

## Four new species of *Cleistes* (Orchidaceae, Vanilloideae) from Colombia

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Received 4 Apr. 2012, final version received 6 June 2012, accepted 8 June 2012

Szlachetko, D. L. & Baranow, P. 2012: Four new species of *Cleistes* (Orchidaceae, Vanilloideae) from Colombia. — *Ann. Bot. Fennici* 49: 377–382.

Four new Colombian species of *Cleistes* (Orchidaceae, Vanilloideae) are described and illustrated: *C. uribei* Szlach. & Baranow, *C. risaraldensis* Szlach. & Baranow, *C. munchiquensis* Szlach. & Baranow and *C. idroboi* Szlach. & Baranow. Notes concerning their morphological distinctions, habitat, and distribution are provided. A key for determination of the Colombian species of *Cleistes* is included.

The neotropical genus *Cleistes* (Orchidaceae, Vanilloideae) consists of about 50 species formerly included in a broadly defined *Pogonia* (Christenson 1992). *Cleistes* is primarily a tropical American genus, with Brazil as the centre of diversity. One species, *C. divaricata*, sometimes recognized as containing two separate taxa, occurs in the southeastern United States (Pridgeon *et al.* 2003).

The name *Cleistes* is Greek and means “closed”, referring to the narrowly funnel-shaped corolla (Correll 1978). The plants are usually large and terrestrial with underground, tuberoid storage organs. The leaves are cauline, usually remotely arranged, sessile, oblong-lanceolate, and thin. The terminal inflorescence bears one to few, large and showy flowers. The sepals are similar, oblong-lanceolate, and the petals are usually shorter and wider than the sepals. The lip is large, simple or 3-lobed, sessile, with or without crests or lamellae on the inner surface, and with paired stipitate processes at the base. The gynostemium is erect, often more or less sigmoid, elongate, slender, and slightly swollen

at the apex. There are four oblong-ovoid to narrowly cylindrical, slightly powdery pollinia, unequal in size.

*Cleistes* species occur primarily in wet soil along rivers, in wet forests, bogs, depressions in prairies and savannahs, usually in strongly acid soils (Correll 1978).

Examination of the Colombian orchid collections at Colombian National Herbarium (COL) and Herbarium of Gdansk University (UGDA) led to the discovery of four new species of *Cleistes*, which are described and illustrated in the present paper. Including the hereby described taxa, the genus is represented in Colombia by thirteen species.

***Cleistes uribei* Szlach. & Baranow, *sp. nova* (Fig. 1)**

TYPE: Colombia. Valle del Cauca, Cali, Las Brisas near Dagua. Along roadside, among fern and undergrowth, close to pine plantation. Alt. 1500 m a.s.l. 16 Feb. 2010 *Szlachetko & J.C. Uribe 9097* (holotype UGDA-DLSz!, spirit; isotype COL!, spirit).

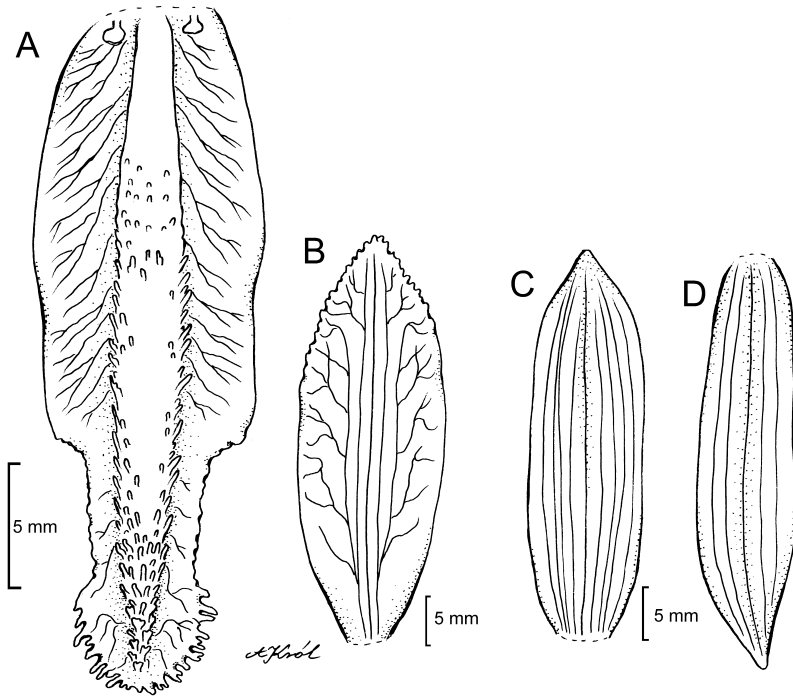


Fig. 1. *Cleistes uribei* (from the holotype). — A: Lip. — B: Petal. — C: Dorsal sepal. — D: Lateral sepal.

