

THREE NEW SPECIES OF *AGAPETES* (*ERICACEAE*) FROM INDIA

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Three new species of *Agapetes* (*Ericaceae*) from Arunachal Pradesh, India are described and illustrated with critical comments: *Agapetes arunachalensis* D.Banik & M.Sanjappa (*Agapetes* ser. *Graciles* subser. *Parvifoliae*), *Agapetes dalaiensis* D.Banik & M.Sanjappa (*Agapetes* ser. *Agapetes* subser. *Agapetes*) and *Agapetes siangensis* D.Banik & M.Sanjappa (*Agapetes* ser. *Graciles* subser. *Longifoliae*).

Keywords. *Agapetes*, Arunachal Pradesh, *Ericaceae*, India, new species.

INTRODUCTION

The genus *Agapetes* D.Don ex G.Don (*Ericaceae*) with c.95 species is distributed in Asia as far as the West Pacific (Mabberley, 1997). There are c.34 species in India (Santapau & Henry, 1973). While revising the genus in India, extensive field surveys were undertaken in northeast India along with examination of material in several Indian herbaria. After critical study of all the specimens, the following three species were found to be new.

NEW SPECIES

1. *Agapetes arunachalensis* D.Banik & M.Sanjappa, **sp. nov.** **Fig. 1.**

Agapeti mitrarioidi Hook.f. ex C.B.Clarke valde similis, sed in lobis calycis lineari-lanceolatis tomentosus ad pilosis, pedicellis epedunculatis differt. – Type: Arunachal Pradesh, Lower Subansiri district, Manipaliang, 1600 m, 2 v 2002, D. Banik 27961, fl. (holo CAL!; iso ASSAM!).

Epiphytic bushy shrub, 6–12 cm tall. Lignotubers irregular, 1–1.5 × 1–1.5 cm. *Stems* slender, striate, lenticellate, 3–4 mm in diameter, young twigs brown, hispidulous, hairs up to 2 mm long; perulae 3–6, ovate to linear-elliptic, caducous. *Leaves* compactly spiral, 3–8 mm apart; petioles 1–1.5 mm long, glabrous abaxially, sparsely hispidulous adaxially; lamina ovate-elliptic, 8–15 × 5–8.5 mm, attenuate to obtuse at base, margin obscurely serrate and revolute, apex acuminate, mucronulate, texture coriaceous, surface glabrous, dull above, sometimes scattered scaly beneath; venation brochidodromous, inconspicuous above; secondary veins 3–4 pairs,

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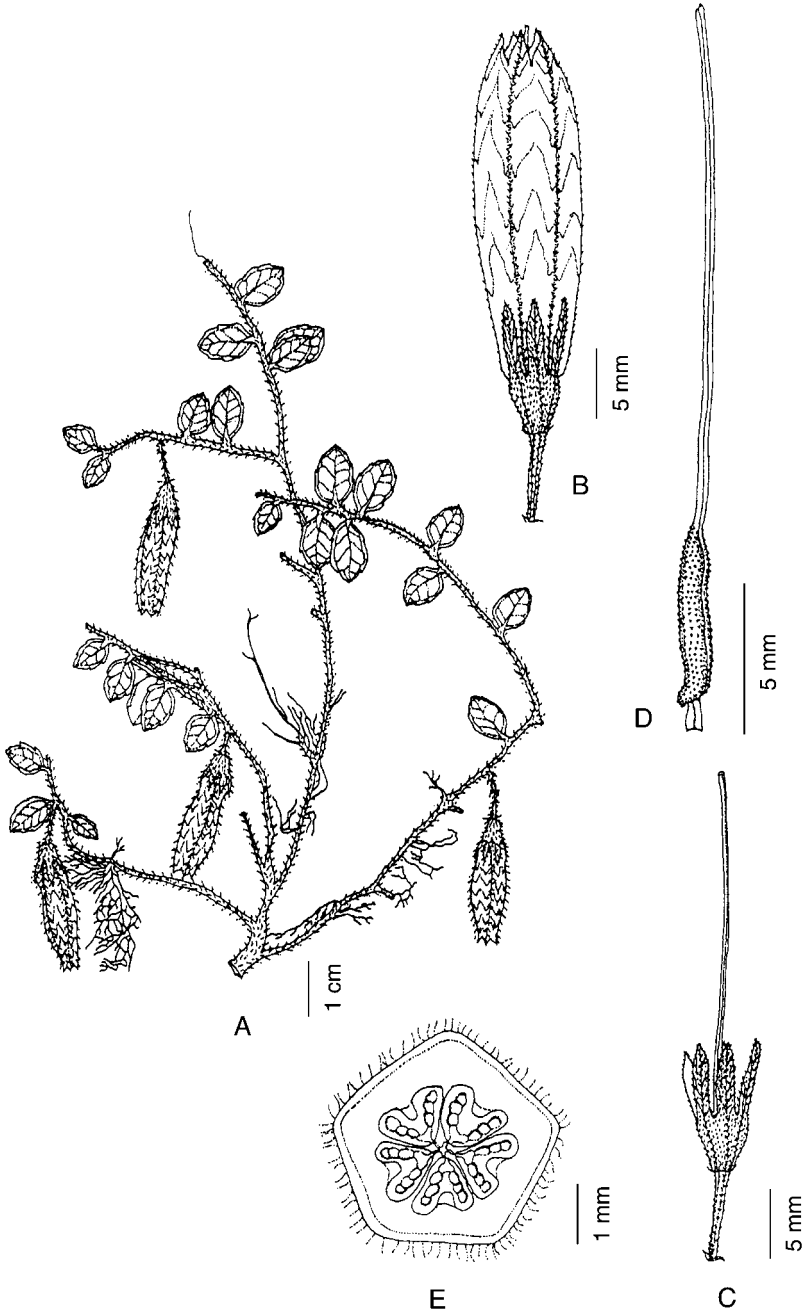


