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Journal of Threatened Taxa

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Open Access

10.11609/jott.2025.17.12.28011-28150

www.threatenedtaxa.org

26 December 2025 (Online & Print)

17(12): 28011-28150

ISSN 0974-7907 (Online)

ISSN 0974-7893 (Print)





ISSN 0974-7907 (Online); ISSN 0974-7893 (Print)

Publisher
Wildlife Information Liaison Development Society
www.wild.zooreach.org

Host
Zoo Outreach Organization
www.zooreach.org

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Cover: Freshly emerged Footman Moth *Nepita conferta* from the cocoon on a brightly painted wall in the Nilgiris. Digital art on Procreate. © Aakanksha Komanduri.



Cardamine fragariifolia O.E.Schulz (Brassicaceae): a new addition to the flora of Sikkim, India

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India is recognized as one of the 12 mega-biodiversity countries of the world with approximately 47,000 plant species and is rich in threatened and endemic plants (Singh et al. 2013). The eastern Himalaya span approximately 1,500 km² across the Indian states of Sikkim, West Bengal, Arunachal Pradesh, and Nagaland (Chettri et al. 2012). Sikkim is a small state covering an area of 7,096 km² with a unique habitat that supports a variety of rich flora and fauna throughout the region. The genus *Cardamine* L., belongs to the family Brassicaceae. It is a cosmopolitan genus with over 280 species (Marhold et al. 2021), mainly distributed in the temperate regions. The genus *Cardamine* is a taxonomically problematic, widespread genus with over 200 arctic, alpine, and boreal taxa, and is one of the largest genera of the family in terms of number of species (Hewson 1982; Al-Shehbaz 1988; Webb et al. 1988; Al-Shehbaz et al. 2006; Carlsen et al. 2009). In India, the genus comprises about 14 species (Sharma & Balakrishnan 1993), of which 12 are reported from Western Ghats (Nayar et al. 2014) and later three species from Maharashtra (Dalavi et al. 2019). Therefore, total 15 taxa are reported from India so far. The genus harbours 12 taxa of *Cardamine* from Sikkim Himalaya (Gogoi et al. 2021).

During the routine field survey of Maenam Wildlife

Sanctuary (MWS), South Sikkim, specimens of *Cardamine* were collected in this subtropical forest. Upon a thorough examination of the collected specimens, including type specimens from BM, E, IBSC, K, KUN, GH, W, WU and additional specimens from BSHC, CAL, L and KUN, ARUN, and comparative analysis with present literature (Hooker & Anderson 1875; Smith 1913; Hara 1966; Grierson 1984; Polunin & Stainton 1984; Singh et al. 2019; Gogoi et al. 2021), the species has been identified as *Cardamine fragariifolia* O.E.Schulz. In India, while literature records indicate the presence of *Cardamine fragariifolia* in Arunachal Pradesh (Hajra & Chowdhery 1993; Hajra et al. 1996), a critical examination of specimens has not been observed till date (Al-Shehbaz & Guang 1998). Therefore the present collection from MWS Ravangla, South Sikkim marks the addition of a new record to state flora. Herbarium specimens were prepared using standard procedures following Jain & Rao (1977), and Bridson & Forman (1998). Voucher specimens are deposited in the Department of Botany, Sikkim University, Gangtok Sikkim.

Taxonomic description

Cardamine fragariifolia O.E.Schulz, Bot. Jahrb. Syst. 32(4): 446. 1903. Type: China: Hubei, 1885–88, A. Henry

Editor: Afroz Alam, Banasthali Vidyapith, Rajasthan, India.

Date of publication: 26 December 2025 (online & print)

Citation: Mangar, S., R. Dutta, P.L. Sherpa, A.K. Rai & A. Chettri (2025). *Cardamine fragariifolia* O.E.Schulz (Brassicaceae): a new addition to the flora of Sikkim, India. *Journal of Threatened Taxa* 17(12): 28140–28143. <https://doi.org/10.11609/jott.9985.17.12.28140-28143>

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Funding: None.

Competing interests: The authors declare no competing interests.

Acknowledgements: The authors express gratitude to the head, Department of Botany, Sikkim University, Gangtok, for providing research support; The Forest and Environment Department, Government of Sikkim, for granting necessary permission and help during the field surveys.



