EDINBURGH JOURNAL OF BOTANY 80, Article 367: 1–28 (2023). https://doi.org/10.24823/EJB.2023.367

Published by the Royal Botanic Garden Edinburgh
ISSN (online): 1474-0036, ISSN (print): 0960-4286

FLORA OF NEPAL NOTULAE IV: NEW SPECIES AND RESURRECTED NAMES IN *SILENE*

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Based on revisionary work for the forthcoming *Flora of Nepal*, five new species of *Silene* are described (*S. scoparia*, *S. procera*, *S. blepharicalyx*, *S. vaginans* and *S. poa*), one nomen novum is introduced (*S. oreoploca* for *Melandrium linearifolium*), one new combination (*S. nyalamensis*) is made, and proper usage is clarified for previously misapplied (*S. moorcroftiana* and *S. nepalensis*) or neglected (*S. thomsonii*) names. Illustrations are provided for all taxa discussed.

Keywords. Flora, Himalaya, Nepal, *Silene*, taxonomy, Tibet.
Received 26 April 2021 Accepted 9 January 2023 Published 19 May 2023

Introduction

During preparation of the *Silene* L. account for the *Flora of Nepal* (volume 2; see Flora of Nepal website, continuously updated), ten undescribed species came to light and an additional five that had not been previously recorded for Nepal. Furthermore, some epithets have been almost universally erroneously applied. The issues regarding *Silene indica* Roxb. ex Otth and the concomitant description of *S. pseudoindica* Lidén have already been published elsewhere (Lidén, 2019a, 2019b) and will not be repeated here.

Several of the novelties and amendments presented in this paper involve both sides of the Nepal–Tibet border, sometimes also neighbouring Indian districts. Some *Silene* species that were previously regarded as widely or erratically distributed (*S. gonosperma* (Rupr.) Bocquet, *S. himalayensis* (Edgew.) Majumdar, *S. nepalensis* Majumdar, *S. indica* and *S. caespitella* F.N.Williams) have turned out to be heterogeneous 'dustbin' taxa that can be resolved into geographically more restricted entities, often agreeing in vicariance and endemism patterns with other plant groups. This reassessment is still in its infancy, and in this series of *Flora of Nepal* Notulae, only species indigenous to Nepal are included. However, we have ascertained that no older names are available for taxa here recognised as new.

With *Atocion* Adans. treated as a separate genus and following the classification of Jafari *et al.* (2020), there are seven sections of *Silene* represented in Nepal: *Silene* sect. *Behenantha* (Otth) Torr. & A.Gray (1 species), *Silene* sect. *Conoimorpha* Otth (1 species), *Silene* sect. *Cucubaloideae* Edgew. & Hook.f. (3 species), *Silene* sect. *Cucubalus* (L.) Greuter

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(1 species), *Silene* sect. *Siphonomorpha* Otth (1 species), *Silene* sect. *Auriculatae* (Boiss.) Schischk. (3 species) and *Silene* sect. *Physolychnis* (Benth.) Bocquet (24 species). The first five do not present any novelties, whereas the two last sections require extensive revision of previous regional treatments. *Silene* sect. *Auriculatae* is most species-rich in West and Central Asia, with few representatives in the Himalayas. By contrast, *Silene* sect. *Physolychnis*, although distributed also in the Arctic region and on the American continent, has most of its species in the Sino-Himalayan area and comprises two-thirds of the Nepalese *Silene*. In this paper, *Silene* sect. *Auriculatae* is covered in its entirety and about half of the species of *Silene* sect. *Physolychnis*; the *S. setisperma* Majumdar and *S. himalayensis* alliances will be discussed in a later paper. A proposed third paper related to *Silene* will cover distributional updates.

To facilitate comparison with earlier treatments, misapplied names are referred to as "[name]" *sensu* [auct] in the nomenclature paragraphs. All line drawings are based on herbarium specimens, and therefore the outline of calyces can be distorted, appearing less or much less constricted at the mouth than in live specimens. Unless otherwise stated, we have examined all specimens cited. Herbarium acronyms follow Thiers (continuously updated). In the lists of 'additional specimens examined', herbarium acronyms are not given separately if they are also used as part of the barcode. Where available, hyperlinks to herbarium specimens are provided. We have tried to include permanent addresses but cannot guarantee that these will not be broken in the future.

Section *Auriculatae*

The species in *Silene* sect. *Auriculatae* are characterised by a perennial habit, caespitose growth, oblong-clavate calyx, finely pubescent androgynophore, and three styles. As regards the Sino-Himalayan species in this section, *Silene moorcroftiana*, with its laxly caespitose habit with soft, oblanceolate, densely glandular hairy leaves and non-papillate seeds, is the odd species out. It inhabits sandy or gravelly soils and screes at high altitudes and is widely distributed in Central, West and Southwest Tibet and adjacent parts of the Himalayas.

The remaining Himalayan species form an eastern continuation of a Central Asiatic group of chasmophytic species, with linear leaves with antrorse-scabrid margin, marcescent basal petioles, and (in the Himalayan species) papillate seeds. A multitude of taxa have been described from West and Central Asia, whereas the Himalayan representatives have been neglected. Here we describe two species occurring in Nepal. Despite several striking differences, they were previously subsumed under *Silene moorcroftiana*. In view of this, it seems appropriate to contrast them with *Silene moorcroftiana* and to each other in Tables 1 and 2, respectively.

Table 1. Morphological comparison of *Silene moorcroftiana* vs *S. oreoploca* and *S. scoparia*

Character	*S. moorcroftiana*	*S. scoparia* and *S. oreoploca*
Habit	± caespitose, with few to several stems	Densely caespitose to tussock-forming, with numerous stems
Rosette leaf petiole residues	Membranous, not long persistent, bud scales with softly ciliate margin	Stramineus, coriaceous, marcescent; margin with stiff short setae
Cauline leaf nodes	3–8	(4–)7–20
Cauline leaves	Dark greyish green, 2–6 mm broad; finely and densely glandular hairy	Bright green, 1–2 mm broad; margin (and often midvein) antrorse-scabrid, otherwise glabrous
Terminal inflorescence	1–3(–7)-flowered	1(–3)-flowered
Calyx veins	With conspicuous reticulations	Without reticulations
Calyx teeth	Triangular-ovate with broad base, margin scarcely scarious	Rounded with narrow base, and with scarious margin
Androgynophore pubescence	Hairs very fine, not tapering to apex	Hairs recurved downwards, tapering to acute apex
Seed	Sharply rectangular in cross-section, without papillae	Ovate to obtusely triangular in cross-section, with papillae on the back
Flowering season	May to August	July to October
Habitat	Sandy soil, gravel, screes	Rock crevices, stony places

Table 2. Morphological comparison of *Silene oreoploca* and *S. scoparia*

Character	*S. oreoploca*	*S. scoparia*
Stem length	(3–)7–20 cm	8–30 cm
Nodes	(4–)7–12	8–20
Calyx size and shape	14–20 mm, gradually widened from base to middle, straight	22–27 mm, basal half narrowly cylindrical, often slightly curved
Calyx pubescence (teeth excepted)	0.2–0.3 mm oblong stout glandular hairs	c.0.2 mm broad-based stout glandular hairs
Calyx teeth	Abaxially with glandular hairs, especially on veins; margin uneven to lacerate, sparsely to densely ciliate	Abaxially with short antrorse acute hairs (scabrid) but without or with few glandular hairs; margin slightly uneven, ciliate
Androgynophore	8–14 mm	13–19 mm
Seed (one sample of each species)	1.2 mm; obtusely obtriangular in cross-section	1.4 mm; elliptic-obovate in cross-section; papillae longer
Altitude	3400–4800 m	2600–3100(–3700) m

1. Silene oreoploca Lidén, **nom. nov.** Figure 1J–Q.

Replaced synonym: *Melandrium linearifolium* L.H.Zhou, Fl. Xizang. 1: 714 (1983), non *Silene linearifolia* Otth in A. P. de Candolle, Prodr. 1: 374 (1824). – Type: Tibet, Nyalam, 4400 m, 20 vi 1966, *Chang Yong-Tian & Lang Kai-Yong* 4302 (holotype PE 01040479).

"*Silene caespitella*" *sensu* Zhou (1983), non F.N.Williams (1909).

"*Silene moorcroftiana*" *sensu* Zhou *et al.* (2001) p.p. and Rajbhandari & Suzuki (2008) p.p., non Benth. (1839).

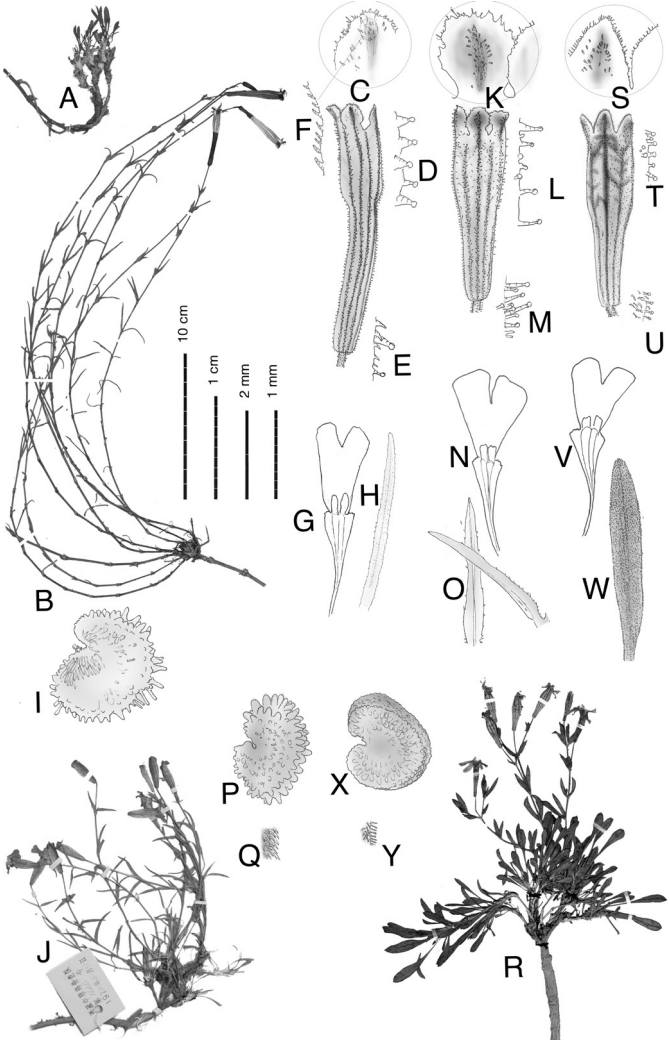

Figure 1. *Silene scoparia* Lidén, sp. nov.: A, whole plant leaf rosettes; B, whole plant with flowers (two damaged flowers have been 'mended' for clarity, with the mended parts appearing lighter); C, calyx (insert: calyx teeth); D, hairs on calyx veins; E, hairs on pedicels; F, hairs on calyx teeth vein; G, petal; H, cauline leaf; I, seed. *Silene oreoploca* Lidén, nom. nov.: J, whole plant with flowers; K, calyx (insert: calyx teeth); L, hairs on calyx veins; M, hairs on pedicels; N, petal; O, cauline leaf; P, seed; Q, androgynophore pubescence. *Silene moorcroftiana* Wall. ex Benth.: R, whole plant with flowers; S, calyx (insert: calyx teeth); T, hairs on calyx veins; U, hairs on pedicels; V, petal; W, cauline leaf; X, seed; Y, androgynophore pubescence. Scale bars: A, B, J, R, 10 cm; G, H, N, O, V, W and C, K, S (excluding inserts), 1 cm; C, K, S (inserts), 2 mm; D–F, I, L, P, Q, T, X and Y, 1 mm. Vouchers: A, *Y. Iokawa* et al. 20020015 (E00826586); B, *M. Minaki* et al. 9104467 (E00231757); C–I, *G. Miehe, S. Miehe & K. Koch* 01-076-08 (GB); J, *Tibet herbal medicine census* 1666 (PE); K–O, *Chen Jia-Rui* 92294 (PE); P and Q, *Miehe* 99-49-10 (GB); R, S. *Noshiro* et al. 20106115 (TI); S–Y, *S. Miehe* 99-62-16 (GB). Drawings: Magnus Lidén.

