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# Taxonomic revision of *Sobralia* section *Racemosae* Brieger (*Sobralieae*, Orchidaceae)

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*Sobralia* Ruiz & Pav. is a large and morphologically diverse neotropical orchid genus. It can be divided into four sections and some informal groups of species based mainly on the inflorescence architecture. While most of the species have strongly abbreviated, compact raceme, the section *Racemosae* is characterized by an elongated inflorescence with distinct internodes between flowers. Although the group is well-defined and easily distinguishable in terms of morphology, its species are often similar to each other and may be easily misidentified. Identification is especially difficult when considering herbarium specimens. Here, a taxonomic revision of *Sobralia* section *Racemosae* is presented. Apart from particular species' morphological characteristics, keys for identification, ecological data, and distribution maps are presented. *Sobralia gambitana* is described as a species new to science. A neotype for *S. hoppii* Schltr. is proposed.

## KEYWORDS

diversity, morphology, neotropics, new species, taxonomy

## 1. Introduction

*Sobralia* is a large orchid genus consisting of about 200 species distributed from southern Mexico to Brazil and Bolivia. Its representatives can be found in various habitats, from humid and shaded tropical forests to sunny, dry, open savannas or roadsides. They grow from sea level to over 3,000 m a.s.l. They can occur as terrestrial or lithophytic plants, but sometimes also as epiphytes (Pridgeon et al., 2006; Baranow, 2015).

*Sobralia* is a morphologically diverse group of species, especially when considering the architecture of inflorescence and morphology of floral bracts and flower segments. The differences allow distinguishing some groups of species, which served as the basis for the description of infrageneric units (Lindley, 1854; Reichenbach, 1873; Brieger, 1983).

The nominal section was characterized by lateral or rarely terminal inflorescences with branching, well-developed raceme and relatively small floral bracts compared to the size of the ovary (Brieger, 1983). The section *Racemosae* Brieger, despite terminal inflorescences, could be distinguished from the former by its elongated and unbranched inflorescences with large floral bracts. Section *Globosae* Brieger is composed of small plants with narrow leaf blades, small flowers positioned in the terminal, and condensed inflorescences (shortened internodes hidden under the floral bracts) that successively produce a single flower at a time and elongate with successively produced floral bracts. Species of section *Abbreviatae* Brieger share terminal and condensed inflorescences with the previous section but, instead, present floral bracts forming a cone. The fifth section, *Intermediae* Brieger, was established for a single taxon *Sobralia fragrans* Lindl. to emphasize its elongated basal internode of the inflorescences. Dressler (2002) enlarged this section, placing other species with small flowers and inflorescences.

The present classification of *Sobralia* is based on Briegers' 1983 division of the genus into sections. However, the development of molecular methods revealed that the nominal section of *Sobralia* is more closely related to other genera of *Sobralieae* than to the remaining groups of *Sobralia*. As the nominal section is also different in the morphological characters, such as branching and often lateral inflorescence, it was elevated to the rank of a separate genus *Brasolia* (Baranow et al., 2017, see also Dressler et al., 2011; Neubig et al., 2011).

Since then, the newly defined *Sobralia* consists of the species with terminal and unbranching inflorescences only. Most of the species have abbreviated and compact raceme, hidden between the floral bracts, forming a tight, cone-like structure, producing one or two flowers at a time. However, there is one group, section *Racemosae* Brieger, with elongated raceme, having distinct internodes. The flowers of its representatives develop from the nodes and are supported by distichous, large floral bracts. The inflorescence contains several flowers at various stages of growth, with the youngest ones on its top. The distinct morphology is supported by the results of the molecular study, which can be seen in the phylogenetic trees (Neubig et al., 2011; Baranow et al., 2017). Also, the karyotype evolution analysis with the phylogenetic study as the background (Baranow et al., 2022) as well as niche conservatism and ecological tolerance evolution study (Kolanowska et al., 2022) have confirmed the consistency of the group. Thus, the section appears to be well-defined and distinct from the other groups of the genus. On the other hand, the species of *Racemosae* are in many cases similar to each other and easy to misidentify. The only study devoted to *Racemosae* was made by Romero-González (2003), but the author focused only on *S. liliastrum* Lindl. and its close allies.

The study aims to present the results of the taxonomic revision of all species of the section *Racemosae* with the descriptions and illustrations of their morphology, with the ecological data and maps of distribution. The revision of the

herbarium material resulted in a discovery of the collection, which, in order of its distinctness, was recognized as a species new to science. Additionally, a neotype for *S. hoppii* Schltr. is selected. In addition, the first comprehensive key for the identification of the species of section *Racemosae* is provided.