5803 [K: K000697727 digital image! Holotype; GH: Isotype]. *Cardamine scoriarum* W.W.Sm., Notes Roy. Bot. Gard. Edinburgh 11: 203. 1920. Type: China: Yunnan: flank of volcanic mountain to Northwest of Ten-yueh, 25° N, 7,000 ft, vi.1912, G. Forrest 8201 [E: E0015541 digital image! Holotype; K: K000697741 image! Isotype]. *Cardamine smithiana* Biswas, J. Bot. 76: 22. 1938. Type: China. Tibet (Xizang): Cong La, 2,900 m, 25.vii.1933, F. Ludlow & G. Sherriff 324 [BM: 000536045 digital image! Holotype]. *Cochlearia alatipes* Handel-Mazzetti, Symb. Sin. Pt. vii: 370. 1931. Type: China. South West Hunan. In monte Yiin- schan prope urbem Wukang, 1,000 m, 12.vi.1918, Handel-Mazzetti 12097 [WU: 024357 digital image! Holotype; E: E00386079 digital image! WU: 024348 digital image! Isotypes] (Image 1 & 2).

Spreading perennial herbs up to 120–130 cm high. Rhizomes 2–5 × 0.2–0.8 cm, sometimes stoloniferous. Stems prostrate or decumbent, simple at base or branched above, often stout or slender, sometimes

rooting from proximal nodes, usually glabrous or sparsely puberulent. Basal leaves wither after flowering. Cauline leaves 10–20 × 7–12 cm, petiolate, usually lowermost trifoliolate or sometimes lowermost leaves with 4–5 leaflets, articulated at base; petiolules 6–11 mm long, leaflets subequal 3–8 × 1–4 cm, terminal leaflet slightly larger, ovate to lanceolate, 5–10 × 2–5 cm, base of terminal leaflet cuneate to obtuse, base of sub-leaflets oblique, margin coarsely or minutely serrate to crenate, apex usually acute to acuminate, rarely caudate-acuminate, glabrous to sparsely appressed. Inflorescence ebracteate, 40–60-flowered corymb; pedicel slender, divaricate up to 13 cm long, usually glabrous or sparsely puberulent. Sepals greenish-white, with dark brown to purplish tips sometimes, oblong, 0.2–0.4 × 0.1–0.2 cm, erect, glabrous or sometimes with few glandular hairs. Petals obovate or obovate-oblong, 0.6–0.8 × 0.4–0.5 cm, purple, lavender or pink, rarely white, apex rounded, claw 0.1–0.2 cm. Stamens