Densely caespitose perennial, forming tufts or tussocks, bright green, with thick rootstock with several short perennating stems ending in dense leaf rosettes surrounded at base by tough, long persistent, stramineus residues of old petiole bases with stiff antrorse marginal setae. Flowering *stems* (3–)7–20 cm long, simple or branched, with (4–)7–12 nodes, densely pubescent with stout patent glandular hairs 0.2–0.3 mm long in upper part, below with reflexed eglandular hairs 0.1–0.2 mm long. *Leaves* of non-flowering rosettes narrowly linear-oblanceolate, 20–35 mm long. Cauline leaves linear, acute, 10–30 × 1–2 mm (uppermost leaf pair [bracts] sometimes smaller), thickish, stiff, glabrous, more or less antrorse-scabrid, bright green, sometimes bluntly purple-mucronate. *Inflorescence* terminal 1(–3)-flowered; 1-flowered lateral branches may grow from upper axils. *Pedicels* 1–10(–20) mm long. *Bracteoles* (if present), and sometimes *bracts*, minute. *Flowers* erect. *Calyx* 14–20 mm, gradually attenuate from middle to base; veins distinct, green or purple, without distinct anastomoses, with stout glandular hairs 0.2–0.3 mm long. Calyx teeth 2 mm, purplish, rounded, constricted at base, with broad scarious ± lacerate-dentate and ± ciliate margin, abaxially with glandular hairs. *Androgynophore* 8–10 mm (to 14 mm in fruit) long, finely retrorse-pubescent with acute hairs. *Petal* claw exserted; limb c.10 mm, white or pale purple above, reddish below, obtriangular, divided to 1/3, rarely with a small basal sharp tooth on each side; coronal scales white, narrow, 1–1.5 mm. *Styles* 3. *Seeds* rounded-reniform in profile, 1.2 mm long; back very broad with prominent papillae.

Distribution. From Kumaon to the Mount Everest region.

Habitat and ecology. Rock crevices, among boulders, on gravel. Altitudinal range 3400–4800 m. Flowering June to October.

Etymology. From Greek ὄρος (‘mountain’) and πλόκα (‘tuft’).

Notes. The type collection of *Melandrium linearifolium* consists of disconnected shade-grown stems with flowers in bud stage. Hence, Zhou overlooked the identity of this plant with her “*Silene caespitella*”.

Additional specimens examined. India. **Uttarakhand**: Kumaon, Rama Darma, *s.d.*, *J.R. Reid s.n.* (E).

Nepal. **Darchula/Bajhang (?)**: Nyibe Karha, 19 xi 1936, *F.M. Bailey s.n.* (E00138263). **Mugu**: 25 xi 1995, *s.col.* 7451 (KATH). **Dolpa**: E side of Ya La (29°38'N, 82°50'E), 4800 m, on gravel, vi 1990, *S. Miehe* 99-49-10 (GB). **Mustang**: Tangte to Chusan, 3800 m, 3 viii 2001, *M.N. Subedi* 80088 (KATH086602); Pongio Kharka to Phalyak (28°51'40"N, 83°44'41"E), 3870 m, 13 viii 2002, *F. Miyamoto* et al. 20210095 (KUN 1264363).

Tibet. **Purang**: 3950 m, 12 vii 1976, *Qing-Zang exp.* 13251 (PE 00048039); 3900 m, *s.d.*, *Tibet investigation team* 4002 (HNWP 41065); Langazuo, 3700 m, 29 viii 1990, *Fei Yong* et al. 663 (KUN 0514266). **Gyirong**: 3750 m, 21 vii 2016, *Wei Lai & He Yi* BNUXZ2016351 (BNU 0028275); near Zhang Duo, 4000 m, 2 vii 1975, *Wu Zhengyih* et al. 75-440 (PE 00580361, HNWP); Butula 3700 m, 20 ix 1990, *Li Hui, Li Bo-Sheng & Yang Yi* 13903 (PE 01486983). **Nyalam**: (28°29'N, 85°14'E), 3360 m, 19 xi 2011, *Chen You-Sheng, Zhang Shu-Ren & Yu Sheng-Xiang* 758 (PE 01961620); Upper Trisuli gorge, NW Mt

Xixabangma (28°42'N, 85°16'E), 3940 m, 25 viii 1993, *G. & S. Miehe* 9570/05 (Miehe); (28°10'N, 85°50'E), 9 ix 2012, *FLPH* 12-0334 (PE 01960774); Zhaxicongcun (28°19'N, 86°02'E), 4164 m, 26 vii 2015, *Wei Lai & Hao Jia-Chen* 15281 (BNU 0026019); 4100 m, hillside, 18 vii 2016, *Wei Lai & He Yi* 2016168 (BNU 0028275, XZ); 3900 m, 8 ix 1981, *Ni Zhi-Cheng & Ci Duo-Deng* 2116 (PE 00580351, XZ0001496); 3400 m, 1 ix 1981, *Ni Zhi-Cheng* et al. 1918 (PE 00558375, XZ0001507); 4100 m, 7 ix 1981, *Ni Zhi-Cheng & Ci Duo-Deng* 2081 (PE p.p., XZ0001505); 4 km S Nyalam, 3700 m, 18 ix 1992, *Chen Jia-Rui* 92294 (PE [1731392]); 3600 m, 31 viii 1972, *Tibet herbal medicine census* 1666 (HNWP, PE 00048034); N Nyalam, c.4100 m, 3 x 1967, *Jiang Shu & Zheng Du* 0182 (PE). **Tingri**: Upper Arun valley, Everest E, Lower Kharta Chu, Yupar (28°5'N, 87°19'E), 3800 m, among granite boulders, 7 x 1989, *B. Dickoré* 6037 (M). **Rongxia**: 3600 m, 30 vii 1959, *s.col.* 703 (PE 00580348).

2. Silene scoparia Lidén, **sp. nov.**

Silene scoparia differs from *S. oreoploca* Lidén in its longer and narrower flowers (22–27 mm vs 15–20 mm long), longer androgynophore (13–16 mm [13–19 mm in fruit] vs 8–10 mm [8–14 mm in fruit]) and calyx teeth scabrid by antrorse acute projections abaxially (vs glandular hairy). – Type: Nepal, Dolpa, Ankhe to Dunai (29°N, 82°50'E), 2750 m, fl. pink – white, 10 x 1991, *M. Minaki* et al. 9104467 (holotype E00232987; isotypes TI 9104467, TUS). **Figures 1A–I, 2.**

"*Silene moorcroftiana*" *sensu* Rajbhandari & Suzuki (2008) p.p., non Benth. (1839).

Densely caespitose perennial forming bright green tufts or tussocks in cliff crevices. *Root* (rarely present in herbarium specimens) crowned by a cluster of several perennating stems, ending in small secondary crowns, each with a terminal rosette subtended by stramineus coriaceous residues of old petiole bases, the latter with minute antrorse marginal setae and persistent midvein. The rosettes are overgrown by flowering stems emerging from below the rosette, up to 15 from each terminal crown and up to 100 per plant. *Stems* ascending from base, 8–30 cm long, with 8–20 nodes evenly distributed, simple or with small leafy branches, with retrorse acute hairs (0.05–0.1 mm long) throughout, and with scattered glandular hairs (0.1–0.2 mm long) in upper part. *Rosette leaves* linear to very narrowly oblanceolate, 20–35 mm long. *Cauline leaves* linear, acute, 10–30 × 1–2 mm, thickish, stiff, with antrorse-scabrid margin and midvein, otherwise glabrous. Uppermost leaf pair (*bracts*) usually smaller. *Inflorescence* terminal, 1(–3)-flowered; axillary 1-flowered branches sometimes grow from upper leaves. *Pedicels* 1–10(–20) mm. *Bracteoles* minute when present. *Flowers* erect or often slightly oblique. *Calyx* 22–27 mm long, with narrow often slightly curved basal half; veins distinct, green or brownish purple, without anastomoses, with very stout broad-based glandular hairs 0.2 mm long. Calyx teeth 2.5 mm long with distinct claw and rounded limb, abaxially scabrid from antrorse acute projections; margin ciliate. *Androgynophore* 13–16(–19) mm long, finely and densely retrorse-hairy. *Petal* claw exserted, narrowly obtriangular. Petal limb c.10 mm long, white or pale purple, obtriangular, divided to 1/3. Coronal scales white, narrow, 1.5 mm long. *Anthers* exserted. *Styles* 3, exserted. *Seeds* rounded-reniform in profile, c.1.4 mm, with obtuse back with long thin papillae.

Figure 2. A small plant of *Silene scoparia* in a rock wall between Lupra and Kagbeni. Note the infection by *Microbotryum violaceum* affecting the anthers. Photograph: Michelle Page.

Distribution. Endemic to Nepal (Southeast Dolpa and Mustang).

Habitat and ecology. Cliff crevices. Altitudinal range 2600–3100(–3700) m. Flowering late July to October.

Etymology. From Latin *scopa* (broom made from thin twigs).

Notes. The related *Silene oreoploca* is also found in Mustang but at higher altitudes (see **Table 2** for distinguishing characters).

Additional specimens examined. Nepal. **Dolpa**: Rachi to Ankhe (29°00'N, 82°50'E), 2980 m, on rock, 9 x 1991, *M. Minaki* et al. 9109283 (TI 9109283); 3000 m, on rock, 10 x 1991, *M.Minaki* et al. 9104446 (E00231757, TI 9104446); Ankhe to Dunai (29°N, 82°50'E), 2950 m, on rock by river side, 9 x 1991, *M. Minaki* et al. 9106159 (E00241152, TI); 2560 m, 10 x 1991, *M. Minaki* et al. 9109307 (E00232986, TI 9109307). **Mustang**: Lower Bhena Khola (28°58'N, 83°49'E), 3700 m, *Juniperus-Cotoneaster* scrub on N-facing slopes, viii/xi 2001, *G. Miehe, S. Miehe & K. Koch* 01-076-08 (GB); Eklebhatti, 2730 m, crevices of rocks, 8 x 2001, *P.R. Shakya, I. Shrestha & S. Shakya* 10562 (KATH086600); Jomsom to Kagbeni (28°47'N, 83°44'E), 2700 m, 21 vii 1983, *H. Ohba* et al. (TI 8310582); Jomsom to Kagbeni

(28°47'N, 83°44'E), 2800 m, 21 vii 1983, *H. Ohba* et al. (E00231788, TI 8330669); Kagbeni to Muktinath, 2800–3550 m, 22 vii 1983, *H. Ohba* et al. (TI 8330720 and TI 8350592, both mixed with *Silene moorcroftiana*); Lupra to Kagbeni, *s.d.*, *M. Page s.n.* (photograph, **Figure 2**); Kagbeni to Chuksang (28°50–55'N, 83°47–49'E), c.3000 m, 9 vii 2000, *Y. Iokawa* et al. 20020015 (E00826586, TI 20020015, non-flowering rosettes only); ibid., *Y. Iokawa* et al. 20020017 (KUN 1264686, TI 20020017, flowering); Jharkot to Marpha (28°49'01"N, 83°51'02"E to 28°45'17"N, 83°41'28"E), 3100 m, on rock at roadside slope, dry and sunny place, 21 viii 1994, *S. Noshiro* et al. 9470526 (E00232984, L, TI 9470526, TUS); Jomson to Jharkot (28°47'09" to 49'38"N, 83°42'50' to 51'07"E), 3040 m, 22 ix 1995, *M. Mikage* et al. 9552385 (E00232977, TI 9552385, TUS); Zwischen Muktinath und Jomosom, 3200 m, 1 xi 1978, *S.-W. Breckle* 6573 (GOET).

3. Silene moorcroftiana Wall. ex Benth. in Royle, Ill. Bot. Himal. Mts. 79 (1839). – Type: India, Kashmir, Luddak [Ladakh], *W. Moorcroft* (*Wallich cat.* 626 holotype K001111436). **Figure 1R–Y.**

Silene gyirongensis L.H.Zhou, Fl. Xizang. 1: 740 (1983). – Type: Tibet, Gyirong, 3900 m, 3 vii 1975, *Wu Zheng-Yih* et al. 75-490 (holotype PE 00934453; isotypes HNWP, KUN 0514269).

Distribution. Widely distributed in West and Central Tibet and the West and Central Himalayas.

Habitat and ecology. Sandy and gravelly soils and screes. Altitudinal range 3000–5000 m. Flowering late May to August; fruiting July to September.

Notes. *Silene moorcroftiana* is easily distinguished from *S. scoparia* and *S. oreoploca* by its dark green, glandular hairy (not bright, green, non-glandular) leaves and reticulating calyx nerves. See **Table 1** and **Figure 1**.

Additional specimens examined. India: **Kashmir**: Kargil, Drass, 3000 m, 2 vii 1992, *J.F. Duthie s.n.* (P05019888); Ladakh, Leh, 3610 m, 7 vii 2005, *Goraya* 102344 (FRLH); Gilgit, Nittar valley, 9000–10,000 ft, 5 viii 1892, *J.F. Duthie* 12418 (IBSC 0149869, K).