FIG. 1. *Agapetes arunachalensis* D.Banik & M.Sanjappa. A, habit; B, flower; C, calyx and style; D, stamen; E, transverse section of ovary. Drawn by D. Banik from *D. Banik* 27961 (CAL).

diverging at 45–60° from the midvein, marginal vein c.0.5 mm from margin. *Inflorescence* 1-flowered, very rarely 2 together, inflorescence bracts c.3, ovate-triangular, 3–5 × 2–3 mm, puberulous; flowers red, cauline, drooping; floral bract c.1, linear, 7–8 × 3–4 mm, acuminate at apex, membranous; bracteoles c.2, opposite, 8–10 × 2–3 mm, similar to bract; pedicels striate, 7–28(–32) mm long, puberulous, very rarely glandular hairy, also with glandular hairs up to 2 mm long in a ring at base of calyx tube, caducous. *Calyx* 9–11 × 2.5–4.5 mm, tomentose to pilose; lobes linear-lanceolate, 5.5–7.5 × 1.3–2.7 mm, acuminate at apex, prominently reticulate, secondary veins 3–4 pairs, diverging at 15–30°. *Corolla* red, veins forming a darker red reticulation, tubular, 21–25 × 5.5–7.5 mm, membranous, puberulous, pilose on midvein, secondary veins 5–6 pairs, diverging at 30–60°; lobes greenish yellow, ovate, 2.5–3 × 1.5–2 mm, acuminate at apex. *Stamens* in 2 whorls, 21–25 mm long; filaments 1–1.5 mm long, glabrous adaxially, sparsely puberulous abaxially; anthers 20–22 mm long in total, thecae verrucate, 3–4.5 mm long, appendiculate c.0.3 mm long at base, tubules 17–19 mm long, ecalcarate. *Ovary* 3.5–4.5 mm in diameter; style linear, 22–25 mm long, glabrous; stigma truncate. *Fruits* not seen.

Distribution. India: Arunachal Pradesh.

Flowering. April–May.

Habitat. Common in subtropical forests at 1500–2460 m. Epiphytic on tall trees or in crevices of rocks or on the base of the trunks of large trees in moist places.

Etymology. This species is named after the political state in which it has been found.

Notes. *Agapetes arunachalensis* is included in *Agapetes* ser. *Graciles* subser. *Parvifoliae* (Airy Shaw, 1959) with its slender stem, appearance of compactly spiral leaves, a lamina less than 6 cm long, and ecalcarate anthers. It is similar to *Agapetes mitrarioides* Hook.f. ex C.B. Clarke, in particular in its 1- or 2-flowered inflorescence, but differs in its tomentose to pilose linear-lanceolate calyx lobes. *Agapetes mitrarioides* has ovate and puberulous calyx lobes. *Agapetes arunachalensis* is also similar to *A. lacei* Craib, but differs from it in having serrate leaves, linear-lanceolate calyx lobes and ecalcarate stamens with 1–1.5 mm long filaments. *Agapetes lacei* has entire leaves, ovate calyx lobes and calcarate stamens with 5–7 mm long filaments.

