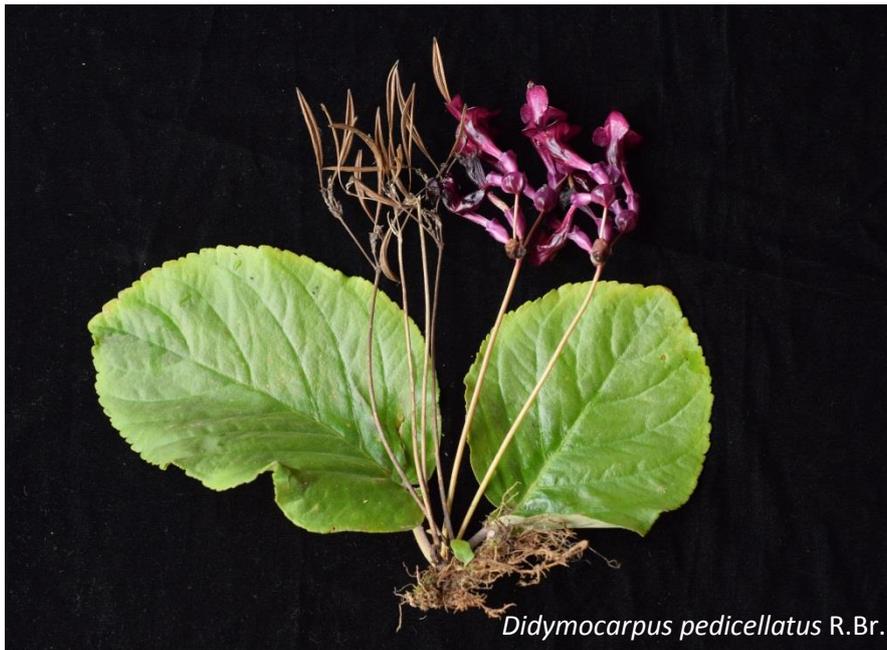


## Revision of the Gesneriaceae for the Flora of Nepal



Report submitted to the Davis Expedition Fund

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## Introduction

The Flora of Nepal is compiling the first comprehensive account of the estimated 6500 species of vascular plants found in Nepal. The Flora of Nepal Project is collaboration between the Royal Botanic Garden Edinburgh (RBGE), the Nepal Academy of Science and Technology (NAST), the Department of Plant Resources (DPR), Kathmandu, Tribhuvan University Central Department of Botany (TU) and the Society of Himalayan Botany, Tokyo (SHB). The need for a Flora has been identified as a priority by the Government of Nepal in their National Biodiversity Strategy 2002, and RBGE has been invited to coordinate the project.

The most recent checklists report 32 species of Gesneriaceae from Nepal (Hara, H., 1982; Press *et al.*, 2000), but at least 35 species are believed to be present there.

The proposed field work for August-September in 2015 had to be cancelled because of earthquake in Nepal in April, and blockade of fuel supplies in September. The grant from the Davis Expedition Fund was used to pay for salary to continue the revision of the Gesneriaceae, resolving several taxonomic issues, and writing the account of the Gesneriaceae. An application was submitted to the RBGE expedition fund to conduct field work in June-July to collect more specimens of Gesneriaceae and other families for the publication of Vol 7 of the Flora of Nepal.

## Major outcomes

**Herbarium study and geo-referencing:** Altogether 548 herbarium specimens from E, BM, K were photographed, georeferenced and databased. These data are available to view and download from <http://www.floraofnepal.org/>

