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On the identity and occurrence of *Rubus racemosus* (Rosaceae) in India with note on its neotypification

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Abstract

Rubus racemosus is an endemic species of Rosaceae and the distribution is strictly restricted to southern parts of the Western Ghats. The present paper provides a detailed taxonomic description, colour photographs and discusses the taxonomic affinity of the taxon with its allied taxa. And also, the name *Rubus racemosus* is neotypified here.

Keywords: endemic; neotype; *Rubus*; Rosaceae; southern Western Ghats

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Introduction

Rubus Linnaeus (1) is one of the largest genera in the family Rosaceae comprises about 1546 species (2) distributed mainly in temperate to subtropical regions of the northern hemisphere (3), especially in south-eastern Asia, east Asia and northern part of south America (4). In India, over 75 species of *Rubus* has been reported so far (5), out of which nine were reported to occur in southern parts of the country (6, 7). As a part of the ongoing taxonomic revision of the genus *Rubus* in southern Western Ghats, the authors came across an interesting specimen of *Rubus*, growing in patches of evergreen forests at Kothagiri in the Nilgiri Biosphere Reserve, Tamil Nadu. On careful scrutiny of protologue, other pertinent literature (6-8), protologue and voucher specimens in different herbaria, its identity has been confirmed as *Rubus racemosus* Roxb. (9), an endemic species of the region.

During the study, we came across the specimens of *R. racemosus* are misidentified in various Indian herbaria with its allied taxa *R. niveus* Thunb. Even though both the species shows some morphological similarities (pinnately compound leaf with 3-5 leaflets, white tomentose on abaxial surface, pink coloured flowers etc.) we can differentiate *R. racemosus* from the later by means of the absence of white glaucous on stem, presence of red glandular hairs on stem, branchlets, petiole, petiolule, peduncle, pedicel and sepals, and large flowers upto 1.2 cm long. The existence of overlapping characters (leaf character, flower colour, etc.) between the species and the lack of detailed description of the taxon might have led to this misidentification.