This species was first collected as a sterile specimen by J. L. Lister on 29 i 1875 from Duphla hills (Arunachal Pradesh). Due to its close resemblance to *Agapetes mitrarioides* it remained unrecognized.

Additional specimens examined. INDIA. Arunachal Pradesh: Taupathi (?), Duphla Hills, 7400 ft, 29 i 1875, J.L. Lister 236 (CAL); Lower Subansiri district, 10 km east of old Ziro, Ziro–Begi road, 10 iv 1980, G.D. Pal 77438, fl. (ARUN¹); 3 km west of old Ziro, Ziro–Begi Road, 26 iv 1980, G.D. Pal 78275, fl. (ARUN); Manipaliang to Pange, 1650–1700 m, 2 v 2002, D. Banik 27968, fl. (CAL), 1700–1800 m, D. Banik 27969, fl. (CAL); Pange to Talle valley,

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1850–1900 m, 3 v 2002, *D. Banik* 27979, fl. (CAL), 1900–2000 m, *D. Banik* 27987, fl. (CAL), 2000 m, *D. Banik* 27988, fl. (CAL).

2. *Agapetes dalaiensis* D.Banik & M.Sanjappa, sp. nov. Fig. 2.

Agapeti parishii C.B.Clarke similis sed in inflorescentia glandulosopubescenti puberulaque, calycis lobis lineari-ellipticis, corollae costis glandulosopubescentibus puberulisque, antheris calcaratis differt. – Type: India, Arunachal Pradesh, Lohit district, near Dalai bridge at Hayuliang, c.600 m, 19 v 2003, *D. Banik* 27535, fl. (holo CAL!; iso ASSAM!).

Epiphytic shrub or shrub on rock, erect, 0.5–1 m tall. *Stems* robust, terete, sparsely pulverulent, glabrescent when mature, lenticellate, 1–1.5 cm in diameter; perulae 2–3, linear-deltoid, 2–3 × 1–1.5 mm, acute at apex, midvein raised abaxially, glabrous, caducous. *Leaves* 6–10 together in pseudowhorls, pseudowhorls 8–10 cm apart; petioles 4–5 mm long, terete, glabrous; lamina obovate, 7.5–10.5 × 2.5–4 cm, attenuate at base, margin entire, recurved, apex acute to acuminate, texture coriaceous, surface glabrous to pulverulent when young, glaucous above, dull beneath, venation brochidodromous, raised above, secondary veins 10–11 pairs, diverging at 15–45° to the midvein, marginal vein 1–2.5 mm from margin. *Inflorescence* axillary or cauline, corymbose, 5–6-flowered, glandular hairy-puberulous, drooping; inflorescence bracts c.6, closely alternate, broadly ovate-acute, 0.5–0.8 × 1–1.2 mm, membranous, persistent to caducous; peduncle light red, 3–3.5 mm long, puberulous to glabrous. *Flowers* red; floral bract 1, linear, 1.4–1.5 × 0.4–0.5 mm, acuminate at apex, glabrous, membranous; pedicels red, 2–3 cm long, sparsely puberulous towards base and glandular towards apex; bracteoles 2, opposite, 2–4 mm from bract, linear, minute, similar to bract. *Calyx* pale yellowish towards base, 9–10 × 5.5 mm, glandular hairy mixed with caducous puberulous hairs; lobes linear-elliptic, 6.5–7 × 2–2.5 mm, acuminate at apex, sparsely glandular, glandular hairy on veins. *Corolla* blood red, veins forming zig-zag darker red reticulation (8–10 pairs of secondary veins diverging at 45–60°), tubular-urceolate, 26–27 × 8 mm, angular, midveins glandular hairy and puberulous; lobes ovate, c.7.5 × 3.5 mm, caudate at apex. *Stamens* 2-whorled, c.25 mm long; filaments 2.5–3 mm long, spatulate, incurved, glabrous; anthers c.22 mm long in total, thecae sparsely verrucate, 6–7 mm long, obscurely appendiculate and bilobed at base, tubules c.17 mm long, calcarate, spurs obscure, c.2/5 up tubules, deflexed and ascending in adjacent anthers. *Ovary* 5–5.5 mm in diameter; style light red, c.27 mm long, slender, glabrous; stigma dark red, glandular-capitate, 5-lobed, 1.5–2 × 1.5 mm. *Fruits* not seen.