Nepal. **Dolpa**: Between Pho village and pass (29°30'N, 82°54'E), 4300 m, Caragana dwarf scrub, vi 1999, *S. Miehe* 99-62-16 (GB); Mahagung Khola, 4 miles east of Tingkyu, 4 viii 1973, *C. Grey-Wilson & Phillips* 497 (K, P); Tarap valley, 13,500 ft, 17 vii 1966, *T.B. Shrestha* 5417 (KATH). **Mustang**: Upper Dhechyan Khola S of De (29°02'N, 84°00'E), 4200 m, 12 viii 2001, *G. Miehe, S. Miehe & K. Koch* 01-033-07 (Miehe, private herbarium); Lo-Manthang (29°1'N, 83°57'E), 3800 m, wet places, 23 viii 2002, *F. Miyamoto* et al. 20230190 (KUN 1264313, TI); N of Sangdala, valley of Thellung Khola (W side) (29°08'N, 83°56'E), 3800 m, 1 vii 2003, *Y. Iokawa* et al. (TI 20320108); between Ekle Bhatti and Khingar, S side of Jhong khola (29°49'N, 83°49'E), 3330 m, on exposed N-facing slope, 26 vi 2003, *Y. Iokawa* et al. (TI 20320027); Kagbeni – Muktinath, (28°50'N, 83°47'E), 2800–3550 m, 22 vii 1983, *H. Ohba* et al. (TI 8330720, mixed with *Silene scoparia*); Tsarang (29°06'19"N, 83°56'E), 3400 m, on sandy steep slope, 7 viii 2001, *S. Noshiro* et al. (E00826114, TI 20106115).

Tibet. **Gar**: 4500 m, 15 viii 1974, *Tibet investigation team* 3946 (HNWP 41077, PE 00580354). **Zanda**: 4200 m, 5 vii 1976, *Qing-Zang exp.* 76-075 (PE 00580341); 4300 m, 10 vii 1976, *Qing-Zang exp.* 76-8179 (HNWP 59909, KUN, PE 00580343); 4000 m, 7 viii 1974, *Tibet investigation team* 3843 (HNWP 41160, PE 00580353); 4400 m, 3 vii 1976, *Qing-Zang exp.* 76-7913 (HNWP 60274, KUN, PE 00580345); Road

to Zada (31°26'N, 80°10'E), 5033 m, 6 ix 2012, *FLPH Tibet exp.* 12-0240 (PE 01960790). **Burang**: upper Karnali (30°10'N, 81°20'E), 4670 m, 30 viii 1993, *G. & S. Miehe* 9608/2 (Miehe, private herbarium); 4200 m, 14 vii 1976, *Qing-Zang exp.* 76-8426 (GB, HNWP 61030; KUN, PE 00580346). **Zhongba**: 4900 m, 31 v 2015, *Wei Lai & Hao Jia-Chen* 15500 (BNU 0029751). **Gyirong**: 4150 m, 19 vii 1975, *Qing-Zang exp.* 5412 (PE 00048002); 4180 m, 9 vii 1975, *Qing-Zang exp.* 6253 (HNWP 49157, PE 00580356); 4300 m, 28 vii 1975, *Qing-Zang exp.* 5610 (PE 00048001); 4000 m, 16 ix 1990, *Li Bo-Sheng* et al. 13817 (PE 01486986); 5 km S of Lima basin, 4000 m, 17 ix 1990, *Li Bo-Sheng* et al. 13842 (PE 01486980); From Bogu [Tegu] lake to Mara Mountain, 4900 m, 2 vii 1975, *Wu Zheng-Yih* et al. 75-0460 (HNWP, KUN, PE 00580349); *s.loc.*, 3900 m, 3 vii 1975, *Wu Zheng-Yih* et al. 75-488 (HNWP 53555, KUN); *s.loc.*, 4200 m, 8 vii 1972, *Tibet herbal medicine census* 728 (HNWP 29871, PE 00048040); Upper Trisuli gorge NW Mt Xixabangma (28°56'N, 85°24'E), 4580 m, 25 viii 1993, *G. & S. Miehe* 9568/06 (Miehe, private herbarium).

Section *Physolychnis*

The section *Physolychnis* was monographed by Bocquet (1969), regrettably with some misapplied names as well as some mergers of unrelated species, which has haunted Asian *Silene* sect. *Physolychnis* taxonomy ever since. Zhou Li-Hua (1983) made a taxonomically sound revision of the Tibetan species, but due to poor access to type specimens she applied erroneous epithets to several taxa, while redescribing others that were already named. Our own *Silene* sect. *Physolychnis* treatment for *Flora of China* (Zhou *et al.*, 2001) perpetuated some of the mistakes by both authors and managed to add at least one. These are rectified here, as far as they pertain to Nepalese species.

The *Silene* sect. *Physolychnis* species in Nepal have prominent petal claw auricles, woolly-hairy androgynophore (with two exceptions), ± inflated calyx and, if not single-flowered, an asymmetrical synflorescence. Because the vast majority have five styles, they were frequently first described in *Lychnis* L. (Bentham, 1839) or *Melandrium* Röhl. (Zhou, 1983), but DNA data indicate that the genera *Physolychnis* and *Melandrium* belong in *Silene sensu stricto* as separate sections within the subgenus *Behenantha* (Otth) Torr. & A.Gray. *Lychnis* is more distantly related (Oxelman *et al.*, 2001). The number of styles is not an absolute indicator for section membership; *Silene aprica* Turcz., *S. firma* Siebold & Zucc., *S. holosteifolia* Bocquet & Chater, *S. indica*, *S. scopulorum* Franch. and a few others have three styles. Allopolyploidy is common in *Silene* sect. *Physolychnis* in the American and Arctic areas, but little is known about the Himalayan taxa in this respect (but see 7. *Silene blepharicalyx*).

4. Silene thomsonii Majumdar, J. Indian Bot. Soc. 42: 650 (1963) [1964], nomen novum for *Lychnis nutans* Benth. in Royle, Ill. Bot. Himal. Mts. 1(3): 80 (1839), nomen illegit., non *L. nutans* (L) Scop. (1771). – *Melandrium nutans* (Benth.) Walp., Rep. Bot. Syst. 1: 281 (1842) comb. illeg. – *L. ciliata* Wall., nom. nud. – Type: Nepal, Gosain Than. 27 x 1821, *Wallich cat.* 621 (lectotype K000728832, here designated; selected because it hails from "Herbarium Benthamianum"; isolectotypes BM000521649, E00015049, G00074039, K000728833, K001111425). **Figures 3, 4.**

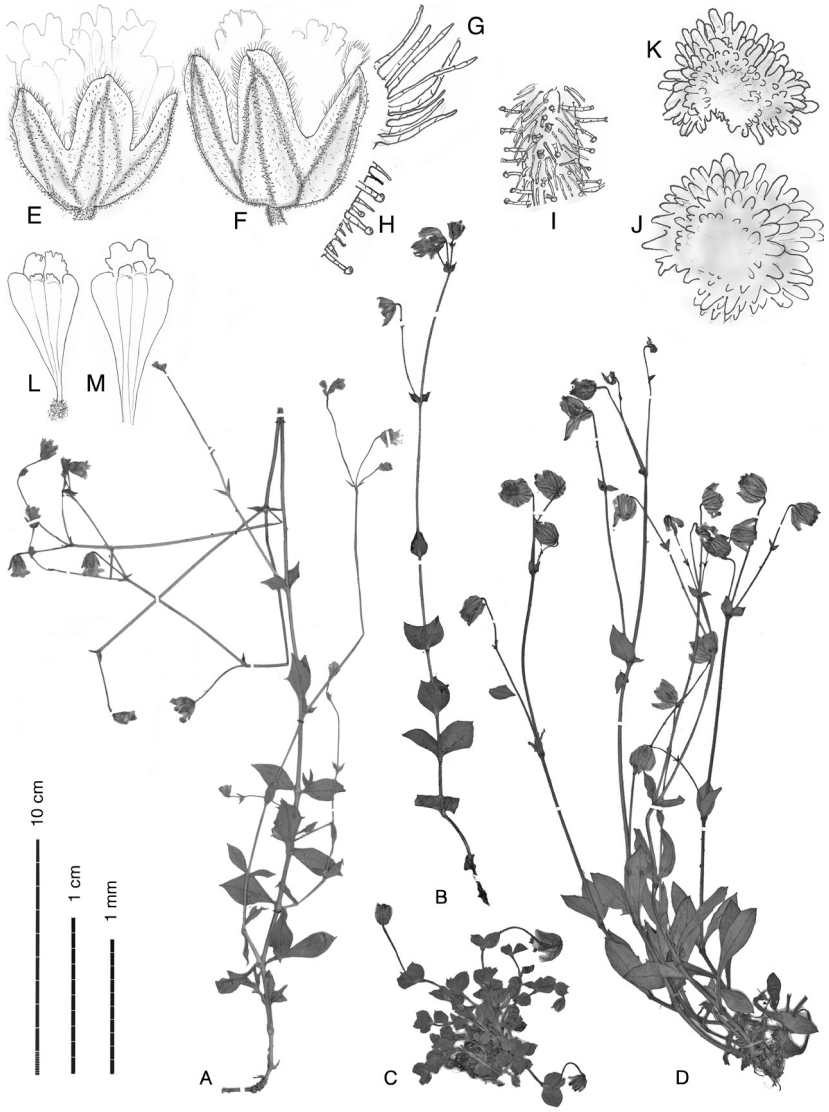

Figure 3. *Silene thomsonii*: A, whole plant, low-altitude form; B, whole plant, Central Nepalese form to which the type of the name *S. thomsonii* belongs; C, whole plant, Central Nepalese form to which the type of the name *S. thomsonii* belongs; D, whole plant, eastern form from Solukhumbu; E, calyx (drawn from resoftened herbarium material; the calyces are much more closed when fresh, see Figure 4); F, calyx (drawn from resoftened herbarium material; the calyces are much more closed when fresh, see Figure 4); G, hairs on calyx teeth; H, hairs on calyx veins; I, upper part of pedicel; J, seed; K, seed; L, petal; M, petal. Scale bars: A–D, 10 cm; E, F, L, M, 1 cm; G–K, 1 mm. Vouchers: A, *Suzuki* et al. 9485253 (E); B, *Hoshino* et al. 9666181 (E); C, *Yon* 165 (E); D, *Wakabayashi* et al. 9710312 (E); E, *Suzuki* et al. 9485253 (E); F–H, *B. Yon* 233 (E); I, DNEP3 AY36 (E); J, *Wakabayashi* et al. 9710312 (E); K, *KR* 9740430 (KATH); L, *B. Yon* 233 (E); M, DNEP3 AY36 (E). Drawings: Magnus Lidén.

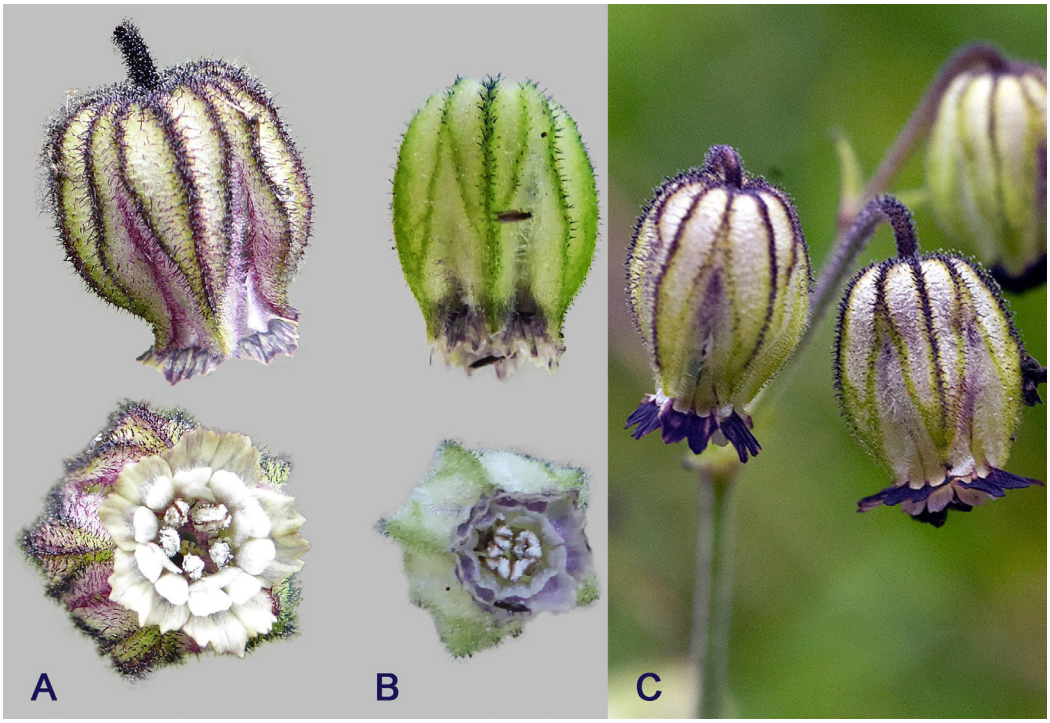

Figure 4. *Silene thomsonii*: A, eastern form; B, 'weedy' lowland form; C, widespread form (except the extreme east of the distribution area). Photographs: A and B, E. Byers; C, K. Halberg.

