

FOUR NEW SPECIES OF *CRANICHIS* (ORCHIDACEAE, SPIRANTHOIDEAE, CRANICHIDINAE) FROM COLOMBIA

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Abstract. Four new species of the Neotropical genus *Cranichis* Sw. are described and illustrated based on Colombian material. The new entities are placed within a key for identification of Colombian members of the genus. Information about their ecology and distribution is provided.

Key words: Andes, biodiversity, Neotropics, taxonomy

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INTRODUCTION

Consisting of over 3000 species, the Colombian orchid flora is one of the world's richest (Ortiz Valdivieso & Uribe Vélez 2007). The subfamily Spiranthoideae is represented by over 200 species within *ca* 30 genera (Dueñas Gómez & Fernández-Alonso 2007, 2009; Ormerod 2007, 2008, 2009a, b). While generic delimitation among the Neotropical terrestrial orchids is the subject of ongoing discussion between taxonomists around the world due to the incompatibility of morphological (Dressler 1993; Szlachetko 1995; Szlachetko & Rutkowski 2010) and molecular findings (Salazar *et al.* 2003; Álvarez-Molina & Cameron 2009), the separateness of *Cranichis* Sw. is not questioned.

The genus was first described by Olof Swartz in 1788, and the nominal species *C. muscosa* Sw. was selected more than 150 years later by Acuña (1939). Morphologically *Cranichis* is clearly defined since the transfer of two monotypic taxa, *Pseudocranichis* Garay and *Exalaria* Garay & G. A. Romero, from the genus.

Species of the genus are easily distinguished from other cranichoid orchids by their villous-hairy roots, distinctly petiolate, suberect or arcuately spreading leaves, nonresupinate flowers,

petals much narrower than sepals, and cochleate lip, often with conspicuously marked, colored reticulate veins. The gynostemium is relatively massive, often swollen at the apex, without a column-foot. The motile anther is oblong to ovate and 2-chambered. The inconspicuous caudiculae are formed from the apices of pollinia. The clinandrium is usually thick, massive and spacious. The single viscidium is thick and relatively small, and the hamulus is usually elongate, finger-like, thick, and directed towards the anther (Szlachetko & Rutkowski 2010).

Representatives of *Cranichis* are found in lowlands as well as in montane forest growing terrestrially or lithophytically, usually in humus and *Sphagnum* tussocks. Their occurrence has been reported from 350 up to 3000 m a.s.l. (Carnevali & Ramírez-Morillo 2003; Cribb 2003).

As currently recognized, the genus embraces *ca* 60 species distributed from Florida and Mexico to Bolivia and Argentina. Ortiz Valdivieso and Uribe Vélez (2007) placed 19 species of *Cranichis* in the most recent list of Colombian Orchidaceae. Most of the national representatives, except *Crachinis muscosa* and *C. parvula* Ranz, were found in Columbia's submontane and montane regions in litter of the Andean forest and shrubs of subparamo and

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paramo. Their occurrence in Colombia was also reported from pastures and rocky slopes (Dueñas Gómez & Fernández-Alonso 2009). The last comprehensive revision of Colombian *Cranichis* was made over 50 years ago (Schneider 1953), but the recent studies on the national Orchidaceae revealed the existence of two new species in the country (Szlachetko & Kolanowska 2013).

During the course of study on north Andean Cranichidinae, three distinct species of *Cranichis* were found and are described here as new.

DESCRIPTIONS OF THE NEW SPECIES

Cranichis cristalinensis Szlach. & Kolan., *sp. nov.*

Fig. 1

Species appears similar to *C. sylvatica* A. Rich. & Gal. and *C. werffii* Garay but the petals are widest at the apex and the lip is sessile, suborbicular, much thickened in the center.

HOLOTYPE: COLOMBIA, Cundinamarca, Fomeca. Vda. La Cristalina. Parque Nacional Natural Chingaza. Laguna de Chingaza. Sector La Playa. Bosque de *Drymys granatensis*, planta terrestre, flores blancas, 4°31'50"N,

73°45'32"W, Alt. 3200 m, 17 Nov. 2003, H. Mendoza, O. Vargas & O. Borbon 15473 (COL).