Distribution. India: Arunachal Pradesh.

Flowering. May.

Habitat. At present known only from the type collection.

Etymology. This species is named after its type locality, ‘Dalai Valley’.

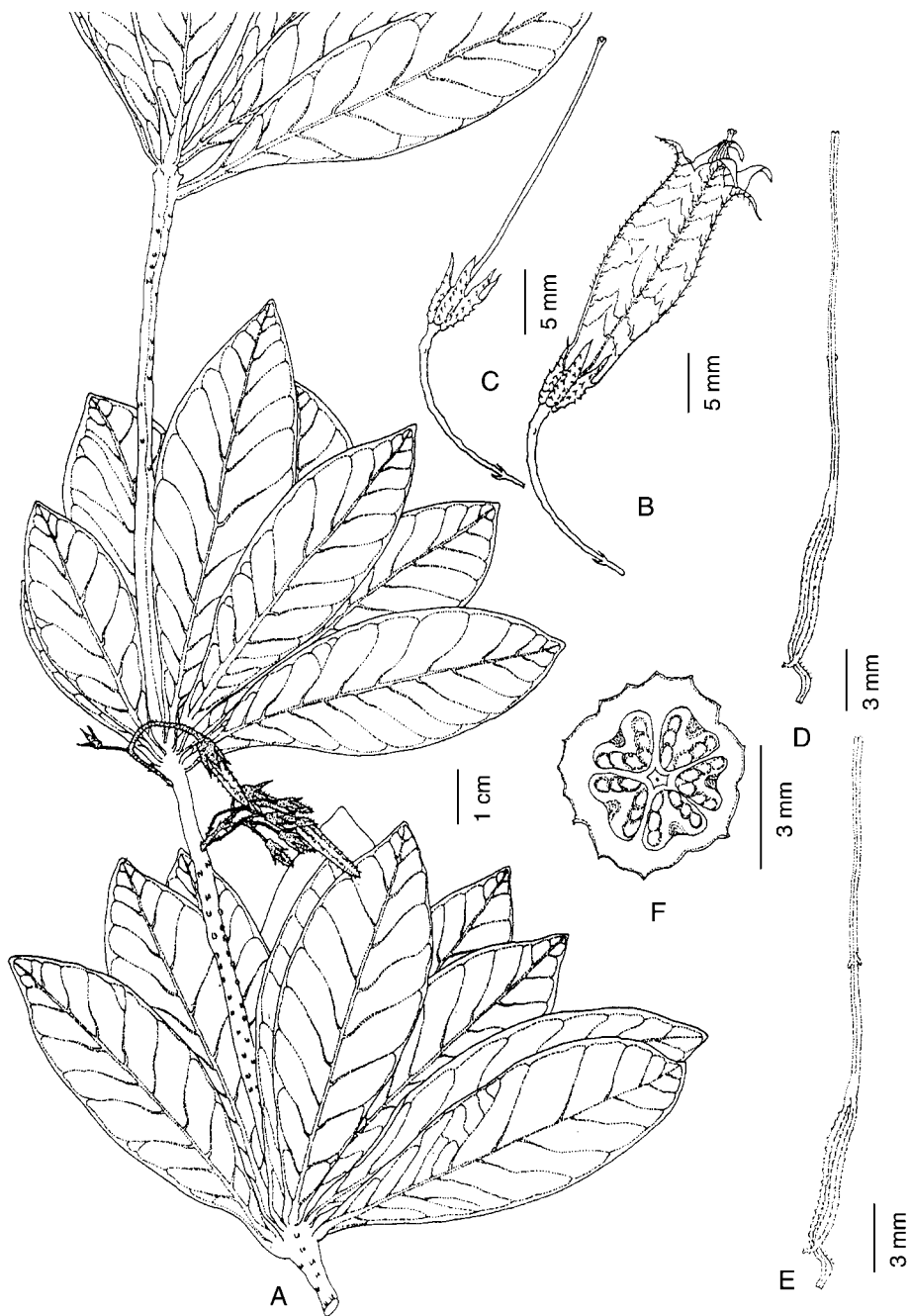


FIG. 2. *Agapetes dalaiensis* D.Banik & M.Sanjappa. A, habit; B, flower; C, calyx and style; D–E, stamens; F, transverse section of ovary. Drawn by D. Banik from the holotype, *D. Banik* 27535 (CAL).