Silene fissicalyx Bocquet & Chater, Enum. Fl. Pl. Nepal 2: 55 (1979). – Type: C. Nepal, Rasuwa, W Mailung Khola drainage area S of Ganesh Himal., 10 ix 1975, *A. Stainton* 7466 (holotype BM000521520, not seen; paratype *Yon* 276 E00783708).

Melandrium dingriense Y.W.Tsui & P.Ke ex L.H.Zhou, Fl. Xizang. 1: 716 (1983). – Type: Tingri, Da-ge-zhang, 4200 m, 29 vii 1959, *Xizang exp.* 676 (holotype PE 00935112).

"*Melandrium cashmerianum*" *sensu* Zhou (1983) p.p., non (Royle ex Benth.) Majumdar (1964).

"*Silene indica*" *sensu* Bocquet (1969) p.p. and Rajbhandari & Suzuki (2008) p.p., non Otth (1824).

"*Silene cancellata*" *sensu* Bocquet (1969) p.p., non (Jacquem. ex Edgew. & Hook.f.) Majumdar (1964).

Because *Silene thomsonii* has been so often confused with other taxa, in particular with the very dissimilar *S. indica* (see Lidén, 2019b), a portrait of this very distinct and common species is needed. Although arguably the most variable of all *Silene* species in Nepal (see below), it exhibits some striking characters (in bold print below) that make it unique among Central Himalayan *Silene* species.

Perennial caespitose herb, pubescent throughout with down-curved eglandular hairs and patent glandular hairs. *Stems* few to many, ascending to suberect, 10–40 cm long, simple, with 5–8 pairs of rather equally sized leaves. *Leaves* pubescent with short acute non-glandular hairs, **ovate to broadly elliptic or obovate, often abruptly shortly acuminate**; lower leaves cuneate into short petiole, middle and upper leaves sessile, (8–)15–40 × 7–20 mm; uppermost leaves (bracts) often smaller. *Inflorescence* very lax, 1- to 5-flowered (to 10-flowered in lowland forms), often widely spreading. *Flowers* nodding, becoming erect in fruit. *Calyx* 8–13 mm, pale green to whitish-translucent, 5-angular, **divided to at least 1/2**; teeth very densely long-ciliate with white or purplish hairs; veins prominently raised, dark green to purple, densely dark-purple pubescent with straight glandular hairs and shorter non-glandular hairs; **commissural veins bifurcating almost from base or shortly above**, confluent with midveins apically; lateral anastomoses absent. *Androgynophore* 3 mm long, densely woolly-hairy. *Petal* claw auriculate, entire to obtusely dentate apically. Petal limb 1.5–2.5 mm long, shallowly bifid. *Styles* 5, exserted. *Seeds* 1 mm, tuberculate, with long dorsal papillae.

Distribution. Endemic to Central Nepal and adjacent South Tibet.

Habitat and ecology. Habitat preferences wide, judging from labels: “rocky slope; sandy slope; sandy grassland slope; rock ledges; grazed grassland”, and for low-altitude records, “open damp place; open grassland near field; eroded trail side”. Altitudinal range (1900–)2300–4700 m. Flowering late July to early September; fruiting August to September.

Notes. Slightly protandrous. Plants with flowers that apparently lack stamens have been encountered, but this needs confirmation.

Silene thomsonii has an extreme altitudinal range (1900–4700 m) and varies greatly in general vegetative appearance and number, size and width of flowers. Three main variants can be distinguished:

a) This form, which includes the type specimen of *Silene thomsonii*, is the most widespread: Figures 3B,C, 4C. *Silene fissicalyx* was based on plants from Ganesh Himal in Central Nepal with short few-flowered stems and small leaves. However, because there are transitional stages in the same area to more floriferous and larger plants, we find that it does not deserve distinction.
b) Lowland forms occurring between 1900 and 3000 m (Figures 3A, 4B), often from field margins or roadsides, are usually paler green, long and slender, more branched and with more numerous smaller, paler and often narrower flowers (*M. Suzuki* et al. 9485253, *N.P. Manandhar* 9873, *F. Miyamoto* et al. 9430120, *E. Byers* 12, *S.K. Kasaju* 810). They are widely scattered throughout the distribution area of the species and are not necessarily related.
c) Plants from the Solukhumbu district (Figures 3D, 4A) in the easternmost part of the distribution area have a different habit with fewer nodes, longer-lasting flowers and longer

basal leaves, and wide synflorescences; a case could certainly be made for subspecific distinction.

Silene cancellata (Jacquem. ex Edgew. & Hook.f.) Majumdar, a species endemic to the border area of Himachal Pradesh and Kashmir, has been erroneously reported from Nepal (Bocquet, 1969) based on specimens of *S. thomsonii* but is easily distinguished by its short pedicels, calyx divided to 3/4 or more with lanceolate acute teeth, long exserted petals with much longer limb and low-colliculate flat-backed seeds.

The related *Silene bhutanica* (W.W.Sm.) Majumdar from East Himalaya and Southeast Tibet differs from *S. thomsonii* in its longer and narrower leaves and longer and less divided calyx. It has been erroneously reported from Nepal.

Additional specimens examined. Nepal. **Rukum**: Above Guibang (28°42'N, 82°56'5"E), 3225 m, 28 viii 2014, *C. Pendry* et al. BRD A137 (E00898984). **Mustang**: Titigaon, 2610 m, 6 viii 1996, *T. Hoshino* et al. (E00826275, TI 9666181). **Manang**: Chame, 2700 m, on open and rocky land, 15 viii 1983, *N.P. Manandhar* 9873 (KATH; small-flowered); Marsyandi Khola, 7 viii 1983, *H. Ohba* et al. 8311145 (TI 8311145). **Gorkha**: near Lungdang Gompa, 2840 m, 28 vii 1994, *M. Suzuki* et al. (PE 01698863, TI 9470233); Ranagaon, 1900 m, 3 viii 1994, *M. Suzuki* et al. 9485253 (E00223990, PE 01522757, TI 9485253, extreme lowland form). **Rasuwa**: Chyauche Kharka (28°14'N, 85°07'E), 2325 m, 12 viii 1994, *F. Miyamoto* et al. 9430120 (E00152785, TI); Ganesh Himal (28°20'N, 85°10'E), v 1974, *B. Yon* 256 (E00826675, filed as *Silene fissicalyx*); Bhairavkunda, 4100 m, 14 vii 1972, *A. Maire* 59 (E00783706, filed as *S. fissicalyx*); Buddha Mandir (28°05'05"N, 85°24'11"E), 4370 m, 16 ix 2016, *M.F. Watson* et al. A216 (E); Gosainkund (28°05'N, 85°25'E), 4300 m, 12 viii 1974, *J.H. de Haas* 2234 (L, filed as *S. fissicalyx*; Z); Tiru Danda ridge (28°12'N, 85°13'E), 4000 m, 23 viii 1974, *J.H. de Haas* 2565 (BM; L, filed as *S. fissicalyx*; Z); Langtang, 3350 m, 21 viii 2000, *M.N. Subedi* 00400293 (KATH); Langtang, Kyangjin (28°13'N, 85°34'E), alpine Weidin, Zwergstrauch-heiden, Schutthalden, 4000 m, 10 viii 1995, *K. Reiter & Wündisch s.n.* (M); Langtang, stony pasture, 27 viii 1976, *Durham univ. Him. Exp.* D35 (KATH019178); Langtang, Ghora Tabela, 3000 m, 10 ix 2009, *K. Halberg* 268 (photograph). **Sindhu-palchok**: Charikot to Kalinchok, 8000 ft, *s.d.*, *Banerji, Shrestha & Upadhyay* 2756 (KATH); Michet, 13,000–14,000 ft, 1927, *Wigram* 1927 (E00219983); Kharidhunga, 2650 m, 6 ix 2017, *S.K. Kasaju* 810 (efloraofindia, small-flowered lowland form). **Dolkha**: 13 x 1960, *S.B. Malla & S.B. Rajbhandari* 436 (KATH); Dongang to Beding, 17 ix 2007, *S. Noshiro* et al. 20720039 (E00477130, TI). **Solukhumbu**: Namche Bazar to Kyangjuma (27°48'39"N, 86°43'25"E), 3550 m, 14 ix 2005, *DNEP3* AY36 (E00248396); Chule (27°58'N, 86°38'E), E facing slope, 4718 m, 21 ix 2005, *DNEP3* BX186 (KATH); Mt Everest national park, drainage of Imje Khola, Pangboche S slope, 4030 m, 26 vii 1984, *A. & E. Byers* 432 (COLO); Tangnag (c.27°42'N, 86°50'E), 4060 m, 21 viii 1997, *M. Wakabayashi* et al. 9710312 (E00241851, TI); Namche to Jorsale, eroded trailside, 3280 m, 4 ix 2017, *E. Byers* 12 (photograph of living plant, no specimen, collection number *EAB* 20170904-12); Syangboche, 3840 m, 7 viii 2017, *E. Byers* 165 (photograph of living plant, no specimen, collection number *EAB* 20170904-165); **Loco ignoto**: 12 viii [year not known], *K.R.* [*Rajbandhari*?] 0749 (KATH, unmounted in 2018); ibid., 4 viii, *K.R.* 0504 (KATH, unmounted); ibid., 3 viii [year not known], *K.R.* 0449 (KATH, unmounted); ibid., 20 viii [year not known], *K.R.* 9740430 (KATH, unmounted).

Tibet. **Gyirong**: Labi to Shale, 3100 m, 1 ix 1990, *Li Bo-Sheng* et al. 13373 (PE 01486962). **Nyalam**: Qu Xian to Nielamu [Nyalam], 3400 m, 31 viii 1972, *Tibet herbal medicine census* 1659 (HNWP;

PE 01187823); ibid., 3400 m, 1 ix 1981, *Ni Zhi-Cheng* et al. 1912 (PE 00558352); ibid., 18 viii 2011, *NN* 5733 (PE). **Tingri**: Da-ge-zhang, 4200 m, 29 vii 1959, *Xizang exp.* 676 (PE 00935112).

(5–7) *Silene procera*, *S. nyalamensis* and *S. blepharicalyx*

There are three similar Himalayan vicariant species, namely *Silene procera*, *S. nyalamensis* and *S. blepharicalyx*, that are distinguished from *S. thomsonii* by narrower leaves, shorter inflorescence branches and pedicels, and less deeply divided and narrower calyx. Differentiating characters are listed in Table 3.

5. **Silene procera** Lidén, **sp. nov.**

Silene procera differs from *S. thomsonii* Majumdar in having fewer and narrower cauline leaves, a less deeply divided calyx, and shorter dorsal seed papillae; from *S. nyalamensis* (L.H.Zhou) Lidén in its larger and more rounded calyx with flat erect teeth, soft glandular hairs on calyx veins, longer dorsal seed papillae, and lower altitude preference; and from both species in having tall slender stems with thin erect branches and reticulate calyx venation. – Type: Nepal, Gorkha, Lho to Sama Gaon (28°34'33"N, 84°41'56"E), highly fragmented *Pinus*–broadleaf forest, open stony banks by pathsides, 3210 m, 2 viii 2008, *H. Ikeda* et al. (*Manaslu 2008 expedition*) 20815090 (holotype E00780081). **Figure 5O–V.**

"*Melandrium firmum*" *sensu* Zhou (1983), non Rohrb. (1869).