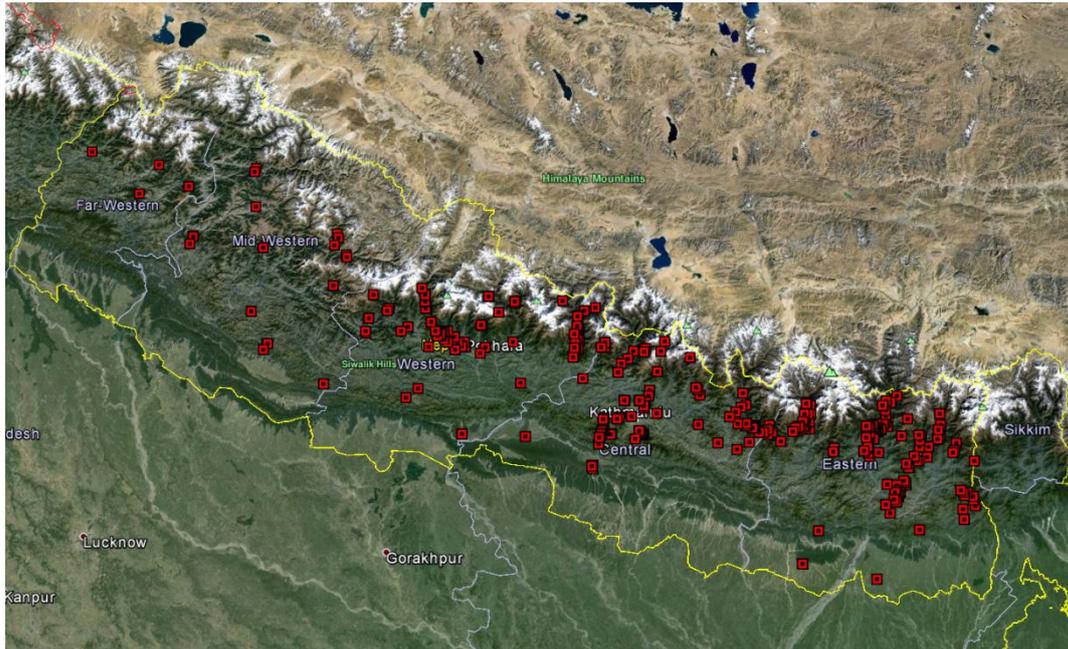


Fig. 1. Distribution of Gesneriaceae in Nepal based on herbarium label data

**Genus *Didymocarpus*:**

- One new species: publication in progress.
- *Didymocarpus curvicapsa* Hilliard is now synonymised under *Didymocarpus aromaticus* Wall. ex D. Don
- *Didymocarpus aurantiacus* C. B. Clarke is now excluded from the species grow in Nepal

A draft of the account is attached at the appendix 1.

**Genus *Henckelia* (former *Chirita*)**

*Henckelia dimidiata*: New addition to the Flora of Nepal.

*Henckelia pumila*: Two distinct morphological types have been identified within *H. pumila*: typical *pumila* with blue flowers with spotted leaves (Fig. 2), and white flowers without spotted leaves (Fig. 3). I have been working closely with Gesneriaceae group at RBGE to understand the genetic basis of this variation to imply the taxonomic criteria. We have sequenced several accessions, and chromosomes were counted

for the white flower types ( $2n=8$ ). However the decision has not yet been made whether a taxonomic entity will be formally recognised.



Fig. 2 Typical blue flower *H. pumila* with spotted leaves



Fig. 3 White flower *H. pumila* with green leaves

## Appendix: 1 Taxonomic account of *Didymocarpus*

***Didymocarpus*** Wall., Edinburgh Philos. J. 1: 378 (1819), nom. cons.

Perennial herbs, stem present or absent, usually covered with sessile pigmented glands. Leaves basal and/or along stems, opposite or alternate, sometimes in whorls, surfaces usually pubescent, rarely glabrous, covered with sessile pigmented glands. Inflorescences arise from leaf axils, few to many flower cymes. Bracts in pair, free or connate at base. Calyx 5-lobed, sometimes 2-lipped, glabrous or glandular pubescent, usually persistent in fruit. Corolla purple to dark reddish purple, salver-form or funnel-form, weakly to strongly 2-lipped, upper lip 2-lobed, lower lip 3-lobed. Stamens 2, included, anthers coherent; staminodes 3, anthers absent. Disc cupular or cylindric. Ovary linear, sessile or stipitate. Capsule linear-oblong, straight or slightly curved, dehiscent loculicidally, valves-2. Seeds many, without appendages.

About 180 species mainly in SE Asia; 12 species in Nepal

### ***Key to the species***

- 1a. Stem absent or very short up to 2 cm.....2
- 1b. Stem present or well-developed 2--32 cm.....4
- 2a. Leaves glabrous (except for sessile glands). Capsule stipitate  
.....**4. *D. pedicellatus***
- 2b. Leaves pubescent. Capsule sessile.....3
- 3a. Corolla funnel-form, lobes of upper lip 1.5—2.5 mm....**3. *D. macrophyllus***
- 3b. Corolla salver-form, lobes of upper lip 7—7.5 mm.....**2. *D. andersonii***
- 4a. Corolla glabrous.....5
- 4b. Corolla glandular pubescent.....8
- 5a. Calyx lobes divided to near base.....**1. *D. albicalyx***
- 5b. Calyx lobes divided half or less than halfway.....6
- 6a. Stem densely villous.....**5. *D. villosus***
- 6b. Stem appressed pubescent.....7

- 7a. Leaves oblong elliptic to narrowly elliptic or obovate. Calyx up to 2.5 mm.....**6. D. oblongus**
- 7b. Leaves ovate to broadly elliptic. Calyx 5—7 mm.....**7. D. primulifolius**
- 8a. Basal leaves well developed, petiole equal or more than the length of the stem.....**10. D. cinereus**
- 8b. Basal leaves absent.....9
- 9a. Cauline leaves clustered only at the top of the stem.....**8. D. podocarpus**
- 9b. Cauline leaves in a pair or more at the top of stem, and also present below along the stem.....10
- 10a. Upper leaves opposite or alternate, capsule without stipe or if present less than 3 mm.....**9. D. aromaticus**
- 10b. Upper leaves in whorls, capsule with well-developed stipe.....11
- 11a. Upper cauline leaves in whorls at the middle or upper half of the stem, petioles usually equal or shorter than the leaves. Calyx distinctly two lipped, lobes unequal.....**11. D. pulcher**
- 11b. Upper cauline leaves in whorls at the middle or lower half of the stem, petioles usually longer than the leaves. Calyx lobes nearly equal  
.....**12.D. sp.nov.**

**1. Didymocarpus albicalyx** C. B. Clarke, Monogr. Phan. 5(1): 78 (1883).

Type: Syntypes: Sikkim, alt. 2000 m, Vulgaris, Griffith, n. 3839 [K, M, W, G-Bioss., G-DC]; J.D. Hooker [BM, G-Boiss., G-DC, K, P, W]; Nepaul, prope flumen Tambur, J.D. Hooker [K].

