

NINE NEW SPECIES OF *SPIRAEA* (ROSACEAE) FROM THE HIMALAYAS

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Botanical Survey of India, Howrah

1. ***Spiraea rhamniphylla*** Panigr. et Purohit
sp. nov. (Figs. 1-8)

S. vacciniifoliae D. Don proxima, sed differt ramis validis, petiolis usque ad 10 mm longis, inflorescentiis in ramo primario usque ad 16.5 cm latis, floribus dense ordinatis, petalis ad apicem emarginatis crenatisve.

Holotypus : INDIA. Uttar Pradesh : Kumaon, W. Boogur, 2135 m, May 1848. fl. R. Strachey & J. E. Winterbottom 3 (CAL. Acc. No. 145271).

S. rhamnifolia Wall. Num. List No. 700. 1829 ; *nom. nud.*

This is near to *S. vacciniifolia* in leaf-shape and general appearance but differs from it in having branches strong and stout, petioles up to 10 mm long, inflorescences on primary branch up to 16.5 cm broad, flowers densely arranged, petals notched or crenate at apices.

Shrubs. Branches terete, stout, reddish brown, hoary, older parts becoming glabrous. *Buds* 1.0-2.5 mm long, ovoid with imbricate scales, tomentose. *Leaves* alternate, lamina 1.2-4.5 × 0.6-2.8 cm, ovate to elliptic-lanceolate, thick, rounded or cuneate at base, acute to obtuse at apices, crenate-serrate except at base, rarely entire, glabrous above, glaucous beneath and ± pubescent or glabrous on veins beneath, 3-4 primary veins on each half ; petioles 2.5-8.0 (-10) mm long, slender, tomentose. *Inflorescences* terminal compound corymbs terminating the stout

primary branch, 4-11.5 (-23.0) cm × 0.7-1.65 cm, flat or convex, densely flowered, tomentose ; pedicels 3-5 (-8) mm long, densely tomentose, each pedicel with 1-2 bracteoles. Bracteoles 1-3 mm long, subulate or lanceolate to spatulate, tomentose. Flowers bisexual, 4-5 mm in diam, white. *Floral tubes* campanulate, ± 1 mm long, tomentose outside, and glabrous inside. *Sepals* c. 1 × 1 mm long, ovate-triangular, acute, tomentose outside, glabrous inside, erect in fruiting stage. *Petals* c. 2 × 2 mm, obovate to suborbicular, apices notched or crenate, white. *Stamens* 15-20, 2-3 mm long, equalling or slightly exceeding petals, filaments glabrous, anthers dorsifixed. *Nectar ring* (Disc) conspicuous. *Carpels* 5, free, c. 1 mm long, glabrous except at inner suture. Style 1.0-1.5 mm long, subterminal, stigma capitate. *Follicles* 5, body of follicles 2.0-2.5 mm long, glabrous except at inner suture, bearing style dorsally. *Seeds* 5-8, 4 large + 1 small or 6 large + 2 small or all equally developed, larger ones 1 mm or more long, smaller ones less than 1 mm, linear ellipsoid, smooth.

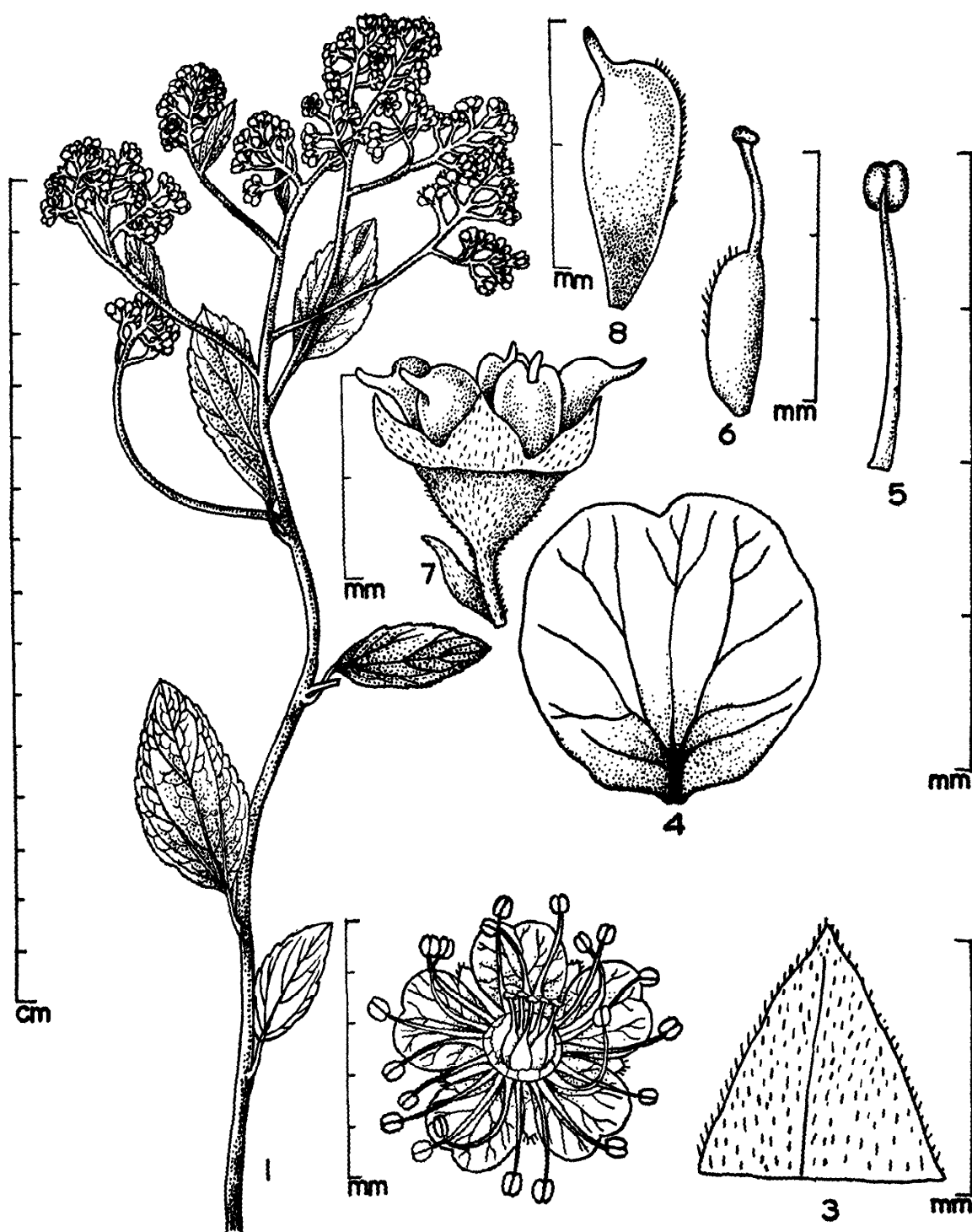
Flowering : May-July. *Fruiting* : July-Sept.

Field note : Shrub ; flowers white.

Distribution : INDIA (Jammu & Kashmir, Himachal Pradesh and Uttar Pradesh).

Ecology : Plants growing on micaceous rocks, limestone cliffs at an altitudinal range of 1300-2135 m.

Specimens examined : JAMMU & KASHMIR : sine prop. loc., H. W. Bellow s. n.



Spiraea rhamniphylla Panigr. et Purohit *sp. nov.*

Figs. 1-8 : 1. A flowering branch. 2. Flower. 3. Sepal. 4. Petal. 5. Stamen. 6. Young carpel. 7. Fruit with five follicles. 8. A single follicle.