Table 3. Morphological comparison of *Silene procera*, *S. nyalamensis* and *S. blepharicalyx*

Character	*S. procera*	*S. nyalamensis*	*S. blepharicalyx*
Stem	40–75 cm, simple or with thin erect branches	15–40 cm, simple or branched above	(7–)10–40 cm, simple or branched
Nodes	6–8	5 or 6	3–6
Stem pubescence	Non-glandular pubescent throughout, or subglabrous basally; glandular hairy in inflorescence	Non-glandular pubescent throughout, or subglabrous basally; glandular hairy in upper half	Non-glandular pubescent throughout; glandular hairs lacking
Calyx	11 mm, subcylindrical in early anthesis, becoming ovate, divided to 1/3	9–10 mm, campanulate, divided to 1/3	8–10 mm, campanulate, divided 1/4 to 1/3
Calyx veins	Greenish brown to purplish; with some short branches and lateral anastomoses	Dark purplish, very distinct; joining in the teeth only; no lateral anastomoses	Green to dark purplish; with short branches and lateral anastomoses
Calyx teeth	Ovate, subobtuse, erect, flat	Triangular, subacute, ± folded and recurved at apex	Triangular, subacute, ± folded and recurved at apex
Glandular hairs on calyx	Present, 0.2–0.3 mm	Present, c.0.3 mm	Absent
Altitude	2150–3750 m	3500–4100 m	2800–4900 m
Flowering	June to August	July to August	July to September

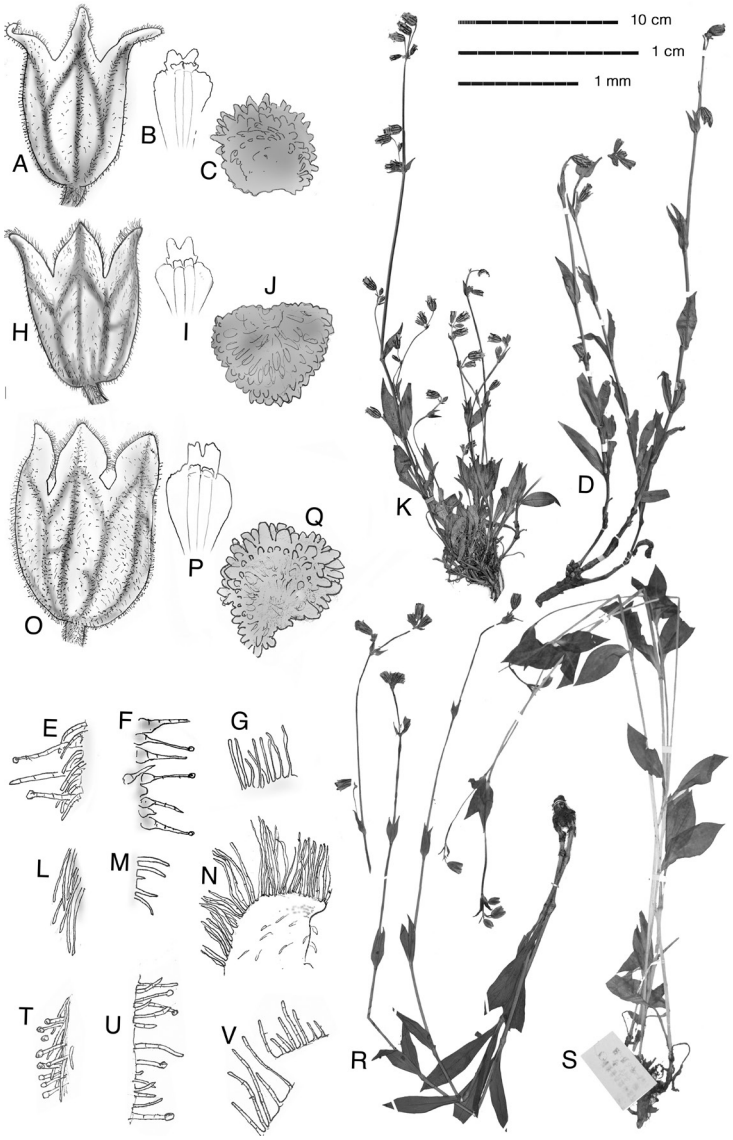

Figure 5. *Silene nyalamensis* (L.H.Zhou) Lidén, comb. nov.: A, calyx; B, petal; C, seed; D, whole plant; E, upper part of pedicel; F, calyx vein pubescence; G, calyx teeth cilia. *Silene blepharicalyx* Lidén, sp. nov.: H, calyx; I, petal; J, seed; K, whole plant; L, upper part of pedicel; M, calyx vein pubescence; N, calyx teeth cilia. *Silene procera* Lidén, sp. nov.: O, calyx; P, petal; Q, seed; R, S, whole plant; T, upper part of pedicel; U, calyx vein pubescence; V, calyx teeth cilia. Scale bars: A, B, H, I, O, P, 1 cm; C, E–G, J, L–N, Q, T–V, 1 mm; D, K, R, S, 10 cm. Vouchers: A, C–G, *Tibet herbal medicine census* 1832 (PE); B, *Banerji & P.R. Shakya* 5706 (KATH); H, L–N, *K.K. Shrestha & S.K. Ghimire* SP363 (KATH); I, J, *S. Noshiro* et al. 20106081 (E); K, *A. Stainton, W.R. Sykes & L.H.J. Williams* 2197 (E); O, P, R–V, *H. Ikeda* et al. (*Manaslu 2008 expedition*) 20815090 (E); Q, *H. Ikeda* et al. 20811114 (E). Drawings: Magnus Lidén.

Laxly caespitose with few to several stems, non-glandular pubescent throughout, glandular pubescent above, at least in the inflorescence. *Stems* slender, erect, simple or often with thin erect branches, 40–75 cm long, with 5–7 pairs of leaves, with dense down-curved eglandular hairs 0.1 mm long, especially above. *Leaves* 25–70 × 8–20 mm, becoming smaller upwards; basalmost leaves withered at flowering time; basal cauline leaves shortly vaginate, elliptic to oblanceolate, acute, long petiolate; middle and upper leaves not vaginate, ovate-lanceolate, acuminate, attenuate at base into indistinct petiole, upper ones sessile; veins and margins with dense short curved non-glandular hairs, otherwise lamina sparsely hairy, especially adaxially. *Inflorescence* lax, few- to many-flowered, irregular, with partial cymes 1- to 3-flowered. *Pedicels* 5–20 mm long in flower, 10–30 mm in fruit, densely pubescent with eglandular and glandular hairs 0.2–0.3 mm long. *Bracteoles* like bracts and upper leaves, but much smaller, with short curved non-glandular hairs 0.05–0.1 mm long and a few glandular hairs, ciliate towards the base by thin 0.2–1.0 mm long hairs. *Calyx* c.11 mm long, subcylindrical in early anthesis, later becoming more rounded, pale green with dark brown to purplish veins with some short vein-branches and lateral anastomoses, densely pubescent, especially on veins, with glandular and non-glandular hairs 0.2–0.3 mm long; divided to 1/3 into ovate subobtuse teeth slightly constricted at middle, densely ciliate with 0.2–0.5 mm long hairs. *Androgynophore* 1–1.5 mm long, pubescent. *Petal* claw obovate, exserted, 4 mm broad at apex. Petal limb 2–3 mm long, ± bifid with shallowly dentate lobes, pale greyish green or suffused with purple; coronal scales 0.5–1 mm long, whitish, entire or slightly emarginate. *Anthers* purple. *Styles* 5. *Capsule* not or slightly exserted. *Seeds* 0.8 mm long, slightly flattened with fairly long dorsal papillae.

Distribution. Endemic to a small area in West Central Nepal and neighbouring South Tibet. Altitudinal range 2150–3750 m. Flowering June to August.

Habitat and ecology. Open forest, grassland.

Etymology. Latin *procerus* ('tall'): "is said of plants which are taller than their parts would have led one to expect" (Stearn, 1992).

Additional specimens examined. Nepal. **Gorkha**: Namrung to Lho (28°33'37"N, 84°44'47"E), grazed grassland, 2790 m, 1 viii 2008, *H. Ikeda* et al. 20811114 (E00779925); Marsyandi: Humde – Pisang – Deorali Khanda – Bardang, 4 viii 1983, *H. Ohba* et al. (TI 8331177, TI 8331179).

Tibet. **Gyirong**: 2150 m, 16 vii 1975, *Qing-Zang exp.* 4650 (PE 00046971, plant in bud stage); ibid., 2850 m, 24 vii 1975, *Qing-Zang exp.* 4747 (PE 00046955); ibid., 3700 m, 24 vii 1975, *Qing-Zang exp.* 7077 (PE 00049696); ibid., 2800 m, 13 vii 1975, *Qing-Zang exp.* 5227 (PE 00046933); ibid., 2900 m, 20 vii 1975, *Qing-Zang exp.* 7033 (KUN 0514128); *Abies* forest, 3500 m, 16 vii 1975, *Qing-Zang exp.* 6945 (PE 01268460); ibid., 3300 m, 3 vii 1975, *Wu Zheng-Yih* et al. 75-529 (HNWP, KUN 0514321, PE); ibid., 3400 m, 22 vi 1972, *Tibet herbal medicine census* 488 (HNWP, PE 00048012); ibid., (28°34'46"N, 85°15'8"E), birch forest, 3752 m, 5 ix 2015, *Zhou Zhuo* et al. ZJW-3692 (KUN 1275266); ibid., (28°24'10"N, 85°21'53"E), forest, 2841 m, 6 ix 2015, *Zhou Zhuo* et al. ZJW-3774 (KUN 1275034); ibid.,

(28°23'51"N, 85°23'28"E), forest, 3353 m, 6 ix 2015, *Zhou Zhuo* et al. ZJW-3846 (KUN 1274796); ibid., 2350 m, 30 viii 1976, *Wu Zheng-Yih* et al. 5246 (KUN).

6. Silene nyalamensis (L.H.Zhou) Lidén, **comb. nov.**

Basionym: *Melandrium nyalamense* L.H.Zhou, Fl. Xizang. 1: 727 (1983). – Type: Tibet, Nyalam, 4000 m, 5 ix 1972, *Tibet herbal medicine census* 1832 (holotype HNWP 30689, isotype PE 00558365). **Figure 5A–G.**

"*Melandrium cashmerianum*" *sensu* Zhou (1983) and "*Silene cashmeriana*" *sensu* Zhou *et al.* (2001 p.p, non *Silene cashmeriana* (Royle ex Benth.) Majumdar).

Rootstock stout, vertical. *Stems* above with dense glandular and eglandular hairs, lower half with only eglandular recurved hairs or subglabrous. Flowering *stems* few to several, erect, 20–40 cm, with 5 or 6 pairs of leaves, simple or branched. *Leaves* green or greyish green with distinct midvein; lowermost leaves petiolate, often withered at flowering time, middle and upper leaves sessile. Lower and middle leaves elliptic to oblanceolate, acute to usually slightly acuminate, 20–50 mm long, 5–15 mm broad, sparsely to densely hairy (always dense on midvein and margin), with short hairs 0.1–0.15 mm long (longer cilia towards the base). Upper leaves sessile, lanceolate, 20–40 × 4–10 mm. *Inflorescence* terminal 3- to 5-flowered; axillary 1- to 3-flowered. *Bracts* like uppermost leaves or smaller, densely ciliate; bracteoles minute. *Flowers* ± nodding. *Pedicels* 2–5 mm long, or up to 11 mm in alar flowers. *Calyx* campanulate, 9–10 × 5–6 mm, divided to 1/3, with prominent dark purple veins coming together at teeth apices, lateral anastomoses absent; densely hairy with ± broad-based acute hairs 0.3 mm long, at least some gland-tipped. Teeth triangular, subacute, slightly constricted at middle, ± recurved and slightly folded at apex, densely ciliate with thin hairs 0.3 mm long. *Androgynophore* c.1 mm long, densely hairy above, less so below. *Petal* claw slightly exserted, 3 mm broad at apex, slightly dentate, slightly auriculate; limb 1.5–2 × 1.5 mm, bifid to 1/3 to 1/2; coronal scales 0.5–1 mm long. *Styles* 5 (described as 3-styled in the protologue, but this is obviously a *lapsus calami*). *Seeds* 0.8 mm long, tuberculate, with longer papillae on back.

Distribution. East Central Nepal and South Tibet (Gyirong, Nyalam).

Habitat and ecology. Open places. Altitudinal range 3500–4100 m. Flowering July to August.

Notes. *Silene nyalamensis* can be confused with *S. procera* in bud or if shade-grown, but the latter is a taller plant with thin erect branches, has a larger more rounded calyx with softer less tapering hairs and greenish reticulate veins, and grows at lower altitudes. Small individuals of *Silene nyalamensis* are similar to *S. blepharicalyx*, but in this case (like in *S. procera*) the calyx veins are less raised and have at least some reticulations; further, glandular hairs are lacking, and the calyx teeth have longer cilia.

Additional specimens examined. Nepal. **Dolakha**: Tangboche to Feroche, on exposed area, 4000 m, 31 vii 1966, *Banerji & P.R. Shakya* 5706 (KATH, US01895810). **Loco ignoto**: *s.col.* 7976 (KATH, specimen unmounted in 2018).

Tibet. **Gyirong**: Tuodang, 3500 m, 26 vi 1972, *Tibet herbal medicine census* 553 (PE 00048046); ibid., (28°34'51"N, 85°15'30"E), 3812 m, *Liujq-09xc-lzt-082* (KUN). **Nyalam**: 3600 m, 31 viii 1972, *Tibet herbal medicine census* 1680 (HNWP 29220, PE 01268454); near the station, 3800 m, 2 ix 1972, *Tibet herbal medicine census* 1714 (HNWP 30674); ibid., 4100 m, 7 ix 1981, *Zhi Cheng* et al. 2081 (PE); ibid., 3750–4100 m, 17 vii 2016, *Wei Lai & He Yi* BNUXZ2016109 (BNU 0028276).