## 2. Materials and methods

The presented revision was based on the morphological study of the herbarium material deposited in the following herbaria AMES, BM, COAH, COL, CUVC!, F, K, K-L, MO, NY, P, UGDA-DLSz, U, US, W, W-R (Thiers, 2022). In total, over 440 herbarium specimens were examined within the study.

Apart from the morphological data, the herbarium specimens were also a source of information concerning the ecology of the studied species given under the morphological descriptions. Moreover, the localities of the collections were used for the distribution presentation, and the geographical distribution maps were generated using the software QGIS version 3.22.12<sup>1</sup> and the Natural Earth<sup>2</sup> data.

A conservation analysis was performed using the criteria from the International Union for the Conservation of Nature (IUCN, 2022). The Extent of Occurrence (EOO) and the Area of Occupancy (AOO) of each species were estimated using GeoCat (Bachman et al., 2011).

## 3. Results

### 3.1. *Sobralia* Ruiz & Pav. section *Racemosae* Brieger

Orchideen 1 (13): 798. 1983; Type species: *Sobralia rosea* Poepp. & Endl., Nov. Gen. Sp. Pl. 1: 54, t. 93. 1836.

The group contains 15 species occurring in South America with the greatest species diversity in Northern Andes.

#### 3.1.1. Key to the species

1. Leaves less than 5 cm wide . . . 2
2. Flowers deep rose–purple with bright yellow throat of the lip, apical stlidia of gynostemium not exceeding anther apex . . . 1. *S. paradisiaca*
- 2\* Flowers yellow or white with yellow lip disk, apical stlidia of gynostemium long, strongly exceeding anther apex . . . 3
3. Flowers yellow, stlidia rounded at apex . . . 2. *S. chrysantha*
- 3\* Flowers white or navy yellow with yellow or orange lip disk or a dot on the apical part, stlidia acute at apex . . . 4

<sup>1</sup> [www.qgis.org/pl/](http://www.qgis.org/pl/)

<sup>2</sup> [www.naturalearthdata.com](http://www.naturalearthdata.com)

4. Lip divided into basal and apical parts by the distinct constriction just below the middle, gynostemium stielidia, horn-like, falcate . . . **3. *S. chrysoleuca***
- 4\* Lip not constricted in the middle, gynostemium stielidia narrowly oblong **5**
5. Leaves ca 4 cm wide . . . **6. *S. liliastrum***
- 5\* Leaves up to 2.5 cm wide . . . **6**
6. Lip white with yellow throat and reddish orange elevated keels, floral segments 50–65 mm long . . . **4. *S. elisabethae***
- 6\* Lip hyaline white with pale yellow, elevated keels, floral segments 40–45 mm long . . . **5. *S. granitica***
- 1\* Leaves 6–12 cm wide . . . **7**
7. Rachis fractiflex, bracts horizontally spreading, acute or obtuse . . . **8**
8. Flowers white, lip red–purple on the lamina and the throat, floral segments 70–75 mm long, lip furnished with a pair of shallow ridges in the throat only . . . **7. *S. luerorum***
- 8\* Flowers creamy white with purple striation on lip, floral segments up to 60 mm long, lip with two basal ridges and 5–7 parallel lamellae running from the base to the apex . . . **8. *S. gloriosa***
- 7\* Rachis sinuously flexuous, bracts suberectly spreading, acuminate . . . **9**
9. Floral bracts leaf-like, up to 20 cm long, decreasing in size toward the apex of inflorescence . . . **9. *S. ruckeri***
- 9\* Floral bracts up to 12 cm . . . **10**
10. Floral segments not exceeding 90 mm in length, lip with two basal ridges, additional lamella can be present too, but it is restricted to the middle of the lip only . . . **11**
11. Two basal thickenings fused together except their margins . . . **10. *S. gambitana***
- 11\* Two basal thickenings separate . . . **12**
12. Lip without any protuberances apart from the basal lamellae . . . **11. *S. tamboana***
- 12\*. Lip with thickenings or lamellae running along one or more central veins . . . **13**
13. Lip base with 2 lamellae running to its middle and the central vein in central part ornamented with lamella . . . **12. *S. splendida***
- 13\* Lip with 2 basal keels, median vein thickened, with two additional thickenings near the middle . . . **13. *S. hoppii***
- 10\* Floral segments 100 mm or more, lip disk with 3–7 lamellae running from the base up to at least its middle . . . **14**
14. Lip white with a broad white margin, with purple veins in the center, disk with 3 lamellae running from the base to the middle, the median one high-carinate . . . **14. *S. pulcherrima***
- 14\* Lip dark purple–magenta with very narrow, white margin, in center with fine, radiating, white veins, disk from the base to center transversed by 5–7 low, parallel lamellae . . . **15. *S. rosea***

### 3.1.1.1. *Sobralia paradisiaca* Rchb.f.

Linnaea **22**: 816. 1850. Type (designated by Baranow *in Szlachetko et al., 2020*: 248): Venezuela. Merida. *Sine prec loc.* Alt. 1600 m. March 1847. N. *Funk and L.J. Schlim 1489* (Lectotype: W!, Isolectotypes: K!, P!).—Garay and Dunsterville. Venezuelan Orchids Illustrated 404. 1959.—Szlachetko et al. Materials to the Orchid Flora of Colombia **3**: 248. 2020.