Stem erect, 2–25 cm, retrosely hairy. Petiole 0.5–8 cm, smaller or nearly sessile on uppermost leaves, retrosely hairy. Basal leaves absent. Upper leaves opposite, slightly anisophyllous, ovate to broadly elliptic, 3–20 × 2–14 cm, base cordate or rounded, usually oblique, apex acute to obtuse, margin single to triple serrate, surfaces pubescent, denser on upper surface and on veins beneath, upper most leaves smaller, clustered near the apex. Flowers many in terminal and axillary (arising from upper leaf axils) cymes, cymes 6–13 cm. Peduncle 3–6 cm, pedicel 0.5–1.5 cm, sparsely glandular pubescent. Bracts free or connate at the base, rounded to rectangular, 2.5–3 × 2 mm, glabrous. Calyx white, glabrous, lobed nearly to the base, tube ca. 0.5 mm, lobes oblong obovate, 2–2.5 × 1–1.5 mm. Corolla dark red or purple, glabrous, tubular, 11–16 mm, tube 10–13 mm cylindrical for whole length,

lobes of upper lip rounded, ca. 1 × 1 mm, lobes of lower lip elliptic to rounded, 1–3 × 2–4 mm. Filaments 2–3 mm, glabrous, anthers 2 mm, hairy; staminodes 1–1.5 mm. Disc cupular, ca. 1 mm, mouth oblique, irregularly crenate. Pistil 8–9 mm, glabrous, stigma funnel-shaped (slightly bilobed?). Capsule 1.5–2.5 cm, straight or slightly curved, shortly stipitate, glabrous. Seed ellipsoid, ca. 0.4 mm.

**Distribution:** Nepal (East), E Himalaya.

**Altitudinal range:** 1350–2800 m.

**Ecology:** On mossy cliff and wet rocks

**Flowering:** July–September. **Fruiting:** August–November.

Notes: This species is readily identified by its calyx lobes which are white and divided near to the base.

**2. *Didymocarpus andersonii*** C. B. Clarke, Commelyn. Cyrtandr. Bengal: 92. t. 62 (1874).

Lectotype: Sikkim, Pankabare, 11, 7. 1862, Anderson 313, Sheet [CAL no. 332135], designated by Weber et al. 2000.

Stem absent or up to 2 cm, densely pubescent with spreading hairs. Petiole 2–20 cm, densely pubescent. Leaves all basal arises near the base or slightly above the base, opposite, rarely in 3, anisophyllous, broadly ovate to broadly elliptic or rounded, smaller leaves half or less than half of the length of the larger leaves, smaller 5–13 × 3–7 mm, larger 12–28 × 8–18 cm, base rounded to cordate, usually oblique, apex obtuse, margin single to triple crenate, both surfaces pubescent. Flowers one to many in terminal cymes, cyme 5–23 cm. Peduncle 3–11 cm, pedicel 0.5–1.5 cm, pubescent with spreading hairs. Bracts connate, obovate, 9–10 × 8–9 mm, glabrous. Calyx purple, glabrous, lobed to one fourth or less, tube 8 mm, lobes rounded, 1–2 × 2–2.5 mm. Corolla dark purple, glabrous, salver-form, 3–4 cm, tube 2–2.5 cm, cylindrical for whole length, slightly bent towards apex, lobes of upper lip rounded, 7–7.5 × 9–11 mm, lobes of lower lip rounded, 8–1.2 × 10–15 mm. Filaments ca. 2 mm, glabrous, anthers 3 mm, smooth; staminodes ca. 1 mm. Disc annular or slightly cupular, 1 mm, mouth crenate. Pistil ca. 10 mm, stigma slightly bilobed. Capsule 2–3 cm, straight, sessile, glabrous. Seeds not seen.

**Distribution:** Nepal (East), E Himalaya.

**Altitudinal range:** 800–1500 m.

**Ecology:** On shady cliffs and mossy rocks.

**Flowering:** June–September. **Fruiting:** June–October.

Notes: Easily identified by its salver-shaped corolla and larger corolla lobes.

**3. *Didymocarpus macrophyllus*** Wall. ex D. Don, Prodr. Fl. Nepal: 122. (1825).

Type: Nepal, Wallich. Associated material: Wallich 784 p.p., [BM, K, L(2), W, G, GZU].