Plants to 40 cm tall. Leaves 2, basal, petiolate; petiole to 6.5 cm long, narrow; blade up to 5.3 cm long and 2.2 cm wide, oblong- or ovate-lanceolate, acute, rounded or truncate at base. Scape erect, acute, rounded or truncate at base. Scape erect, delicate, glandular in the upper third, enclosed in 4 sheaths. Inflorescence to 5.5 cm long, subdensely many-flowered. Flowers small, inconspicuous. Floral bracts 4.5 mm long, lanceolate, acuminate, glabrous or sparsely glandular. Pedicel and ovary up to 7.5 mm long, papillate. Sepals glabrous. Dorsal sepal 3.5 mm long, 2.1 mm wide, ovate, subobtuse, rather cochleate in center, 3-nerved. Petals 3.1 mm long, 1.3 mm wide, oblong-spathulate, rounded at apex, subfalcate, glabrous along margins, 1-nerved. Lateral sepals 3.2 mm long, 2.1 mm wide, ovate to elliptic-ovate, acute to shortly acuminate, somewhat oblique, slightly concave, 3-nerved. Lip 3 mm and wide, suborbicular in outline, sessile, greatly thickened in center, apical margins slightly wavy. Gynostemium 1.8 mm long.

ETYMOLOGY. In reference to the name of the place of origin of the type specimen.

ECOLOGY. Terrestrial in high-montane forest with *Drymys granatensis* (Winteraceae) at ca 3200 m a.s.l. Flowering in November.

DISTRIBUTION. So far known only from the Eastern Cordillera of the Andes, Colombian department of Cundinamarca.

NOTES. *Cranichis cristalinensis* seems related to *C. sylvatica* A. Rich. & Gal. and *C. werffii* Garay, but is easily separable from both species by the petals and lip form. The petals of the new entity are widest at the apex and the lip is sessile, suborbicular, and much thickened in the center.

Cranichis queremalensis Szlach. & Kolan., *sp. nov.*

Fig. 2

Species similar to *C. parvula* Renz but the petals are attenuate toward the base and apex with only the outer margin shortly and densely ciliate, and the lip elliptic-suborbicular, very thin, and almost flat with a recurved apex.

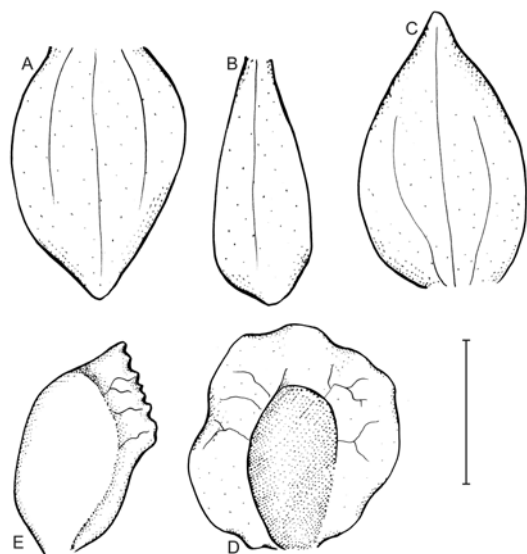


Fig. 1. *Cranichis cristalinensis* Szlach. & Kolan., *sp. nov.* – dissected perianth. A – dorsal sepal; B – petal; C – lateral sepal; D – lip; E – lip (side view). Drawn by S. Nowak from the holotype. Scale bar = 2 mm.

