

## TWO NEW SPECIES OF GENTIANACEAE FROM INDO-CHINA

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Two new species of Gentianaceae from Indo-China are described: *Exacum darae* Hul (Cambodia, Thailand) and *Canscora bidouensis* Hul (Vietnam).

*Keywords.* Cambodia, *Canscora*, *Exacum*, Gentianaceae, Vietnam.

### INTRODUCTION

Collections of plants made during my most recent expeditions to Cambodia and Vietnam have allowed me to identify two new species of the family Gentianaceae: *Exacum darae* Hul and *Canscora bidouensis* Hul. This family has previously been revised for the *Flora of the Malay Peninsula* (Ridley, 1923), the *Flora of Thailand* (Ubolcholakiet, 1987) and the *Flore du Cambodge, du Laos et du Viêt Nam* (Hul, 2003). The two new species, together with the recently described *Gentiana khammouanensis* Hul (Hul, 2007), add to the great richness of Gentianaceae in the Indo-Chinese Peninsula.

### SPECIES DESCRIPTIONS

#### ***Exacum darae* Hul, sp. nov. Fig. 1.**

Thailandiae Birmaniaeque *Exacum sutaepensi* Hosseus ex Craib proximissima, sed clare gracili habitu atque ad 25 cm altitudine, floribus 7–8(–8.5) mm in longitudine, praesertim minutissimis antheris 0.5–1 mm in longitudine (versus *E. sutaepensi*, habitu minus gracile ad 15–16 cm in altitudine, floribus 10–11 mm in longitudine, antheris 1.5–2.5 mm in longitudine) praecipue differt. – Type: Cambodia, Kompong Speu, Phnom Knang Veal, Mt. Aural, Cardamom Mts., c.1000 m, 11°48'28"N, 103°51'38"E, 25 xi 2004, Hul & Khou Eang Hourt 1979 (holo P (P00739948); iso P (P00739949), RUPP).

*Exacum sutaepense* Hosseus ex Craib var. *gracile* Toyokuni, Acta Phytotax. Geobot. 32(5–6): 198–203 (1981). – *Exacum sutaepense* Craib forma *gracile* (Toyokuni) Toyokuni, Acta Phytotax. Geobot. 36(4–6): 124 (1985). – Type: Thailand, Ranong, Khao Pawta Luangkaeo, Kaper District, 1200–1300 m, 10 xii 1979, Shimizu et al. T-26864 (holo KYO!; iso BKF, S, SHIN).

*Exacum sutaepense* auct. non Hosseus ex Craib: Klack., Opera Bot. 84: 57 (1985), *quoad van Beusekom & Phengkklai* 2607 (AAU!); *Garrett* 1104 (AAU!, K); *Geesink, Hiepko & Phengkklai* 7618 (BKF, C!, P!); *Hosseus* 194 (P!).

Slender herb, 3–25 cm high, stems simple, sometimes  $\pm$  branched, quadrangular or subquadrangular, 4-winged or marked with fine lines. *Leaves* sessile to shortly petiolate; lamina ovate or ovate-elliptic, 5–7(–9)  $\times$  3–5 mm, base attenuate, apex acute; petiole 0–2 mm. *Inflorescences* terminal, rarely axillary. *Flowers* 4- or 5-merous, blue, blue-violet or white, in simple cymes, sometimes appearing solitary, due to the maturation sequence, 7–8(–8.5) mm long, pedicel 5–15 mm long. *Bracts* leafy, narrowly ovate, 4–5  $\times$  1–2 mm. *Calyx* with 4 or 5 sepals, fused for 1/4 to 1/3 of their length; lobes narrowly ovate, 2.5–3.5  $\times$  1 mm, acute-acuminate at apex, bearing a dorsal wing 1(–1.5) mm wide, somewhat accrescent in fruit. *Corolla* with 4 or 5 petals, tube 3.5–4 mm long; lobes narrowly ovate to ovate-elliptic, reflexed, 3–4.5  $\times$  1(–2) mm, acute or acute-acuminate at apex. *Stamens* 4 or 5, filaments glabrous, c.1.5 mm long, inserted below the sinuses of the corolla lobes; anthers 0.5–1 mm long, dehiscing by 2 apical pores, then enlarging into longitudinal slits. *Ovary* subglobulose, glabrous, 2.5  $\times$  2 mm, style straight, 2–2.5 mm long, glabrous; stigma bilobed. *Fruits*: capsules subglobulose, 3  $\times$  2.5 mm, included in the corolla tube, surrounded by the persistent calyx. *Seeds* numerous, minute.

