, white but green at apex	Straight, white in colour
Stigma lower lip	Bilobed	Obdeltoid, emarginated
Style	Glandular pubescent, green	Sparsely pilose, white
Ovary	Glabrous, green coloured	Densely pubescent, gland dotted, white, covered by claret coloured hairs
Capsules	Tomentose	Pubescent

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