

A NEW SPECIES OF *EPIDENDRUM* (LAELIINAE) OF THE INCOMPTUM GROUP FROM THE NORTH OF ANTIOQUIA, COLOMBIA

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ABSTRACT. A new species of *Epidendrum* of the Incomptum group is described and illustrated, thus far found only at the type locality. Information is provided to separate the species belonging to the Arbuscula and Incomptum groups. Additionally, the new taxon described herein, *Epidendrum pambertonii*, is thoroughly compared with the four most morphologically similar species (*E. brenesii*, *E. bisulcatum*, *E. foldatsii*, *E. sotoanum*), revealing notable differences in the number and shape of leaves, inflorescence length, flower color, venation of sepals, as well as the shape and ornamentation of the lip and column.

RESUMEN. Se describe e ilustra una especie nueva de *Epidendrum* del grupo Incomptum, hasta ahora encontrada solamente de la localidad tipo. Se proporciona información para separar las especies pertenecientes a los grupos Arbuscula e Incomptum. Además, el nuevo taxón descrito aquí, *Epidendrum pambertonii*, se compara minuciosamente con las cuatro especies morfológicamente más similares (*E. brenesii*, *E. bisulcatum*, *E. foldatsii*, *E. sotoanum*), mostrando diferencias notables en la cantidad y forma de las hojas, longitud de la inflorescencia, color de las flores, venación de los sépalos, forma y ornamentación del labelo y columna.

KEYWORDS / PALABRAS CLAVE: Alto de Ventanas, Arbuscula group, *Epidendrum brenesii*, *Epidendrum pambertonii*, Yarumal

Introduction. *Epidendrum* L. (Linnaeus 1763) is a neotropical genus that exhibits an extensive distribution range from South Carolina in the United States to Argentina (Hágsater & Soto 2005). With an estimated 2400 species, *Epidendrum* showcases remarkable variability in both vegetative and floral characteristics (Hágsater *et al.* 2016, Karremans 2021, Rincón-González *et al.* 2022). Hágsater (1985) introduced a classification system that organizes *Epidendrum* species into informal groups and subgroups to unravel the complexities of studying this genus. This system primarily relies on morphological features, with a strong emphasis on vegetative structures, particularly the architecture of the plant, simple or branching stems, the presence or lack of spathes at the base of

the inflorescences, and these, racemose or paniculate, and flowering only once or repeatedly over several years. This approach has been widely adopted for taxonomic studies of the genus (Hágsater & Salazar 1993, Hágsater *et al.* 1999, Hágsater & Sánchez-Saldaña 2001, 2004, 2006, 2007, 2008, 2009, 2010, 2013, 2015, 2016, Hágsater & Santiago 2018a, b, 2019, 2020a, b, 2021, 2022a, b, 2023, Hágsater *et al.* 2016, Rincón-González *et al.* 2022).

Initially, Hágsater (1985) proposed to recognize the Arbuscula group, consisting of species that produce the new growth from one of the middle internodes of the previous growth, typically without branching and sometimes producing aerial roots. This group is further treated as the Arbuscula subgroup (Hágsater &



FIGURE 1. Comparison between *Epidendrum incomptum* Rchb.f. (Incomptum group) (A, B) and *Epidendrum arbusculum* Lindl. (Arbuscula group) (C, D). Photographs by Adam Karremans (A–B) and Rolando Jiménez (C–D).

TABLE 1. Characteristics of the Arbuscula and Incomptum groups.

Group/Character	Arbuscula	Incomptum
Inflorescence	Racemose, lax, > 12.5 cm long	Racemose, compact, < 12 cm long
Floral bract	4–30 mm long	3–7 mm long
Flower texture	Membranaceous	Fleshy
Number of flowers	> 20	< 15 (except in <i>E. molinae</i> > 40)
Ovary (length)	0.9–6.0 cm	1.0–2.0 cm

Sánchez-Saldaña 2006: pl. 808), characterized by a racemose, nutant inflorescence, membranaceous, colorful flowers, with long ovary, and a bicallose lip. Conversely, the Incomptum subgroup (Hágsater & Sánchez-Saldaña 2004: pl. 710) is characterized by a racemose, nutant inflorescence, fleshy flowers with the perianth green, green-violet, purple, with entire to 3-lobed lip, extended to convex, orbicular, reniform to obreniform, bicallose, and a short ovary (Fig. 1). Subsequently, Hágsater & Santiago (2018a) published five species of *Epidendrum* classified within the “Incomptum group”, indicating a clear distinction between the Arbuscula and Incomptum groups, considering them as distinct lineages. Comparative morphological details of each group are shown in Table 1. Additionally, there is a geographical association with these groups, as the Arbuscula group is exclusive to Mexico and northern Mesoamerica, while the Incomptum group has a broader distribution, encompassing Mexico, Central America, the Caribbean, and South America (Hágsater *et al.* unpubl. data).