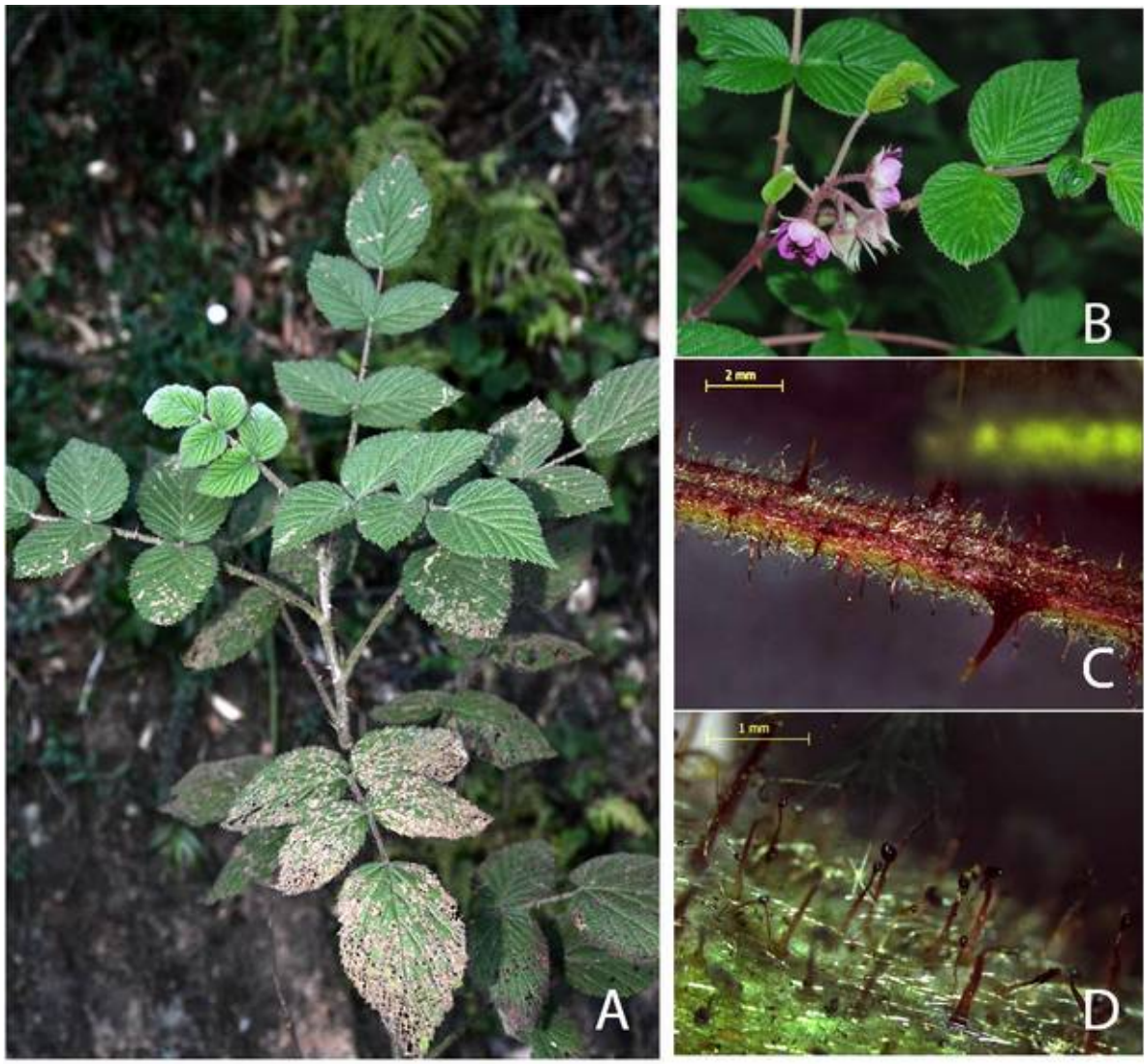

Fig. 1. *Rubus racemosus* Roxb. (**A**) habitat; (**B**) inflorescence; (**C**) glandular hispid on stem; (**D**) glandular hair

Hence, a detailed taxonomic study was done and elaborated description has been prepared based on live collections. While looking on its nomenclature, the need of neotypification of the name *R. racemosus* has been identified and thus a neotype has been designated here for the name as per Art. 9.8 of Schenzhen Code (10).

Taxonomical treatment

Rubus racemosus Roxb., Hort. Bengal. 92. 1814 & Fl. India 2: 519. 1832; Hook. f. Fl. Brit. India 2: 340. 1878; Gamble, Fl. Madras 442. 1919; Manilal, Fl. Silent Valley 99. 1988; Sivar. & P. Mathew, Fl. Nilambur 248. 1997; K.M. Matthew, Fl. Palni Hills 445. 1999; Fyson, Fl. S. Indian Hill Stat. 1: 195. 1932; Fyson, Fl. S. Indian Hill Stat. 2: 148. 1932; Fyson, Fl. Nilgiri & Pulney Hill Top. 2: 97. 1915; Fyson, Fl. Nilgiri & Pulney Hill Top. 1: 134. 1920.

Neotype (designated here):— India, Tamil Nadu, Thriunelvelli District, Naterical, ± 1100 m, 24.9.1967, E. Vajravelu, 29293 (MH00233480 image)!.

Erect or straggling, armed shrub, reaching 1–4 m high. Stem terete, green, densely covered with red-glandular hairs throughout, not thick tomentum; prickles stout, distantly arranged, 1–6 mm long, thick, straight or curved, reddish. Stipules prominent, 1–1.4 cm long, linear or linear-lanceolate, margin entire, apex acute, pubescent on both surfaces. Leaves imparipinnate, petiolate; petioles terete, 1–8 cm long, glandular- pubescent, reddish; prickles thick, c. 3 mm long, reddish. Leaflets 3-5 (7), sub chartaceous, petiolulate; petiolules of lateral leaflets subsessile, terete with reddish glandular hairs and a few prickles; petiolule of terminal leaflets 1.3–3.5 cm long, terete, glandular, reddish hairy with a few prickles. Blades of the lateral leaflets 2–4.5 × 1–2.3 cm long, lanceolate or ovate-lancolate; the terminal leaflets often larger than the lateral ones, often sub-lobulate, 4–6.5 × 1.5–4 cm long, elliptic, elliptic-ovate or lanceolate; base rounded, margins serrated or double serrated, serrations 7–8 mm deep, apex acute, pubescent on both surfaces, white-tomentose beneath, younger leaflets more velvety than mature ones; prickles present on lower surface of veins, reddish, c. 1 mm long; leaflets penniveined with 5–8 pairs of lateral veins, brochidodromous; midrib and

