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## Rediscovery of *Rubus sikkimensis* Hook. f. from Northeast India and lectotypification of its name

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**Keywords:** Arunachal Pradesh, Himalaya, lectotype, raspberry, Sikkim.

**Summary.** *Rubus sikkimensis* Hook. f. is an endemic species of eastern Himalaya, described from Sikkim by J. D. Hooker in 1849. Since then, the species was never collected from India until its rediscovery from Sikkim in 2019 after a gap of 170 years. Another collection from Tawang, Arunachal Pradesh, India, made by the author in 2021, is reported here as a new distributional record. A detailed description of the species with lectotype designation, photographs, and comparison with allied species are provided to facilitate its easy identification.

## Повторное открытие *Rubus sikkimensis* Hook. f. из Северо-Восточной Индии и лектотипификация его названия

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**Ключевые слова:** Аруначал-Прадеш, Гималаи, лектотип, малина, Сикким.

**Аннотация.** *Rubus sikkimensis* Hook. f. – эндемичный вид Восточных Гималаев, описанный из Сиккима Дж. Д. Хукером в 1849 г. С тех пор этот вид никогда не собирался в Индии и был повторно найден в Сиккиме в 2019 г. после перерыва в 170 лет. Приводится новое местонахождение в округе Таванг (Аруначал-Прадеш, Индия) по сборам автора в 2021 г. Для облегчения идентификации вида приведено подробное описание вида с обозначением лектотипа, фотографии и сравнение с родственными видами.

### Introduction

*Rubus* L. is one of the largest genera of Rosaceae distributed mostly in Northern Hemisphere (Lu, Boufford, 2003). *Rubus* is a very complex genus due to the presence of polyploidy, apomixis, and hybridization. According to Carter et al. (2019), the genus originated in North America and migrated repeatedly to the other continents. The exact number of species is uncertain due to high level of hybridization, but it is estimated that there are

1471 accepted species (POWO, 2023). The genus is classified into 12–15 subgenera (Focke, 1910–1911, 1914; Jennings, 1988; Daubeny, 1996). In India, *Rubus* is represented by 74 species and 6 varieties which are restricted to hilly terrains and are mostly distributed at elevations between 1800 and 2200 m a. s. l. (Gupta, Dash, 2018; Gupta, 2019; Gupta, Kumar, 2023).

During the author's field exploration to Arunachal Pradesh in 2021, an unusual taxon of *Rubus* was collected. After examination of its morphological

characters and study of relevant literature (Hooker, 1878; Long, 1987; Lu, Boufford, 2003; Boufford et al., 2011; Ansari, 2014; Gupta, 2019), it was determined as *R. sikkimensis* Hook. f. (subgenus *Idaeobatus* Focke). Comparison with the species protologue and type specimens confirmed the correctness of determination. During my study of herbarium specimens at Sikkim Himalayan Regional Centre, BSI (BSHC), another specimen of *R. sikkimensis* (R. Gogoi and N. Sherpa 40823) collected in 2019 from Sikkim has been traced. At the same time, the specimen D. S. C. Raju and S. Singh 5680 (BSHC, CAL) cited by Ansari (2014) in his survey of Rosaceae of Sikkim as *R. sikkimensis* is found to belong to *R. moluccanus* L.

*Rubus sikkimensis* was first described by Sir J. D. Hooker (1878) based on his collections made in 1849 from Lachen valley of Sikkim Himalaya (India). Later, it was also recorded from Bhutan and China (Long, 1987; Lu, Bufford, 2003). However, it was never recollected from the territory of India since 1849. Therefore, the collection of this species from Sikkim (R. Gogoi and N. Sherpa 40823) is reported here as a rediscovery of this species after a gap of 170 years, whereas the collection from Tawang (V. Kumar 20917) is a new distributional record for Arunachal Pradesh, India. A detailed description, phenology, field photographs and an image of the type specimen are provided below along with a

comparison of *R. sikkimensis* with its allied species to facilitate its easy identification (Table).