Plants up to 130 cm tall, caespitose, often leafy for all except the basal quarter. Stem concealed in green tubular sheathing leaf bases which tend to become red or dark red when well exposed. Leaves up to 25 cm long and 4.5 cm wide, lanceolate, apex lightly attenuate, plicate, the sides of blades tend to be revolute, making the upper surface convex, the uppermost leaves smaller than the ones below, with spathe-like base subtending the rachis. Inflorescence producing 3–6 flowers developing in succession from 1 to 3 at a time; rachis terete, fractiflex. Sepals and petals deep rose–purple paler right at base, lip deep rose–purple with bright yellow throat. Dorsal sepal up to 65 mm long and 25 mm wide, oblanceolate to ligulate-oblanceolate, acute, moderately fleshy. Lateral sepals up to 70 mm long and 33 mm wide, ligulate-lanceolate, somewhat oblique, moderately fleshy. Petals up to 70 mm long and 30 mm wide, elliptic-oblanceolate, acute, somewhat oblique. Lip 48–70 mm long, 33–50 mm wide when spread, elliptic-rectangular in general outline, entire, apical margins truncate, strongly undulate and crispate, thin for the most part but axially much thickened at base where there are two ventral swellings about 10 mm long, projecting from each side and almost touching each other, the rest of the axial part not thickened but with several raised veins giving the impression of a thickening terminating in a small hollow point. Gynostemium up to ca 35 mm long, stielidia short, obscure, subequal in length to the anther or shorter (**Figure 1**).

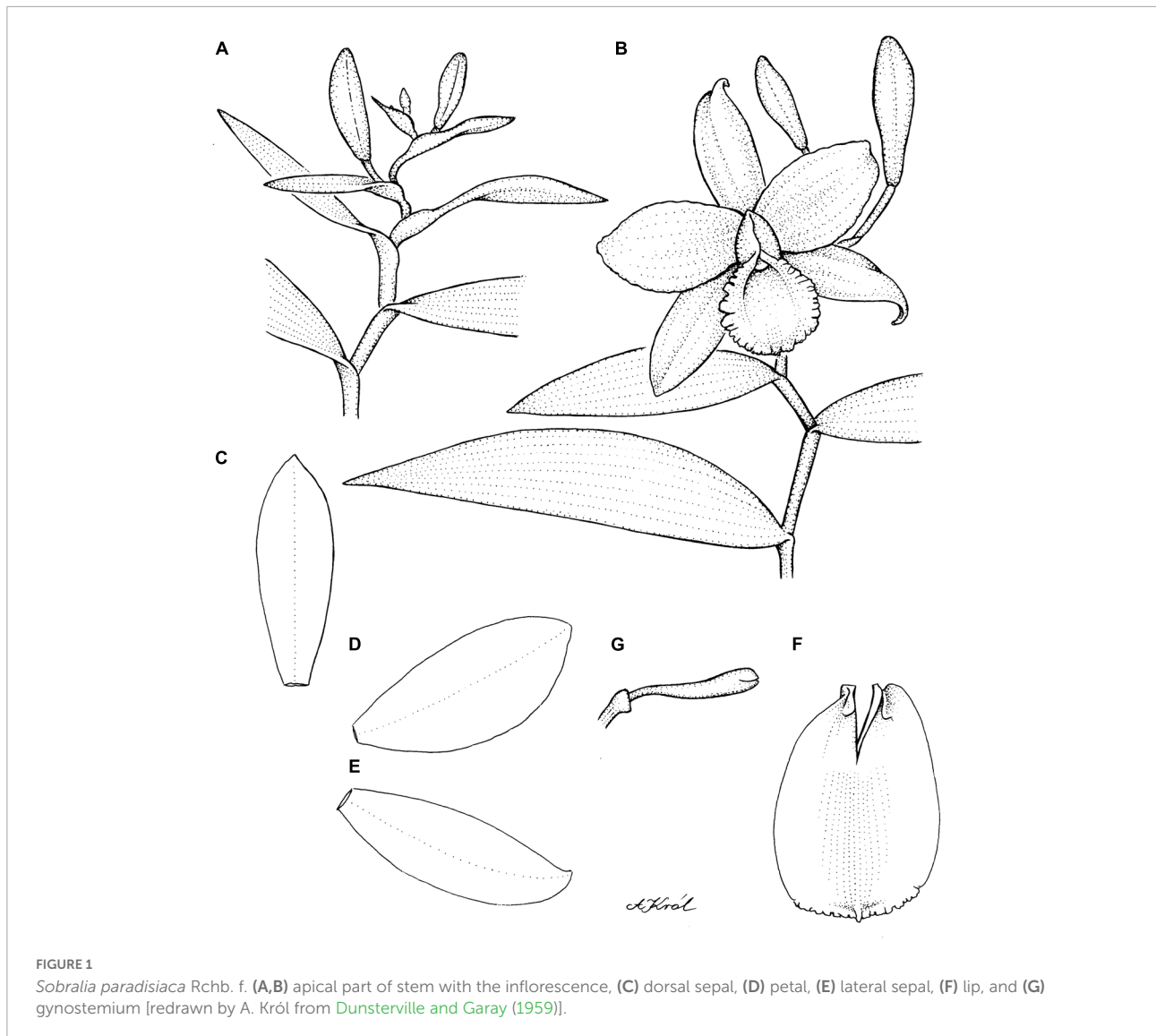
Ecology: Terrestrial. Flowering in March, September, and December.