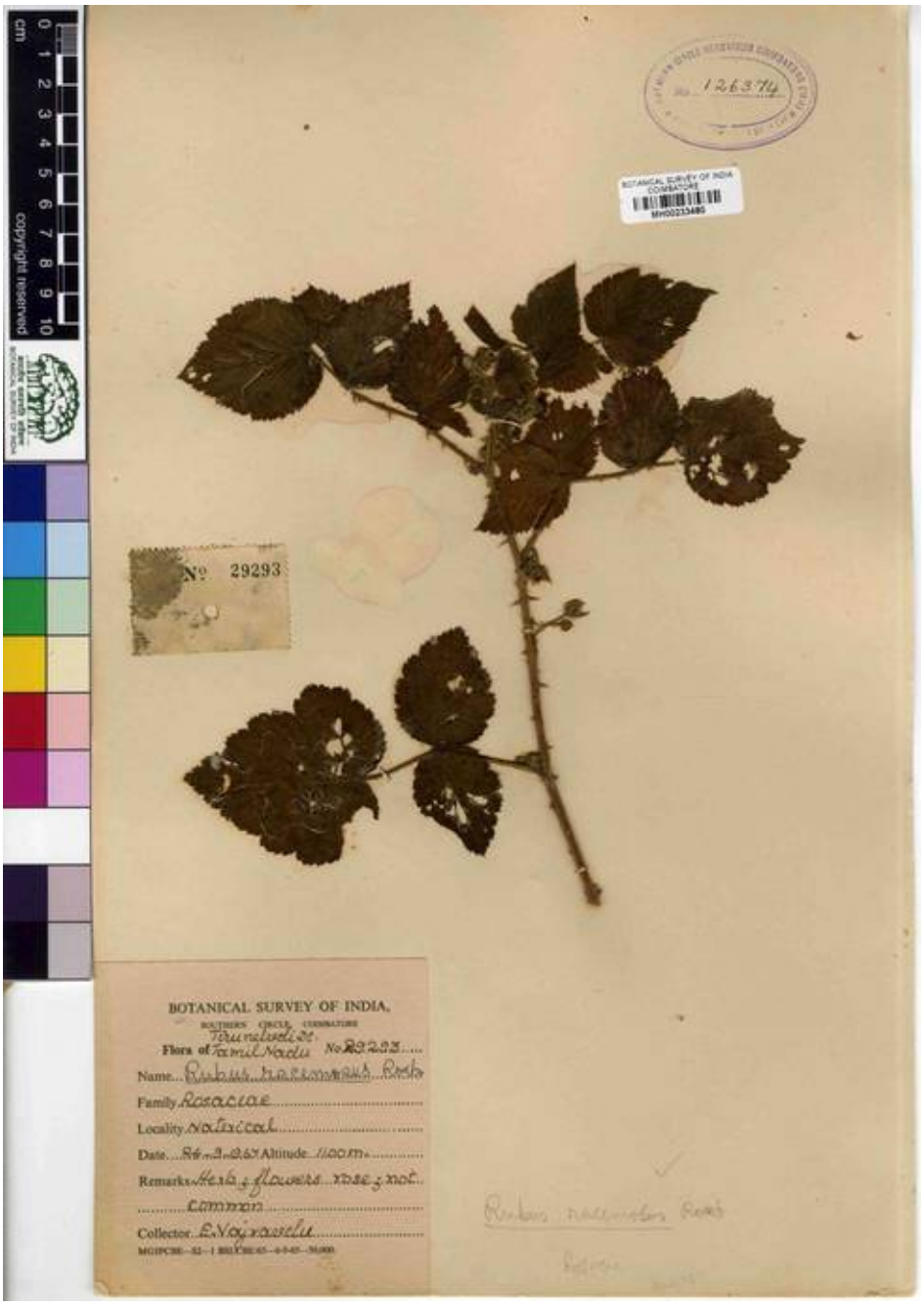

Fig. 2. Digital image of chosen neotype of *Rubus racemosus* Roxb. housed at MH

lateral veins more raised beneath. Inflorescence raceme, axillary or terminal, 3-5 flowered; peduncles 2–3 cm long, terete, densely covered with glandular hairs. Flowers pink or red, bisexual and actinomorphic. Bracts 5–6 mm long; lanceolate or subulate. Pedicels 1–1.5 cm long, terete, reddish glandular hairs. Calyx 5 lobed; lobes free, 1–1.2 × 0.5–0.8 cm long, lanceolate or ovate, margin entire, apex acuminate, glandular pubescent on both surfaces. Petals 5, free, 1–1.2 cm long, as long as the calyx lobes, obovate-truncate, pink or red. Stamens numerous; filaments up to 3.5 mm long, glabrous, creamy with pink at apex; anther 2 celled, c. 1 mm long, brown. Carpels numerous; ovary c. 5 mm long, oblique ovoid, green; style 3–4 mm, pink; stigma entire. Drupelets aggregate, globose, c. 1 cm, white tomentose, purple inside (Fig. 1).

Phenology: December–April.

Habitat and Ecology: *Rubus racemosus* is usually seen in higher elevation between 1100 and 2300 m. It grows in open areas, shola-grassland ecotone, road sides of forest areas and disturbed forest patches.

Distribution: *Rubus racemosus* is endemic to southern Western Ghats (7).

Taxonomic affinity: *R. racemosus* most closely resembles with *R. niveus* Thunb. from south India. Sometimes, at juvenile stage it may look alike *R. ellipticus*, due to the presence of reddish hair on the stem. Previous reports revealed that the colour of petals in *R. racemosus* is mentioned as red. However, during the present study it has been observed that the petals are initially pink but after anthesis, it turns to red. The same kind of changes in petal colour also noticed in *R. odoratus*.

In the flora of the Nilgiri and Palney Hill tops, Fyson (11) mentioned two forms of *R. racemosus*, hairy forms and glabrous forms. But during the revisionary studies, we are failed to locate the glabrous form and our specimens exactly matches with Fyson's hairy forms.

Etymology: The specific epithet, 'racemosus' refers to the majestic appearance of raceme inflorescence, which looks majestic in this species.

Cytology: 2n= 14 (12)