(CAL). HIMACHAL PRADESH : Simla, Sudrvey lysium hill, 1830 m, 9 Sept. 1877, fr., J. S. Gamble 4996 c (CAL) ; north Kulu, Beas valley, from Bijoura to the floor of the Rotang pass, 1220-1982 m, *Stoliczka* s. n. (CAL-Acc. No. 145270) ; Simla, Naldhera, 1820 m, 26 June 1887, G. Watt s. n. (CAL-Acc. No. 145266) ; *ibid.*, 1830 m, 19 June 1877, fl., J. S. Gamble 4401 c (CAL). UTTAR PRADESH : Mussoorie, Charleville Road, 2000 m, 2 Aug. 1963, fr., H. Santapau 28553 (CAL) ; Mussoorie, June 1898, fl., Mackinnon s. n. (Cal-Acc. No. 145265) ; hills southeast of Mussoorie 1677 m, May 1895, R. Proudlock s. n. (Cal-Acc. No. 145124 & 145125) ; *ibid.* Landour, *sine lect.*, s. n. (CAL-Acc. No. 145119) ; Mussoorie, July 1869, fl., G. King s. n. (CAL-Acc. No. 145282) ; Garhwal, Birehi-Gohna, 1800 m, 8 June 1958, fl., M. A. Rau 10011 (CAL, BSD) ; Kumaon, Shalma Sarju valley, 3 July 1900, fr., Inayat 24400 (CAL, DD) ; Mussoorie 1830-2135 m, July 1899, fl., J. F. Duthie 22715 (CAL-left hand specimen, DD) ; Mussoorie, 13 July 1870, fl., G. King 8 m (CAL-left hand specimen) ; Mussoorie, 1830 m, 22 Aug. 1982, K. M. Purohit 15 (CAL).

Notes : J. D. Hooker (1878) included *S. rhamnifolia* Wall. Num. List No. 700. 1829, *nom. nud.* as a synonym of *S. vacciniifolia*. But a comparison of Lindley's t. 17 (1840) representing *S. vacciniifolia* D. Don with the microfiche of the Wall. Num. List No. 700 representing *S. rhamnifolia* brings out significant differences between them. We, therefore, segregate a number of the Himalayan specimens matching with Wall. Num. List No. 700, from *S. vacciniifolia* D. Don complex and identify them with *S. rhamnifolia* Wall. Num. List No. 700. 1829, *nom. nud.* Since J. D. Hooker (1878) cited *S. rhamnifolia* Wall. *nom. nud.* merely as a synonym under *S. vacciniifolia* D. Don, the description of the latter cannot be utilized to validate *S. rhamnifolia* Wall. *nom. nud.* [Art. 34.1 (d)]. As such, one is obliged to

describe the Himalayan specimens thus segregated and matched with Wall. Num. List No. 700 as a new taxon (*sp. nov.*). Since Wallich 700 is in K-WALL, not available for detailed analysis and there is no duplicate of this number in CAL, one regrettably abandons the more familiar epithet 'rhamnifolia' in favour of a new epithet, 'rhamniphylla' and the holotype is chosen from among the specimens studied in CAL.

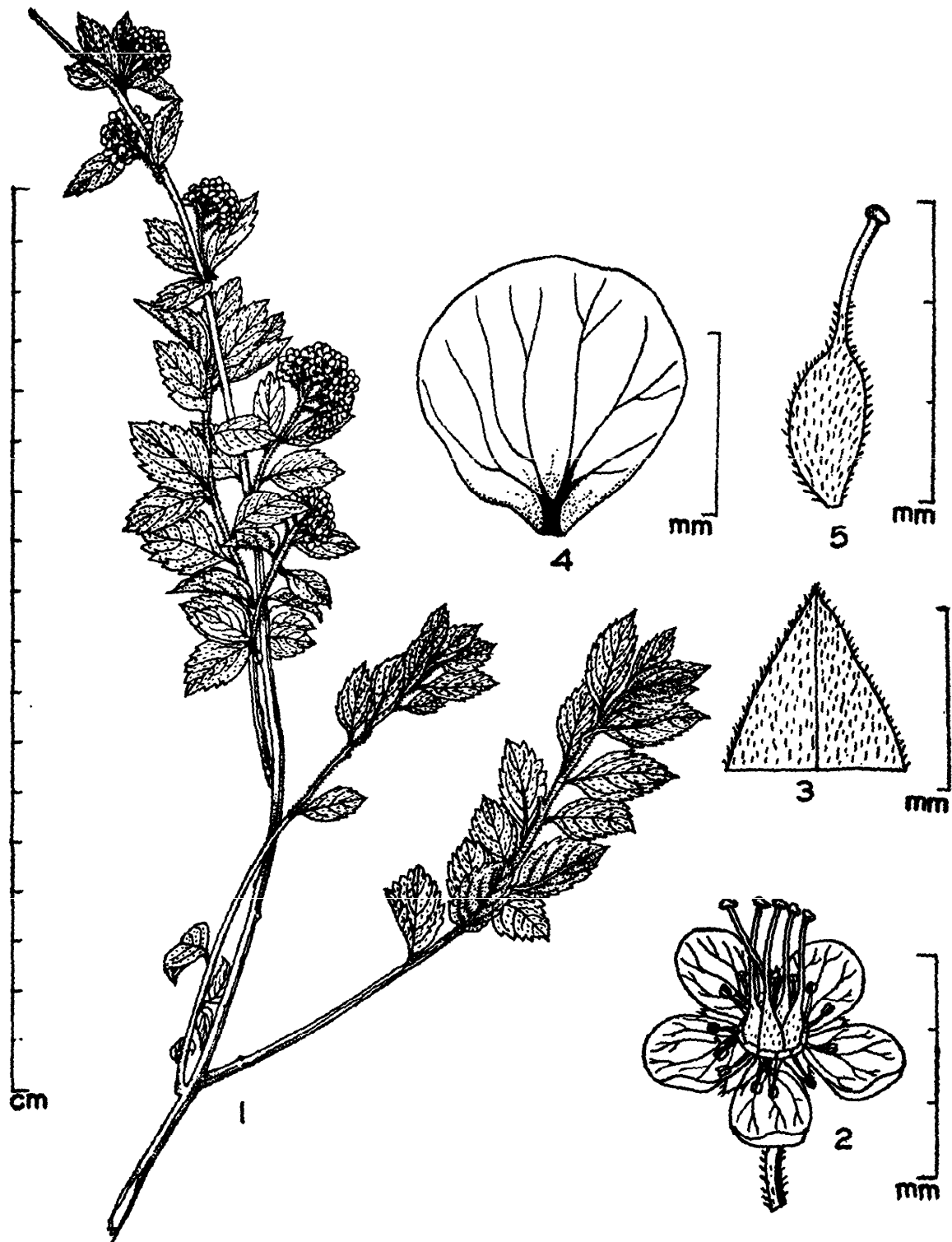
2. *S. nayarii* Purohit et Panigr. *sp. nov.* (Figs. 1-5)

S. tanguensis Purohit et Panigrahi affinis in formis foliorum in ramis florentibus, et in carpellis pilosis, sed differt ramis florentibus usque ad 2.2 cm longis, gracilibus, erectis, inflorescentiis usque ad 2 cm latis, paucifloris, pedicellis 2-3 mm longis.

Holotypus : INDIA. Sikkim : Tiatong above Tallum Samdong, 3660 m, Aug. 1885, fl., G. King's Collector, Gyalu s. n. (CAL-Acc. No. 145139).

It is near to *S. tanguensis* in the leaf-shape of flowering branchlets and in hairy carpels but differs from it in having flower-bearing branchlets up to 2.2 cm long, slender, erect, inflorescences up to 2 cm broad, few-flowered, pedicels 2-3 mm long.

Shrub, older branches arcuate, puberulous, younger part of the vegetative branch and the flower-bearing branchlets pubescent, striated, dioecious. *Buds* 2-3 mm long, ovoid with several exposed imbricate scales, minutely and sparsely pubescent. *Leaves* alternate, lamina 0.9-2.4 × 0.4-1.5 cm, ovate elliptic to oblong in flower-bearing branchlets, serrate-dentate except the lower third (in case of vegetative branch), the upper 1/3rd, 5-9 toothed (in flowering branchlets), rounded to cuneate at base, acute to obtuse at apices, upper surface green, minutely pubescent, lower surface pale, more pubescent, veins 3-4 on each half ; subsessile or petioles 1-2 mm long, pubescent. *Inflorescences* compound corymb on short (1.0-2.2



Spiraea nayarii Purohit et Panigr. sp. nov.