### Materials and Methods

The specimens were collected from Tawang district of Arunachal Pradesh in 2021 and field photographs were taken using Nikon D7500 DSLR camera. Herbarium specimens were made using the standard protocol and deposited at PLP herbarium. Specimens along with dissected floral parts were examined under Olympus SZ61Tr stereo-zoom microscope and identified using relevant literature. The identity of species was confirmed by studying herbarium specimens/images deposited at BSHC, K and P. The lectotype of *Rubus sikkimensis* is designated here according to the International Code of Nomenclature for algae, fungi, and plants (Turland et al., 2018).

### Taxonomic treatment

*Rubus sikkimensis* Hook. f. 1878, Fl. Brit. India 2(5): 336. Fig. 1, 2.

**Lectotype** (designated here): [India] “Sikkim Himalaya, Lachen, 13000 ft, J. D. Hooker s. n.” (K000737947 – image!; isolecto – Sikkim Himalaya, 13000 ft, J. D. Hooker s. n. P03373126 – image!).

Table

Morphological comparison between *Rubus sikkimensis* and allied species

Characters	<i>R. sikkimensis</i> Hook. f.	<i>R. lasiostylus</i> Focke	<i>R. pungens</i> Cambess.	<i>R. thomsonii</i> Focke
Stipules	linear to filiform, 1.0–1.5 cm long	linear-lanceolate, up to 7 mm long	filiform to subulate, up to 7 mm long	divided into 2–3 linear segments up to 6 mm long
Lower surface of leaves	puberulous	densely tomentose	whitish grey tomentose to glabrescent	glabrous
Inflorescences	1–2-flowered in leaf axils	corymbose, 4–6-flowered	3–5-flowered cymes	3–5-flowered in axillary raceme
Lower surface of calyx	densely pubescent with glandular bristles and needle- like prickles	tomentose or villous, deep red	tomentose with needle-like prickles and stipitate glands	densely pubescent to velutinous along margin
Flower	purple to pinkish-red	red	white	pink
Stamens	in two series, 4–7 mm long	in two series, 2–3 mm long	in one series, 6–7 mm long	in more than 2 series, 2–3 mm long
Ovary	puberulous	apex of ovary and base of style densely tomentose, woolly	pilose, style base sparsely pilose	apex of ovary and base of style pubescent