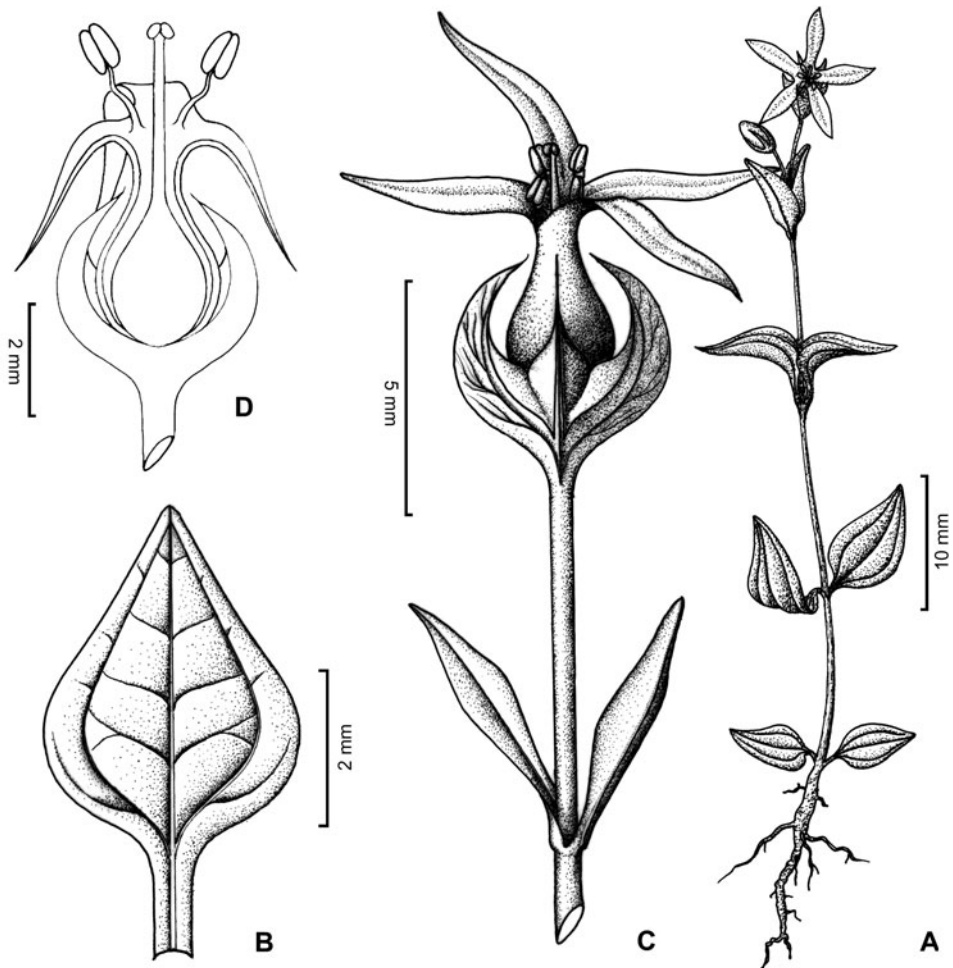
*Distribution.* *Exacum darae* is present in Cambodia, in the Cardamom Mountains, at Phnom Knang Veal on Mount Aural, Kompong Speu Province, c.1000 m altitude. It has also been collected in Thailand in the mountains of the northwest, Chiang Mai Province, between Me Tawn and Me Sawi (c.1550–1700 m), at Doi Suthep (around 1680 m), at Doi Pui (c.1600 m), and in the peninsula, at Khao Pawta Luang Keow, c.1200–1300 m in Phangnga and Ranong Provinces.

*Habitat and ecology.* Open, humid environments in rocky places in mountains, 1000–1700 m.

*Taxonomic note.* The duplicate *Hosseus* 194, housed at P, is annotated in error as an isotype of *Exacum sutaepense* Hosseus ex Craib; material of this collection housed at P belongs to *Exacum darae*.