Here, we propose a new species of *Epidendrum* from Colombia belonging to the Incomptum group. We provide a detailed description, illustrations, discuss its morphological similarities with other species, and offer information regarding its distribution, ecology and conservation status.

Materials and methods. During recent expeditions in 2018–2022, several field trips were made to the forests in Alto de Ventanas in Yarumal, Antioquia, within natural reserves owned and managed by Corporación Salvamontes, Colombia. We collected plant material that was deposited in the JAUM herbarium. The Colombian herbaria CAUP, COL, FMB, HUA, JAUM, JBB, MEDEL, PSO, and TOLI were also reviewed in search

of more specimens of this species, and the virtual collections (digital photographs) of A, BHBC, F, HBG, K, MBM, NY, RB, and U. We followed the morphological species concept (De Queiroz 2007). Photographs with scale were taken for study and description; we measured the organs with a digital caliper and observed the specimens under a stereomicroscope Motic SMZ 168. The information derived from the review of the specimens was verified at the AMO-DATA base (2021), and was searched for possible duplicates or other unidentified specimens of the Incomptum group from the same general geographic area. A Lankester Digital Composite Plate (LCDP) was prepared from the photographic material available, and a botanical description, and the new species was compared with the most similar species in the Incomptum group.

TAXONOMIC TREATMENT

Epidendrum pambertonii Rinc-González, E.Santiago & S.Vieira-Uribe, *sp. nov.* (Fig. 2–3A).

TYPE: Colombia. Antioquia: Municipio de Yarumal, Vereda Tobón, Finca Guasimal, 2080 m. 25 Julio 2022. *Sebastian Vieira et al.* #382 (holotype: JAUM).

DIAGNOSIS: *Epidendrum pambertonii* is similar to *E. brenesii* Schltr. (Schlechter 1923) but easily distinguished by having two, elliptic (*vs.* 3–5, oblong) larger leaves (5.2–6.0 × 2.5–2.7 *vs.* 2–8 × 1.3–2.5 cm), longest inflorescence (7.2 *vs.* 2–4 cm), tepals greenish yellow with a brown tinge (*vs.* light green with purple tinge to deep purple), red lip with yellow to red calli (*vs.* purple tinge to deep purple lip with yellow-greenish calli), greenish yellow column (*vs.* green), the dorsal sepal narrowly obovate, 5-veined (*vs.* obovate-elliptic, 3-veined), the lateral sepals obliquely elliptic, 5-veined

