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Cover: The critically endangered *Lilium polyphyllum* in watercolour and acrylics. © Aishwarya S Kumar.



Three new additions to the flora of Himachal Pradesh, India from Khokhan Wildlife Sanctuary, Kullu District

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Abstract: *Chamabainia cuspidata* Wight (Urticaceae), *Debregeasia orientalis* C.J.Chen (Urticaceae), and *Hydrocotyle himalaica* P.K.Mukh. (Araliaceae) are being reported here as new additions to the flora of Himachal Pradesh, India. All three species were collected from Khokhan Wildlife Sanctuary in Kullu district. Of these, *H. himalaica* also forms an addition to the flora of western Himalayan region. Detailed description, distribution, information on habitat and colour photographs of all three species are provided for easy identification in the field.

Keywords: Araliaceae, *Debregeasia orientalis*, floristics, taxonomy, Urticaceae, Western Himalaya.

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Author contributions: Ashutosh Sharma designed the research as a part of his master's thesis work and S. Noorunnisa Begum supervised the work; Ashutosh Sharma & G.S. Goraya carried out field surveys and collected the material; Ashutosh Sharma, Gopal S. Rawat, Vaneet Jishtu S. Noorunnisa Begum & G.S. Goraya drafted the manuscript; Ashutosh Sharma revised the manuscript. All authors read and approved the final manuscript.

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INTRODUCTION

The state of Himachal Pradesh, India forms the central part of western Himalaya, which is one of the important floristic regions in the Indian sub-continent and is also a part of Himalayan biodiversity hotspot (CEPF 2023). This region has had a long history of botanical explorations and its flora is relatively well documented. The flora of Himachal Pradesh has been studied by a number of workers (Collett 1921; Nair 1977; Chowdhery & Wadhwa 1984; Aswal & Mehrotra 1994; Dhaliwal & Sharma 1999; Singh & Rawat 2000; Kaur & Sharma 2004; Singh & Sharma 2006; Subramani et al. 2014; Singh 2018; Singh et al. 2019; Sinha et al. 2019). Despite detailed surveys and systematic enumeration of flora in different sub-regions, several localities still remain under-explored and fresh collections are lacking for several taxonomically challenging groups. We selected Khokhan Wildlife Sanctuary (WS) (Image 1), a little-known protected area in Kullu District of Himachal Pradesh in order to make a floristic inventory and to identify the species of high conservation significance. Results of detailed surveys conducted during this work are presented in Sharma (2023). The sanctuary has a geographical area of about 14.94 km², and is situated within the geo-coordinates north (31.8805N, 77.0805E), east (31.8602N, 77.1150E), south (31.8288N, 77.0822E), and west (31.8486N, 77.0552E) and is characterized by temperate climate and a wide altitudinal range (1,500–2,790 m) harbouring 510 species of plants (Sharma 2023).

In this communication, we report the occurrence of three interesting species of angiosperms collected by the first author from Khokhan WS which form new additions to the flora of Himachal Pradesh. These species are *Chamabainia cuspidata* Wight (Urticaceae), *Debregeasia orientalis* C.J.Chen (Urticaceae) and *Hydrocotyle himalaica* P.K.Mukh. (Araliaceae). Perusal of the literature on the flora of western Himalaya, from the state and 'Checklist of Flowering Plants of India' (Karthikeyan et al. 2009; Mao & Dash 2020; Pusalkar et al. 2022) reveal that so far, they have not been reported from the state. While *C. cuspidata* and *D. orientalis* are previously known from eastern part of Uttarakhand, *Hydrocotyle himalaica* is being reported for the first time from the western Himalayan region. Since all the three species are rather inconspicuous and little known, we have provided systematic treatment for these three species along with author citations, morphological description, phenology, updated global distribution, information on habitat and colour photographs for

easy identification in the field. Additionally, the voucher specimens are deposited at FRLH, Bengaluru & BSS, Solan herbarium for the future references (Herbaria code follow Thiers 2023).