*Additional specimens examined.* THAILAND. **Chiang Mai:** Doi Pui, 18°45'N, 99°00'E, c.1600 m, 19 xii 1969, *van Beusekom & Phengkklai* 2607 (AAU); Me Tawn – Me Sawi, 1550–1700 m, 1938, *Garrett* 114 (AAU); Doi Suthep, 1680 m, 2 xii 1914, *Hosseus* 194 (P). **Phangnga:** Khao Pawta Luang Keow, 8°30'N, 99°00'E, 1300 m, 27 xi 1974, *Geesink, Hiepko & Phengkklai* 7618 (C, P).

*Exacum darae* closely resembles *E. sutaepense* Hosseus ex Craib, known from eastern Burma and northwestern and peninsular Thailand. *Exacum darae* may be distinguished by its more slender habit with very thin and gracile stem and the plant reaching to 25 cm high (to 15–16 cm high in *E. sutaepense* although the overlap for smaller plants is large); its ovate or ovate-elliptic leaves (*E. sutaepense* has elliptic to broadly ovate leaves); its blue, blue-violet or white flowers (*E. sutaepense* has pink



Hul & Khou

FIG. 1. *Exacum darae* Hul. A, habit; B, leaf; C, flower; D, flower dissection (Hul & Khou Eng Hourt 1979).

flowers); the flowers are 4- or 5-merous, 7–8(–8.5) mm long (5-merous, 10–11 mm long in *E. sutaepense*); the calyx with sepals bearing a dorsal wing 1(–1.5) mm wide (1.5–2 mm wide in *E. sutaepense*); the anthers not exceeding 1 mm long (anthers are 1.5–2.5 mm long in *E. sutaepense*); and the subglobulose capsules (capsule globose in *E. sutaepense*).

*Exacum darae* differs from *E. pteranthum* Wall. ex G. Don principally by its narrower leaves, 3–5 mm wide (0.6–2.5 cm in *E. pteranthum*); its calyx bearing a dorsal wing 1(–1.5) mm wide (2–2.5 mm in *E. pteranthum*); and its small anthers (2 mm long in *E. pteranthum*).

This new species, along with *Exacum pteranthum* and *E. tetragonum* Roxb., brings to three the number of species in this genus that occur in the area covered by the *Flore du Cambodge, du Laos et du Viêtname*.

***Canscora bidoupensis* Hul, sp. nov. Fig. 2.**

Ut videtur *C. andrographioidi* Griff. ex C.B. Clarke affinis, sed brevissimo (0–)1–4 mm pedicello, plerumque 20–22(–26) mm in longitudine floribus, ± aequaliter prope corollae faucem affixis, inaequalibus (una 3–3.5(–4) mm in longitudine filamento, tribus alteris brevissimo filamento 0.5(–1) mm) staminibus (*C. andrographioides* longo (0–)1–2(–3) cm pedicello, plerumque 15–20(–23) mm floribus, unico stamine cum 2.5–3.5 mm filamento in corollae fauce affixo, alteris tribus staminibus cum 1.5–2 mm filamento 2–2.5 mm infra faucem affixis) praecipue differt. – Type: Viêtname, Lâm Đông, 60 km from Dalat, Bidoup-Nui Ba National Park, Hôn Giao forestry station, 12°11'11"N, 108°42'50"E, c.1500–1600 m, 11 vi 2008, Hul & Ly Ngoc Sam 3537 (holo P (P00739963); iso E, P (P00739964), RUPP, VNM, and National University of Laos, Faculty of Science).

*Canscora andrographioides* auct. non Griff. ex C.B. Clarke: Hul in Morat (ed.) *Flore du Cambodge, du Laos et du Viêtname* 31: 76 (2003), *quoad* Chevalier 1535 (*leg. Poilane*) (E, P, RUPP, VNM); *Chevalier* 38737 (E, P); *J. & M.S. Clemens* 4229 (NY, P); *Poilane* 6919 (P), 29052, 29687, 29950 and 31207 (P).