Figs. 1-5 : 1. A flowering branch. 2. Flower. 3. Sepal. 4. Petal. 5. Carpel.

cm long) leafy, slender lateral branchlets, erect and very close to the main branch, 0.7-1.2 cm long, 0.9-2.0 cm broad, tomentose, leafy, a few-flowered, pedicels 2-3 mm long, tomentose; bracteoles c. 2.0-2.5 mm long, linear-lanceolate, hairy. Flowers (only female flowers seen), c. 3.5-4.0 mm across, red. *Floral tubes* (calyx tubes or hypanthia) campanulate, villous on both exterior and interior surfaces. Calyx lobes $\pm 1 \times 1$ mm, triangular, tomentose outside and glabrous inside, reflexed. *Petals* c. 1.5×1.25 mm, obovate or suborbicular, red, entire, notched at apex. *Stamens* reduced, c. 1 mm long, anthers small, empty. *Disc* crenate-dentate with triangular teeth. *Carpels* 5, 1.5 mm long, villous; style c. 1.5 mm long, basally pubescent, stigma discoid; ovules 7-8, linear-oblong, mature carpels not seen.

Flowering : August.

Field note : Shrub, flowers red.

Ecology : Plant growing at an altitude of 3660 m.

Specimen examined : The type collection only.

This species is named after Dr. M. P. Nayar, a renowned, internationally famous plant taxonomist and phytogeographer of India.

3. ***S. panchananii*** Panigr. et Purohit *sp. nov.* (Figs. 1-7)

S. duthieana Zinserling affinis in dispositione inflorescentiarum in caule, sed differt laminis (sub inflorescentia) $5-6 \times 2-3$ mm, subsessilibus, pedicels 4-6 mm longis, villosis.

Typus : INDIA. Uttar Pradesh : Pithoragarh district, Munsiri, 2400 m, 23 Apr. 1965, N. C. Nair 35541 (BSD).

It is near to *S. duthieana* in the arrangement of inflorescences on the stem but differs from it in having the lamina (below inflorescences) $5-6 \times 2-3$ mm, subsessile, pedicels 4-6 mm long, villous.

Shrub with branches angled, striated, greyish, glabrous. *Buds* c. 2 mm long, ovoid

with 7-8 imbricate scales, minutely pubescent. *Leaves* of flowering branches fascicled in clusters of 5-8 below the inflorescences, obovate-oblong, lamina $5-6 \times 2-3$ mm, entire, cuneate at base, subsessile, pubescent. *Inflorescences* in sessile, umbels or the lower ones sessile corymbs, simple (or sometimes compound), densely hairy, 2-12 (15)-flowered; pedicels 4-6 mm long, densely hairy, slender, erect to drooping, bracteoles 1.0-2.5 mm long, linear-lanceolate, hairy. *Flowers* bisexual, 5-6 mm (7.5 mm) in diam., white. *Floral tubes* campanulate, 1.5-2.0 mm long, c. 2 mm broad, pilose on both exterior and interior. Calyx lobes c. 1.5×1.0 mm, ovate-triangular, pubescent outside, glabrous or scarcely pubescent inside. *Petals* $2.5-3.0 \times 2.0-3.0$ mm, sessile, obovate-cuneate, retuse, or irregularly crenate at apices, white. *Stamens* 15-20, 1.5-2.0 mm long, filaments glabrous, anthers dorsifixed. *Disc* with free notched glands. *Carpels* 5, free, 1.0-1.5 mm long, densely hairy on the outer side above the base and on the inner suture, styles c. 1 mm long, glabrous, stigma swollen, ovules 6-8, pendulous, linear-ellipsoid.

Flowering : April.

Ecology : Plants growing at 2400 m.

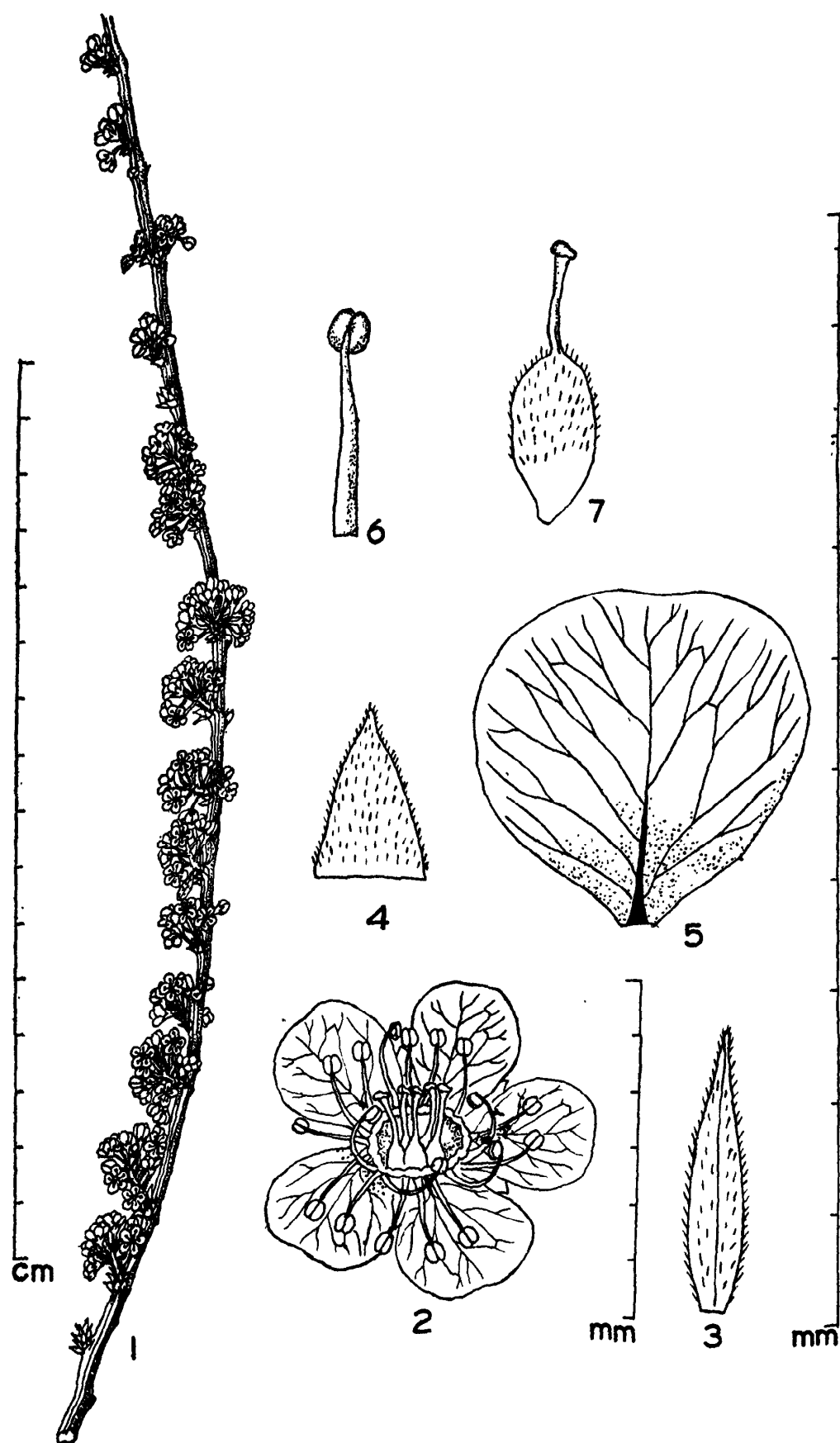
This species is dedicated in honour of late Prof. Panchanan Maheshwari, F.R.S. an eminent botanist and world famous embryologist of India.

4. ***S. tanguensis*** Purohit et Panigr. *sp. nov.* (Figs. 1-5)

Spiraea bellae Sims affinis, sed differt gemmis pubescentibus, laminis usque ad 2.5×0.8 cm, oblongo-ellipticis vel oblanceolatis, integris vel apice 3-6 dentatis, utrinque pubescentibus, carpellis dense pilosis, stylis basi pubescentibus.

Holotypus : INDIA. Sikkim, Tangu, 3965 m, 1 July 1903, fl., F. E. Younghusband s. n. (CAL-Acc. no. 145145).