Systematic Treatment

Chamabainia cuspidata Wight, Icon. Pl. Ind. Orient. 6: 11. t. 1981 (1853); Hook.f., Fl. Brit. India 5: 580 (1888); Murti & Pusalkar, Fl. Pl. India Annot. Checkl. 1: 516 (2020); Murti & Pusalkar, Fl. Ind. 24: 28 (2022). *Boehmeria squamigera* Wedd., Ann. Sci. Nat., Bot., sér. 4, 1: 203 (1854). *Chamabainia squamigera* (Wedd.) Wedd, in A.D.C., Prodr. 16(1): 218 (1869). (Image 2, G–J)
Lectotype: India, Tamil Nadu, Neelgherry [Nilgiris], Oct. 1852, R. Wight s.n. (K000741409!).

Synonyms

Boehmeria squamigera Wedd. in Ann. Sci. Nat., Bot., sér. 4, 1: 203 (1854)

Chamabainia cuspidata var. *denticulosa* W.T.Wang & C.J.Chen in Acta Bot. Yunnan. 3: 16 (1981)

Holotype—China, Yunnan: Fengqing, Wumulong, 2,400 m, under the bamboo forest, 09.vii.1938, T.T. Yu 16626 (PE).

Chamabainia cuspidata var. *morii* (Hayata) W.T. Wang in Acta Bot. Yunnan. 3: 15 (1981)

Chamabainia morii Hayata in J. Coll. Sci. Imp. Univ. Tokyo 30(1): 282 (1911)

Type—Taiwan, 01.vii.1908, Takiya Kawakami and Ushinosuke Mori 7101 (TAIF8259) (TAIF!)

Chamabainia squamigera (Wedd.) Wall. ex Wedd. in A.P.de Candolle, Prodr. 16(1): 218 (1869)

Perennial creeping herbs, 10–60 cm long, monoecious or dioecious; stem and branches slender, ascending or procumbent, creeping and rooting at lower nodes, purplish, reddish-brown, sometimes greenish, strigose or hairy with mixed pilose hairs. Leaves opposite, usually equal or sub-equal in pairs (at nodes), sometimes unequal, narrow or broad ovate to rhombic-ovate, sub-rotund, elliptic or elliptic-ovate, 1.5–6 x 1–4 cm, base rounded or cuneate, oblique, margin bluntly or acutely serrate, apex acute to acuminate, 3-veined from base, surfaces glabrous, sparsely pubescent or lower surface pilose or strigose, often densely so along veins. Petioles 4–15 mm long, strigose; stipules four at each node, orbicular to obliquely ovate or triangular to oblong-lanceolate, mucronate, to 1 cm long, brown when dry, persistent, enclosing flower buds. Flowers sessile, subsessile or pedicellate, 0.5–1.5 cm across, in axillary fascicled glomerules; male glomerules in distal axils; female dense, proximal or sometimes