Herb 10–25(–50) cm high, stems branched from the base, quadrangular. *Leaves* subsessile to shortly petiolate; lamina ovate, ovate-elliptic or elliptic, 1.5–4 × 0.5–2.5 cm, base obtuse or ± attenuate, apex acute; petiole 0.5–2 mm long. *Inflorescences* terminal or axillary, forming lax cymes. *Flowers* 4-merous, white, 20–22(–26) mm long; pedicel (0–)1–4 mm long. *Bracts* leafy, narrowly ovate, 2–4 × 0.5–1 mm. *Calyx* of 4 sepals; tube 12–14 mm long, 8-ribbed; lobes narrowly triangular, 2.5–3 × 0.5 mm, apex acuminate. *Corolla* of 4 petals; tube 15–16 mm long; lobes unequal, two wider, obovate, (8–)9–10 × 5–7 mm, apex obtuse sometimes slightly mucronate. *Stamens* 4, inserted near the throat of the corolla tube, one of them 1–1.5 mm above the other three and with a filament 3–3.5(–4) mm long; the other three with filaments 0.5(–1) mm long; anthers ovoid, c.1.5 mm long, dehiscing by 2 apical pores, widening by longitudinal slits. *Ovary* subcylindrical, 4–5 mm long, style 12–15 mm long; stigma bilobed. *Fruits*: capsules ellipsoid-oblong, 5–6(–7) × 1–2 mm. *Seeds* numerous, minute.

*Distribution.* *Canscora bidoupensis* is currently known only from Vietnam, in Khanh Hoa Province, Hon Bà Range, 1000–1500 m; in Lâm Đông Province, 60 km from Dalat, around the area of Mount Bidoup, 1500–1600 m; in Quang Nam-Dà Nang Province, Mount Ba Na, 1400–1500 m; and in Thua Thiên-Huê Province, Nui Bach forestry station, 1000–1500 m.

*Habitat and ecology.* Understorey of mixed forest, on clay–sand soil over granite, on mountains.