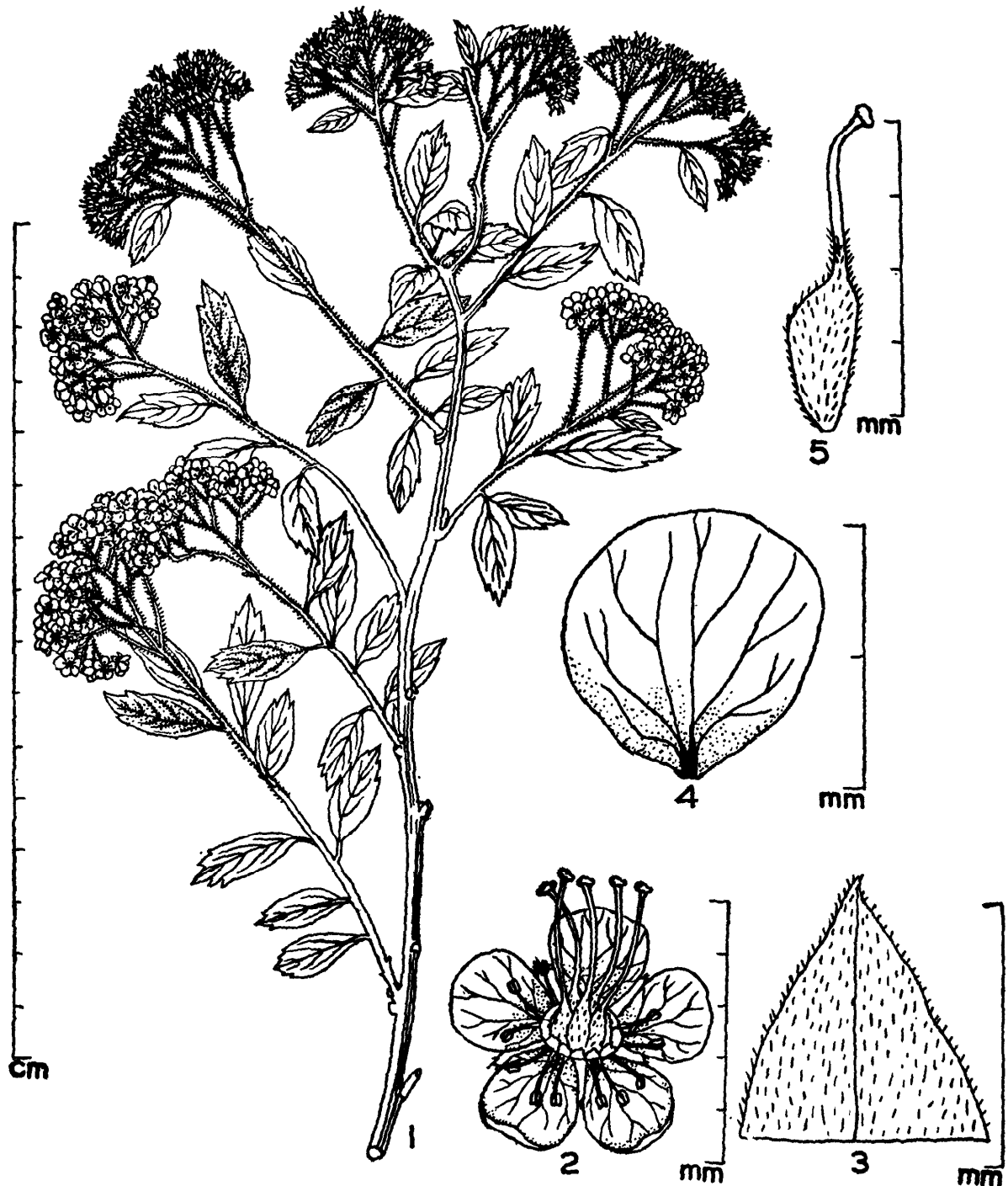
Shrub, older branch zigzag towards apex, glabrous, dark, branchlets pubescent, red-



Spiraea panchananii Panigr. et Purohit *sp. nov.*

Figs. 1-7 : 1. Flowering branch. 2. Flower. 3. Bracteole. 4. Sepal. 5. Petal. 6. Stamen. 7. Carpel.

dish brown, angled-striated, flower-bearing branchlets (1.5-) 2.8-8.2 cm long, (excluding inflorescence), subdioecious. Buds ovoid with imbricate scales, c. 2 mm long, shortly pubescent. Leaves alternate, lamina 1.2-2.5 × 0.4-0.8 cm, oblong-elliptic to oblanceolate, entire or 3-6-toothed at apices, acute at both ends or obtuse at apices, pubescent on both



Spiraea tanguensis Purohit et Panigr. sp. nov.

Figs. 1-5 : 1. A flowering branch. 2. Flower. 3. Sepal. 4. Petal. 5. Carpel.

surfaces, more so on the veins beneath, lower surface pale, veins 3-4 on each half, raised; subsessile or with petioles 1-3 mm long, pubescent. *Inflorescences* compound corymb on leafy stout lateral branchlets, diverging away from the main stem, (2.0-) 3.2-5.0 cm broad (1.6-) 2.4-3.8 cm long, tomentose, leafy, many-flowered, pedicels 2.5-6.0 mm long, tomentose. *Bracteoles* c. 3 mm long, linear-lanceolate, filiform, hairy, $\pm$ equalling the calyx. *Flowers* (only female flowers seen), 5-6 mm across. *Floral tubes* campanulate, villous on both outside and inside. Calyx lobes $\pm 1 \times 1$ mm, triangular, tomentose outside, and glabrous inside, erect or reflexed. *Petals* c. 2×2 mm, obovate to suborbicular, entire or notched at apex. *Stamens* reduced, filaments 1 mm or more long, shorter than petals, anthers empty. *Nectar ring* (disc) crenate-dentate with triangular scales. *Carpels* 5-6, free, c. 2 mm long, densely hairy, half-enclosed; styles c. 2.5 mm long, subterminal, basally pubescent. *Ovules* 12-15, linear-ellipsoid, less than 1 mm long. Mature carpels not seen.

Flowering : July.

Distribution : Known by the type collection only.

Ecology : A high altitude plant growing at an elevation of 3965 m.

5. ***S. arunachalensis*** Panigr. et Purohit
sp. nov. (Figs. 1-3)

In inflorescentiarum ramificationibus, carpellis villosis, *S. darjeelingensis* Panigrahi et Purohit *sp. nov.* proxima, sed differt foliis rhombico-ellipticis ad obovatis, obtusis, utrinque pubescentibus, subsessilibus vel petiolis 1-2 mm longis.

Holotypus : INDIA. Arunachal Pradesh : Kameng District, Morsing, 1500 m, 16 May 1958, G. Panigrahi 15720 (CAL); *Isotypi* CAL.

It is nearer to *S. darjeelingensis* in the branching pattern of inflorescence and villous carpels but differs from it in having leaves

rhombic-elliptic to obovate, blunt, pubescent on both surfaces, subsessile or with 1-2 mm long petioles.

Shrubs 1.5-3.0 m high. *Branches* subterete, grayish brown, glabrescent, young ones minutely tomentose. *Buds* c. 2 mm long, ovoid, tomentose. *Leaves* alternate, lamina 1.7-3.0 $\times$ 0.8-1.5 cm, elliptic-rhombic, cuneate at base, acute at apices, entire below and serrate in the upper half, pubescent on upper surface, adpressed hairy on veins beneath and pubescent on the interveinal region, primary veins 4 on each half, subsessile or with-petioles 1-2 mm long, pubescent. *Inflorescences* terminal compound corymbs, much branched, leafless, 3.5-10.0 (-15.0) cm long, 5.0-9.0 (-13.5) cm broad, hoary-pubescent, terminating on 12-24 cm long branches. *Pedicels* 5-6 mm long, pubescent; bracteoles not seen. *Flowers* not seen. *Floral tubes* (calyx tubes or hypanthia) campanulate, c. 1 mm long, pubescent on both exterior and interior. *Sepals* c. 1×1 mm, ovate-triangular, acute, pubescent outside and glabrous inside, reflexed in fruit. *Petals and stamens* not seen. *Follicles* 5, erecto-parallel, body of follicles 2.0-2.5 mm long, villous, style c. 1 mm, subterminal; stigma swollen. *Seeds* 8-12 (4 large, + 8 small) or all equally developed, larger ones ± 1 mm long, smaller ones ± 0.5 mm long, linear-ellipsoid.