Stem absent. Petiole 5–20 cm, sparsely pubescent. Leaves all basal, 1–3, slightly anisophyllous, broadly ovate to rounded, 4–17 × 4–13 cm, base cordate, apex obtuse or rounded, margin single to triple crenate, upper surface densely appressed hairy, lower surface glabrous except for few hairs on veins. Flowers many in cymes arising from the base, cymes 10–20 cm. Peduncle 7–15 cm, pedicel 0.5–1.5 cm, sparsely pubescent to glabrous. Bracts free, elliptic-ovate, 3.5–4.5 × 2.5–3.5, glabrous. Calyx purple, glabrous, lobed to middle to one fourth, tube 4–6 mm, lobes ovate-triangular, 2–2.5 × 1.5–2.5 mm. Corolla dark purple, glabrous, funnel-form, 2–2.5 cm, tube cylindrical for ca. 5 mm then gradually widens, lobes of upper lip ovate-rounded, 1.2–2.5 × 2–3 mm, lobes of lower lip rounded 3–7 × 4.5–8 mm. Filaments 2.5–3 mm, glabrous, anthers 1.5–2 mm, smooth; staminodes 1–1.5 mm. Disc cupular, 1.5–2 mm, mouth oblique, irregularly lobed. Pistil 11–15 cm, stigma slightly flattened. Capsule 2–3 cm, straight or slightly curved, sessile, sparsely pubescent to glabrous. Seeds ellipsoid, 0.3 mm.

**Distribution:** Nepal (West, East), W Himalaya.

**Altitudinal range:** 1650–2300 m.

**Ecology:** Climber in tropical and subtropical forest.

**Flowering:** July–October. **Fruiting:** July–October.

**4. *Didymocarpus pedicellatus*** R. Br., Cyrtandreae: 118. (1839).

Type: Himalaya occidentalis, alt. 800–1700 m, a Chumla usque ad Kumaon frequens, Royle [K]

Stem absent or very short up to 1.5 cm, sparsely pubescent. Petiole 2–15 cm, glabrescent. Leaves all basal, usually 2, sometimes with rudimentary second pair, slightly anisophyllous to isophyllous, ovate to broadly elliptic or rounded, 5–18 × 3–17 cm, base cordate to rounded, usually unequal, apex obtuse, margin single to double crenate-serrate, surfaces glabrous except the pigmented sessile glands. Flowers many in cymes arising from the base of leaves, cymes 10–22 cm. Peduncle 5–15 cm, pedicel 0.5–1.5 cm, glabrous. Bracts connate at base (to middle), elliptic, 6–11 × 4–6.5 mm, glabrous gradually smaller towards apex. Calyx purple, glabrous, shallowly lobed to less than one fourth, tube 9–11 mm, lobes

triangular, 1–1.5 × 1–3 mm. Corolla dark purple, glabrous, funnel-form, 3.5–4 cm, tube cylindrical for 1.5–2 cm then gradually widens towards mouth, lobes of upper lip rounded, 3–5 × 4–7 mm, lobes of lower lip ovate-rounded, 6–8 × 6–8 mm. Filaments 4–5 mm, glabrous, anthers 2–2.5 mm, hairy; staminodes 1–2 mm. Disc cupular, 1.5–2 mm, mouth crenate. Pistil 2.5–3 cm, stigma flattened. Capsule 3–4 cm, slightly curved, stipitate, glabrous. Seeds ellipsoid, 0.3–0.4 mm.

**Distribution:** Nepal (West, Central, East), W Himalaya, E Himalaya.

**Altitudinal range:** 350–1400 m.

**Ecology:** On moist shady rocks and on rock crevices.

**Flowering:** July–September. **Fruiting:** July–November.

Notes: *D. pedicellatus* is close to *D. macrophyllus* but distinguished by its glabrous leaves covered with pigmented brown sessile glands.

##### **5. *Didymocarpus villosus* D. Don, Prodr. Fl. Nepal: 123 (1825).**

Type: Nepal, Wallich [BM, G]. [need lectotypification]

Stem 4–12 cm, villous, hairs spreading up to 3 mm. Petiole 1–2 cm, densely villous. Basal leaves absent, upper leaves usually 4 crowded at stem apex, sometimes with a pair of small leaves, slightly anisophyllous to isophyllous, ovate to elliptic or obovate, sometimes asymmetric, 3–8 × 2.5–7 cm, base cuneate to rounded, apex obtuse, margin irregularly single to triple crenate, surfaces densely appressed pubescent. Flower many in terminal cymes, cyme 5–10 cm. Peduncle 2–7 cm, pedicel 0.5–1 cm, sparsely pubescent to glabrous. Bracts connate at base, boat shaped, 2–2.5 × 3–4 mm, glabrous. Calyx purple, glabrous, lobed to middle to one fourth, tube 2–3 mm, lobes triangular, 0.7–1.5 × 1.5–2.5 mm. Corolla purple, glabrous, tubular, 1.5–2.5 cm, tube 11–13 mm, cylindrical for its whole length, lobes of upper lip rounded, 2–2.5 × 1.5–2 mm, lobes of lower lip rounded, 4–5 × 5–6 mm. Filaments 2–2.5 mm, glabrous, anthers 1 mm, smooth; staminodes 1.5 mm. Disc cupular, 2.5 mm, mouth crenate. Pistil 11–13 mm, stigma flattened. Capsule 1.5–2.5 cm, straight to slightly curved, sessile, glabrous. Seeds ellipsoid, 0.4 mm.

**Distribution:** Nepal (Central, East), Tibetan Plateau.

**Altitudinal range:** 900–2300 m.

**Ecology:** On mossy rock in forest floor.

**Flowering:** June–September. **Fruiting:** June–October.

Notes: It is readily identified by long spreading hairs along the stem. Other Nepalese species have short appressed hairs on the stem.