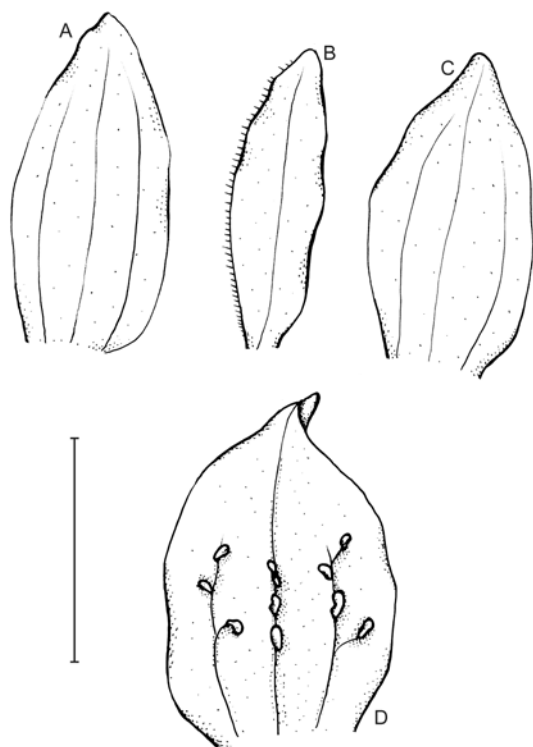


Fig. 2. *Cranichis queremalensis* Szlach. & Kolan., *sp. nov.* – dissected perianth. A – dorsal sepal; B – petal; C – lateral sepal; D – lip. Drawn by S. Nowak from the holotype. Scale bar = 2 mm.

HOLOTYPE: COLOMBIA, Valle del Cauca, Dagua. Corregimiento El Queremal, 0–6 km carretera El Queremal-Buenaventura. 3°31.42–81'N, 76°43.62–44.92'W. Relictos bosque al lado de la carretera, Alt. 1430–1550 m, 30 Dec. 2009, *M.F. Gonzalez, Betancur & A. Zuluaga 168* (COL; ISOTYPE: FMB).

Plants to 20 cm tall. Leaves 3, basal, petiolate; petiole to 4.5 cm long, narrow; blade up to 4.5 cm long and 2 cm wide, elliptic-suborbicular, base subcordate, obtuse to subobtuse at apex. Scape erect, delicate, glabrous, enclosed distantly in 4 sheaths, of which the lower ones are leafy. Inflorescence to 4 cm long, subdensely many-flowered. Flowers small, inconspicuous. Floral bracts 4 mm long, lanceolate, acuminate, glabrous. Pedicel and ovary up to 8 mm long, glabrous. Sepals glabrous. Dorsal sepal 3 mm long, 1.1 mm wide, oblong-elliptic-ovate, subobtuse, rather cochleate in center,

3-nerved. Petals 3 mm long, 0.6 mm wide, oblong-lanceolate, subacute to subobtuse, subfalcate, densely and shortly ciliate along outer margin except for base and apex, 1-nerved. Lateral sepals 3 mm long, 1.2 mm wide, ovate to elliptic-ovate, subobtuse to subacute, slightly oblique, slightly concave, 3-nerved. Lip 3 mm long, 2 mm wide, elliptic-suborbicular in outline, widest near middle, apex with short, triangular, recurved, acute apiculus, lamina almost flat, nerves 3, obscure, with 1 or 2 branches and several knob-like swellings on nerves. Gynostemium 1.1 mm long.

ETYMOLOGY. In reference to the name of the place of origin of the type specimen of this species.

ECOLOGY. This species was found on the roadside in an area covered with premontane forest. Alt. 1430–1550 m. Flowering in December.

DISTRIBUTION. So far it is known only from the pacific slope of the Western Andean Cordillera, department of Valle del Cauca Colombia.

NOTES. *Cranichis queremalensis* appears to be related to its Colombian-Ecuadorian congener *C. parvula*, originally described from the Colombian department of Meta. *Cranichis queremalensis* is characterized by petals attenuate toward the base and apex with only the outer margin shortly and densely ciliate, the lip elliptic-suborbicular, very thin, and almost flat with a recurved apex. Petals of *C. parvula* are oblong-ligulate, rounded at the apex and glabrous on the margins, with the lip similar in shape to *C. queremalensis* but cochleate in the center, with numerous knob-like projections and a straight apex.

Cranichis schlechteri* Szlach. & Kolan., *sp. nov.

Fig. 3

Species similar to Ecuadorian *C. macroblepharis* Rchb. f. but with the lip prominently auriculate and petals long-ciliate along the margins.