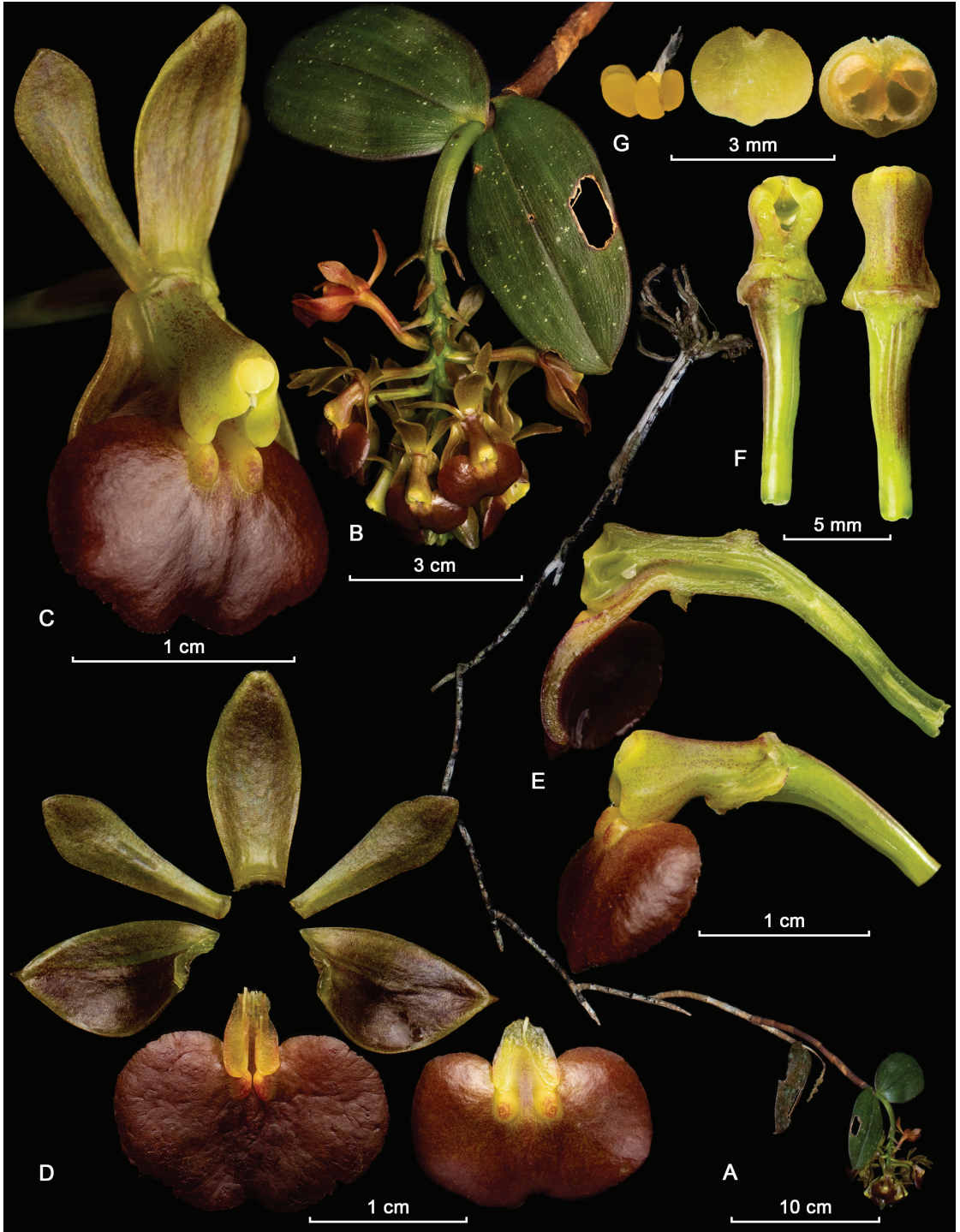


FIGURE 2. LDCP of *Epidendrum pambertonii* Rinc-González, E.Santiago & S.Vieira-Uribe. A. Habit. B. Inflorescence. C. Flower. D. Dissected perianth. E. Column and lip, side view. F. Column, ventral and dorsal views. G. Pollinarium and anther cap, dorsal and ventral views. LDCP prepared by S. Vieira-Uribe, based on *Vieira et al.* #382.