Nomenclature Notes: William Roxburgh (9) proposed the name *R. racemosus* (9) based on his collection from mountains of Mysore and also provided a note on this species in an unpublished manuscript (13). In the protologue, the provenance was quoted as "a native of the mountains of Mysore". In the Flora of British India, Hooker (8) mentioned that, he had failed to trace out authentic specimen's of Roxburgh's plant for reference. Our efforts also to trace out the specimens from BM, BR, CAL, CALI, K, P and RHT herbaria are in vain, and our personal communication with personnel in concerned herbaria confirmed that, no original material referred to *R. racemosus* is extant. Hence, the name warrants the need of neotypification. During the herbarium consultation at MH, we have succeeded to locate some specimens of *R. racemosus* from Tamil Nadu collected by recent researchers. Of which, the specimen collected by Vajravelu in 1967 from Tamil Nadu (MH00233480) is well preserved with flowers and the characters are perfectly fit with the protologue, hence the same is selected here as the neotype of the name according to the ICN Art. 9.8 of Shenzhen Code (10) (Fig. 2).

Specimen examined: India, Kerala, Silent Valley National Park, ± 2200m, 25.3.1982, T. Sabu 10324 (CALI!); India, Kerala, Sispara, 27.2.1983, Philip Mathew 34010 (CALI!); Tamil Nadu, Nilgiris district, Nanjanad, 26.3.1950, G.H. Maduram 93962 (MH!); Carriott Shola, 5.2.1971, J.L. Ellis 37869 (MH!); India,; Naduvattam, Pykkara, 22.11.2007, M. Mohanan & J.V. Sudhakar 120376 (MH!); Mukkurthy National Park, ± 2275m, 23.11.2007, M. Mohanan & J.V. Sudhakar, 120407 (MH!); Mukurthy National Park, ± 2200m, 29.1.2008, K. Althaf Ahmed Kabeer 121610 (MH!); Western Catchment 1, 14.4.2008, M. Mohanan & J.V. Sudhakar 122276 (MH!).

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Competing interest

Authors have no competing interest to declare.

Author's contributions

BN collected the specimen as part of Ph D work, analysed, filed data and wrote initial manuscript. KMP supervised the work and provided technical and academic support. UBT mentored the Ph D work.

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