HOLOTYPE: COLOMBIA, Huila. Mpio. La Plata. Vereda Agua Bonita. Finca Merenburg, Alt. 1200–1300 m, 20 Jul. 1975, *S. Diaz P., G. Lozano C. & J.H. Torres 745* (COL).

Plants to 40 cm tall. Leaf 1, basal, petiolate; petiole to 3.5 cm long, narrow; blade up to 6 cm long and 3.7 cm wide, ovate, acute, subcordate at base. Scape erect, delicate, glabrous in lower half, otherwise glandular, enclosed in 5 sheaths. Inflorescence subdensely many-flowered. Flowers small, inconspicuous, glabrous. Floral bracts 5 mm long, lanceolate, acuminate. Pedicel and ovary up to 10 mm long. Dorsal sepal 4.5 mm long, 1.5 mm wide, oblong-ovate above narrow base and attenuate towards obtuse apex, rather cochleate in center, obscurely 3-nerved. Petals 4 mm long, 0.6 mm wide, oblong-lanceolate to linear-lanceolate, acute at apex, subfalcate, margins covered by long and soft cilia except base and apex, 1-nerved. Lateral sepals 4.5 mm long, 1.8 mm wide, ovate to elliptic-ovate, subobtuse, slightly oblique, slightly concave, obscurely 3-nerved. Lip 2.5 mm long, 1.6 mm wide, oblong-ovate in outline, sessile,

basally auriculated, apex elongate, subobtuse, incurved, nerves 3, protruding, sparsely branching. Gynostemium 1.5 mm long.

ETYMOLOGY. Named in honor of Rudolf Schlechter, an eminent orchid taxonomist.

ECOLOGY. No habitat record. Alt. 1200–1300 m. Flowering in July. This species most probably is autogamous.

DISTRIBUTION. So far known only from the eastern slope of the Andean Central Cordillera, Colombian department of Huila.

NOTES. The new species appears to be similar to its Ecuadorian congener *C. macroblepharis* but is easily separable from the latter by having an auriculate base of the lip and long-ciliate petal margins.

***Cranichis rotundifolia* Szlach. & Kolan., sp. nov.**

Fig. 4

Species similar to *C. diphylla* Sw. but distinguished by its suborbicular leaf blade, spathulate, apically rounded petals, and the lip broadly ovate and obtuse, with two anastomosed veins.

HOLOTYPE: COLOMBIA, Nariño, Pasto, Correg. de El Encano, Isla La Corota, Alt. 2700 m. 14 Nov. 1980, O. S. Benavides 2699 (PSO).

Plant up to ca 30 cm tall. Roots fleshy, fasciculate, puberulent. Leaf 1, basal, petiolate; petiole ca 3 cm long; blade ca 5 cm long, 3.5 cm wide, suborbicular, subacute, subcordate at the base. Scape ca 25 cm long, slender, erect, remotely few-sheathed; spike ca 6 cm long, densely many-flowered. Flowers glabrous, translucent white. Floral bracts 3–4 mm long, lanceolate, acute. Pedicel and ovary 5–6 mm long, very sparsely glandular-ciliate. Dorsal sepal 3.1 mm long, 1 mm wide, narrowly elliptic, obtuse, 3-veined. Petals 2.5 mm long, 1 mm wide, spathulate, apex rounded, 1-veined. Lateral sepals 2.9 mm long, 1.5 mm wide, obliquely ovate, subobtuse, 3-veined. Lip ca 2 mm long, 1.6 mm wide, concave, sessile, broadly ovate, obtuse, with two anastomosed veins. Gynostemium 1.1 mm long.