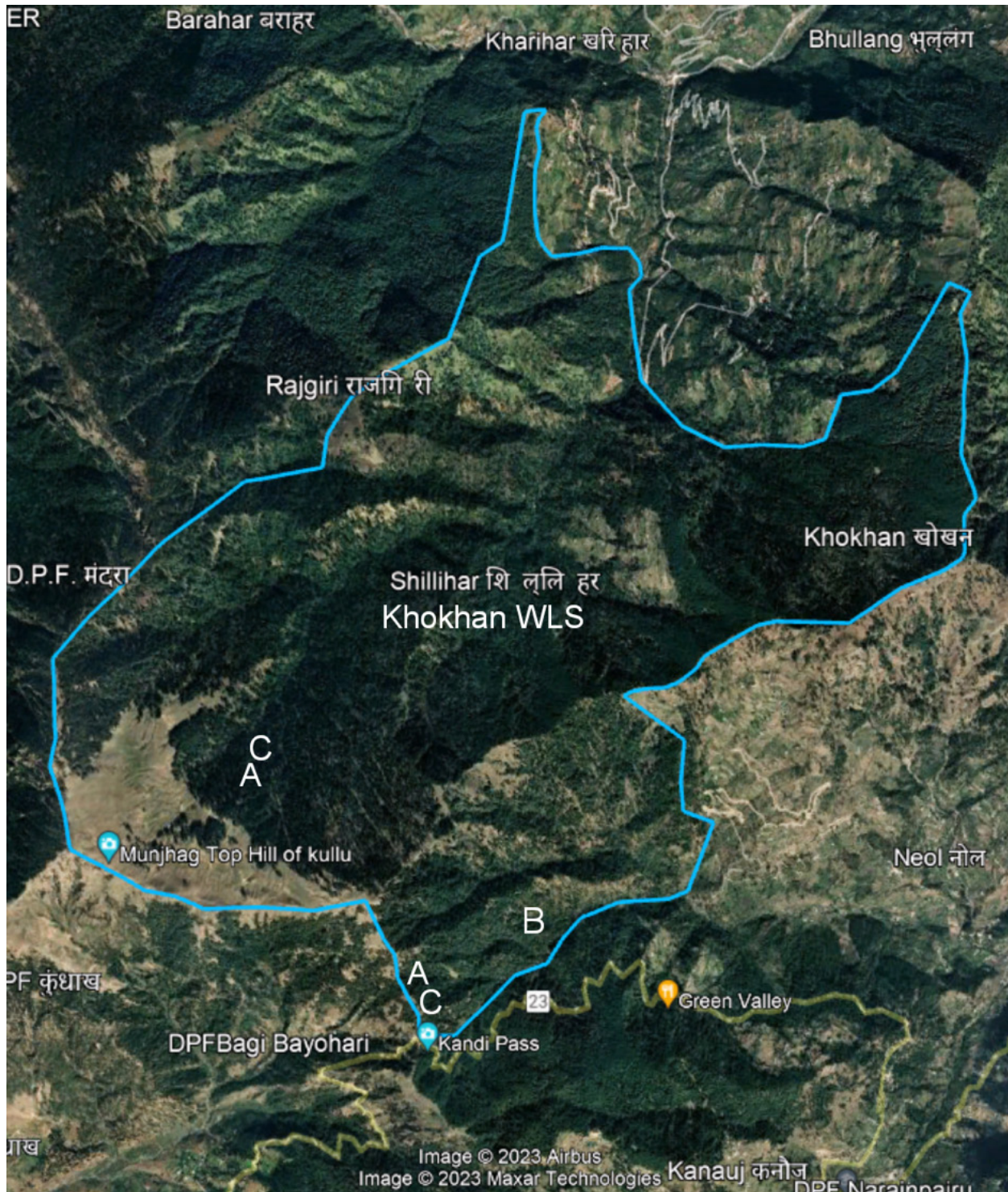


Image 1. Khokhan Wildlife Sanctuary map with approximate locations of species marked as A—*Chamabainia cuspidata* | B—*Debregeasia orientalis* | C—*Hydrocotyle himalaica*. Map made using Google Earth Pro.

mixed in the middle part of the stem. Male flowers subsessile; perianth lobes 3–4, equal or subequal, connate below, gibbous, mucronate, 1.5–3.5 mm long, puberulous or hairy above; stamens 3 or 4, exserted,

pistillode rudimentary, clavate. Female flowers sessile, compactly aggregated into fascicles of 2–4, embraced by broad ovate, membranous bract; perianth tubular, subcompressed, contracted above, minutely 2–4