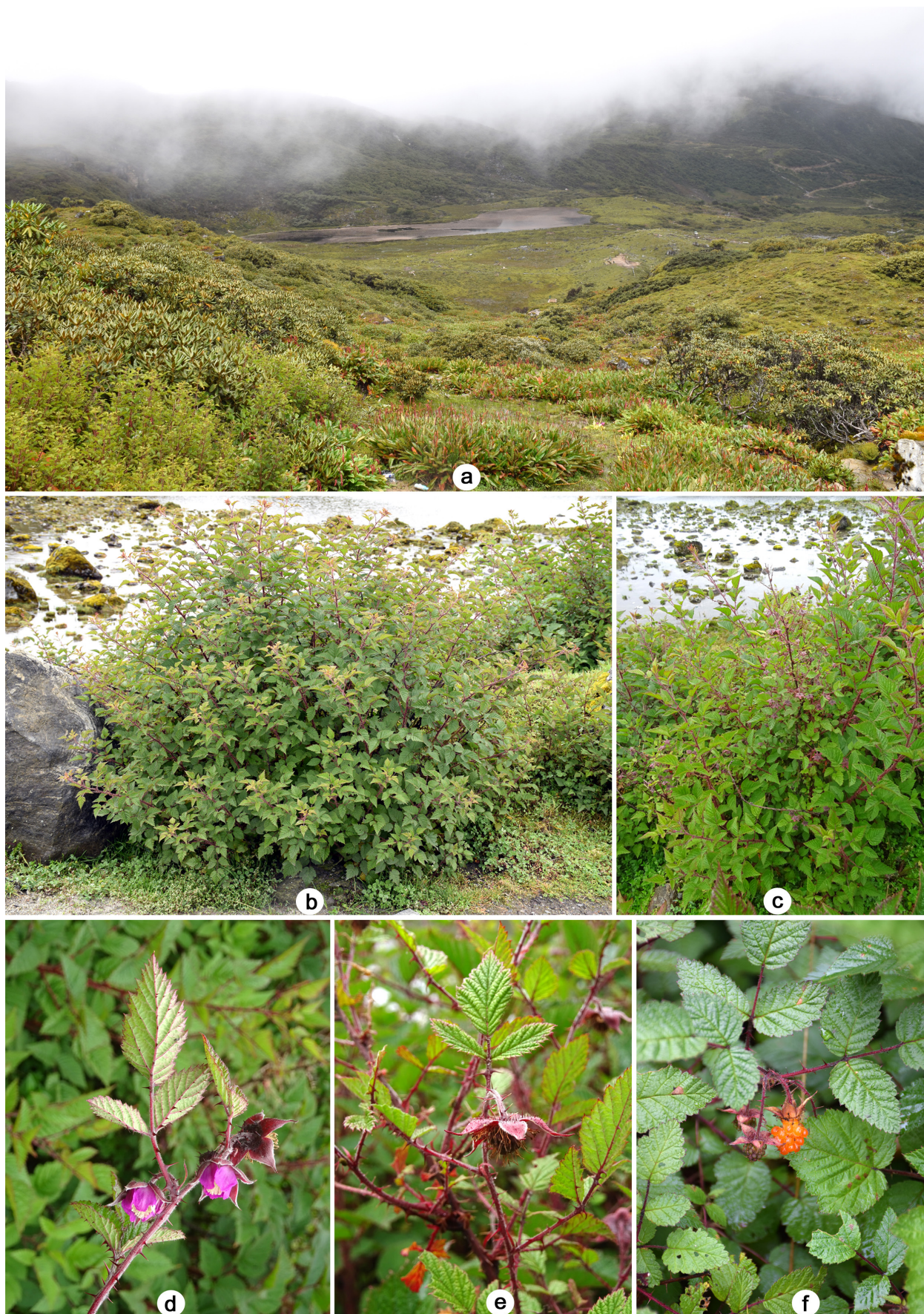


Fig. 1. Plants of *Rubus sikkimensis* Hook. f. in nature: a–c – habitat; d–e – enlarged view of flower's showing reddish flowers and gland-tipped hairs; f – fruits.



Fig. 2. Lectotype of *Rubus sikkimensis* Hook. f. (K000737947). © copyright of the Board of Trustees of the Royal Botanic Gardens, Kew.

Erect to subscandent shrubs, 2–3 m high. Branches and branchlets puberulent with short simple hairs intermixed with purplish red gland-tipped hairs, and dense covered with numerous needle-like prickles intermixed with few larger recurved prickles. Stipules linear-filiform, 1.0–1.5 cm long, acuminate, pubescent with few glandular hairs, persistent. Petioles 2–7 cm long, indumentum same as on branchlets; terminal petiolules 2–4 cm long; lateral leaflets subsessile to sessile. Leaves alternate, pinnately 3-foliolate; terminal leaflets ovate, broadly ovate to rhombic-ovate, sometimes lobulate, 3–8 × 2–5 cm, base weakly cordate, margin irregularly coarsely crenate-dentate, acuminate; lateral leaflets ovate to elliptic-ovate, 2–5 × 1.5–3 cm, base cuneate to obtuse; lower surface puberulous along veins with sparse glandular hairs; upper surface puberulous along veins, intermixed with glandular hairs, glabrescent at maturity. Inflorescences 1–2-flowered in leaf axils. Bracts similar to stipules. Pedicels 1–3 cm long, pubescent with simple and glandular hairs and few needle-like prickles. Flowers up to 3 cm in diameter. Calyx shallowly cupped, 5-lobed; lobes ovate-lanceolate to ovate, 7–9 × 3–6 mm, apex caudate, lower surface densely pubescent with glandular bristles and needle-like prickles, upper surface densely pubescent. Petals 5, obovate, 4–8 × 3–5 mm, base shortly clawed, margin entire, apex acute to subacute, purple to pinkish red. Stamens numerous, in two rows; filaments flattened at base, 4–7 mm long. Pistils numerous; torus convex, hairy, ca. 3 mm long; ovary lunate, ca. 1 mm long, puberulous, style 2–3 mm long, stigma capitate. Fruits subglobose, up to 1.5 cm across, glabrous, with persistent style, orange red to red.

**Phenology.** Flowers in June – August; fruiting in July – August.

**Habitat and Ecology.** Found in open, *Abies–Rhododendron* forest, usually near water channels at an elevation of 3500–4300 m.