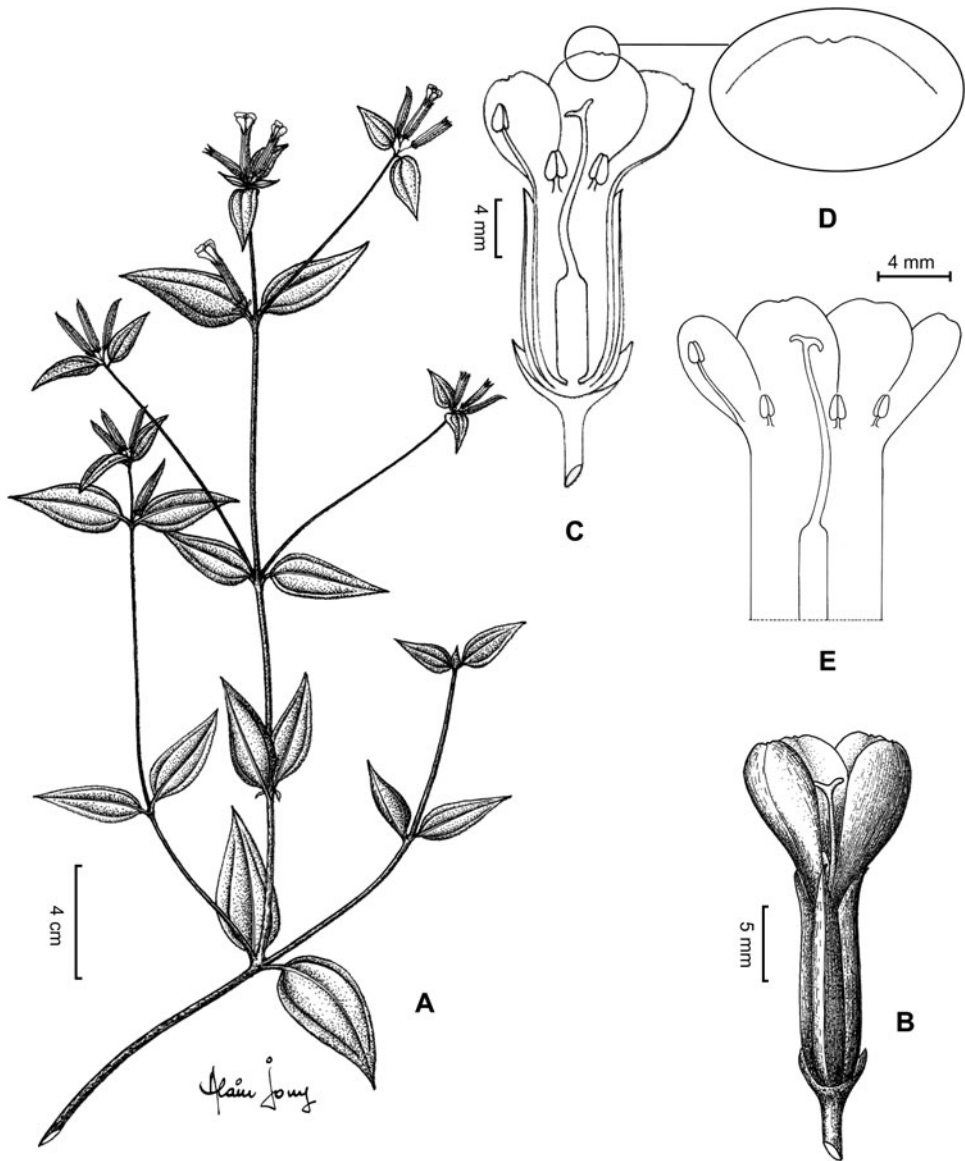


FIG. 2. *Canscora bidoupensis* Hul. A, habit; B, flower; C, flower cross-section; D, corolla lobe apex; E, dissection, flower detail (Hul & Ly Ngoc Sam 3537).

*Additional specimens examined.* VIETNAM. **Khanh Hoa:** Massif du Hon Bà, 1000–1500 m, 26 viii 1918, *Chevalier* 38737 (P (P00656783)). **Lâm Đông:** c.50–60 km from Dalat, around Bidoup-Nui Ba National Park, Hôn Giao forestry station, c.1600 m, 17 vii 2007, *Hul, Le Cong Kiệt, Luu Hong Trung & Yok Lin* 3000 (E, P (P00739970), RUPP, VNM, and National University of Laos, Faculty of Science); *ibid.*, 12°11'11"N, 108°42'50"E, c.1500–1600 m, 11 vi 2008, *Hul & Ly Ngoc Sam* 3538 (E, P (P00656642, P00656643), VNM), 3539 (E, P (P00739967, P00739968), RUPP, VNM, and National University of Laos, Faculty of Science). **Quang Nam-Dà Nang:**

Mt. Ba Na, 1400 m, 6 vi 1920, *Chevalier* 1535 (*leg. Poilane*) (E, P (P00656784), RUPP, VNM); *ibid.*, 16 viii 1927, *J. & M.S. Clemens* 4229 (NY, P (P00347834)); near Tourane (Dà Nang), 1500 m, 8 vii 1923, *Poilane* 6919 (P (P00347839, P00347840)); *ibid.*, c.1500 m, 25 ii 1939, *Poilane* 29052 (P (P00347841)). **Thua Thiên-Huê**: Mt. Bach Ma, near Huê, 1450 m, 14 iv 1939, *Poilane* 29687 (P (P00347842)); *ibid.*, 1000 m, 23 iv 1939, *Poilane* 29950 (P (P00347843)); *ibid.*, 1200–1500 m, 18 xii 1940, *Poilane* 31207 (P (P00347844)).

*Canscora bidoupensis* closely resembles *C. andrographioides* Griff. ex C.B. Clarke, but is distinguished principally by its flowers being generally 20–22(–26) mm long, borne on a short pedicel (0–)1–4 mm long (flowers generally 15–20(–23) mm long, borne on long pedicels (0–)1–2(–3) cm long in *C. andrographioides*); the 4 unequal stamens are inserted near the throat of the corolla tube, one of them 1–1.5 mm above the other three and a filament 3–3.5(–4) mm long, the other three much shorter, 0.5(–1) mm long (the longer filament 2.5–3.5 mm long and inserted at the throat of the corolla tube and the other three 1.5–2 mm long, inserted c.2–2.5 mm below the throat in *C. andrographioides*).

*Canscora bidoupensis*, along with *C. andrographioides*, *C. alata* (Roth) Wall. and *C. diffusa* (Vahl) R.Br. ex Roem. & Schult., brings to four the number of species in the genus that are known from the area covered by the *Flore du Cambodge, du Laos et du Viêtنام*.

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