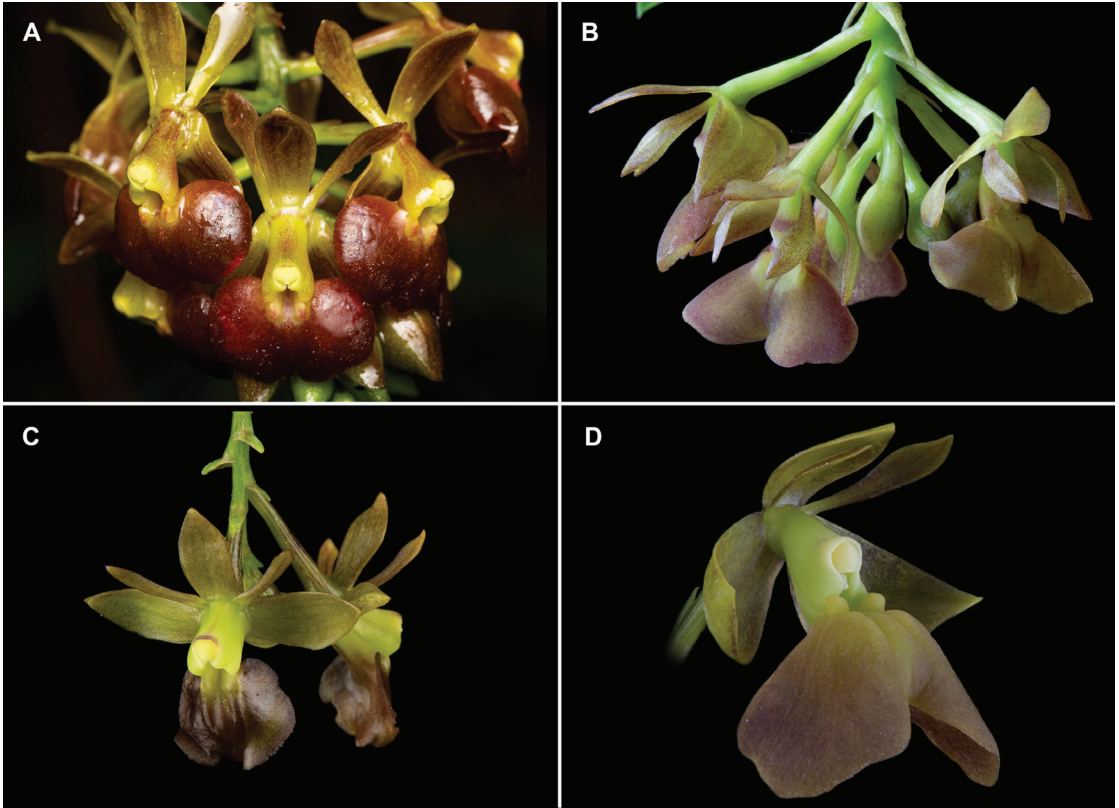


FIGURE 3. Comparison of *Epidendrum pembertonii* Rinc-González, E.Santiago & S.Vieira-Uribe and most similar species. A. *Epidendrum pembertonii*. B. *Epidendrum brenesii* Schltr. C. *Epidendrum bisulcatum* Ames. D. *Epidendrum sotoanum* Karremans & Hágsater. Photographs by S. Vieira-Uribe (A), Adam Karremans (B–C) and Melissa Díaz (D).

(*vs.* obovate-elliptic, 3-veined), the lip smooth, apex apiculate, (*vs.* velutinous, short setose, apex sometimes slightly 4-lobed) and the longer column (9–10 *vs.* 7–8 mm), straight, apex arching upwards (*vs.* arching downwards).

Epiphytic, sympodial, erect to pendulous *herb* 78 cm tall, new stems produced from a sub-apical internode of previous stem. *Roots* fleshy, from base of primary stem. *Stems* 8–13 × 0.3–0.5 cm, cane-like, terete, erect to pendulous when weight in old plants makes them hang from the roots, simple. *Leaves* 2, aggregate towards the apex of the stem, spreading, alternate; sheaths 0.32–0.65 × 0.3–0.5 cm, tubular, striated, reddish-brown; blades 5.2–6.0 × 2.5–2.7 cm, elliptic, obtuse, coriaceous, green, concolor. *Spathe* lacking. *Inflorescence* 7.2 cm long, apical, from the mature stem, racemose, arcuate; peduncle 2.2 × 0.43 cm, laterally compressed, green;

rachis 5 cm long, arching-nutant. *Floral bracts* 5–6 mm long, much shorter than ovary, decreasing in size towards apex of the rachis, triangular, acute, embracing. *Flowers* *ca.* 18, opening in succession, until most open at the same time, resupinate, greenish yellow tinged with brown, lip red with calli yellow to red, column greenish yellow, slightly tinged reddish brown, anther yellow; fragrance none detected. *Ovary* 12–15 × 2.2–2.8 mm, slightly inflated behind the perianth, terete, furrowed, somewhat arcuate. *Sepals* free, fleshy, 5-veined, margins entire; dorsal sepal 13.5 × 6.0 mm, spreading, narrowly obovate, sub-rounded, minutely apiculate; lateral sepals 13.1 × 7.5 mm, partly spreading, obliquely elliptic, obtuse, apiculate. *Petals* 13.5 × 4.2 mm, free, spreading, oblanceolate, apex obtuse, 3-veined, margin entire. *Lip* 9–12 × 15.2–17.0 mm, united to column, fleshy, convex, smooth, wider than long, reniform, base cordate, apex emarginate, margin entire, spreading; bi-

callose, calli globose, slightly separate, disc with a thick, low rib running at the apex, reaching apical sinus of lip. *Column* 9–10 mm long, somewhat thick towards the apex, truncate, straight, apex arching upwards. *Clinandrium-hood* reduced, margin entire. *Anther* 1.9 × 2.3 mm, sub-globose, apex minutely apiculate, apical surface minutely papillose, 4-celled. *Pollinia* 0.87 × 0.66 mm, ovoid; caudicles granulose, shorter than pollinia; viscarium semi-liquid. *Rostellum* apical, slit. *Lateral lobes of stigma* about half length of stigmatic cavity. *Cuniculus* shallow, slightly penetrating ovary, narrow, smooth. *Capsule* not seen.