7. Silene blepharicalyx Lidén, **sp. nov.**

Silene blepharicalyx differs from *S. nyalamensis* (L.H.Zhou) Lidén in having fewer leaves, a calyx with reticulate veins, no glandular hairs and long-ciliate teeth; from *S. caespitella* F.N.Williams by its shorter and broader leaves, a broader more open calyx with reticulate veins and long-ciliate teeth, and seeds with longer tubercles or papillae on the back. – Type: Nepal, Tegar N of Mustang, open grassy slopes, 4420 m, 5 viii 1954, *A. Stainton, W.R. Sykes & L.H.J. Williams* 2197 (holotype E00219973, isotype TI). **Figure 5H–N.**

"*Silene caespitella*" *sensu* Rajbhandari & Suzuki (2008), non F.N.Williams.
"*Silene nepalensis*" *sensu* Boquet pro parte (1969), non Majumdar.

Perennial herb, densely pubescent throughout with down-curved non-glandular hairs; glandular hairs absent. *Rootstock* simple or often branched, often forming a small crown, without runners; sterile leaf rosettes usually absent in flowering individuals. *Stems* few to several, ascending to suberect, simple or often branched below, (7–)10–40 cm long with (3–)4–6 pairs of leaves, upper internodes longer than lower. *Leaves* not vaginate, green to greyish green, usually paler abaxially, ± densely pubescent with short curved hairs; lower leaves with indistinct petioles 5–25 mm long, lamina oblanceolate, cuneate at base, acute; middle leaves subsessile, lanceolate to ovate-lanceolate, acuminate, 20–60 × (4–)7–15(–18) mm; upper leaves sessile, narrowly ovate to lanceolate, acuminate, 20–40 × 4–11 mm; bracts and bracteoles small, long-ciliate at base. *Inflorescence* few- to many-flowered, irregular; partial cymes 1–3(–5)-flowered; dichasial internodes very short. *Pedicels* 3–10(–20) mm long. *Flowers* ± nodding. *Calyx* campanulate, 8–10 mm long, pale green; veins broad, dark green to dark purplish, not prominently raised, broadly anastomosing below teeth apices, usually with some transverse anastomoses and/or short supernumerary basal veins; pubescent throughout with mostly recurved hairs 0.1–0.2 mm long; divided 1/4 to almost 1/3; teeth triangular, subacute, apex usually ± recurved and ± folded, densely ciliate with soft hairs 0.2–0.5 mm long. *Androgynophore* 1 mm long, densely hairy above, less so below. *Petal* claw pale, usually conspicuously exserted, 2.5–3 mm broad at apex, broadly auriculate, obscurely dentate, sometimes very sparsely ciliate. Petal limb 1.5–2 mm long and broad, bifid, often with a small lateral basal tooth on each side, white or purplish; coronal scales 0.5 mm long. *Styles* 5. *Capsule* ovate, conspicuously protruding from calyx. *Seeds* 0.8 mm long, brown with small dorsal papillae.

Distribution. Widespread and fairly common in dry areas from Himachal Pradesh eastwards to Annapurna in Nepal; South Tibet east to Lhozhag (the Lozhag find is geographically isolated in the East, and needs confirmation).

Habitat and ecology. Open grassy slopes, meadow, alpine dwarf scrub, north-facing open *Pinus wallichiana* A.B.Jacks stand, wet place sheltered by rocks, cultivated fields. Altitudinal range 2800–4900 m. Flowering July to September; fruiting August to October.

Etymology. Greek βλέφαρον ('eyelid'), alluding to the long-ciliate calyx teeth.

Notes. High-altitude plants are generally shorter and more greyish with denser indumentum. The colour of calyx veins varies from green to dark purple.

DNA data (Petri & Oxelman, 2011) from chloroplast and nuclear loci suggest that *Silene blepharicalyx* is an allotetraploid with the diploid *S. caespitella* as closely related to the pollen parent. This conclusion is based on the sequences of collections by *G. Miehe, S. Miehe & K. Koch* (01-049-16, 01-061-16, 01-067-03, 01-124-08, 01-127-22), determined as *Silene nepalensis* by Petri & Oxelman (2011), and of *G. Miehe, S. Miehe & K. Koch* 01-061-16 (as *S. indica*). Morphologically, *Silene blepharicalyx* is intermediate between *S. caespitella* and *S. procera* (the latter was not included in the Petri & Oxelman study).

Additional specimens examined. India. **Himachal Pradesh**: Spiti, Thumla, 4100 m, 31 vii 1972, *U.C. Bhattacharyya* 49170 (BSD); Rakcham Kanda, grassy slopes, 14,000 ft, 13 viii 1973, *N.P. Janardhanan* 52701 (BSD). **Uttarakhand**: Uttarkashi, Kedarganga, open slopes among boulders, 3600 m, 30 viii 1983, *U.C. Bhattacharyya* 74643 (BSD); Gangotri national park, 21 vii 2003, *P. Pusalkar* 102160, 102394, 103320, 103901, 105298 (BSD); Nanda Devi national park, Ramni to Bhujgara, open hill slopes, 26 viii 1981, *P. K. Hajra* 73324 (BSD); Garwal, Kaga-Ana, erect herb on rocky slopes, 3000 m, 17 viii 1974, *Naithani* 54099 (DD); Tehri-Garwal, Gaumukh to Rispabasta, glacial soil, 4200 m, 24 ix 1967, *Kedarnath Parbat exp.* 37434 (BSD); Chamolo district, N of Bampa, moraine slopes, 3800 m, 6 ix 1975, *Naithani* 56089 (BSD); Kumaon, Furkia Pindari, moraine, 3500–5000 m, 23–24 ix 1957, *T.A. Rao* 4450 (BSD); Sankuti to Grabbe, slopes, 12 viii 1998, *Panchchuli multidimensional expedition, R.P. Uniyal & Bipin Balodi* 94186 (BSD); Dudhpani, 4000 m, 27 vi 1886, *J.R. Reid s.n.* (E); Tihri-Garwal, Jaulea [= Jhala?] under Srikanta, 11,000–12000 ft, [early viii] 1883, *J.F. Duthie* 627a (DD); Kumaon, Lebung glacier, 15,000 ft, 6 ix 1884, *J.F. Duthie* 2744, 2745 (DD); Kumaon, Ralam valley, 16 viii 1900, *Inayat* 24263 (DD).

Nepal. **Seti Zone**: Paya, 4300 m, 28 viii 1936, *F.M. Bailey s.n.* (E00219950). **Mugu**: Between Mugu and Purana Mugu, Mugu Khola, open coniferous forest, 3800 m, 20 viii 1952, *O. Polunin, W.R. Sykes & L.H.J. Williams* 5333 (TI). **Dolpa**: Naru, Chhepka, 2980 m, 8 viii 1996, *K.K. Shrestha & S.K. Ghimire* SP160 (KATH); Chhepka, 3800 m, 8 viii 1996, *K.K. Shrestha & S.K. Ghimire* SP228 (KATH); Chhepka, 2980 m, 9 viii 1996, *K.K. Shrestha & S.K. Ghimire* SP278 (KATH); Kagmera, 4300 m, 9 viii 1996, *K.K. Shrestha & S.K. Ghimire* SP363 (KATH); Bamere, 2750 m, 8 viii 1981, *Dep. med. pl. (Kathmandu)* 6924 (KATH). **Mustang/Manang**: 13 collections from 28°48'N, 83°43'E to 29°07'N, 84°03'E, 3470–4510 m, 7 viii to 10 ix 2001, *G. Miehe, S. Miehe & K. Koch* 01-014-20, 01-049-16, 01-061-16, 01-072-22, 01-116-13, 01-127-22, 01-128-19, 01-067-03, 01-120-05, 01-124-08, 01-125-03, 01-134-08, 01-013-09 (all GB); Namdo, N of Mustang, 4900 m, 9 viii 1954, *A. Stainton, W.R. Sykes & L.H.J. Williams* 2298 (BM, E00066537); W Makhchung, 3.5 km S from Tibetan border (29°15'N, 83°59'E), 4490 m, 3 vii 2003, *Y. Iokawa* et al.

(TI 20320159); Jomson to Kagbeni, 2750–2800 m, 21 vii 1983, *H. Ohba* et al. 831057 (KATH012896, TI); Phedi to Thanti, 4100–4400 m, 26 vii 1983, *H. Ohba* et al. 8330864 (KATH, TI 8330864); Thanti (29°01'43"N, 84°04'04"E), 4520 m, 12 viii 2001, *Y. Iokawa & M.N. Subedi* 20105080 (E00826227, TI 20105080); Ghami – Zhaite (29°03'42"N, 83°52'39"E), in meadow on a hill top, 4350 m, 16 viii 2001, *S. Noshiro* et al. 20106197 (E00826214, TI 20106197); Samar (28°55'53"N, 83°49'41"E), in cultivated fields, 3450 m, 16 viii 2001, *S. Noshiro* et al. 20106081 (E00826213, TI 20106081); Lo Monthang – Chmmithong (Chumithou) (29°10'59"N, 83°57'12"E), 3834–4866 m, 1 viii 2002, *T. Watanabe* et al. LOM-SP020801(054) (TI); Annapurna W side, Marche, 10,000 ft, 15 iv 2021 (B.S. date = 30 vii 1964), *T.B. Shrestha & M.S. Bista* 1455 (KATH); Dhaulagiri: Batase damda, 11,000 ft, 15 iv 2021 (B.S. date = 30 vii 1964), *T.B. Shrestha & M.S. Bista* 1428 (KATH); Ghemi to Samar (29°04'N, 83°52'E), wet places sheltered by rocks, 3800 m, 25 viii 2002, *F. Miyamoto* et al. (TI 20230205).

Tibet. **Zanda**: 4100 m, 28 vi 1976, *Qing-Zang exp.* 76-7885 (PE). **Burang**: 5100 m, 24 vii 1976, *Qing-Zang exp.* 76-8286 (HNWP 58790, PE 00559849); ibid., 4850 m, 19 vii 1976, *Qing-Zang exp.* 76-8533 (HNWP 59265, KUN 0513896, PE); ibid., 4850 m, 19 vii 1976, *Qing-Zang exp.* 13050 (PE 00047846); Kejia, 3700 m, 29 viii 1990, *Fei Yong* et al. 630 (KUN 0531688); Kangrinboqe Feng, 4700 m, 25 viii 1990, *Fei Yong* et al. 495 (KUN 0531689). **Zhongba**: 5000 m, 8 viii 1975, *s.col.* 44-7126 (PE 00046988). **Gyirong**: 4500 m, 4 viii 1975, *s.col.* 5755 (PE 00046956).

The following (all in TI but not seen as not available on website) were also cited as *Silene caespitella* by Rajbhandari & Suzuki (2008): **Mustang/Manang**: Ghar Gompa (29°7'N, 83°53'E), in shrubbery near stream on scree slope, 4000–4200 m, 19 viii 2002, *F. Miyamoto* et al. 20220192; Around Sangda pass (28°53'N, 83°43'E), in open grassy place on scree slope, 4400–4650 m, 19 viii 2002, *F. Miyamoto* et al. 20220083; ibid., stony slopes, 4460 m, 10 viii 2002, *F. Miyamoto* et al. 2023001; Pongio Kharka – Phalyak (28°51'40.3'N, 83°44'41.3'E), on banks, 3870 m, 13 viii 2002, *F. Miyamoto* et al. 20210091; NE Lo to Manthang (29°16'N, 84°01'E), soil slopes, 3800 m, 20 viii 2002, *F. Miyamoto* et al. 20230137; Alubari Kharka (28°45'23"N, 83°40'12"E), on heavily grazed slope in meadow, 3600 m, 31 vii 2001, *S. Noshiro* et al. 20106036.