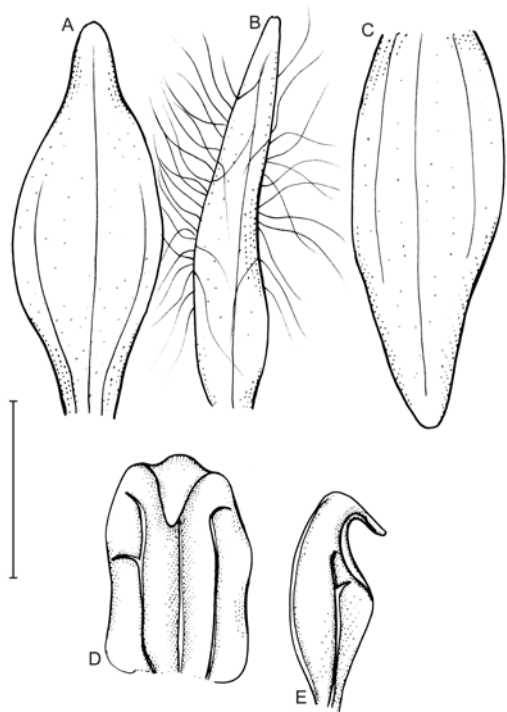


Fig. 3. *Cranichis schlechteri* Szlach. & Kolan., sp. nov. – dissected perianth. A – dorsal sepal; B – petal; C – lateral sepal; D – lip; E – lip (side view). Drawn by S. Nowak from the holotype. Scale bar = 2 mm.

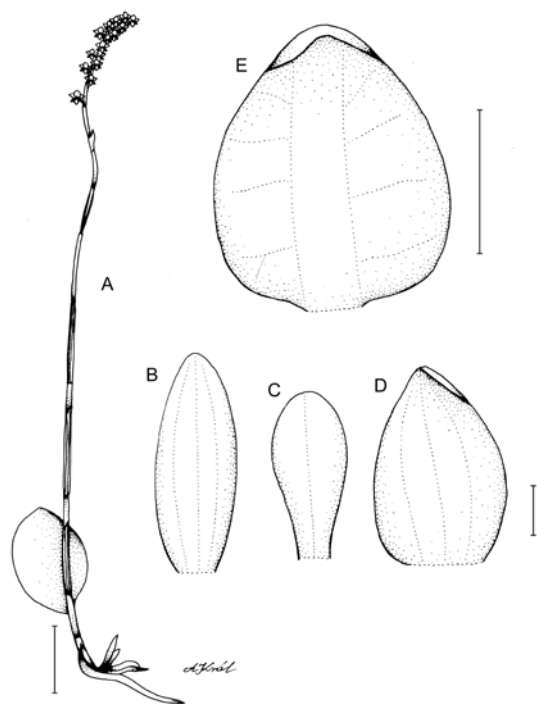


Fig. 4. *Cranichis rotundifolia* Szlach. & Kolan., sp. nov. A – habit. B – dorsal sepal; C – petal; D – lateral sepal; E – lip. Scale bars: A = 3 cm; B–E = 1 mm. Drawn by Anna Król from the holotype.

ETYMOLOGY. In reference to the leaf shape.

ECOLOGY. The species was found growing terrestrially on humid soil in high-montane humid forest. Alt. 2700 m. Flowering in November.

DISTRIBUTION. So far this species is known only from Laguna de la Cocha in southern Colombia.

NOTES. Species similar to *C. diphylla* but distinguished by its suborbicular leaf blade (vs ovate to ovate-lanceolate), the spatulate, apically rounded petals (vs linear-ob lanceolate, acute to obtuse) and the lip broadly ovate and obtuse, with two anastomosed veins (vs lip ovate to broadly elliptic, disc obcordately papillose-thickened with 3 branching, often glandular veins). Vegetatively the new species seems to resemble *C. tenuis* Rchb. f., from which it differs by the form of its perianth segments as well as by the shorter floral

bracts and ovaries. In the floral parts *C. rotundifolia* resembles *C. fendleri* Schltr., especially in having spatulate petals and a broadly ovate lip. The two species are easily distinguished by a series of characters. In *C. fendleri* there are 3–4 oblong-elliptic to ovate-lanceolate, acute leaves, an oblong-lanceolate dorsal sepal and a lip with 3 anastomosed veins.