Eponymy: We dedicate this species to Robert W. Pemberton, an entomologist and botanist, as well as a generous donor who contributed to the expansion of the Los Magnolios Natural Reserve, which protects the habitat of the new species.

Habitat and Ecology: Known only from Colombia, specifically from the north slope of the Cordillera Central in Antioquia. It grows as an epiphyte at 2080 m of elevation in premontane wet forest. A single plant has been found, thriving near an open pasture on the main trunk of a medium sized tree located along a small creek at approximately 2 m above the ground and in partial shade. It grows together with several other orchid species, including *Maxillariella lawrenceana* (Rolfe) M.A. Blanco & Carnevali (Blanco *et al.* 2007) and *Restrepia pelyx* Luer & R. Escobar (Luer & Escobar 1982). The plant has been observed flowering during every month of the year, with a single inflorescence lasting 2-3 months.

Conservation Status: DD. Deficient Data. This species is apparently endemic to the Alto de Ventanas region of Yarumal-Antioquia, located in the north of the central Andes. Thus far, it has been exclusively found in the Los Magnolios Natural Reserve, owned and managed by Corporación Salvamontes. The reserve protects 770 hectares of habitat in the Alto de Ventanas area. However, this region has experienced significant deforestation, with approximately 70% of its forests lost due to the expansion of pastures for dairy farming (CORANTIOQUIA 2020)

Morphological Affinities: *Epidendrum pembertonii* belongs to the Incomptum Group which is characterized by the successive lateral growths produced from the middle of the previous growth, the few leaves ag-

gregate towards the apex of the stems, a short apical, racemose, nutant inflorescence, with fleshy, green, yellow, yellow-greenish, violet-green, to black flowers, short ovaries, and the lip entire to 3-lobed. The species is recognized by having 2 elliptic leaves, inflorescence of 7.2 cm long, the combination of color in the flowers, sepals 5-veined, petals oblanceolate, lip reniform, 9–12 × 15.2–17.0 mm and column somewhat thick towards the apex, straight, apex arching upwards, 9–10 mm long. *Epidendrum brenesii* is the most similar species, differing in having 3–5 oblong leaves (*vs.* 2, elliptic), shorter inflorescence (2–4 *vs.* 7.2 cm), 3-veined sepals (*vs.* 5-veined), Column arched downwards, 7–8 mm long (*vs.* straight, apex arched upwards, 9–10 mm). *Epidendrum bisulcatum* Ames (Ames 1923) differs in having oblong leaves (*vs.* elliptic), inflorescence 3.8 cm long (*vs.* 7.2 cm), dorsal sepal oblong, 3-nerved (*vs.* narrowly obovate, 5-nerved), lip suborbicular, retuse to rounded apex (*vs.* reniform, emarginate, apiculate). *Epidendrum foldatsii* Hágsater & Carnevali (Hágsater & Salazar 1993) is characterized by an inflorescence 2 cm long (*vs.* 7.2 cm), ovary 5–7 mm long (*vs.* 12–15 mm), sepals 3-veined (*vs.* 5-veined), petals 1-veined (*vs.* 3-veined), lip obreniform (*vs.* reniform) and column slightly sigmoid, 3 mm long (*vs.* straight, apex arched upwards, 9–10 mm). *Epidendrum sotoanum* Karremans & Hágsater (Karremans & Hágsater 2009) is characterized by an inflorescence 2 cm long (*vs.* 7.2 cm), cuniculus short, without penetrating the ovary (*vs.* shallow, slightly penetrating ovary), sepals 3-4 veined (*vs.* 5-veined), petals narrowly-obovate (*vs.* oblanceolate), lip superficially glabrous but with low rounded papilla, 10–17 × 20–30 mm (*vs.* smooth, 9–12 × 15.2–17 mm). The mentioned differences with the most similar species are expanded and illustrated in Table 2 and Figure 3.

Acknowledgments. The authors wish to thank Libardo Cuartas and Luz Dary Echavarría, the forest guards working in Los Magnolios Natural Reserve, for discovering and photographing this species for the first time; Corporación Salvamontes and the Orchid Conservation Alliance for the protection of the habitat of the new species, the staff at the herbarium Jardín Botánico Joaquín Antonio Uribe (JAUM) for their support, and finally Robert Pemberton for his support to the expansion and management of the natural reserve where the new species was found. We would also like to thank the anonymous reviewers for all their suggestions and comments for the improvement of this manuscript.