ETYMOLOGY: Dedicated to Juan Carlos Uribe, co-collector of the type specimen.

Plant about 60 cm tall, slender, erect. Leaves 3 in upper part of stem, ca.  $10 \times 1.5$  cm, oblong-lanceolate, acute. Flowers medium-sized for genus, sepals pinkish, petals purple-red, lip purple-red with bright-yellow callus. Floral bracts 37 mm, oblong-lanceolate to elliptic-lanceolate. Pedicellate ovary 25 mm, slender. Dorsal sepal  $35 \times 8$  mm, oblong to oblong-elliptic, subobtuse, concave in center, 7-nerved. Lateral sepals  $35 \times 7$  mm, oblong to linear-ob lanceolate, somewhat oblique, subacute, 5-nerved. Petals  $33 \times 10$  mm, elliptic, obtuse, with margins erose towards apex, 3-nerved, nerves branching. Lip 32 mm long, greatly thickened along midveins from base almost to apex, callus puberulent gradually denser towards apex, with 2 clavate projections at base; hypochile  $22 \times 10$  mm, rectangular-elliptic in outline, apical margins rounded, slightly erose; epichile long-clawed, ca. 5 mm, lamina 5–6  $\times$  5–6 mm, suborbicular, margins fimbriate-denticulate. Gynostemium 19 mm long.

DISTRIBUTION: Known so far from the type locality only.

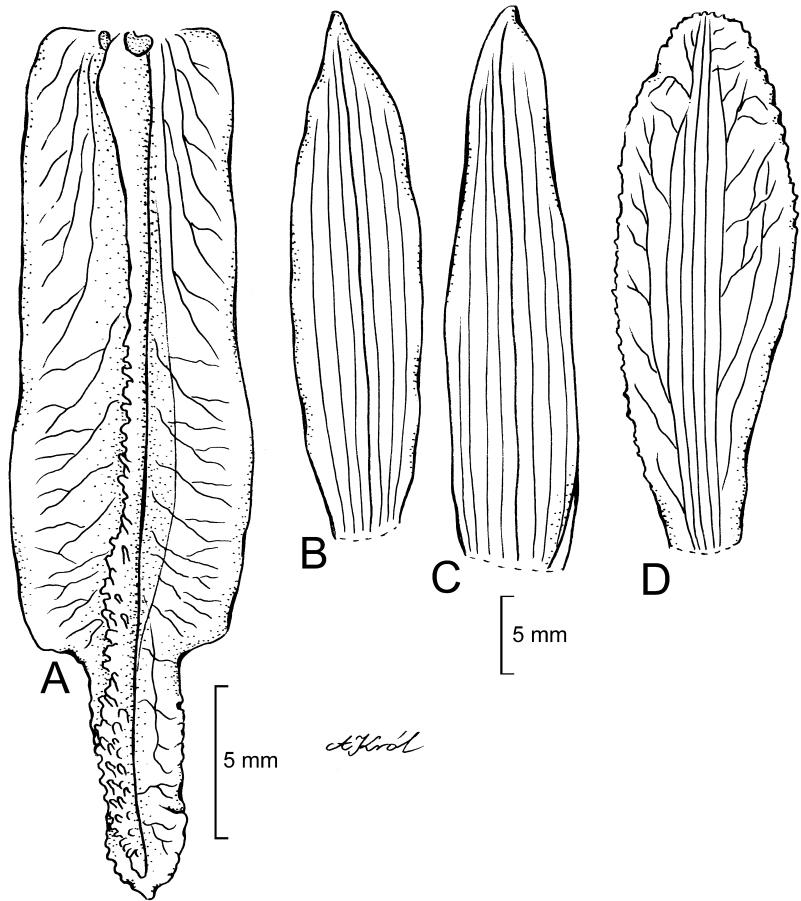
*Cleistes uribei* is similar to *C. unifoliata*, but differs in having flowers twice as large, petals with erose margins, a hypochile with rounded lobes and erose apical margins, a long-clawed epichile, and densely puberulent callus above the basal third.