KEY TO THE COLOMBIAN SPECIES OF *CRANICHIS*

- 1. Petals with long hairs or cilia along the margins 2
- 1* Petals without long hairs on the margins 3
- 2. Lip ovate-saggitate in outline, acute, almost flat *C. wagneri* Rchb. f.
- 2* Lip oblong-ovate in outline, apex elongate, sub-obtuse, incurved *C. schlechteri* Szlach. & Kolan
- 3. Petals ciliate 4
- 3* Petals with entire or slightly erose margins, glabrous 15
- 4. Scape glabrous 5
- 4* Scape glandular or glandular-pubescent 8
- 5. Lip ovate-elliptic, base saccate *C. crumenifera* Garay
- 5* Lip ovate to suborbicular 6
- 6. Petals from a short claw broadly oblanceolate to elliptic *C. polyantha* Schltr.
- 6* Petals linear-ligulate to oblong-ob lanceolate 7
- 7. Lip midvein unbranched *C. engelii* Rchb. f.
- 7* All lip veins branching *C. muscosa*
- 8. Ovary glandular 9
- 8* Ovary glabrous 11
- 9. Lip without any additional projections on the surface 10
- 9* Lip with spiculate pustules or knob-like projections *C. schlimii* Rchb. f.
- 10. Lateral sepals obscurely 3-veined, lip obtuse at the apex *C. brachyblephara* Schltr.
- 10* Lateral sepals obscurely 1-veined, lip truncate at the apex with short, triangular, acute apiculus *C. zarucchii* Szlach. & Kolan.
- 11. Inflorescence elongate, raceme 8–12 cm long, longer than the leaf blade *C. antioquiensis* Schltr.
- 11* Raceme up to 4–7 cm long, shorter than the leaf blade 12
- 12. Leaf blade elliptic-suborbicular, obtuse to sub-obtuse at apex *C. queremalensis* Szlach. & Kolan.

- 12.* Leaf blade ovate to elliptic, acute or acuminate 13
13. Flowers *ca* 3 mm in diameter, ovary *ca* 5–6 mm long 14
- 13.* Flowers *ca* 3.5 mm in diameter, ovary up to 11 mm long *C. ciliata* (Kunth) Kunth
14. Sepals attenuate towards the apex, petals minutely ciliate along margins, lip longer than wide *C. pleioneura* Schltr.
- 14.* Sepals rounded at the apex, petals pubescent along margins, lip as long as wide *C. polyblephara* Schltr.
15. Petals margins erose *C. picta* Rchb. f.
- 15.* Petals margins entire 16
16. Petals oblong-spathulate 17
- 16.* Petals linear-oblongate 18
17. Leaf one, blade suborbicular *C. rotundifolia* Szlach. & Kolan.
- 17.* Leaves 2, blade oblong- or ovate-lanceolate *C. cristalinensis* Szlach. & Kolan.
18. Leaves narrowly oblanceolate to linear-lanceolate 19
- 18.* Leaves ovate, ovate-lanceolate to orbicular 20
19. Lateral sepals obliquely oblong-triangular, outer margin not forming a lobe *C. lehmanniana* (Kraenzl.) L. O. Williams
- 19.* Lateral sepals obliquely ovate with expanded basal outer margin forming a lobe *C. carlos-parrae* Szlach. & Kolan.
20. Leaves usually two, often one is much larger than the other *C. diphylla* Sw.
- 20.* Leaves several, subequal in size 21
21. Petals elliptic *C. gibbosa* Lindl.
- 21.* Petals lanceolate to oblong-oblongate 22
22. Floral bracts subequal or longer than ovary *C. lehmannii* Rchb. f.
- 22.* Floral bracts shorter than ovary 23
23. Leaf blade elliptic to orbicular; petiole 0.4 cm long; blade 0.9–6 × 0.6–2 cm *C. tenuis* Rchb. f.
- 23.* Leaf blade broadly ovate to broadly elliptic; petiole at least 1 cm long; blade 4–8 × 2–4 cm 24
24. Petiole up to 2.5 cm long, lip unlobed *C. parvula* Renz
- 24.* Petiole up to 9 cm long, lip 3-lobed at apex *C. pulvinifera* Garay