Fruiting : May.

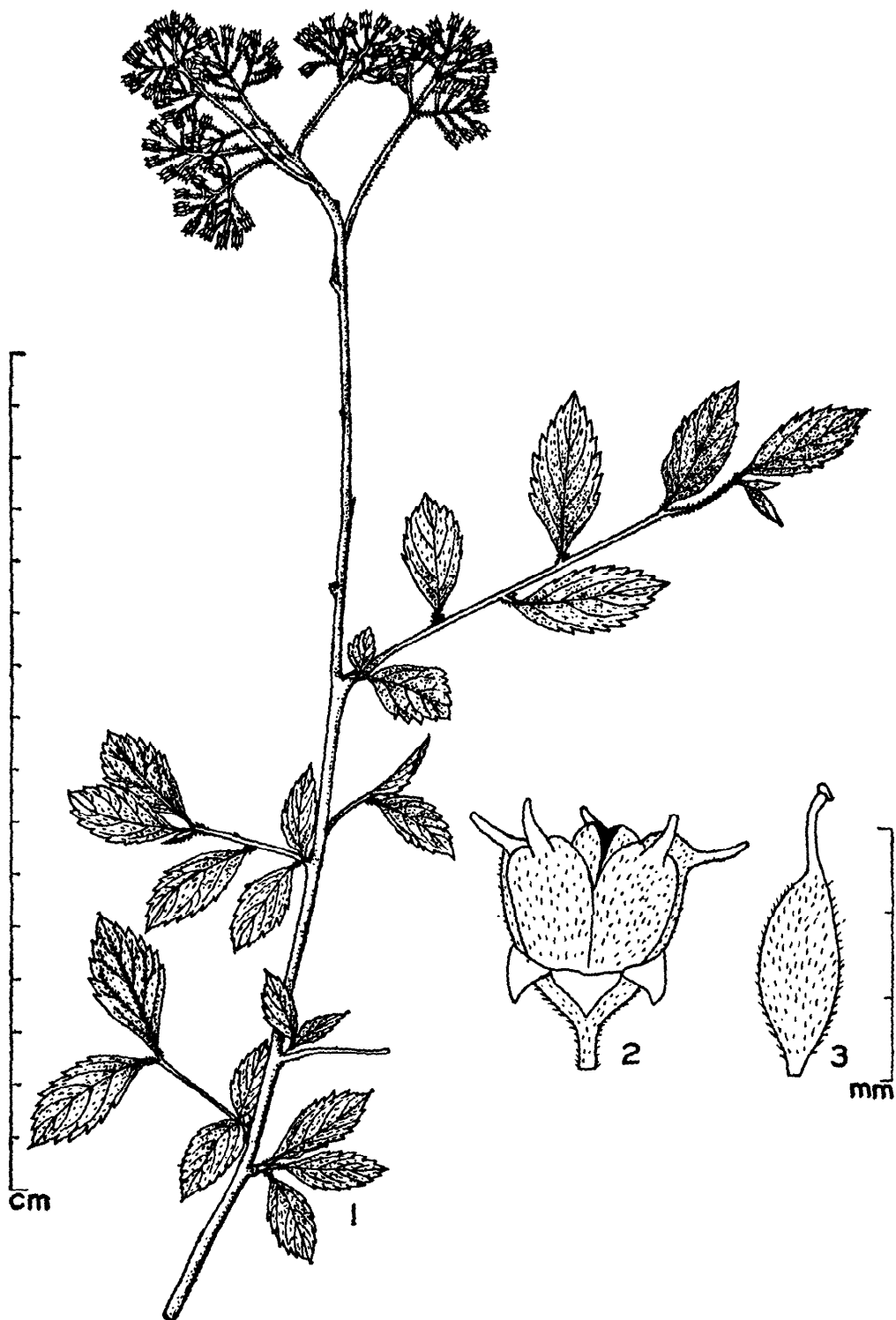
Distribution : INDIA. (Arunachal Pradesh).

Ecology : A high altitude plant growing at 1500-2516 m.

Specimens examined : ARUNACHAL PRADESH : Hill slopes towards the east of Nyukmadong, 2516 m, 19 May, 1957, R. S. Rao 7590 (CAL—4 sheets without accession numbers).

6. ***S. darjeelingensis*** Panigr. et Purohit
sp. nov. (Figs. 1-2)

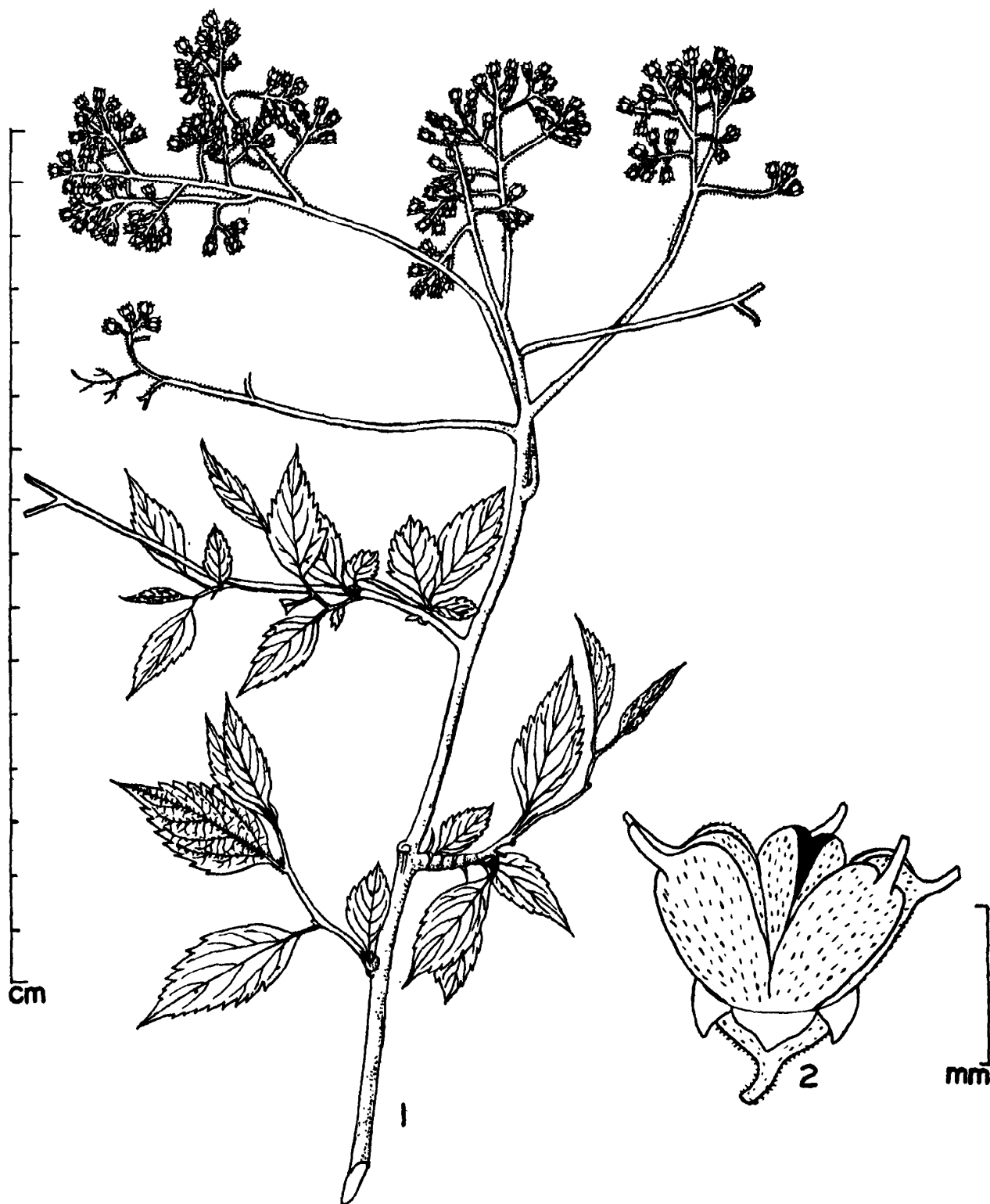
In foliorum formis et inflorescentiis *S. micranthae* J. D. Hooker proxima, sed



Spiraea arunachalensis Panigr. et Purohit *sp. nov.*
Figs. 1-3 : 1. A fruit bearing branch. 2. Fruit with five follicles. 3. A single follicle
[drawn from G. Panigrahi 15720 (CAL)].

differt lamina usque ad 5.8 cm longa,
simpliciter serrata, petiolis 3-5 mm longis,
inflorescentiis aphyllis.