Notes. This species is similar to *Agapetes parishii* C.B. Clarke in having pseudo-whorled petiolate leaves, lamina obovate, coriaceous, glaucous and with raised venation on the upper surface, a corymbose inflorescence, and a tubular-urceolate corolla, but differs from it in having a glandular hairy and puberulous inflorescence, linear-elliptic calyx lobes, a corolla that is glandular hairy-puberulous on midveins, and calcarate anthers. *Agapetes parishii* has a glabrous inflorescence, deltoid to linear-deltoid calyx lobes, a corolla that is glabrous, and ecalcarate anthers.

This species is also similar to *Agapetes variegata* (Roxb.) D. Don ex G. Don var. *elegans* (Kurz) Airy Shaw but differs from it in having an obovate and glaucous lamina with raised venation above, a marginal vein 1–2.5 mm from the margin, and linear-elliptic calyx lobes. *Agapetes variegata* var. *elegans* has a narrowly obovate-oblong and dull lamina with inconspicuous venation above, a marginal vein close to the margin, and ovate calyx lobes.

This species is assigned to *Agapetes* ser. *Agapetes* subser. *Agapetes* (syn.: *Agapetes* ser. *Robustae* subser. *Coriaceae*; Airy Shaw, 1959) in having a robust stem, pseudowhorled coriaceous leaves with an entire margin, and a corolla more than 2 cm long.

3. *Agapetes siangensis* D. Banik & M. Sanjappa, **sp. nov.** Fig. 3.

Agapeti griffithii C.B. Clarke similis sed in foliis ellipticis, inflorescentia teneri cernua, calycis lobis 1.5–1.7 mm longis differt. – Type: India, Arunachal Pradesh, West Siang district, 4 km from Sikar-Bulli, 28 xi 1984, K. Haridasan 1823, fl. (holo APFH²).

Terrestrial undershrub. *Stems* slender, terete, glabrous, branches drooping; perulae 3–4, closely alternate, linear-triangular, obscure, glabrous, caducous. *Leaves* loosely spiral, 1.5–4 cm apart, drooping; petioles 3.5–5 × 1.5–2 mm, glabrous, winged; lamina elliptic, 6–7 × 1.7–2.1 cm, cuneate to attenuate at base, entire to obscurely serrate at margin, caudate at apex for 1–1.7 cm, chartaceous, midvein slightly raised above, venation brochidodromous, secondary veins 4–5 pairs, diverging at 30–60° from midvein, submarginal vein c.5 mm from margin. *Inflorescence* axillary, corymbose, glabrous, up to 4-flowered, slender, drooping; inflorescence bracts 2–3, triangular, acute at apex, scaly, caducous; peduncle c.1.4 cm long, slender, glabrous. *Flowers* red; floral bract 1, deltoid, obscure, acute at apex, scaly, caducous; pedicels 1–1.2 cm long, 2–2.5 mm wide at apex, obconical, glabrous; bracteoles 2, similar to bract. *Calyx* 4.5–5 × 2.7–3 mm, coriaceous, glabrous; lobes ovate, 1.5–1.7 × 1.2–1.5 mm, acuminate at apex, reticulate. *Corolla* red, tubular, 10–15 × 2–2.3 mm, glabrous, reticulate with 6–7 pairs of secondary veins diverging at 15–30°; lobes linear-triangular, obscure or 1–1.5 × c.0.7 mm, acuminate at apex. *Stamens* in 2 whorls, 5 in outer whorl longer by c.1 mm, 10–11 mm long; filaments spatulate, 0.5–1 mm long; anthers c.10 mm long in total, thecae granular, 3–3.5 mm long,