**6. *Didymocarpus oblongus*** Wall. ex D. Don, Prodr. Fl. Nepal: 123. (1825).

Type: Nepal, Wallich [neotypified by Weber et al 2000, Wallich 738 BM]. (Check specimens in BM).

Stem 5–12 cm, pubescent with spreading hairs, hairs 1–2 mm. Petiole 0.5–3 cm, pubescent. Basal leaves absent, upper leaves usually 4 crowded at stem apex, sometimes with a pair of small leaves, anisophyllous to nearly isophyllous, oblong elliptic to elliptic or obovate, sometimes asymmetric, 3–14 × 1.5–6.5 mm, base cuneate, sometimes oblique, apex acute to obtuse, margin irregularly single to triple crenate, upper surface sparsely to densely pubescent, lower surface sparsely pubescent, denser along veins. Flowers many in terminal cymes, cymes 3–10 cm. Peduncle 2–6 cm, pedicel 0.5–1 cm, sparsely pubescent to glabrous except for few sessile glands. Bracts connate at base, rounded to orbicular, 2–2.5 × 2–3 mm, glabrous. Calyx pale pink, glabrous, lobed to middle or more, tube 1.5 mm, lobes ovate-triangular, 1–1.5 × 1 mm. Corolla pinkish purple, glabrous, tubular, tube 1–1.5 cm, cylindrical for its whole length, tube slightly ventricose below, lobes of upper lip rounded, 1 × 1–1.5 mm, lobes of lower lip rounded, 2–2.5 × 3–3.5 mm. Filaments 0.8 mm, glabrous, anthers 1.5 mm, smooth; staminodes ca. 0.2 mm. Disc cupular, ca. 1 mm, mouth irregularly toothed. Pistil 5 mm, stigma bilobed? Capsule 1–2 cm, straight, sessile, glabrous. Seeds ellipsoid, 0.3 mm.

**Distribution:** Nepal (West, Central, East), W Himalaya, E Himalaya.

**Altitudinal range:** 800–3000 m.

**Ecology:** On damp moist rocks.

**Flowering:** May–August. **Fruiting:** May–August.

**7. *Didymocarpus primulifolius*** D. Don, Prodr. Fl. Nepal: 123. (1825).

Type of the genus *Didymocarpus*: [Nepal: Wallich 1818- 2 sheets in BM (Lecto Hara 1972); Wallich, no. 785 *D. aromatica*, 1821, KW, K, BM).

Stem 5–17 cm, sparsely to densely appressed pubescent, hairs 0.3–0.5 mm. Petiole 0.5–3.5 cm, pubescent. Basal leaves absent, upper leaves usually 3–4, sometimes with a pair of small leaves, rarely 2, crowded at stem apex, ovate to broadly elliptic, 4–12 × 2–7.5 cm, base cuneate to rounded, apex acute to obtuse, margin crenate-serrate, upper surface appressed pubescent, lower sparsely pubescent, denser along veins. Flowers many in terminal cymes, cyme 5–9 cm. Peduncle 4–6 cm, pedicel 0.5–1 cm, glabrous to sparsely pubescent. Bracts free, ovate to rounded, 4–5 × 4.5–5 mm, glabrous. Calyx purplish brown, glabrous, lobed to middle to one fourth, tube 3.5–4.5 mm, lobes ovate to rounded, 1.5–2.5 × 1.5–3.5 mm. Corolla purple, glabrous, tubular, 1.5–2 cm, tube 10–12 mm, cylindrical for its whole length, slightly dilated towards apex, lobes of upper lip rounded, 1–1.5 × 2–2.5 mm, lobes of lower lip rounded, 4–5 × 4.5–6.5 mm. Filaments 2–2.5 mm, glabrous, anthers 1.5–2 mm, smooth; staminodes 1–1.5 mm. Disc cupular, 2–2.5 mm, mouth oblique, crenate. Pistil 10–12 mm, stigma flattened. Capsule 2–2.5 cm, straight, sessile, glabrous. Seeds ellipsoid, ca. 0.3 mm.

**Distribution:** Nepal (West, Central, East), Tibetan Plateau.

**Altitudinal range:** 2000–3200 m.

**Ecology:** On exposed moist rocks.

**Flowering:** May–August. **Fruiting:** June–August.

#### **8. *Didymocarpus podocarpus* C. B. Clarke, Monogr. Phan. 5(1): 76 (1883).**

Syntypes: India, Sikkim, Himalaya centralis, in regionibus temperatis & subalpinis, provinciae; Sikkim; Lachen, alt. 3400–3800 metr., Hooker f. [K]; King [CAL?]; Sinchul, at 2700 metr., Hooker f. [K]; alt. 2600 metr., Treutler 95 [K]; Tumlok, Clarke 12966 [Xl.] Distr.: NE India, Bhutan.