TABLE 2. Distribution and morphological comparison between the closest species to *Epidendrum pembertonii*.

	<i>E. bisulcatum</i>	<i>E. brenesii</i>	<i>E. foldatsii</i>	<i>E. pembertonii</i>	<i>E. sotoanum</i>
Country	Costa Rica Panama	Costa Rica	Venezuela	Colombia	Costa Rica
Leaves number, shape, measures)	2–4, oblong, 6.0–9.0 × 1.4–2.2 cm	3–5, oblong, 2–8 × 1.3–2.5 cm	2–4, obovate-elliptic, 2.0–4.5 × 1.1–1.7 cm	2, elliptic, 5.2–6.0 × 2.5–2.7 cm	3, obovate-elliptic, 5–10 × 1.3–2.5 cm
Inflorescence (length)	3.8 cm	2–4 cm	2 cm	7.2 cm	2 cm
Tepals (color)	Live-green	Light green with purple tinge to deep purple	Unregistered	Yellow-greenish tinge brown	Greenish brown or yellow
Lip (color)	Lighter with a purple cast over it	Light green with purple tinge to deep purple	Unregistered	Red with the calli yellow to red	Greenish brown or yellow
Column (color)	Yellow-greenish	Green	Unregistered	Yellow-greenish, slightly tinge reddish brown, anther yellow	Green, darker at the base
Ovary (length)	10–11 mm	8–13 mm	5–7 mm	12–15 mm	12–20 mm
Cuniculus nectary	Shallow, slightly penetrating ovary, narrow, smooth	Penetrating somewhat the ovary, smooth	Unregistered	Shallow, slightly penetrating ovary, narrow, smooth	Short, without penetrating the ovary, smooth
Dorsal sepal (shape, length, number of veins)	Oblong, 12–15 × 6.0–6.5 mm, 3-veined	Obovate-elliptic, 12–13 × 6.0–6.5 mm, 3-veined	Elliptic, 4.5–5.0 × 2.5 mm, 3-veined	Narrowly obovate, sub-rounded, 13.5 × 6.0 mm, 5-veined	Obovate-elliptic, 12–16 × 4.0–7.5 mm, 3–4 veined
Lateral sepals (shape, length, number of veins)	Oblong, 12–15 × 6.0–6.5 mm, 5-veined apparently	Obovate-elliptic, 14.5–15.0 × 7.5 mm, 3-veined	Obliquely ovate, 5 × 2.8 mm, 3-veined	Obliquely elliptic, 13.1 × 7.5 mm, 5-veined	Obovate-elliptic, 13–18 × 7–9 mm, 3–4 veined
Petals (shape, length, number of veins)	Linear-spathulate, 11–12 × 2.5 mm, 3-veined	Linear-oblongate, 12 × 2.5–3 mm, 3-veined	Linear-oblongate, 4.5 × 1 mm, 1-veined	Oblanceolate, 13.5 × 4.2 mm, 3-veined	Narrowly-obovate, spreading, 11–15 × 2–4 mm, 3-veined
Lip (shape, surface, measures)	Suborbicular, surface unregistered 9.0–10 × 11.0–12.5 mm	Reniform, velutinous, short setose, densely covered by short, pointed trichomes. 8–12 × 15–19 mm	Obreniform, surface unregistered, 4 × 7.5 mm	Reniform, smooth, 9–12 × 15.2–17.0 mm	Widely reniform, superficially glabrous in appearance but with low rounded papilla. 10–17 × 20–30 mm
Callus and keels	Bicallose, callus laminar, short, with 3 low keels in front, the central keel running to the apex of the lip, the lateral ones short	Bicallose, callus formed by a pair of short, laterally compressed thickenings; disc with a low, wide keel that reaches the apical sinus	Bicallose, callus divergent in front of the column, with a fleshy, rounded keel running down the middle without reaching the apical sinus	Bicallose, callus globose, slightly separate; disc with a thick, low rib running at apex, reaching apical sinus of lip	Bicallose, callus thickened at the base and ending in a pair of low keels
Lip apex (shape)	Retuse to rounded	Emarginate, the apex sometimes slightly 4-lobed	Deeply emarginate	Emarginate, apiculate	Deeply emarginate
Column (shape, length)	Slightly arched upward, 7.0–8.0 mm long	Arching downwards, 7–8 mm long	Slightly sigmoid, 3 mm long	Straight, apex arching upwards, 9–10 mm long	Somewhat arching downwards, 7–8 mm long

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