Holotypus : INDIA. West Bengal : Dar-
jeeling, 2135 m, 3 Apr. 1877, fr., J. S.
Gamble 4108 C (CAL).



Spiraea darjeelingensis Panigr. et Purohit *sp. nov.*

Figs. 1-2 : 1. A fruit bearing twig. 2. Fruit with five villous follicles [drawn from J. S. Gamble 4108 C (CAL)].

It is nearer to *S. micrantha* J. D. Hooker in its leaf-shape and inflorescence but differs from it in having leaf-lamina up to 5.8 cm long, simply serrate, petioles 3-5 mm long; inflorescence leafless.

Shrubs. Branches terete, greyish brown, glabrous or young part pubescent. *Buds* minute, pubescent. *Leaves* alternate, lamina 1.8-5.8 × 0.8-1.8 cm, ovate to elliptic, cuneate at base, acuminate at apices, simply serrate except at base, glabrous or pubescent on the veins beneath, young leaves tomentose, primary veins 4-5 on each half; petioles 3-5 mm long, glabrous or pubescent. *Inflorescences* terminal compound corymbs on the long and straight branches of the current year, branched, leafless, 6.5-15.5 cm long, 8.0-17.0 cm broad, pubescent. *Pedicels* 2.0-5.0 mm long, pubescent. *Bracteoles* not seen. *Flowers* not seen. *Floral tubes* (calyx tubes or hypanthia) in fruit shallow cup-shaped, pubescent outside and glabrous inside. *Sepals* ± 1 × 1 mm, ovate-triangular, sparsely pubescent outside and glabrous inside, reflexed in fruit. *Petals and stamens* not seen. *Follicles* 5-6, divergent, fully exposed, body of follicles 1.5-2.0 mm long, villous-pubescent throughout, styles c. 1 mm long, subterminal, stigma swollen. *Seeds* 9-10, c. 1 mm long, 8 large + 1-2 small or all ± equally developed, linear-ellipsoid.

Fruiting : April-May.

Distribution : INDIA. (Darjeeling, Sikkim).

Ecology : Plants growing in temperate climate.

Specimen examined : SIKKIM : Lachen, 2592 m, May 1885, fr., G. King's collector s. n. (CAL).

7. *S. subdioica* Purohit et Panigr. sp. nov. (Figs. 1-6)

Habitu *S. robustae* Hand.-Mazz. proxima sed differt foliis utrinque pubescentibus, uniserratis, subsessilibus vel petiolis 1-2 mm longis, floribus unisexualibus (femineis visis), 3-4 mm in diametro, tubis floralibus intus

glabris, carpellisque omnino pubescentibus.

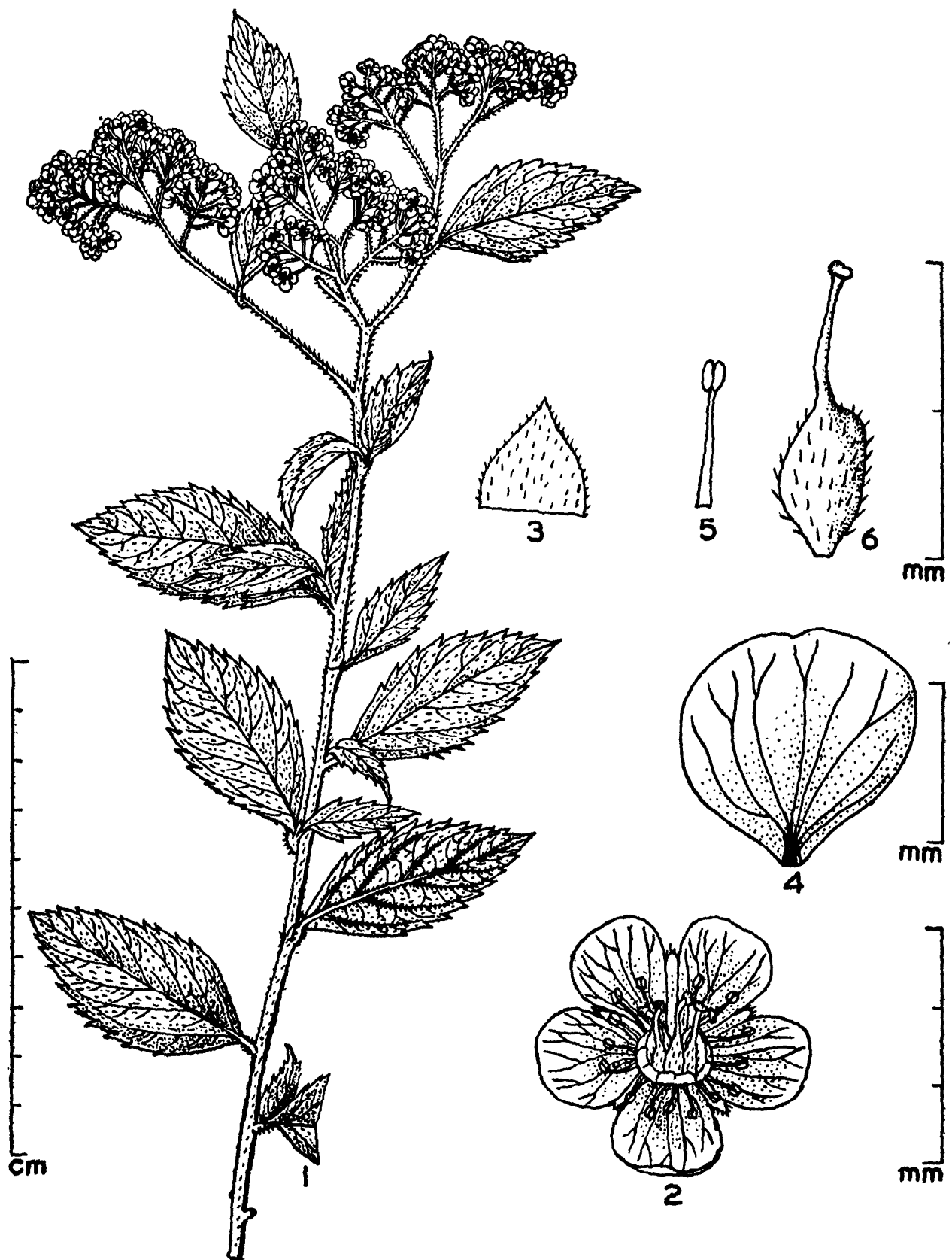
In inflorescentiis et carpellis pubescentibus *S. micranthae* J. D. Hooker similis, sed differt foliis 2.4-5.0 × 0.8-2.4 cm, rhombico ellipticis, apice non acuminatis, utrinque pilosis, sub-acute serratis, sessilibus vel petiolis 1-2 mm longis.

Holotypus : INDIA. Arunachal Pradesh : Kameng dist. Bomdila, 2780 m, 14 Sept. 1964, fl., J. Joseph 39895 (CAL); *Isotypus*—ASSAM.

This species is nearer to *S. robusta* in general appearance but differs from it in having leaves hairy on both surfaces, singly serrate, subsessile or with petioles 1-2 mm long, flowers unisexual (female flowers seen), 3-4 mm in diam., white, floral tubes glabrous inside, carpels pubescent throughout.