8. Silene vaginans Lidén, **sp. nov.**

Silene vaginans differs from *S. blepharicalyx* Lidén in having prominent intrapetiolar vaginae, a much larger calyx and larger seeds; from *S. poa* Lidén (see species 10) in having tuberculate seeds and lack of glandular hairs; from both species in having much taller stems which are conspicuously thinner above, long-stalked lower leaves, and a pubescence of much longer hairs. – Type: Nepal, Seti zone, Bajhang/Badhura (29°31'43"N, 81°24'01"E to 29°35'02"N, 81°22'16"E), on open grassy slope, 2190–3350 m, 16 viii 1991, *M. Suzuki* et al. 9160673 (holotype E00224916, isotype TI 9160673). **Figure 6.**

Perennial caespitose herb. *Stems* erect, 50–75 cm long, stiff, simple; larger stems 3 mm thick basally, much thinner above, glabrous below, above hairy on nodes and in the inflorescence with long non-glandular reflexed appressed hairs 0.4–1 mm long, with 4 or 5 distant pairs of leaves. Nodes prominent, with up to 9 mm long interpetiolar vaginae. *Leaves* erect, narrowly oblong-oblanceolate (lower) to lanceolate or linear-lanceolate (middle and upper), tapering to acute apex; leaves 25–150 × 4–10 mm, with upper leaves much smaller;

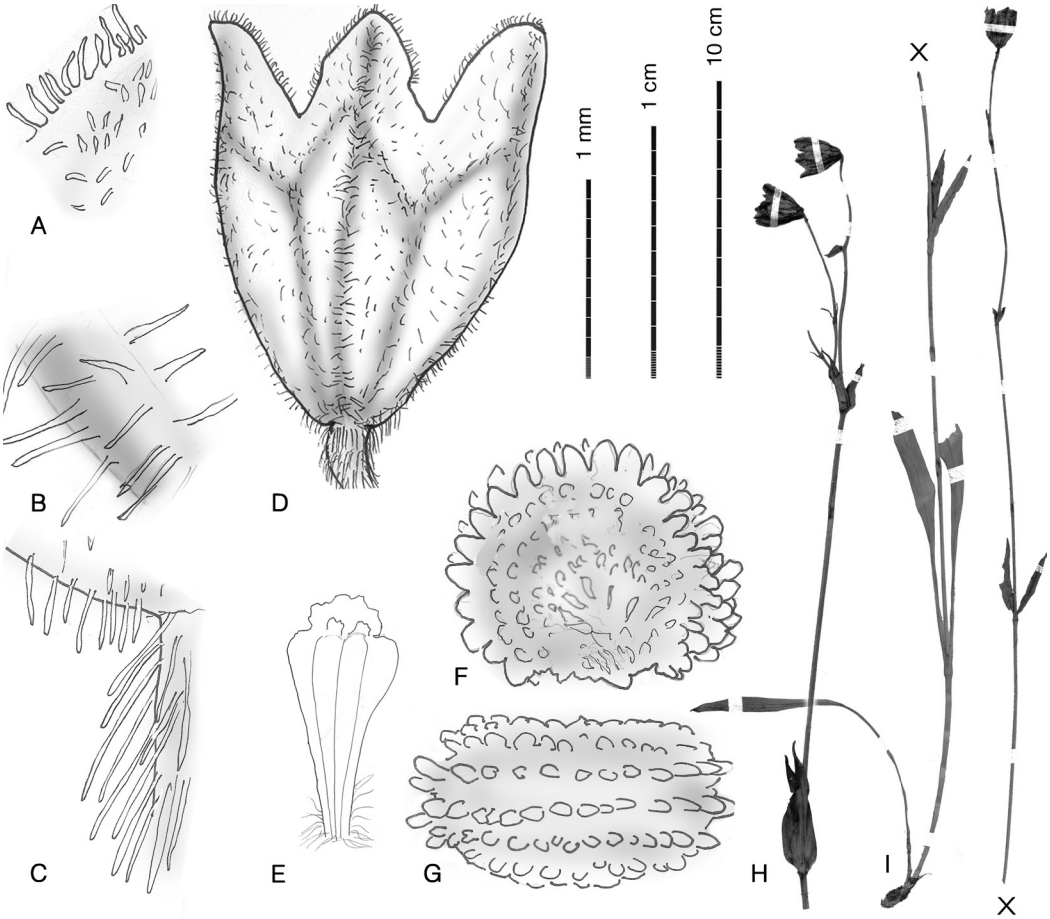

Figure 6. *Silene vaginans* Lidén, sp. nov.: A, calyx tooth margin; B, calyx vein; C, upper part of pedicel with calyx base; D, calyx; E, petal; F, seed (side view); G, seed (dorsal view); H, whole plant; I, whole plant ('X' indicates single stem join). Scale bars: A–C, F, G, 1 mm; D, E, 1 cm; H, I, 10 cm. Vouchers: A–G, *M. Suzuki* et al. 9160673 (E); H, I, *M. Suzuki* et al. 9160673 (TI). Drawings: Magnus Lidén.

lowermost leaves attenuate into long petiole, glabrous; upper sessile, ciliate towards the base. *Bracts* 5–20 × 0.5–2 mm. *Inflorescence* lax, 1- to 4-flowered. *Calyx* campanulate, 16–17 mm long, broad at mouth, divided to 1/4 with triangular subacute teeth slightly constricted at base, pubescent all over with non-glandular hairs 0.1–0.3 mm long, denser, purple-coloured and up to 0.5 mm long on the veins; teeth with 0.1–0.3 mm long dense cilia. *Androgynophore* 3 mm long, long-woolly hairy, especially above. *Petals* included within calyx, claw evenly broadened, 4 mm broad at apex, not or slightly auriculate, at base with very long fine hairs; limb 1.5 × 3 mm long, very shallowly lobed; coronal scales small. *Styles* 5. *Capsule* included within calyx. *Seeds* grey, rounded in profile, flattened, 1.5 mm in diameter, with three distinct rows of thin-walled dorsal papillae.

Distribution. Known only from the type gathering.

Habitat and ecology. Open grassy slope at 2190–3350 m. Early flowering stage mid August.

Etymology. The Latin epithet alludes to the long interpetiolar vaginae (leaf sheaths) of the lower cauline leaves.

Notes. *Silene vaginans* has no obvious close relatives, at least not among the Central Himalayan taxa. It is superficially similar to *Silene poa* in the long interpetiolar vaginae and narrow leaves, but the stem is taller and conspicuously thinner above, the lower leaves have long petioles, the pubescence consists of much longer and exclusively non-glandular hairs, and the seeds are papillate, not winged as in *S. poa*. It is known only from this single gathering.

(9, 10) *Silene nepalensis* and *S. poa*

Silene nepalensis and *S. poa* are two similar vicariant species. They are distinguished from all other Nepalese species of *Silene* by the combination of grass-like leaves, campanulate glandular hairy calyx, and winged seeds.

9a. Silene nepalensis Majumdar, J. Indian Bot. Soc. 42: 649 (1964) [1963], nomen novum for *Lychnis multicaulis* Wall. ex Benth. in Royle, Ill. Bot. Himal. Mts. 1[3]: 80 (1839), non *Silene multicaulis* Guss. (1826). – *Melandrium multicaule* (Benth.) Walp., Repert. Bot. Syst. (Walpers) 1: 280 (1842). – Type: Nepal, [Rasuwa] Gossain Tain. 1821, *Wallich cat.* 622, (lectotype K000728818 [mixed collection ex herbarium Benthamianum] left-hand specimen, here selected, see Note 1 below; isolectotypes K000728819 [mixed collection] the two right-hand specimens [of four]; K001111426 [mixed collection] three detached stems, one with flower; BM [not seen]; G00074044 [mixed collection] two middle stems; G00074045). **Figure 7A–L.**

Silene gonosperma subsp. *himalayensis* var. *pertica* Bocquet, Candollea 22: 9 (1967). – Type: Nepal, Lamrak, 15000', 1929, *Lall Dhwoj* 194 (holotype E00015047, isotype BM000521650).

"*Lychnis apetala* var. *gracilis* Hook.f.", cited by Rohrbach (1869), see Note 2.

Densely caespitose with few to many stems and non-flowering leaf rosettes. *Stems* erect, slender, (8–)15–40(–60) cm long, with (2–)3 to 4(–5) pairs of leaves, pubescent with recurved hairs or (sub)glabrous at base; nodes often purplish. *Leaves* linear, 30–130(–190) × 1.5–4(–6) mm (uppermost leaves smaller), slightly tapering to sub-obtuse apex, 10–20 times as long as broad, with prominent midvein, sunken adaxially, raised abaxially; subglabrous or vein hairy, ciliate at the base and ± hairy along the fusion lines of the leaf vaginae, green to glaucous green, concolorous or paler beneath; middle and lower vaginae 4–7 mm long; upper 1–3 mm. *Inflorescence* with 1–3(–6) flowers in a compound

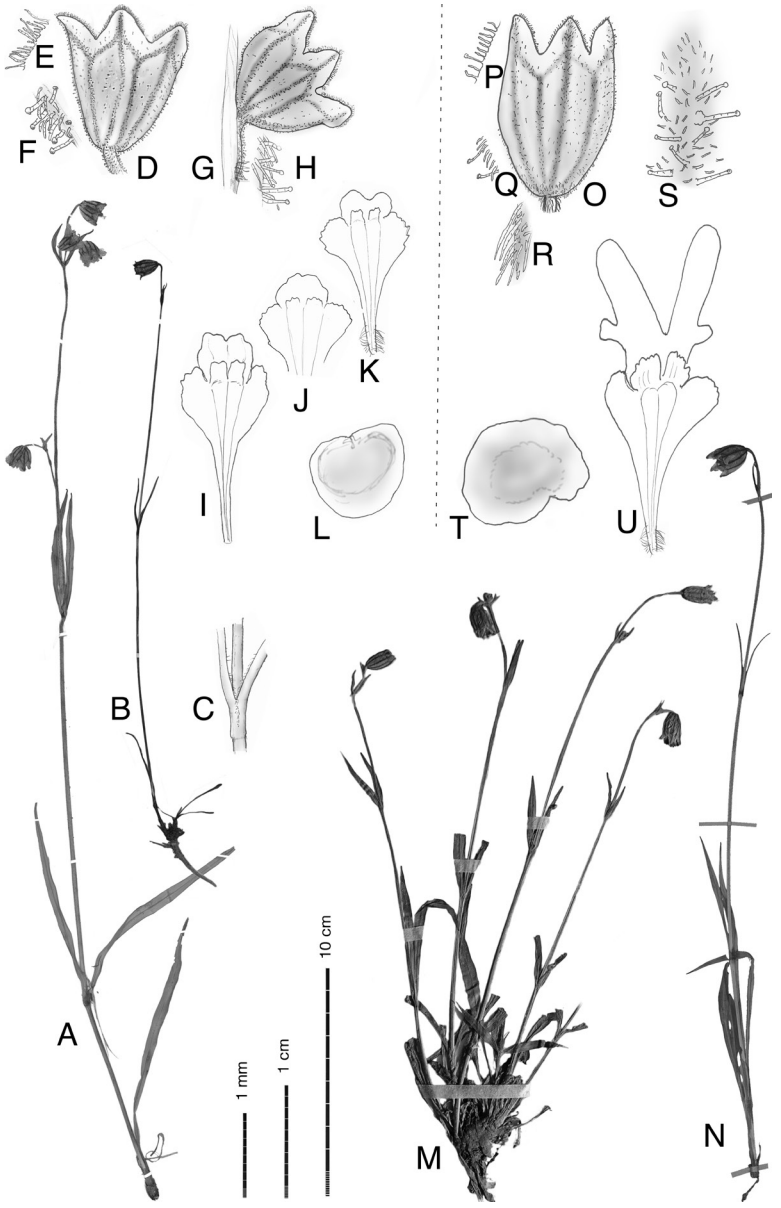

Figure 7. *Silene nepalensis*: A, whole plant; B, whole plant; C, lower stem node; D, calyx; E, teeth cilia; F, vein pubescence; G, calyx; H, upper part of pedicel; I, petal; J, petal; K, petal; L, seed. *Silene poa* Lidén, sp. nov.: M, whole plant; N, whole plant; O, calyx; P, teeth cilia; Q, vein pubescence; R, upper part of pedicel; S, calyx vein en face; T, seed; U, petal. Scale bars: A, B, M, N, 10 cm; C, D, G, I–K, O, U, 1 cm; E, F, H, L, P–T, 1 mm. Vouchers: A, K, *H. Ohba* et al. 8580491 (E); B, J, *H. Ikeda* et al. 20811234 (E); C–F, I, L, *M. Wakabayashi* et al. 9730195 (E); G, H, *Durham univ. exp.* D037 (KATH); M, *Dep. Med. Pl. Kathmandu* 6293 (KATH); N, S, U, *PSW* 2570 (E); O–R, T, *J.F. Duthie* 2742 (DD). Drawings: Magnus Lidén.

synflorescence, nodding. *Bracts* 10–40 mm long, linear to lanceolate, usually densely long-ciliate towards the base, and with short hairs adaxially. *Pedicels* 7–20(–40) mm long, elongating and erect in fruit, densely pubescent with recurved non-glandular acute hairs and with patent glandular hairs in upper part. *Calyx* 10–13 mm long (± enlarging in fruit), campanulate, pale green with conspicuous purplish or rarely greenish veins, joining in the teeth, occasionally with a lateral branch, densely pubescent with patent glandular hairs 0.2–0.4 mm long and non-glandular hairs 0.1–0.2 mm long; cleft 1/4 to 1/3, teeth triangular, margin broadly hyaline, very densely eglandular ciliate with thin 0.1–0.3 mm long hairs; apex subobtuse, slightly folded and recurved. *Androgynophore* 1–1.5 mm long, densely hairy. *Petal* claw included, apically 4–5 mm broad, auriculate, ± dentate, base narrow, often purplish, with purple hairs. Limb purple or greenish white, 1–2 mm long, 2–3 mm broad, entire to broadly emarginate or irregularly lobed; coronal scales 0.5 mm long, entire to shallowly crenate. *Styles* 5, very rarely 3. *Seed* 1.5 mm long with broad wing.