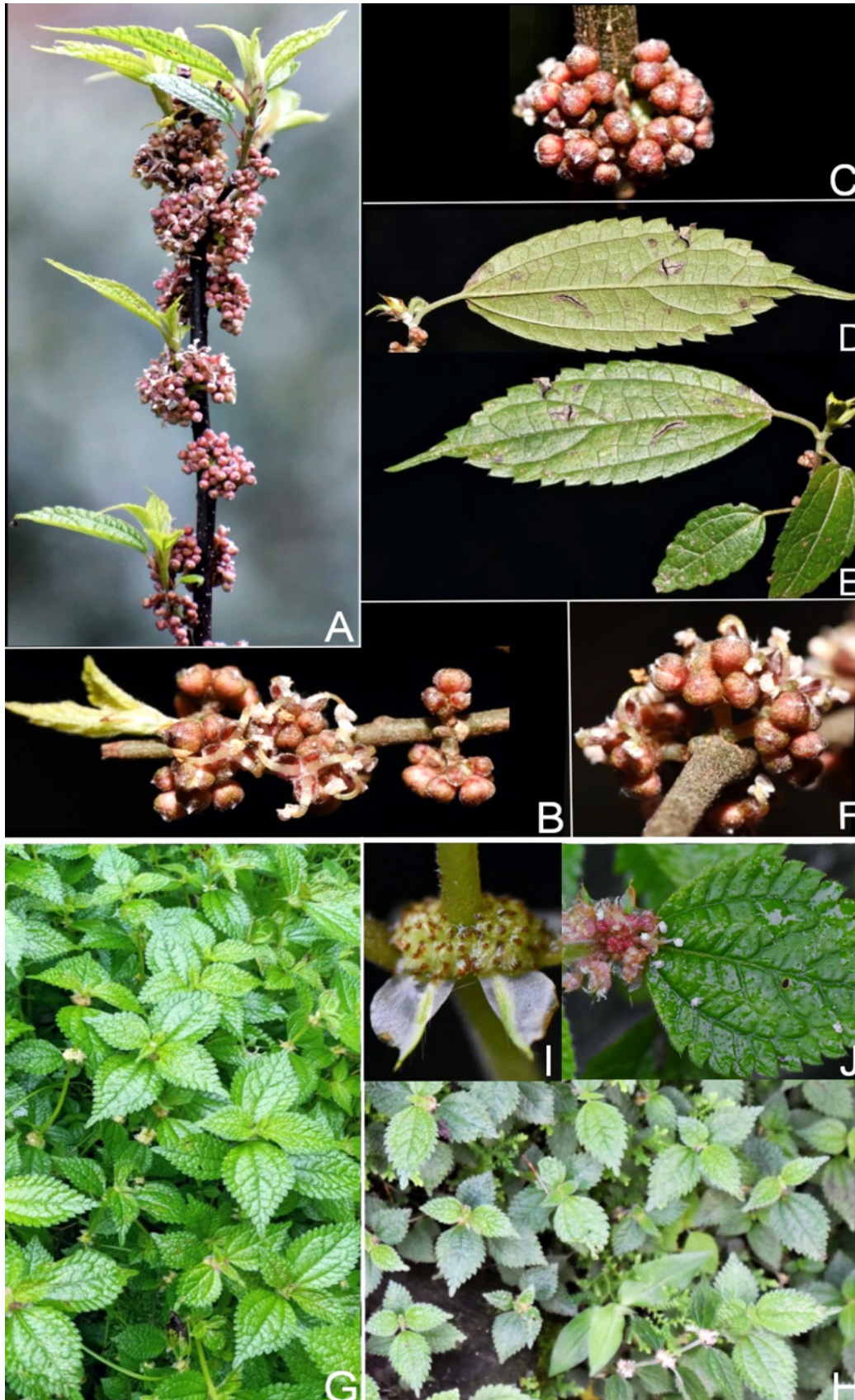


Image 2. A–E—*Debregeasia orientalis* C.J.Chen: A–B—flowering twig | C—buds | D—leaf (dorsal) | E—leaves (ventral) | F—inflorescence | G–J—*Chamabainia cuspidata* Wight: G–H—plant habit | I—infructescence & bracts | J—male inflorescence. © Ashutosh Sharma.

toothed, hirsute, enlarged and thin.

Flowering: July–September; **Fruiting:** August–October.

Habitat: *Chamabainia cuspidata* is found in small patches in shady moist forests, especially along stream courses and moist boulders between 1,900–2,400 m in Khokhan WS in association with *Hydrocotyle himalaica* P.K.Mukh., *Impatiens* spp., *Onychium lucidum* (D. Don) Spreng., *Parochetus communis* Buch.-Ham. ex D. Don, *Rubus macilentus* Cambess, *Sarcococca saligna* (D. Don) Müll.Arg., *Selaginella* sp. and *Girardinia diversifolia* (Link) Friis.