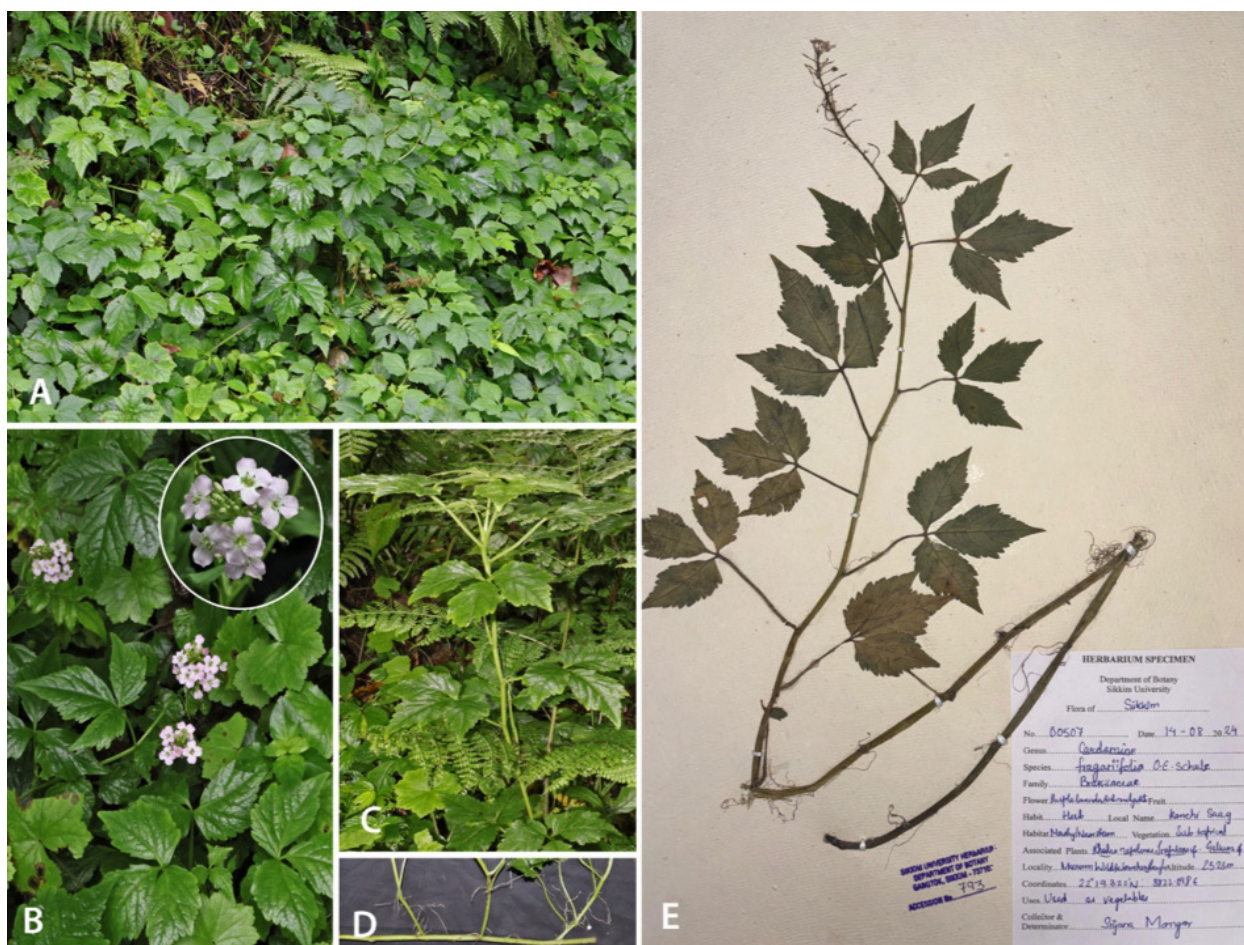


Image 1. *Cardamine fragariifolia* O.E.Schulz: A—Plant habit in its natural habitat | B—Flowering plant in its natural habitat | C & D—Proximal rooting of plants from the nodes | E—Herbarium specimen of *Cardamine fragariifolia* prepared and deposited at Department of Botany, Sikkim University (Accession no: 793). © Srijana Mangar.