Stem 10–20 cm, appressed pubescent, hairs 0.2–0.5 mm. Petiole 0.5–3(--9) cm, pubescent. Basal leaves absent, upper leaves usually 4, sometimes with a pair of small leaves, crowded at stem apex, lanceolate to ovate, rarely elliptic, 6–17 × 3–8 cm, base cuneate to rounded, sometimes unequal, apex acute, margin irregularly single to triple serrate, upper surface appressed pubescent, lower sparsely pubescent mainly on the veins. Flowers many in terminal cymes, cymes 5–10 cm. Peduncle 5–7 cm, pedicel 0.5–1.5 cm, glabrous to sparsely glandular pubescent. Bracts free, ovate, 3–4 × 2–3.5, gradually smaller towards apex, glabrous. Calyx reddish purple, glabrous, lobed near to middle, tube 2–2.5 mm, lobes ovate, 2.5–3.5 × 1.5–2.5 mm. Corolla dark reddish purple, glandular pubescent, funnel-form, 3–3.5 cm, tube 15–20 mm, cylindrical at base for ca. 10 mm and then gradually widens, lobes of upper lip ovate, 2--3 × 2--4 mm, lobes of lower lip ovate, 3–5 × 4–6 mm. Filaments 6–7 mm,

glabrous, anthers 2 mm, sparsely hairy; staminodes 2.5 mm. Disc cupular ca. 3 mm, mouth sub entire. Pistil 2--3 cm, stigma capitate, slightly bi-lobed. Capsule 3.5--4 cm, straight to slightly curved, stipitate, glabrous. Seeds ovoid-ellipsoid, ca. 0.2 mm.

**Distribution:** Nepal (Central, East), E Himalaya.

**Altitudinal range:** 2100--3300 m.

**Ecology:** On moist shady rocks and on rock crevices.

**Flowering:** May--September. **Fruiting:** May--September.

**9. *Didymocarpus aromaticus*** Wall. ex D. Don, Prodr. Fl. Nepal: 123 (1825).

Wallich, 1819 sub *D. subalternans*, BM (lectotypified by Hara, 1972); *Nepalia*, e monte Sheopore (Wallich, no. 782 *D. subalternans*, Aug 1821, KW, K, BM)

*Didymocarpus curvicapsa* Hilliard syn nov., Edinburgh J. Bot. 52 (2): 217 (1995). [ Type: Sikkim, Lachen, 7000-8000ft, 4 viii 1849, Hooker (holo. K, iso. BM).]

Stem 12--32 cm, appressed pubescent, denser towards apex, hairs ca. 0.3 mm. Petiole 0.4--15 cm, gradually smaller towards apex, pubescent. Basal leaves absent, upper leaves alternate to nearly opposite, with few leaves crowded at the stem apex, isophyllous to slightly anisophyllous, ovate to elliptic (shape usually distorted), 2--7 X 1--5 cm, base cuneate to rounded, often oblique, apex acute to obtuse, margin double crenate to serrate, upper surface densely appressed pubescent, lower sparsely pubescent mainly on the veins only. Flowers many in terminal cymes or on axils of upper leaves, cymes 5--10 cm. Peduncle 1.5--4.5 cm, pedicel 0.3--1 cm, glandular pubescent. Bracts free, ovate-lanceolate, 4--4.5 x 2--2.5 mm, glandular pubescent. Calyx reddish purple, glandular pubescent, lobed near to middle, tube ca. 3.5 mm, lobes oblong-ovate, 1.5--2.5 x 0.7--1 mm. Corolla dark reddish purple, glandular pubescent, funnel-form, 1.5--2 cm, tube 11--13 mm, cylindrical at base for ca. 4 mm then gradually widens, lobes of upper lip oblong ovate, 3--4 x 3--3.5 mm, lobes of lower lip oblong ovate, 4--5 x 3--4 mm. Filaments 6--7 mm, glabrous, anthers 2.5 mm, hairy; staminodes 3--4 mm. Disc cupular, 3--3.5 mm, mouth irregularly 3--5-lobed. Pistil ca. 1.2 cm, stigma capitate? Capsule 2--3 cm, straight to curved, sessile or with stipe less than 3 mm, glabrous. Seeds ellipsoid, ca. 0.3 mm.

**Distribution:** Nepal (West, Central, East), E Himalaya.

**Altitudinal range:** 1200—2600 m.

**Ecology:** On moist mossy rocks.

**Flowering:** May–September. **Fruiting:** May–October.

Note:

**10. *Didymocarpus cinereus*** D. Don, Prodr. Fl. Nepal: 122 (1825).

Type: Wallich s.n., Nepalia [Type of *D. obtusa* Wall. ex Br, in Bennet Pl. Jav. Rar. 118 (1840)]