***Cleistes risaraldensis* Szlach. & Baranow, sp. nova** (Fig. 2)

TYPE: Colombia. Risaralda, Mpio. de Pueblo Rico, Cerro Montezuma.  $5^{\circ}14'59''\text{N}$ ,  $76^{\circ}06'35''\text{W}$ . Alt. 2500 m a.s.l. 31 Dec. 2006 R. Arevalo, A. Tapasco, H. Tapasco, Betancur & O. Laverde 672 (holotype COL 539263!).

ETYMOLOGY: In reference to the Colombian Department of Risaralda, where this species has been collected.

Plants 70 cm tall, erect, slender. Leaves 3, distributed along stem; blade to  $6 \times 1.5$  cm, oblong- or elliptic-lanceolate, acute. Inflorescence 8 cm long, laxly 2-flowered. Flowers medium-sized for genus. Floral bracts to 35 mm long, leafy. Pedicellate ovary to 25 mm long. Dorsal sepal  $34 \times 8$  mm, oblong-lanceolate, acute, 7-nerved. Lateral sepals  $35 \times 7$  mm, oblong-lanceolate, suberect, subacute, 5-nerved.



**Fig. 2.** *Cleistes risaraldensis* (from the holotype). — **A:** Lip. — **B:** Dorsal sepal. — **C:** Lateral sepal. — **D:** Petal.

Petals  $30 \times 9$  mm, oblong-ovate, subfalcate, subobtusate to subacute, margins erose, nerves 3 or 5, much branching. Lip 33 mm long in total, callus consists of two lamellae running along whole labellum length, lamellae with entire edges in basal third, more or less laciniate towards apex, with two small, clavate projections at base; hypochile  $25 \times 10$  mm, rectangular, with subacute lateral lobes, concave in centre; epichile  $8 \times 3$  mm, oblong-ligulate, subacute, margins irregularly dentate. Gynostemium 18 mm long.

**DISTRIBUTION:** Known only from the type locality.

Similar to *Cleistes elegantula*, however differs in the lip form. The lip callus of *C. risaraldensis* consists of two lamellae running from its base almost to the apex; the edges of the lamellae are laciniate. The lateral lobes of the hypochile are rounded and the epichile is oblong-ligulate.

***Cleistes munchiquensis* Szlach. & Baranow, sp. nova (Fig. 3)**

**TYPE:** Colombia. Cauca, Parque Nacional Natural Munchique, en el borde de la Quebrada El Sopladero. Alt. 2205 m. *J. Alvarez, F. Gonzalez & C. Acevedo 121* (holotype COL 423546!). — **PARATYPES:** Colombia. Cauca, Mpio. de El Tambo, Corregimiento La Romelia, km 75 via a la Gallera. Alt. 1700–2000 m a.s.l. 29 Jan. 1995 *N. Ruiz, G. Lozano C., R. Sanchez & C. Acevedo 343* (COL!); Norte de Santander, 35 km de San Bernardo de Bata en la via a Saravena, 4.5–5 km despues del parador. Alto de Santa Ines. Alt. 1980 m a.s.l. 1 Nov. 1994 *J.L. Fernandez, C.I. Orozco & P. Galvis 11813* (COL!).

**ETYMOLOGY:** In reference to the name of the type locality.

Plants to 75 cm tall, erect, slender, leafy. Leaves 3, distributed above basal third of stem, to  $7 \times 1.5$  cm, oblong- to narrowly lanceolate, acute. Inflorescence to 16 cm long, laxly 3–4-flowered. Flowers medium-sized for genus. Floral bracts to 40 mm long, leafy. Pedicellate