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REFERENCES

- ACUÑA J. 1939. Catalogo descriptivo de las Orquideas Cubanas. *Boletín Estación Experimental Agronómica, Santiago de las Vegas, provincia de La Habana* **60**: 1–221.
- ÁLVAREZ-MOLINA A. & CAMERON K. M. 2009. Molecular phylogenetics of Prescottiinae s.l. and their close allies (Orchidaceae, Cranichideae) inferred from plastid and nuclear ribosomal DNA sequences. *Amer. J. Bot.* **96**(5): 1020–1040.
- CARNEVALI G. & RAMÍREZ-MORILLO I. M. 2003. *Cranichis*. In: J. A. STEYERMARK, P. E. BERRY, K. YATSKIEVYCH & B. K. HOLST (eds), *Flora of the Venezuelan Guayana*. 7. Missouri Botanical Garden Press, St. Louis.
- CRIBB P. 2003. *Cranichis*. In: A. M. PRIDGEON, P. J. CRIBB, M. W. CHASE & F. N. RASMUSSEN (eds), *Genera Orchidacearum*. 3. Oxford University Press, Oxford.
- DRESSLER R. L. 1993. Phylogeny and classification of the orchid family. Dioscorides Press, Portland.
- DUENAS GÓMEZ H. C. & FERNÁNDEZ-ALONSO J. L. 2007. Sinopsis de la subfamilia Spiranthoideae (Orchidaceae) en Colombia, parte I. *Revista Acad. Colomb. Ci. Exact.* **31**: 5–27.
- DUENAS GÓMEZ H. C. & FERNÁNDEZ-ALONSO J. L. 2009. Sinopsis de la subfamilia Spiranthoideae (Orchidaceae) en Colombia, parte II. *Revista Acad. Colomb. Ci. Exact.* **33**: 157–181.
- ORMEROD P. 2007. Studies of Neotropical Goodyerinae (Orchidaceae) 2. *Harvard Pap. Bot.* **11**(2): 145–177.
- ORMEROD P. 2008. Studies of Neotropical Goodyerinae (Orchidaceae) 3. *Harvard Pap. Bot.* **13**: 55–87.
- ORMEROD P. 2009a. Notulae Goodyerinae (IV). *Taiwania* **54**(1): 45–51.
- ORMEROD P. 2009b. Studies of neotropical Goodyerinae (Orchidaceae) 4. *Harvard Pap. Bot.* **14**(2): 111–129.
- ORTIZ VALDIVIESO P. & URIBE VÉLEZ C. 2007. Galería de Orquideas de Colombia (CD edition). Asociación Bogotana de Orquideología, Bogotá.
- SALAZAR G. A., CHASE M. W., SOTO ARENAS M. I. & INGROUILLE M. 2003. Phylogenetics of Cranichideae with emphasis on Spiranthinae (Orchidaceae, Orchidoideae): evidence from plastid and nuclear DNA sequences. *Am. J. Bot.* **90**(5): 777–795.
- SCHNEIDER M. 1953. El Género *Cranichis* (Orchidaceae) en Colombia. *Caldasia* **6**: 11–18.

- SWARTZ O. 1788. Nova Genera Species Plantarum seu Pro-
dromus descriptionum Vegetabilium maximam partem in-
cognitorum quae sub itinere Indiam Occidentalem annis
1783–87. Bibliopoliis Acad. M. Swederi, Holmiæ, Upsaliæ
& Aboæ.
- SZLACHETKO D. L. 1995. Systema orchidalium. *Fragm. Florist.
Geobot., Suppl.* **3**: 1–152.
- SZLACHETKO D. L. & KOLANOWSKA M. 2013. New species
of the genus *Cranichis* (Orchidaceae, Cranichidinae) from
Colombia. *Plant Syst. Evol.* **299**: 979–983.
- SZLACHETKO D. L. & RUTKOWSKI P. 2000. Gynostemia Or-
chidalium Vol. 1 Apostasiaceae, Cypripediaceae, Orchi-
daceae (Thelymitroideae-Vanilloideae). *Acta Bot. Fenn.*
169: 1–380.

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