Distribution: India (Arunachal Pradesh, Himachal Pradesh (present work), Meghalaya, Sikkim, Tamil Nadu, Uttarakhand, West Bengal, Assam), Bhutan, China, Indonesia, Myanmar, Nepal, Sri Lanka, Taiwan, and Vietnam.

Specimens examined: 125441 (FRLH), 23.viii.2022, India, Himachal Pradesh, Kullu district, Khokhan WS, stream courses near Munjhag, 2,300 m, coll. Ashutosh Sharma; 5443 (BSS), 23.viii.2022, India, Himachal Pradesh, Kullu district, Khokhan WS, stream courses near Munjhag, 2,300 m, coll. Ashutosh Sharma; s.n. (K000741409) (K), x.1852, India, Neelgherry, coll. Wight; 4592(K000741410) (K), 1821, Nepal, coll. N. Wallich; 7101 (TAIF8259)(TAIF), 01.vii.1908, Taiwan, coll. Takiya Kawakami and Ushinosuke Mori.

Note: Recently the species was also observed at McLeod Ganj (near Bhagsu Nag waterfall), Dharamshala, Kangra district, Himachal Pradesh by the first author (AS).

Debregeasia orientalis C.J. Chen Novon 1: 56 (1991); Murti & Pusalkar in Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. 1: 517 (2020); Murti & Pusalkar, Fl. Ind. 24: 32 (2022). (Image 2, A–F).

Holotype: China, southeastern Sichuan: Nanchuan Co., Sanquan, Longguxi, 550 m, alongstreams, 27.iii.1957, G.F. Li 60238 (PE); isotype (SZ).

Shrubs 1–3 m high, generally dioecious, rarely monoecious; branchlets slender, reddish, sparsely pubescent with usually fine appressed hairs or subglabrous. Leaf blade adaxially dark green, oblong to linear-lanceolate, rarely linear, 5–18(–24) × 1–2.5(4) cm, papery or thinly so, 3-veined at base, lateral ones straight, reaching to middle, secondary veins 3–5 on each side from middle of leaf, anastomosing along margins, abaxial surface thinly greenish-grey, sparsely appressed pubescent on distinct veins, adaxial surface sparsely appressed strigose, often rugose, base rounded or broadly cuneate, margins finely serrulate or denticulate, apex acuminate; petioles 0.5–2.5 cm

long, pubescent; stipules oblong-lanceolate, 5–10 mm long, 2-cleft. Inflorescence on previous years' branches, usually appearing before foliage, axillary, solitary or 1–2 times dichotomously branched, 0.5–1.5 cm long, with up to 1.5 cm long peduncle, appressed pubescent; flowers in dense, globose clusters/glomerules, 3–5 mm across; bracts membranous, obovate or triangular, 0.2–1 mm long. Male flowers: short pedicellate; perianth lobes (3–)4, triangular-ovate, acute, sparsely puberulent; stamens (3–)4; rudimentary ovary sessile, obovoid. Female flowers: sessile, obovoid, 0.7–2 mm across; perianth tube membranous, glabrous, 4-denticulate. Fruit orange, of fleshy perianths, enclosing ovoid, subcompressed, 0.5–1 mm long achene.

Flowering: March–May; **Fruiting:** June–August.

Habitat: *Debregeasia orientalis* is found in shady moist forests especially along ravines between 1,700–2,000 m in Khokhan WS. Common associates of this species are *Bergenia ciliata* (Haw.) Sternb., *Debregeasia saeneb* (Forssk.) Hepper & J.R.I. Wood, *Drepanostachyum falcatum* (Nees) Keng.f., *Machilus duthiei* King ex Hook.f., *Neolitsea pallens* (D. Don) Momiy. & H. Hara, *Polystichum squarrosus* (D. Don) Fée, *Rubus macilentus* Cambess. and *Urtica* sp.

Distribution: India (Himachal Pradesh (present work), Uttarakhand, northeastern India), Bhutan, China, Japan, Nepal, and Taiwan.