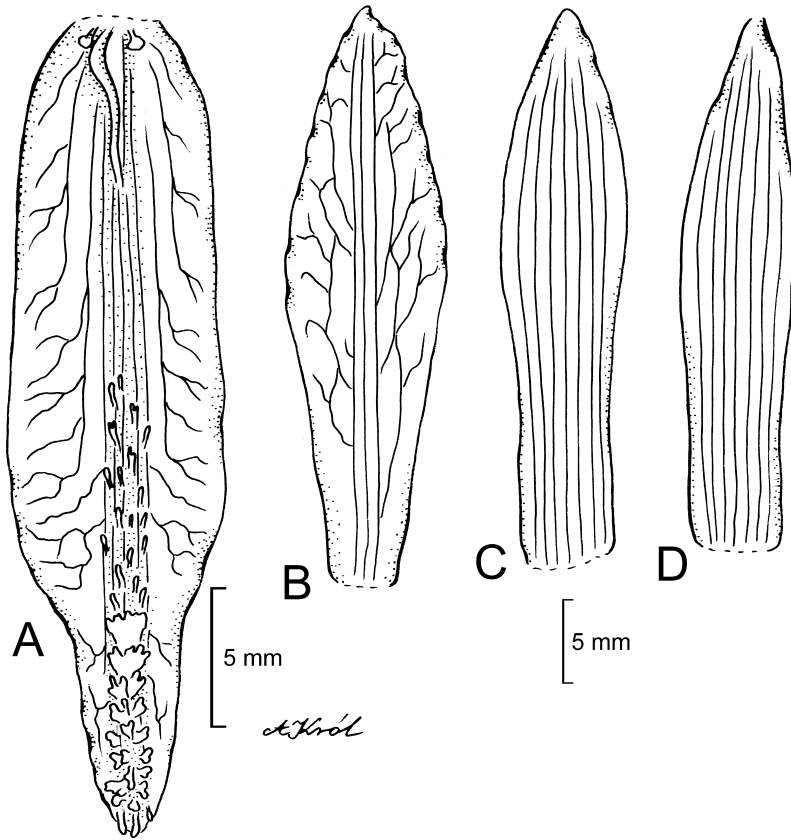


Fig. 3. *Cleistes munchiquensis* (from the holotype). — A: Lip. — B: Petal. — C: Dorsal sepal. — D: Lateral sepal.

ovary to 30 mm long. Dorsal sepal  $33 \times 9$  mm, oblong-oblancoate, subobtuse to subacute, somewhat concave above middle, 7-nerved. Lateral sepals  $32 \times 9$  mm, oblong to linear-lanceolate, subobtuse, subfalcate, 7-nerved. Petals  $32 \times 9$  mm, oblong-deltoid, widest near middle, subacute, nerves 3, branching. Lip  $33 \times 10$  mm, oblong, gradually attenuate towards blunt apex, lateral margins rounded, base adorned with two small lamellae and two knob-like projections, above middle with some glandular hairs, with transverse, laciniate lamellae towards apex. Gynostemium 20 mm long.

**DISTRIBUTION:** Known only from the Departments of Cauca and Norte de Santander, Colombia.

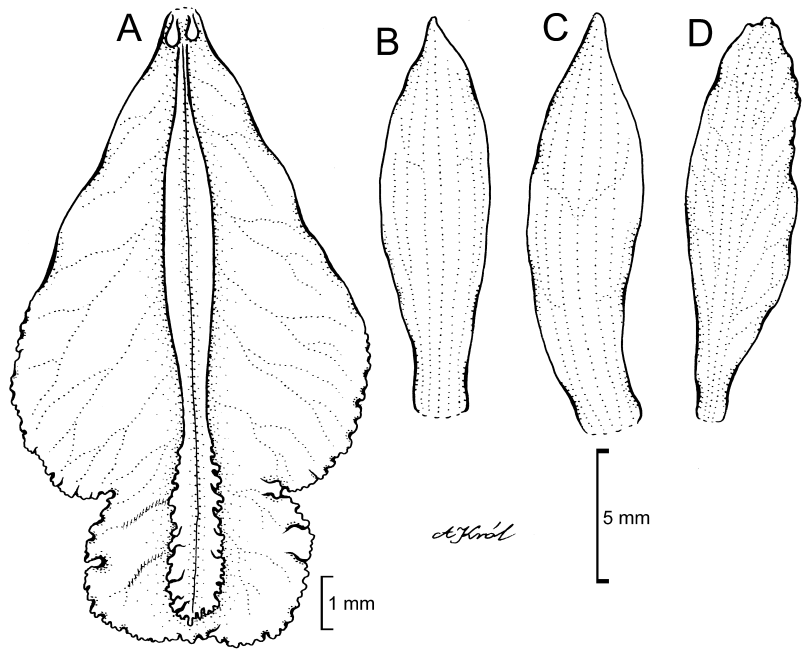
Similar to *C. tenuis*, but the lip is obscurely 3-lobed, the callus consists of two lamellae at the lip base only, glandular hairs in the middle of the lip and laciniate, transverse lamellae at its apex.

***Cleistes idroboi* Szlach. & Baranow, sp. nova** (Fig. 4)

**TYPE:** Colombia. Amazonas, Araracuara, Aeropuerto Restrepo. 9 Aug. 1977 J.M. Idrobo 9006 (holotype COL 307283!; isotype COL!).