Stem 2–13 cm, minutely (short hairs) pubescent, hairs less than 0.3 mm. Petiole 3–12 cm, uppermost leaves sessile, sparsely pubescent. Basal leaves ovate to elliptic, 3–8 × 2–8.5 cm, base cordate, sometimes oblique, apex obtuse, margin crenate, upper surface sparsely to densely pubescent, lower surface glabrous except on the veins below; upper leaves 0.5–1.5 × 0.5–1.5 mm, base cordate to rounded, apex obtuse or rounded, margin crenulate, surfaces as in basal leaves. Flowers in axillary (arising from the axis of basal leaves) or terminal cymes, cymes 7–13 cm. Peduncle 2–7 cm, pedicel 0.5–1.5 cm, sparsely glandular pubescent. Bracts free, elliptic, 3.5–4 × 2–2.5 mm, sparsely glandular pubescent. Calyx greenish purple, glandular pubescent, lobed near to middle to one fourth, tube 4–4.5 mm, lobes triangular, 2–2.5 × 1.5–2 mm. Corolla dark purple, glandular pubescent, funnel-form, 3–3.5 cm, tube 2.5–3 cm, cylindrical at base for ca. 1 cm then gradually widens, lobes of upper lip ovate, 2.5–3 × 3–4 mm, lobes of lower lip ovate to rounded, 4.5–5 × 5–6.5 mm. Filaments 8–9 mm, glabrous, anthers 2–2.5 mm, hairy; staminodes 1–1.5 cm. Disc cupular, ca. 2 mm, mouth irregularly crenate. Pistil 3–5 mm, stigma capitate. Capsule 2.5–5 cm, straight or slightly curved, stipitate, glabrous. Seeds ellipsoid, 0.4 mm.

**Distribution:** Nepal (East), E Himalaya.

**Altitudinal range:** 1000–2100 m.

**Ecology:** On moist and wet rock surfaces

**Flowering:** June–September. **Fruiting:** August–November.

**11. *Didymocarpus pulcher*** C. B. Clarke, Monogr. Phan. 5(1): 79. (1883).

Syntypes: East Himalaya, Sikkim, Griffith 3841 [W, K, M (2), G-DC, G-BOISS]; 5-6000 ped., J.D. Hooker [K, M, W]

Stem 10--30 cm, appressed pubescent, hairs less than 0.3 mm. Petiole 0.5--6 cm, upper most usually sessile, lower petiolate, pubescent. Basal leaves absent, upper leaves in whorls of 3--4, near the middle or in the upper half of the stem, anisophyllous to nearly isophyllous, ovate, elliptic-ovate, 4--13 X 2--9 cm, base obtuse or cuneate to cordate, sometimes oblique, apex acute to obtuse, margin irregularly crenate or serrate, upper surface densely appressed pubescent, lower appressed pubescent denser along veins; uppermost leaves 2--4 crowded at the stem apex, 0.8--3 X 0.5--2 cm. Flowers many in terminal cymes, cymes 2--8 cm. Peduncle 1--3 cm, pedicel 0.5--1 cm, glandular hairy. Bracts connate at base, rounded or ovate, 5--6 X 5--7 mm, glandular pubescent. Calyx purple, glandular pubescent, 6--6.5 mm, lobed near to middle, tube 3.5--4 mm, lobes unequal, lobes of upper lip triangular, 1.5--2 X 1 mm, lobes of lower lip 3--3.5 X 1.5--2 mm. Corolla purple or dark violet, glandular pubescent, funnel-form, 3--3.5 cm, tube 2--2.5 cm, cylindrical at base for ca. 8 mm and then gradually widens, lobes of upper lip triangular 1--2.5 X 1--2 mm, lobes of lower lip ovate, 3--4 X 3--3.5 mm. Filaments 4--5 mm, glandular hairy, anthers 2--2.5 mm, sparsely hairy; staminodes 1.5--3 mm. Disc cupular, ca. 2 mm, mouth bilobed. Pistil 2.5 cm, stigma capitate. Capsule 3--4 cm, straight to slightly curved, stipitate, glabrous. Seeds not seen.

**Distribution:** Nepal (East), E Himalaya.

**Altitudinal range:** 1800--2700 m.

**Ecology:** On moist mossy rocks.

**Flowering:** June--August. **Fruiting:** July--August.

## 12. *Didymocarpus* sp nov.

Stem 10--17 cm, appressed pubescent, hairs ca. 0.1 mm. Petiole 1--14 cm, uppermost usually sessile or shortly petiolate, lower petiolate, appressed pubescent. Basal leaves absent, upper leaves in whorls of 3-4, near the middle or in lower half of the stem, isophyllous to anisophyllous, ovate-elliptic or cordate, 4--7 X 1--5 cm, base cordate, apex obtuse, margin irregularly crenate, upper surface densely appressed pubescent, lower appressed pubescent denser along veins, sometimes pair of opposite petiolate leaves present below the uppermost leaves; uppermost leaves usually 4 sometimes 2, crowded

near stem apex, 1—3.5 X 0.8—3 cm. Flowers many in terminal cymes, cymes 5—8 cm. Peduncle 3—5 cm, pedicel 0.5—1 cm, glandular pubescent. Bracts free, ovate, 4.5—5 X 3—3.5 mm, densely hairy below and along the margin. Calyx purple, 6.5--7 mm, glandular pubescent (with sessile glands), lobed one fourth to near middle, tube 3-5 mm, sometimes weakly bi-lipped, lobes nearly equal, triangular, 1.5--2.5 X 1--1.5 mm. Corolla dark purple, glandular pubescent, funnel-form, 3.5—4 cm, tube cylindric for ca. 1 cm and gradually widens, lobes of upper lip ovate-triangular, 3--4 X 4--5 mm, lobes of lower lip ovate, 4—5 X 4—5.5 mm. Filaments 7—9 mm, glabrous, anthers 2.5 mm, sparsely hairy; staminodes 2—5 mm. Pistil 3—3.5 cm, stigma capitate, slightly bilobed. Disc cylindrical, 1.5--2 mm, mouth crenate. Capsule 3—3.5 cm, straight to slightly curved, stipitate, glabrous. Seeds not seen.