Specimens examined: 125701 (FRLH), 06.iv.2023, India, Himachal Pradesh, Kullu district, Khokhan WS, Khanogi Nallah, 2,000 m, coll. Ashutosh Sharma & G.S. Goraya; 5450 (BSS), 06.iv.2023, India, Himachal Pradesh, Kullu district, Khokhan WS, Khanogi Nallah, 2,000 m, coll. Ashutosh Sharma & G.S. Goraya; 45257 (BM014617834) (BM), 22.vii.2023, China, Yunnan Province, Jiangchuan, 1,950–2,150 m, coll. David Edward Boufford, Jian-Ling Guo, Lin Su, Xin Yu.

Hydrocotyle himalaica P.K. Mukh., Indian Forester 95: 470 (1969); P.K. Mukh., R. Manik. & Murug. in Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. 1: 623 (2020). *Hydrocotyle podantha* Molk. in Karthik., Sanjappa & Moorthy, Fl. Pl. India 1: 111 (2009). *Hydrocotyle javanica* Thunb. var. *podantha* C.B. Clarke in J.D. Hooker Fl. Brit. India 2: 668. (1879) (Image 3).

Holotype: India, Khursiong, 1,445 m, 24.ix.1884, C.B. Clarke 35825 A (CAL0000015439) (CAL!).

Decumbent, creeping herbs; stem 10–45 cm long, ferruginous tomentose with dark purple-brown hairs. Leaves simple, alternate, petiolate, stipulate; petiole 2.5–15 cm long, tomentose; lamina orbicular or reniform, 2–8 cm in diameter, obtuse, repand crenate, shallowly