**ETYMOLOGY:** Dedicated to J. M. Idrobo, who collected this plant.

Plants to 15 cm tall, erect, delicate. Leaves 1–2, in upper part of stem, to  $2 \times 0.4$  cm, linear-lanceolate, acute, erect. Inflorescence 3–4 cm long, laxly 1–2-flowered. Flowers small for genus. Floral bracts 16 mm long, leafy. Pedicel and ovary 9 mm long. Dorsal sepal  $15 \times 3.1$  mm, linear-oblancoate, acute, 5-nerved. Lateral sepals  $15 \times 3.1$  mm, oblong-oblancoate, acuminate, subfalcate, 5-nerved. Petals  $14 \times 3.1$  mm, oblong-elliptic, attenuate towards base, rounded at apex, subfalcate, margins somewhat erose, nerves 3, branching. Lip 11–12 mm long, constricted at apical quarter, with two lamel-



**Fig. 4.** *Cleistes idroboi* (from the holotype). — **A:** Lip. — **B:** Dorsal sepal. — **C:** Lateral sepal. — **D:** Petal.

lae stretched between base and apex of lip, edges in lower two-third entire, above crenate, nerves branching, distally thickened; hypochile  $9 \times 7$  mm, obovate-obtriangular, margins erose above middle, base with two clavate projections; epichile  $2-3 \times 4$  mm, transversely elliptic, truncate, margins crenate-undulate. Gynostemium 8 mm long.

**DISTRIBUTION:** Known only from the type locality.

Differs from the other species of *Cleistes* by the form of the lip, being distinctly constricted in the apical third, with crenate-undulate margins and two lamellae running through the whole lip length. The margins of the lamellae are entire in their basal two-thirds, and crispate above.

#### A key for identification of the Colombian species of *Cleistes*

- |   |                         |
|---|-------------------------|
| 1. Lip distinctly 3-lobed, divided into hypochile and epichile .....  | 2                       |
| 1. Lip unlobed, elliptic or oblong-elliptic, more or less attenuate towards apex .....  | 6                       |
| 2. Hypochile obovate-obtriangular, margins erose above middle, epichile distinctly wider than long, transversely elliptic, truncate .....                             | <i>C. idroboi</i>       |
| 2. Hypochile oblong or oblong-elliptic, margins entire, epichile longer than wide, oblong .....   | 3                       |
| 3. Petals with entire margins, apex of hypochile more or less cordate .....   | 4                       |
| 3. Petals with erose margins, apex of hypochile truncate or obtuse .....  | 5                       |
| 4. Hypochile with 3 lamellae running from base to apex .....  | <i>C. elegantula</i>    |
| 4. Hypochile with oblong, papillate callus running to base of epichile .....  | <i>C. moritzii</i>      |
| 5. Hypochile with erose apical margins, massive callus densely puberulent above basal third, epichile long-clawed .....   | <i>C. uribei</i>        |
| 5. Hypochile with entire margins, callus consisting of two lamellae running from its base almost to apex, edges of lamellae laciniate, epichile oblong-ligulate ..... | <i>C. risaraldensis</i> |
| 6. Lip linear-oblong in outline .....   | 7                       |
| 6. Lip elliptic to trullate in outline .....  | 8                       |
| 7. Lip obscurely 3-lobed, the callus consisting of two lamellae at lip base only, glandular hairs in middle and laciniate, transverse lamellae at apex ..             | <i>C. munchiquensis</i> |
| 7. Lip unlobed, callus consisting of a single lamella in central part of lip, with erose margin .....   | <i>C. tenuis</i>        |
| 8. Lip callus consisting of two lamellae disappearing in centre of lamina or transforming into erose thickening(s) .....  | 9                       |
| 8. Lip callus consisting of two lamellae much higher in basal half than in apical half .....  | 11                      |
| 9. Lip elliptic, two lamellae disappearing near centre of lamina .....  | <i>C. triflora</i>      |
| 9. Lip trullate, two lamellae transforming into erose thickening(s) .....   | 10                      |

10. Lip widest just above middle, lamellae oblong-linear when flattened and spread, basal clavate callosities prominent ..... *C. rosea*
10. Lip widest below apex, lamellae obtrullate-obovate when spread and flattened, basal callosities very obscure ..... *C. abdita*
11. Lip oblong-pandurate in outline, lamellae shorter near middle than above and below ..... *C. lehmanni*
11. Lip oblong-elliptic, lamellae not as above ..... 12
12. Lip acuminate at apex, anther's filament with entire margins ..... *C. acuminata*
12. Lip acute at apex, anther's filament with crenate margins ..... *C. venusta*

## Acknowledgments

We thank Anna Król for the illustrations. This article was prepared thanks to a grant from Polish Ministry of Science and Higher Education (NN303 81 2440).

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