**Distribution:** Nepal (East), E Himalaya.

**Altitudinal range:** 1800 m

**Ecology:** On moist mossy cliff.

**Flowering:** June–August. **Fruiting:** July–August.

**Excluded taxa:**

**Didymocarpus aurantiacus** C. B. Clarke, Commelyn. Cyrtandr. Bengal. t 60 (1874).

*Known from only one Wallich collection annotated as aurantiacus by C.B. Clarke but the specimens doesn't look like aurantiacus.*

Type: Lectotype (proposed by Weber et al. 2000): India, Sikkim, Runjeet, 2500 ft., Darjeeling, 29. VIII. 1869, Clarke 8912C [holo K; iso Clarke 8912 E: CAL].

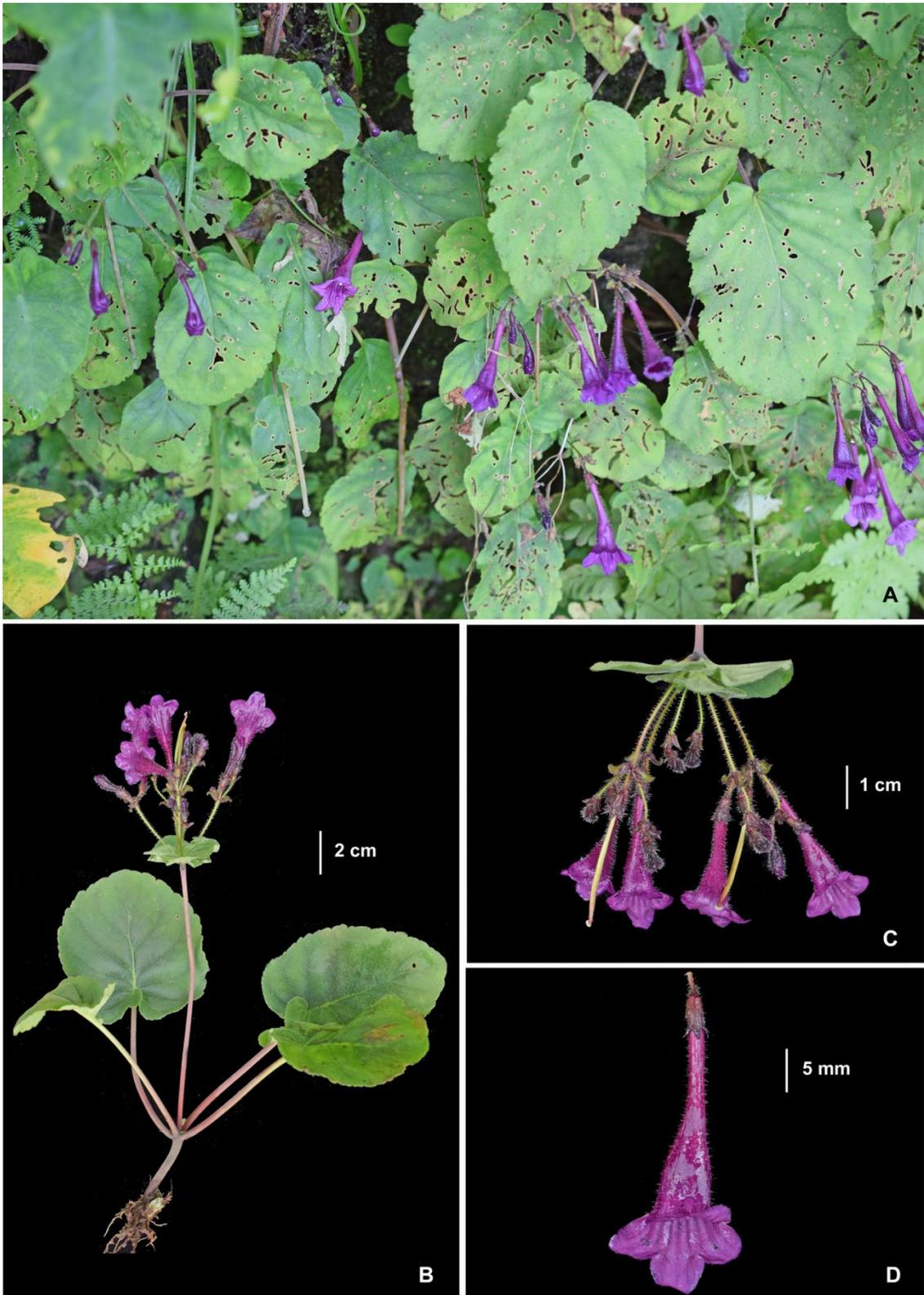


Fig. 4. *Didymocarpus* sp. nov. A. Habitat. B. A single plant. C. Inflorescence. D. A single flower