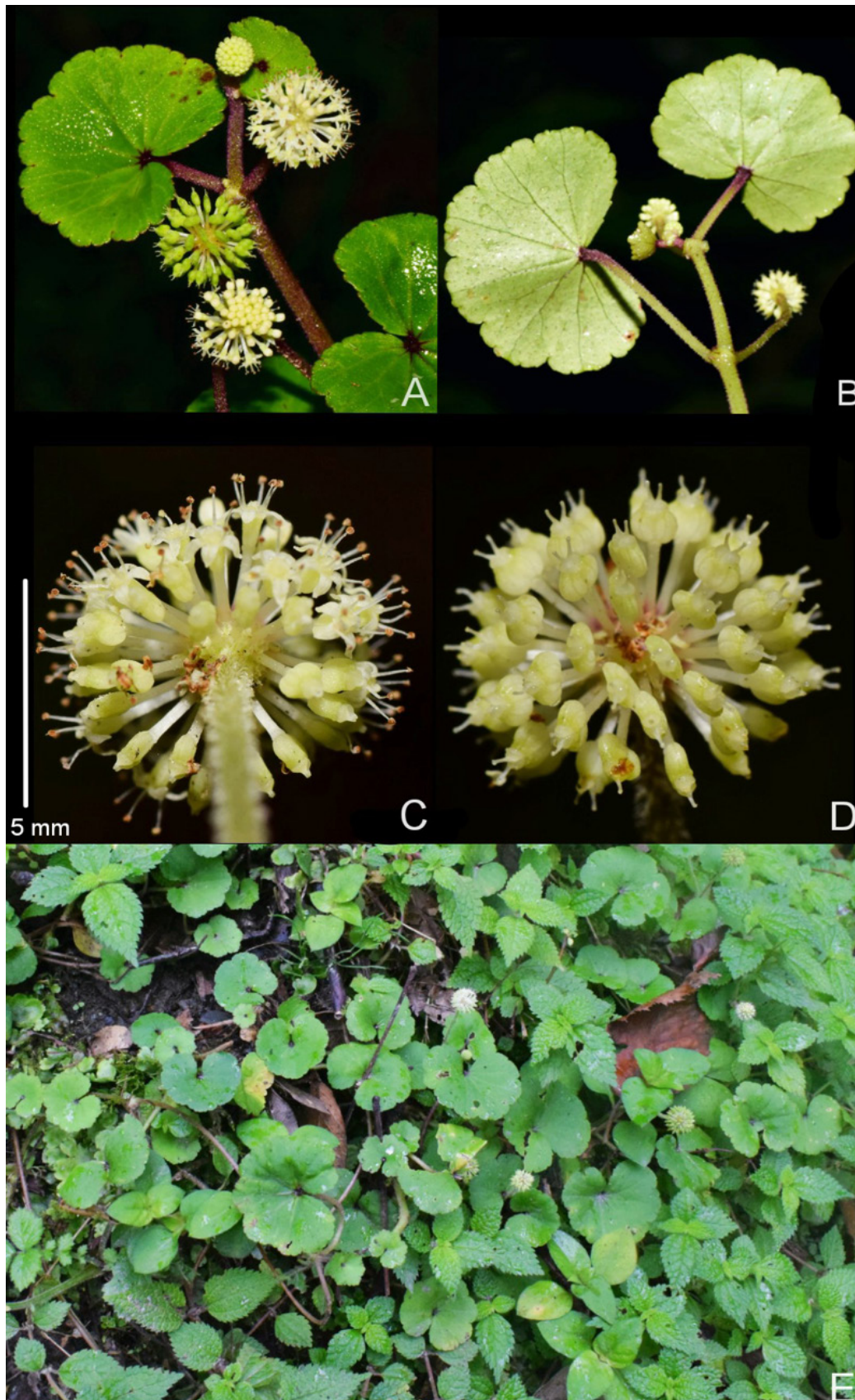


Image 3. *Hydrocotyle himalaica* P.K.Mukh: A—flowering twig & leaves (ventral view) | B—leaves (dorsal view) | C—inflorescence | D—inflorescence | E—plant habit (growing with *Chamabainia cuspidata* and others). © Ashutosh Sharma.

5–7 lobed, lobes rounded, sinus wide, chartaceous, both surfaces sparsely hirsute; main nerves 9, raised on ventral surface, rough and bristly; stipules opposite, 2–3 mm long, ovate, membranaceous. Inflorescence solitary, simple, umbellate, densely capitate in flower, about 40 flowered, 1.4 cm in diameter; peduncle leaf opposed, 3–7 cm long, ferruginous. Flowers 1.5–1.7 mm long, bisexual; pedicels 0.5–0.7 cm long, puberulous. Calyx 5-lobed, minute, ± 1 mm long, hairy outside. Corolla polypetalous, petals 5, white to pale yellowish, 1–1.3 mm long, triangular, membranaceous, apex slightly incurved, base broad. Stamens 5, ± 1.7 mm long, exceeding the petals, anthers yellow, dorsifixed, bilobed. Ovary 2-celled, style 1 mm long, bifid; stigma obtuse. Fruit brown to purplish-red, sub-orbicular, 1×1.5 –2 mm, broader than long, primary ridge indistinct.

Flowering: July–September; **Fruiting:** August–September.

Habitat: *Hydrocotyle himalaica* is found growing in moist evergreen forests especially in shaded damp areas between 1,800–2,100 m in Khokhan WS. Common associates of this species include *Bistorta amplexicaulis* (D. Don) Greene, *Chamabainia cuspidata* Wight, *Hydrocotyle javanica* Thunb., *Lysimachia debilis* Wall., *Oplismenus burmanni* (Retz.) P. Beauv., *Potentilla indica* (Andrews) Th. Wolf, *Sanicula elata* Buch.-Ham. ex D. Don, *Selaginella* sp. and *Viola canescens* Wall.

Distribution: India (Arunachal Pradesh, Assam, Himachal Pradesh (present work), Meghalaya, Sikkim, Darjeeling), Bhutan, China, Myanmar, and Nepal.

Specimens examined: 125442 (FRLH), 30.vii.2022, India, Himachal Pradesh, Kullu district, Khokhan WS, Kandi, 1,900 m, coll. Ashutosh Sharma; 5440 (BSS), 30.vii.2022, India, Himachal Pradesh, Kullu district, Khokhan WS, Kandi, 1,900 m, coll. Ashutosh Sharma; 35825 A (CAL0000015439) (CAL), India, Khursiong, 1,445 m, 24.ix.1884, C.B. Clarke; s.n. (MW0743359) (MW), 25.ix.2009, Nepal, Mustang Prov., Larjung village, 2,400 m, coll. A. Sukhorukov & A. Konstantinova.