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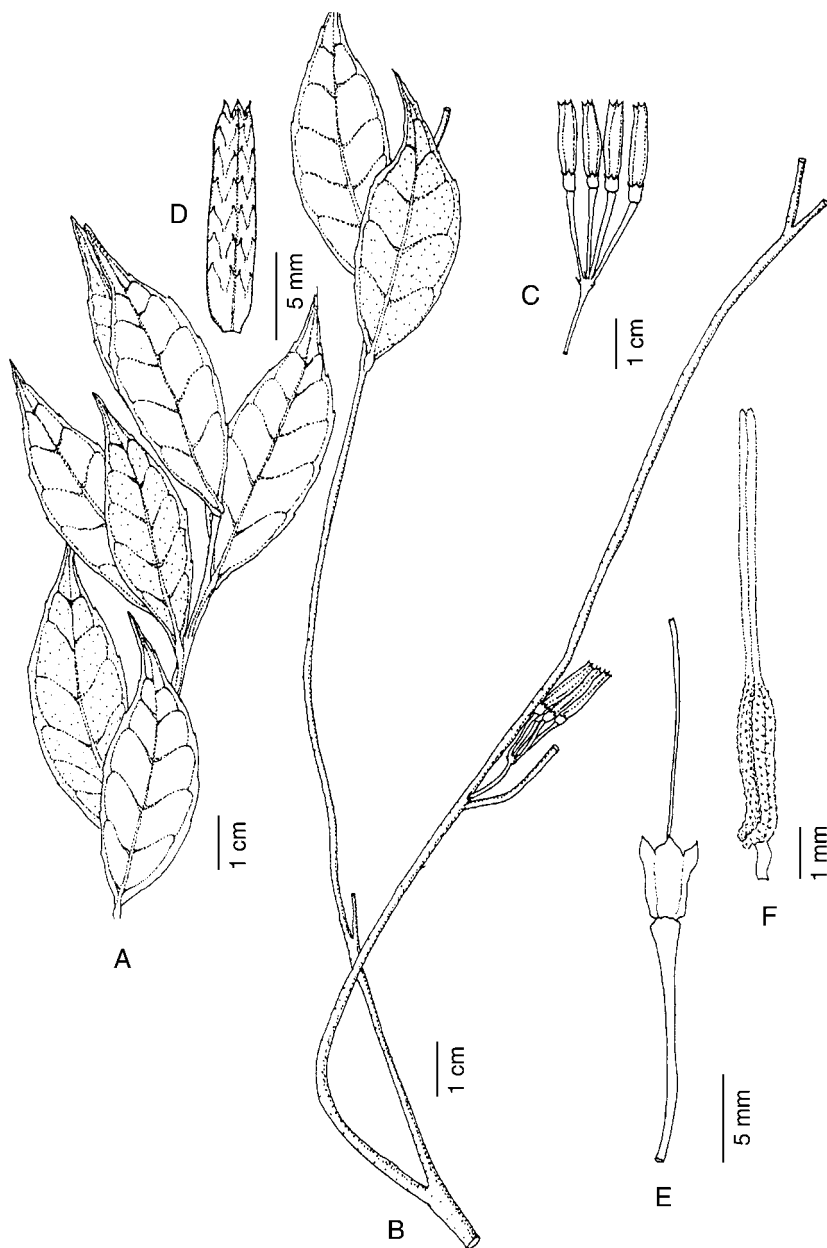


FIG. 3. *Agapetes siangensis* D.Banik & M.Sanjappa. A–B, habit; C, inflorescence; D, corolla; E, calyx and style; F, stamen. Drawn by D. Banik from the holotype, *K. Haridasan* 1823 (APFH).

obscurely appendiculate at base, tubules c.7 mm long, ecalcarate. *Ovary* slender; style c.1.2 cm long, glabrous; stigma truncate. *Fruits* not seen.

Distribution. India: Arunachal Pradesh.

Flowering. November.

Habitat. Temperate forest.

Etymology. After West Siang district.

Notes. This species is similar to *Agapetes griffithii* C.B. Clarke in having slender stems, loosely spiral leaves with a chartaceous caudate lamina, glabrous, drooping, corymbose inflorescences, and a corolla with obscure lobes. It differs from *Agapetes griffithii* in having elliptic leaves, a slender inflorescence and a calyx with lobes 1.5–1.7 mm long. *Agapetes griffithii* has leaves ovate-elliptic or oblong-lanceolate, a stout and fleshy inflorescence, and a calyx with lobes 6–7.5 mm long.

This species is also similar to *Agapetes saligna* (Hook.f.) Hook.f. in having a caudate, elliptic lamina, corymbose and glabrous inflorescences, and a truncate stigma. It differs from *Agapetes saligna* in having slender stems, a chartaceous lamina, slender pedicels, and a tubular corolla with linear-triangular lobes 1–1.5 × c.0.7 mm. *Agapetes saligna* has robust stems, coriaceous lamina, stout pedicels and an infundibular corolla with triangular lobes 4.5–8 × 2.6–4 mm.

This species is included under *Agapetes* ser. *Graciles* subser. *Longifoliae* (Airy Shaw, 1959) because of its slender stem, laxly spiral leaves, internodes more than 1 cm long, glabrous corymbs, a tubular corolla with obscure lobes, and a truncate stigma.

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