**Distribution.** India: Sikkim, Arunachal Pradesh; Bhutan; China.

**Specimens examined.** India: “Arunachal Pradesh, Tawang, 4254 m. 20 VIII 2021. V. Kumar 20917” (PLP!); “Sikkim, North Sikkim, Katao, 3500 m. 13 VIII 2019. R. Gogoi, N. Sherpa 40823” (BSHC!).

**Typification.** While searching for the original material, two specimens were traced deposited at K (K000737947) and P (P03373126). The specimen K000737947 bears the dissected flower as well as the label mentioning the specific location and flower colour by J. D. Hooker that its duplicate from P does not have. Thus, this specimen is selected here as a lectotype for the name *Rubus sikkimensis* in accordance with the article 9.3 of the ICN (Turland et al., 2018).

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#### REFERENCES / ЛИТЕРАТУРА

- Ansari A. A.** 2014. *Rosaceae of Sikkim (including Brachycaulaceae)*. Dehradun: Bishen Singh Mahendra Pal Singh. 391 pp.
- Boufford D. E., Siwakoti M., Pendry C. A.** 2011. *Rubus* L. In: M. F. Watson, S. Akiyama, H. Ikeda, C. A. Pendry, K. R. Rajbhandari, K. K. Shrestha (eds.). *Flora of Nepal*. Edinburgh, U.K.: The Royal Botanic Garden. Pp. 327–346.
- Carter K. A., Liston A., Bassil N. V., Alice L. A., Bushakra J. M., Sutherland B. L., Mockler T. C., Bryan D. W., Hummer K. E.** 2019. Target capture sequencing unravels *Rubus* evolution. *Front. Plant Sci.* 10: 1615. DOI: 10.3389/fpls.2019.01615
- Daubeny H. A.** 1996. Brambles. In: J. Janick, J. N. Moore (eds.). *Fruit breeding: Vol. II. Vine and small fruit crops*. New York, NY: Wiley. Pp. 109–190.
- Focke W. O.** 1910–1911, 1914. Species Ruborum. Monographiae generis Rubi Prodrumus. *Biblioth. Bot. (Stuttgart; E. Schweizerbart, New York, USA)* 17 (72, part I): 1–120 (1910); 17 (72, part II): 121–223 (1911); 19 (83): 224–488 (1914).
- Gupta C.** 2019. *Taxonomic revision of the genus Rubus L. (Rosaceae) in India*. Ph.D. Thesis. West Bengal: University of Calcutta. 255 pp.

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- Gupta C., Dash S. S.** 2018. A new species of *Rubus* (Rosaceae) from Arunachal Pradesh, India. *Blumea* 63: 26–30.
- Gupta C., Kumar V.** 2023. *Rubus dhauladharensis* (Rosaceae), a new species from Himachal Pradesh, India. *Annales Botanici Fennici* 60(1): 265–270.
- Hooker J. D.** 1878. Rosaceae. In: J. D. Hooker (ed.). *The Flora of British India*. Vol. 2. London, UK. Pp. 307–388.
- Jennings D. L.** 1988. *Raspberries and Blackberries: Their Breeding, Diseases and Growth*. London: Academic Press. 230 pp.
- Long D. G.** 1987. *Rubus* L. In: A. J. C. Grierson, D. G. Long (eds.). *Flora of Bhutan*. Vol. 1(3). Edinburgh, UK: Royal Botanic Garden. Pp. 543–562.
- Lu L., Boufford D.** 2003. *Rubus*. In: Z. Wu, P. Raven, D. Hong (eds.). *Flora of China*. Vol. 9. Beijing, China: Science Press; St. Louis, USA: Missouri Botanical Garden Press. Pp. 195–285.
- POWO [2023]. *Plants of the World Online*. Kew: Facilitated by the Royal Botanic Gardens. URL: <http://www.plantsoftheworldonline.org/> (Accessed 22 May 2023).
- Turland N. J., Wiersema J. H., Barrie F. R., Greuter W., Hawksworth D. L., Herendeen P. S., et al.** (eds.). 2018. *International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017*. Glashütten (*Regnum Vegetabile*, vol. 159). DOI: 10.12705/Code.2018