Note: Recently, the species was also observed at McLeod Ganj (near Bhagsu Nag waterfall), Dharamshala, Kangra district, Himachal Pradesh by the first author (AS).

REFERENCES

- Aswal, B.S. & B.N. Mehrotra (1994). *Flora of Lahaul-Spiti*. Bishen Singh Mahendra Pal Singh, Dehradun, 761 pp.
- CEPF (2023). Biodiversity Hotspot maps. Conservation International Foundation. Published on the internet; <https://www.cepf.net/our-work/biodiversity-hotspots/himalaya>. Accessed 25 August 2023.
- Chowdhery, H.J. & B.M. Wadhwa (1984). *Flora of Himachal Pradesh, Analysis Vols. 1–3*. Botanical Survey of India, Calcutta, 860 pp.
- Collett, H. (1921). *Flora Simlensis: A Handbook of the Flowering Plants of Simla and the Neighbourhood*. Thacker Spink and Co., Calcutta, 652 pp.
- Dhaliwal, D.S. & M. Sharma (1999). *Flora of Kullu District, Himachal Pradesh*. Bishen Singh Mahendra Pal Singh, Dehra Dun, India, 744 pp.
- Karthikeyan, S., M. Sanjappa & S. Moorthy (2009). *Flowering Plants of India: Dicotyledons Volume 1 (Acanthaceae - Avicenniaceae)*. Botanical Survey of India, Kolkata, 111 pp.
- Kaur, H. & M. Sharma (2004). *Flora of Sirmour (Himachal Pradesh)*. Bishen Singh Mahendra Pal Singh, Dehra Dun, 770 pp.
- Mao, A.A. & S.S. Dash (2020). *Flowering Plants of India: An Annotated Checklist (Dicotyledons). Volume 1–2*. Botanical Survey of India, Kolkata, 970 pp, 705 pp.
- Nair, N.C. (1977). *Flora of Bashahr Himalayas*. International Biosciences Publishers, Hissar, Madras, India, 360 pp.
- Pusalkar, P.K., A.A. Mao & P. Ingle (2022). *Flora of India. Volume 24. Urticaceae – Ceratophyllaceae*. Botanical Survey of India, Kolkata, 688 pp.
- Sharma, A. (2023). *Plants of Khokhan Wildlife Sanctuary, Kullu district, Himachal Pradesh*. M.Sc. Thesis, The University of Trans-Disciplinary Health Sciences and Technology, xi + 168 pp.
- Singh, H. & M. Sharma (2006). *Flora of Chamba District, Himachal Pradesh*. Bishen Singh Mahendra Pal Singh, Dehradun, 881 pp.
- Singh, P.B. (2018). *Flora of Mandi District Himachal Pradesh: North West Himalaya*. Bishen Singh Mahendra Pal Singh, Dehradun, India, 723 pp.
- Singh, P., S.S. Dash & B.K. Sinha (2019). *Plants of Indian Himalaya Region. An Annotated Checklist & Pictorial Guide Part I*. Botanical Survey of India, Kolkata, 448 pp.
- Singh, S.K. & G.S. Rawat (2000). *Flora of Great Himalayan National Park, Himachal Pradesh*. Bishen Singh Mahendra Pal Singh, Dehradun, India, 304 pp.
- Sinha, B.K., S.S. Dash & P. Singh (2019). *Plants of Indian Himalaya Region. An Annotated Checklist & Pictorial Guide Part II*. Botanical Survey of India, Kolkata, 863 pp.
- Subramani, S.P., K.S. Kapoor & G.S. Goraya (2014). Additions to the floral wealth of Sirmour District, Himachal Pradesh from Churdhar Wildlife Sanctuary. *Journal of Threatened Taxa* 6(11): 6427–6452. <https://doi.org/10.11609/JoTT.o2845.6427-52>
- Thiers, B. (2023). *Index Herbariorum: A Global Directory of Public Herbaria and Associated Staff*. New York Botanical Garden's Virtual Herbarium. Available from: <http://sweetgum.nybg.org/science/ih/>. Accessed 05 July 2023.



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