It also resembles *S. micrantha* in its inflorescence and pubescent carpel but differs from it in having leaves 2.4-5.0 × 0.8-2.4 cm, rhombic-elliptic, not acuminate at apices, hairy on both surfaces, somewhat sharply serrate, sessile or with short petioles (1-2 mm long).

Shrub. Stem terete, brown, hoary pubescent. *Buds* ± 2 mm long, ovoid, tomentose. *Leaves* alternate, often 2-3 leaves developing at each node, lamina 2.4-5.0 × 0.8-2.4 cm, rhombic-elliptic, cuneate at base, acute at apices, singly serrate, sparsely pubescent above, sufficiently hairy beneath, more so on the veins, primary veins 5-6 on each half; subsessile or with petioles 1-2 mm long, densely pubescent. *Inflorescence* terminal compound corymb, 7.5 cm long, 11.5 cm broad, flat topped, close, tomentose, leafy, terminating a branch of 31 cm long. *Pedicels* 2-5 mm long, tomentose. *Bracteoles* 1.5-2.0 mm long, linear-subulate, ciliate. *Flowers* unisexual (♀), 3-4 mm in diameter, white. *Floral tubes* (calyx tubes or hypanthia) spherical, less than 1 mm long, villous on exterior and glabrous on interior. *Sepals* 0.5-0.75 × 0.5-0.75 mm, ovate-triangular, unicostate, tomentose outside and glabrous



Spiraea subdioica Purohit et Panigr. sp. nov.

Figs. 1-6 : 1. A flowering twig. 2. Female flower with carpels and rudimentary stamens. 3. Sepal. 4. Petal. 5. Reduced stamen. 6. Carpel [drawn from J. Joseph 39895 (CAL)].

inside, erect or spreading or reflexed. *Petals* 1.0-1.5 × 1.0-1.5 mm, obovate, sessile, apices entire or slightly retuse, white. *Staminodes* 15-20, c. 1 mm long, anthers empty. *Nectar ring* (disc) prominent with incurved scales. *Carpels* 5, free, ± 1 mm long, pubescent throughout, style subterminal, c. 1 mm long, stigma swollen. *Seeds* 12-14, 4-6 large + 8 small, or all equally developed, ± 1.0 mm long, ovate-oblong, tapering at both ends, cells of testa ± rectangular with straight walls. Male flowers not seen.

Flowering & Fruiting : September.

Field note : Common shrub ; flowers in corymbs, white.

Distribution : Known by the type collection only.

Ecology : Plant growing at the edge of the forest at an altitude of 2780 m.

8. *S. emarginata* Purohit et Panigr. sp. nov. (Figs. 1-5)

Spiraea gracili Maxim. et *S. vacciniifoliae* D. Don affinis. A priore differt foliis ovato-acutis, pubescentibus in venis infra, pedicellis calycibusque villosis, petalis emarginatis ; ab altera differt laminis usque ad 15 × 6 mm, petiolis 1.0-1.5 mm longis, glabris, inflorescentiis 1.5-2.5 cm latis, tubis floralibus intus extusque villosis, petalis emarginatis.

Holotypus : INDIA. Jammu & Kashmir : Banihal, 1708 m, 14 May 1954, Ram Lakhan 10093 (LWG).

Shrub. Branches slender, flexuous, terete, dark purple, flower bearing branchlets drooping. *Buds* ± 1 mm long, ovoid, pubescent, outer scales glabrous. *Leaves* alternate, lamina 0.8-1.5 × 0.3-0.6 cm, ovate-elliptic to oblong, obtuse to acutish at apex, entire or crenate on the upper half, glabrous or minutely pubescent and green above, glaucous beneath ; petioles 1.0-1.5 mm long, glabrous. *Inflorescences* compound corymbs, hemispherical, 1.0-1.5 cm long, 1.5-2.5 cm broad, many-flowered, pubescent, terminating drooping lateral branchlets of 1.5-4.0 cm

long. *Pedicels* 4-10 mm long, slender, pubescent. *Bracteoles* 1.0-2.0 mm long, linear-lanceolate, pubescent. *Flowers* bisexual, 5-6 mm in diameter, white. *Floral tubes* (calyx tubes or hapanthia) obconical, ± 1 mm long, pubescent on both exterior and interior. *Sepals* ± 1 × 1 mm, ovate-triangular, acute, pubescent on both surfaces, spreading at anthesis. *Petals* 2.0-2.5 × 2.0-2.5 mm, obovate-suborbicular, always emarginate or notched, sessile, white. *Stamens* c. 20, 1.5-2.0 (-2.5) mm long, shorter than or equalling petals, filaments glabrous, slender and flexuous, anthers roundish oblong, dorsifixed. *Nectar ring* (disc) conspicuous, with thin squarish lobes. *Carpels* 5, sessile, glabrous except at inner suture, ± 1 mm long, style apparently terminal, c. 1 mm long, glabrous, stigma swollen. *Follicles* not seen.

Flowering : May.

Field note : Dense shrubs ; flowers white.

Distribution : Known by the type collection only.

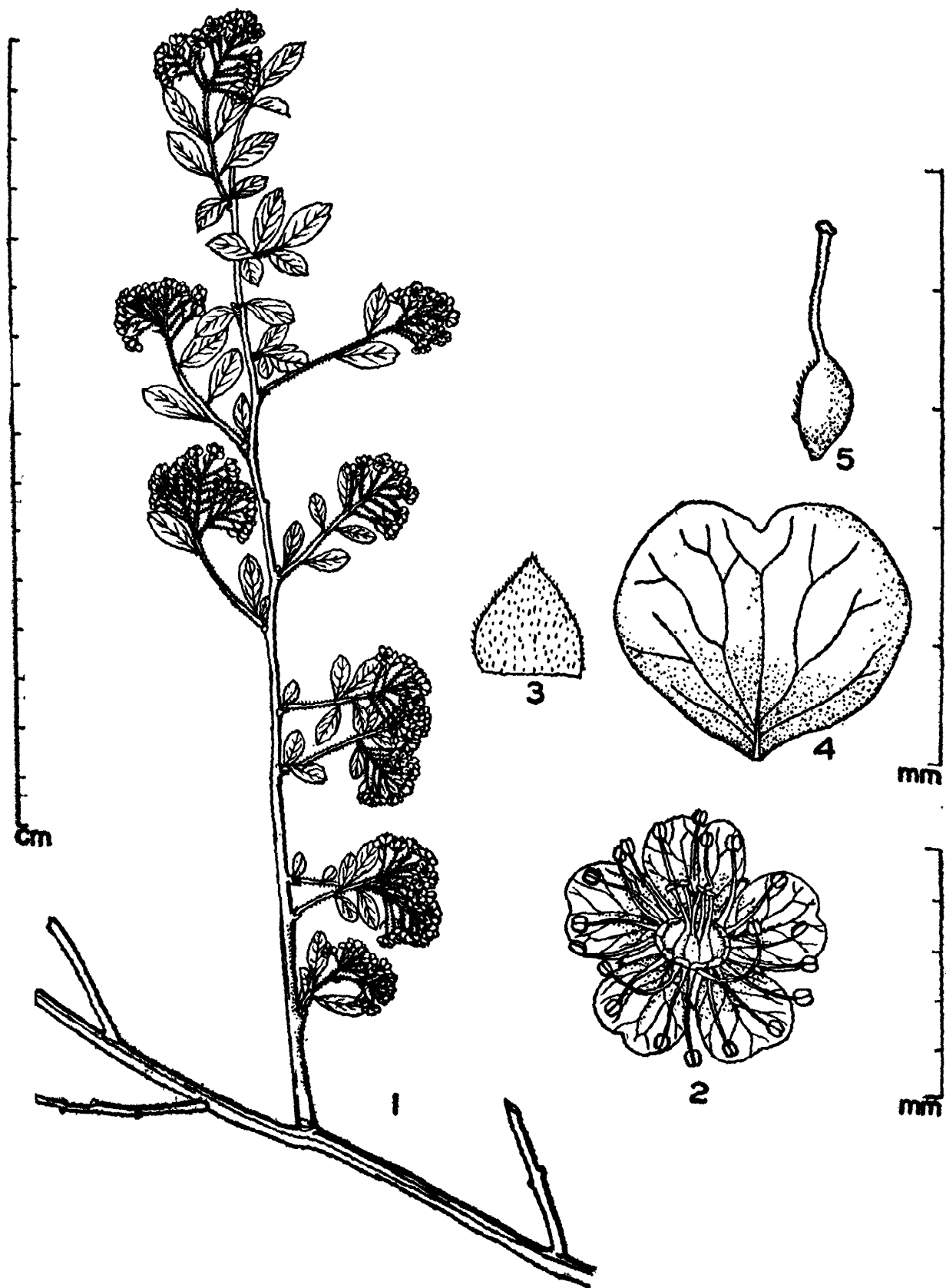
Ecology : Plant growing at an altitude of 1708 m.