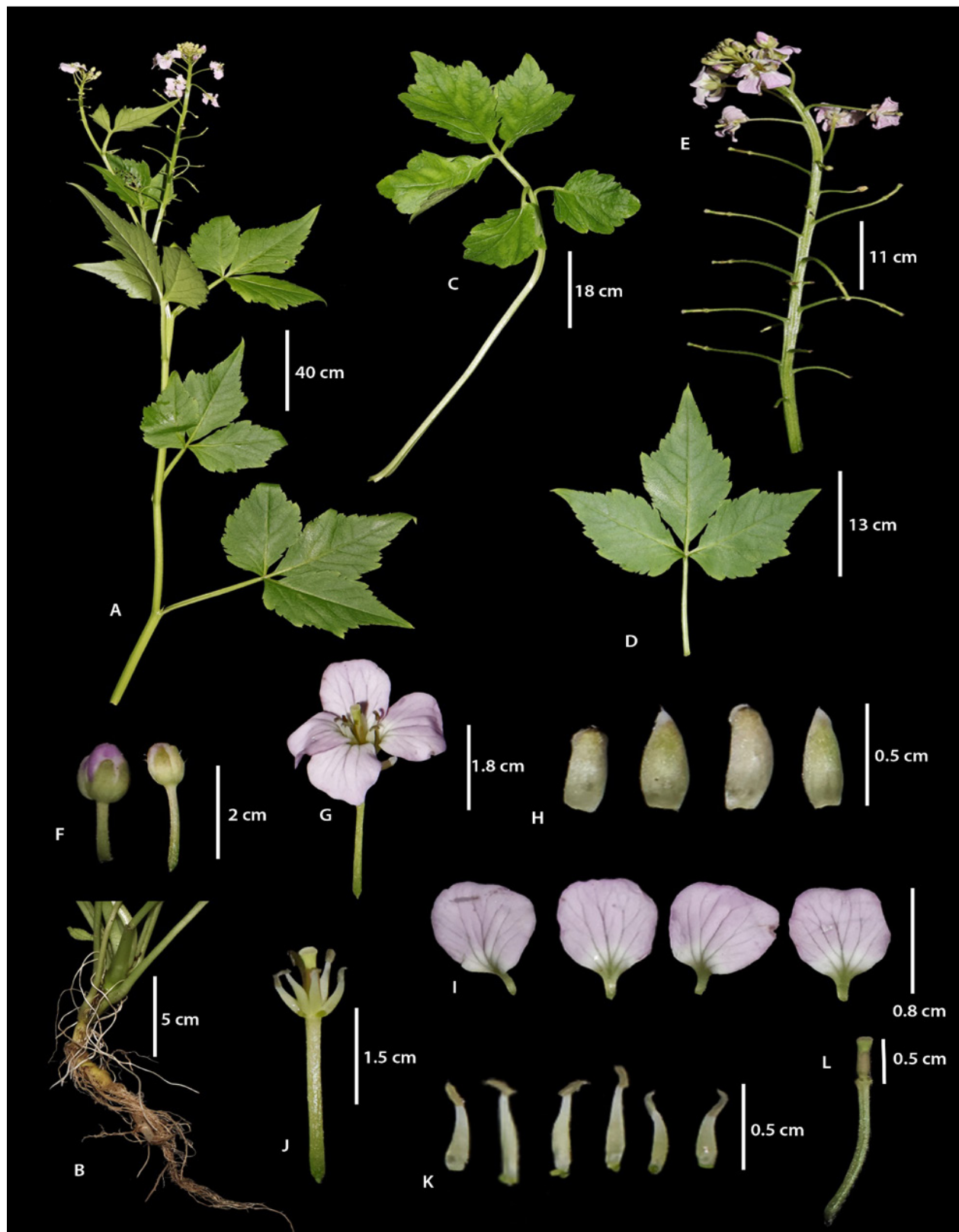


Image 2. *Cardamine fragariifolia* O.E.Schulz: Dissected flower parts: A—Flowering twig | B—Rhizome | C—Basal leaves | D—Upper trifoliate leaves | E—Inflorescences | F—Flower buds | G—Single flower | H—Sepals | I—Petals | J—Stamens arrangement on pistil | K—Stamens | L—Pistil. © Srijana Mangar.

six, tetradynamous; filaments white, median filaments 4–5 mm long, lateral filaments 3–4 mm long; anthers oblong, up to 2 mm long. Pistil glabrous; style slender, 5 mm long; siliques linear.

Phenology: Flowering during July to September; fruits not seen

Specimen examined: INDIA, Sikkim, South Sikkim, Ravangla, 22.406° N, 88.393° E, 2,323 m, 14.viii.2024, S. Mangar, 00507 (Sikkim University Herbarium, Accession No. 793).

Distribution: India: Sikkim (South Sikkim, Ravangla: Maenam Wildlife Sanctuary, Arunachal Pradesh), Bhutan, China, and northern Myanmar.

Notes: The specimens are usually found in the wet areas near streams of broad-leaved temperate forests. It is associated with *Rohdea nepalensis* (Raf.) N.Tanaka, *Codonopsis gracilis* Hook.f. & Thomson, *Chamabainia cuspidata* Wight, *Pilea umbrosa* Wedd. ex Blume, *Impatiens uncipectata* C.B.Clarke ex Hook.f., *Chrysosplenium nepalense* D.Don, *Elatostema nasutum* Hook.f., *Hydrocotyle himalaica* P.K.Mukh., *Begonia cathcartii* Hook.f. & Thomson, and *Galium asperifolium* Wall. Locally, it is referred as "Kanchi saag" and its young tender leaves are consumed as vegetables and considered a local delicacy.

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Print copies of the Journal are available at cost. Write to:
The Managing Editor, JoTT,
c/o Wildlife Information Liaison Development Society,
3A2 Varadarajulu Nagar, FCI Road, Ganapathy, Coimbatore,
Tamil Nadu 641006, India
ravi@threatenedtaxa.org & ravi@zooreach.org

Journal of Threatened Taxa is indexed/abstracted in Bibliography of Systematic Mycology, Biological Abstracts, BIOSIS Previews, CAB Abstracts, EBSCO, Google Scholar, Index Copernicus, Index Fungorum, JournalSeek, National Academy of Agricultural Sciences, NewJour, OCLC WorldCat, SCOPUS, Stanford University Libraries, Virtual Library of Biology, Zoological Records.

NAAS rating (India) 5.64



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ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

December 2025 | Vol. 17 | No. 12 | Pages: 28011–28150

Date of Publication: 26 December 2025 (Online & Print)

DOI: 10.11609/jott.2025.17.12.28011-28150

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