Distribution. From West Nepal east to West Arunachal Pradesh; South Tibet from Burang east at least to Chumbi.

Habitat and ecology. Grassy and stony slopes. Altitudinal range 3500–4700 m. Flowering May to September.

Notes. Four out of five sheets of *Wallich cat.* 622, that we have examined, are mixed collections of two distinct entities. The lectotype represents a widespread and common species. The second element differs in broader leaves, insignificant interpetiolar vaginae, thicker stems with patent hairs, and calyx veins dark and prominent with commissural veins bifurcating about 1/3 from the base (vs 2/3). This latter entity has not been recollected at Gosain Than or elsewhere and is presumed to be a hybrid specimen (see 9b below for further discussion). The protologue fits both entities equally well; the lectotype represents that entity which is present on all *Wallich cat.* 622 sheets that we have seen (disregarding G00074046, which only holds a Rubiaceae specimen), whereas the hybrid is lacking on G00074045. The specific sheet K000728818 was selected as lectotype for the name *Lychnis multicaulis* because it was in the possession of the author.

Silene nepalensis is usually found in herbaria as *S. gonosperma* subsp. *himalayensis* or *S. himalayensis*. This confusion started with Hooker, who annotated both a Sikkim collection of *Silene nepalensis* (*Hooker s.n.*: C, DD, G, GH, K, P [lower left], S) and the type specimen of the remotely related *S. himalayensis* (Rohrb.) Majumdar as "*Lychnis apetala* var. *gracilis*". Subsequently, Rohrbach (1869) cited the Sikkim collection with Hooker's herbarium name under *Melandrium apetalum* δ *himalayense* Rohrb., as a "… *forma gracile*…". Several later authors (Edgeworth, 1875; Bocquet, 1969; Rajbhandari & Suzuki, 2008) have likewise mostly treated both species under *Silene himalayensis*, while using the epithet *nepalensis* for several unrelated species but occasionally also for *S. nepalensis*. In *Flora of China* (Zhou *et al.*, 2001), following Bocquet (1969), the epithet *nepalensis* is used for a Southwest Chinese

taxon related to *Silene caespitella* but with more robust habit, broader leaves and larger flowers.

This species is very variable in size, probably mostly a plastic response to growing conditions (shade, water, nutrients). On two occasions (*Durham univ. exp.* D37 (KATH); *M. Suzuki* et al. 8880652 (KATH)), individuals with three styles have been encountered, but plants with five styles are known from the same localities, and correlated differences are not apparent.

Additional specimens examined. Bhutan. Upper Mo Chu, above Laya (28°7'N, 89°44'E), grassy slopes among *Berberis* and *Potentilla* shrubs, 4080 m, 20 ix 1984, *I.W.J. Sinclair & D.G. Long* 5167 (E00074202); Rodophu, forb-rich pasture encroached by *Rhododendron lepidotum* on SE-facing slope, 4330 m, 16 viii 2000, *G. & S. Miehe* 00-290-50 (GB); Philé La river, 14,000 ft, 23 vii 1914, *R.E. Cooper* 1711 (E00074245); [Luyshi Timpu], among long grass in sheltered corners, 15,000 ft, 21 vii [1914], *R.E. Cooper* 1673 (E00074246).

India. **Sikkim**: Lhonak, 15,000 ft, 25 viii 1947, *G.H. Cave* 5/47 (E). **Arunachal Pradesh**: Se La, pass between Tawang and W Kameng districts, 4200 m, 22 viii 2015, *P. Bharali & M. Lidén* 14B (CAL).

Nepal. **Dolpa**: E of Chalikhe Pahar, 14,000 ft, 1 viii 1954, *A. Stainton, W.R. Sykes & L.H.J. Williams* 3710 (E00074264, KATH). **Mustang**: Muktinath, 13,000 ft, 28 vii 1954, *A. Stainton, W.R. Sykes & L.H.J. Williams* 2041 (E00074269, KATH). **Lamjung**: Rambrong, 14,000 ft, 7 vii 1954, *A. Stainton, W.R. Sykes & L.H.J. Williams* 6201 (E00074267). **Gorkha**: Dharamsala (28°39'28"N, 84°34'40"E), 4640 m, 11 viii 2008, *H. Ikeda* et al. 20811234 (E00774752). **Rasuwa**: Ganesh Himal (28°20'N, 85°10'E), v 1975, *B. Yon* 115 (E); ibid., (28°12'N, 85°38'E), 4000–5000 m, 20 vii 1992, *F. Miyamoto* et al. 9220290 (E00224914, TI 9220290); Gosaikunda, 14,800 ft, 8 viii 1976, *Durham univ. exp.* D37 (KATH021835, 3 styles!); Gosaikunda, 4400 m, 14 viii 1974, *J.H. de Haas* 2268 (L); Langtang, 12,000 ft, 23 vi 1949, *O. Polunin* 557 (BM, TI, KUN 0514320); Langtang valley, Kyangjin, (28°13'N, 85°34'E), 3970 m, 8 ix 1985, *K. Reiter* 287 (M, late fruiting); Mulkharka to Chilime, 3800–4100 m, 2 vii 1970, *Kanai & Shakya* 675179 (KATH). **Solukhumbu**: Mosom Kharka, (27°40'N, 86°49'E), 3600 m, 22 viii 1997, *M. Wakabayashi* et al. 9720261 (E00241838); ibid., 10 viii 1997, *M. Wakabayashi* et al. 9715125 (L). **Sankhuwasabha**: Yangri Kharka (27°45'N, 87°10'E), *s.d.*, *M. Suzuki* et al. 8820658 (KATH012903); ibid., 3600 m, 20 vii 1988, *M. Suzuki* et al. 8880652 (KATH, TI 8880652); Merek, 4380 m, 20 vii 1988, *M. Suzuki* et al. 8850625 (KATH019300, TI); Panch Pokhari to Jaljale S Sabha, 7 viii 1991, *M.N. Subedi* 221-1921 (KATH). **Taplejung**: Ratopokhari to Topkegola, under big rock, shade among mosses, 14,000 ft, 26 vii 1971, *T.B. Shrestha & D.P. Joshi* 339 (KATH); Ramdang to Ghunsa (27°45'55"N, 87°59'56"E), 4411 m, 20 ix 2009, *M.K. Dhamala, B.P. Bhurtel & B. Paudel* 183 (TCD). **Loco ignoto**: 3 viii [year not known], *K.R. Rajbhandari* 456 (KATH).

Tibet. **Burang**: Kangrinboqe Feng, alpine grassland, 4700 m, 25 viii 1990, *Fei Yong* et al. 482 (KUN 0513549, right-hand specimen, mixed with *Silene caespitella*). **Gyirong**: (28°45'33"N, 85°18'28"E), 3977 m, 28 vii 2015, *Wei Lai, Hao Jia-Chen* 15413 (BNU 0030419); Pabasi, 3900 m, 27 vi 1972, *Tibet herbal medicine census* 590 (HNWP, PE 00559828); ibid., 3700 m, 5 vii 1975, *Wu Zheng-Yih* et al. 530 (PE); ibid., (28°32'N, 85°16'E), 4400 m, 23 viii 1993, *S. & G. Miehe* 9548/09 (Miehe). **Nyalam**: 3400 m, *Tibetan Chinese herbal medicine survey team* 1511 (HNWP, PE 00559843). **Dinggye**: 4800 m, 8 xi 1991, *Li Bo-Sheng* et al. 13099 (PE 01486960). **Chumbi (Yadong)**: Gyong, 13,000 ft, 12 ix 1912, *Rohmoo Lepcha* 186 (E00074257); ibid., 21 viii 2011, *Yu Sheng-Xiang* et al. 5802 (PE).

9b. Silene nepalensis × thomsonii

Most sheets of the collection *Wallich cat.* 622 are mixed, with one part being *Silene nepalensis* as clarified above (species 9a, notes). The second element is most probably a hybrid between *Silene nepalensis* and *S. thomsonii*. It is intermediate in many characters (including the bifurcation of commissural calyx veins) between the alleged parents, which were both collected in the same place during the same visit. Further, it has never been collected again, despite the locality having been frequently revisited. We presume that all stems come from a single large individual. Unfortunately, we have not had the opportunity to check pollen or seed. The alleged hybrid could be confused with *Silene nyalamensis* but has narrower leaves and more deeply bifurcating commissural veins.

Distribution. Nepal, Rasuwa district.

Habitat and ecology. Not known.

Specimens examined. Nepal. **Rasuwa**: Gosain Than, 1821, *Wallich cat.* 622 p.p., mixed with *Silene nepalensis* (K000728819, two left-hand specimens; K000728818, large right-hand specimen; K001111426, large specimen and a couple of detached stems; G00074044, left and right stems [of four]).

10. Silene poa Lidén, **sp. nov.**

Silene poa differs from *S. nepalensis* Majumdar in its more robust habit with thicker stems, grass-like leaves gradually tapering to an acute apex, a calyx larger and comparatively less deeply divided, and a petal limb much longer and deeply divided. – Type: India, Uttarakhand, Kumaon, Nipchang valley, Darma, 14,000–15000 ft, 31 viii 1884, *J.F. Duthie* 2742 (holotype DD, isotype E00074280). **Figure 7M–U.**

Rhizome thick, branched, forming dense crown(s) with withered leaf remnants and few to several stems, with one or two non-flowering rosettes. *Stems* (15–)30–40 cm long, simple, erect, rather stout, ± glabrous below, above with short recurved hairs, densely so towards apex and in inflorescence, with 3 or 4 pairs of leaves. Lower *leaves* subglabrous, attenuate towards the base, long vaginate; upper leaves not or shortly vaginate, sessile, pubescent with short recurved hairs; nodes ciliate with short and long reflexed hairs. Lamina narrowly linear-lanceolate, 4–10 cm × 3–6 mm, gradually tapering to acute apex. Terminal *inflorescence* usually 1-flowered, rarely 2- or 3-flowered; axillary flowers from uppermost leaves sometimes present. *Flowers* nodding. *Bracteoles* 2–5 mm long. *Pedicels* 4–15 mm long, longer and erect in fruit, densely hairy with short recurved hairs. *Calyx* campanulate, 15–17 mm long, pale green with dark veins, often with some short divaricate veinlets, with very short hairs overall and with longer glandular hairs on veins; divided to (1/5 to) 1/4; teeth triangular, sometimes slightly constricted 1/3 from base, ciliate with short obtuse hairs. *Androgynophore* 1.5 mm long, pubescent. *Petal* claw profoundly auriculate; petal limb 3–4 mm long, deeply bifid into narrow lobes, with two smaller lateral lobes basally; coronal

scales 1 mm long, broad, fleshy, shallowly lobed. *Stamens* not exserted from corolla mouth. *Styles* 5. *Seeds* brown, c.1 mm long including entire wing, body 0.5–0.6 mm.

Distribution. Uttarakhand and West Nepal.

Habitat and ecology. Open slopes. Altitudinal range 3000–4000 m. Flowering May to September.

Etymology. Greek ποα ('grass'), alluding to the grass-like leaves.

Additional specimens examined. India. **Uttarakhand**: Gangotri national park, Kedarganga valley, open slopes, common, 7 viii 2003, *P. Pusalkar* 104284 (BSI, DD); Rudragonga valley, semi-open slopes, common, 1 viii 2003, *P. Pusalkar* 103987 (BSD).

Nepal. **Doti**: Khaptad, 2950 m, open slope, 3 vii 1981, *Dep. med. pl. (Kathmandu)* 6293 (KATH). **Jumla**: Bhurchula Lek S of Jumla, open slopes, 11,000 ft, 19 vii 1952, *O. Polunin, W.R. Sykes & L.H.J. Williams* 4784 (BM000017353, TI 10004761). **Dolpa**: near Balangra pass, open grassy slopes, small ravines, 13,000 ft, 26 vii 1952, *O. Polunin, W.R. Sykes & L.H.J. Williams* 2570 (BM, E00066540, TI).

Acknowledgements

We much appreciate the help we have received from Hem Rej Paudel (KATH), Hao Jia-Chen (PE), Prashant Pusalkar (BSD), Sabine and Georg Miehe for letting us access their private herbarium, Bernhard Dickoré (M), and Colin Pendry and Mark Watson (E). Thanks to Elizabeth Byers, Michelle Page and Kai Halberg for sharing photographs. We are grateful to the the herbaria BM, BNU, BSD, COLO, DD, E, FRLH, G, GB, GOET, HNWP, IBSC, K, KATH, KUN, L, M, PE, S, TCD, TI, TUS, UPS, US and Z and their curators for kindly making herbarium specimens available for study. We thank two anonymous reviewers for constructive criticism and the editors for their patience.

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