9. *S. subrotundifolia* Panigr. et Purohit sp. nov. (Figs. 1-7)

In floribus dioeciis et in habitu *S. bellae* Sims affinis, sed differt plantis pumilis (22-37 cm altis), gemmis pubescentibus, laminis usque ad 3.5 × 2.5 cm, ± ovato-orbicularibus, singulatim serratis, subsessilibus vel petiolis 1-2 mm longis, sepalis subanthesi patentibus.

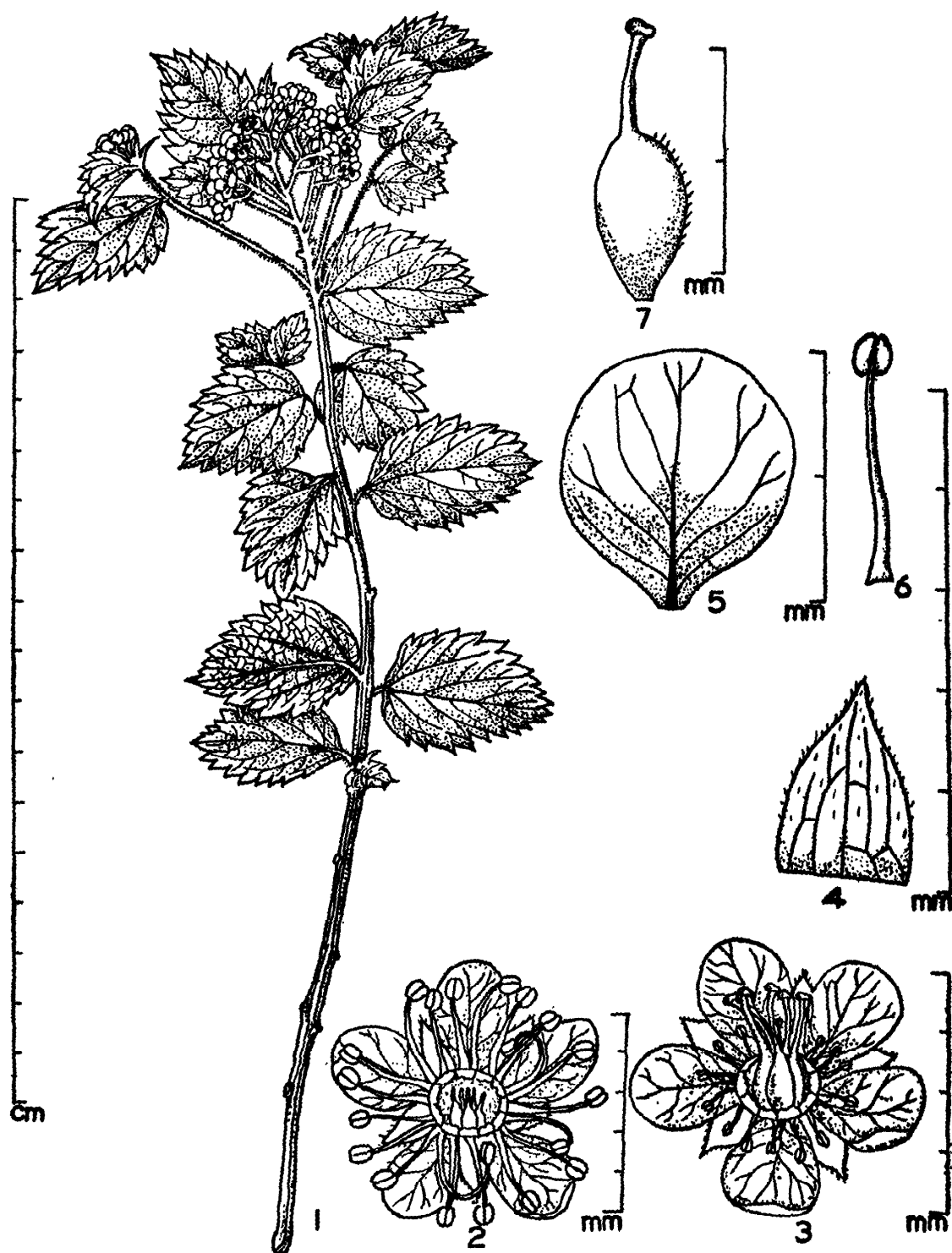
Holotypus : INDIA. Sikkim : Tiamphong, Jongri, Aug. 1887, fl., King's collector s. n. (CAL ♂ + ♀ on the same sheet) ; *Isotypi* : CAL-Acc. nos. 145166 & 145168.

Plants 22-37 cm tall. *Stems* erect, terete, or angled, glabrous or young ones pubescent. *Buds* 1.0-1.5 mm long, ovoid, pubescent. *Leaves* alternate, lamina 1.4-3.5 × 1.2-2.5 cm, ± orbicular, rarely ovate, entire at base, singly serrate on the upper two-thirds, thick,



Spiraea emarginata Purohit et Panigr. sp. nov.

Figs. 1-5 : 1. A flowering twig. 2. Flower. 3. Sepal. 4. Petal. 5. Carpel [drawn from Ram Laxhan 10093 (LWG)].



Spiraea subrotundifolia Panigr. et Purohit sp. nov.

Figs. 1-7 : 1. A flowering twig with female flowers only. 2. Male flower with fertile stamens and reduced carpels. 3. Female flower with fertile carpels and reduced stamens. 4. Sepal. 5. Petal. 6. Stamen. 7. Carpel [drawn from King's collector s. n. (CAL)].

rounded at base, apices acute to obtuse, glabrous or sparsely pubescent only on veins beneath ; primary veins 5-7 on each half, subsessile or petioles 1-2 mm long, pubescent. *Inflorescences* terminal compound corymbs, 1-4 cm long, 2-6 cm broad, leafy, pubescent, many-flowered. *Pedicels* 3-8 (-10) mm long, pubescent. *Bracteoles* c. 3 mm long, lanceolate, pubescent. *Flowers* dioecious, 5-8 mm in diam., white (?). *Floral tubes* (calyx tubes or hypanthia) spherical, 2.0-2.5 mm in diam., villous within and outside. *Sepals* c. 2.0 × 1.5 mm, ovate-acute, pubescent outside and glabrous inside, spreading at anthesis. In ♂ flowers petals obovate, c. 3 × 2 mm, entire ; *stamens* 20-25, c. 3 mm long, equalling or shorter than petals, bowed inwards immersing the anthers in the floral cup, filaments glabrous, anthers dorsifixed. *Nectar ring* (disc) prominent with broad incurved scales, continuous. ♀ flowers smaller (c. 5 mm across), petals c. 2 × 2 mm, ±

orbicular, entire. *Stamens* reduced, shorter than petals. *Carpels* 5, free, 1.5-2.0 mm long, glabrous except at inner suture ; styles c. 1 mm long, subterminal, stigma swollen. *Follicles* 5, body of follicles 2.0-2.5 mm long, erecto-parallel, fully exposed, glabrous except at inner suture. *Seeds* 10-12, linear to ellipsoid, 3 larger + 7-9 smaller, larger ones 1 mm or more, smaller ones less than 1 mm long.

Flowering: July-Aug. *Fruiting*: Sept.-Nov.

Distribution : INDIA (Sikkim).

Ecology : Plants growing at an altitudinal range of 3050-4270 m.

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