Distribution: Colombia, Venezuela. Alt. 1600–2300 m.

Conservation status: EOO—CR, AOO—CR.

Representative specimens (**Supplementary Map 1**)—**Venezuela**. Merida. Between La Carbonera and La Azulita. 17 September 1966. *J. de Bruijn 1134* (MO!); *Sine loc.* Alt. 2300 m. *H. Wagens 124* (W! 21607, UGDA-DLSz!—drawing). **Colombia**. Norte de Santander. Ocaña. Alt. 1830 m. 1846. *L.J. Schlim 1203* (W-R!). Vaupés. Entre Wacaricuara y El Varador. Al Río Yi. 9–12 December 1952, *R. Romero Castañeda 3922* (COL!).

*Sobralia paradisiaca* belongs to the group of species having relatively narrow leaves (up to 5 cm width) along with *S. chrysantha*, *S. liliastrum*, *S. chrysoleuca*, *S. elisabethae*, and *S. granitica*. It can be easily separated from all of them by the color of the flowers—it is the only taxon having deep rose–purple tepals with a bright yellow throat of the lip. The species differs from other *S. liliastrum*-complex representatives also by very short, rounded stielidia of gynostemium.



In our opinion, there is a mistake in the protologue of the species. In W and K there are *Funck and Schlim* collections numbered 1489, and not 1749 as stated in the original description. Apart from fragments of plants, the collection includes also a hand drawing of a plant and floral parts (W-R 21609). It appears that collection 1489 should be indicated as the type specimen.

[Dunsterville and Garay \(1959\)](#) stated that *S. paradisiaca* may be only a juvenile form of *S. liliastrum* and treated as a synonym of the latter species. Surprisingly, in the same publication, the same authors listed *S. paradisiaca* as a valid species emphasizing its distinctness observed during the study of the type specimen.

### 3.1.1.2. *Sobralia chrysantha* Lindl.

Fol. Orchid. 5 (*Sobralia*): 3. 1854. Type: Colombia. (Santander). Socorro. Alt. 1220 m. *L.J. Schlim* 6 (Holotype: K-L,

ISOTYPE: W!).—[Szlachetko et al. Materials to the Orchid Flora of Colombia](#) 3: 249. 2020.

Plants height unknown, probably well over 100 cm tall. Leaves up to 25 cm long and 4 cm wide, lanceolate to elliptic-lanceolate, acute, plicate. The leaf subtending the rachis up to 10 cm long. Inflorescence ca 10 cm long, rachis inconspicuously flexuose. Floral bracts 15–50 mm long, narrowly lanceolate-triangular, acute to acuminate. Flowers yellow, large. Dorsal sepal 83 mm long, 12 mm wide, oblong-ligulate to linear, subobtusate. Lateral sepals 83 mm long, 12 mm wide, obliquely linear-lanceolate, shortly acuminate. Petals 85 mm long, 13 mm wide, obliquely linear-lanceolate to ligulate-lanceolate, shortly acuminate. Lip 70 mm long, up to 49 mm wide, broadly obovate to suborbicular-obovate in outline above cuneate base, rounded at apex, indistinctly denticulate and undulate along margins in the upper half, attenuate and canaliculate

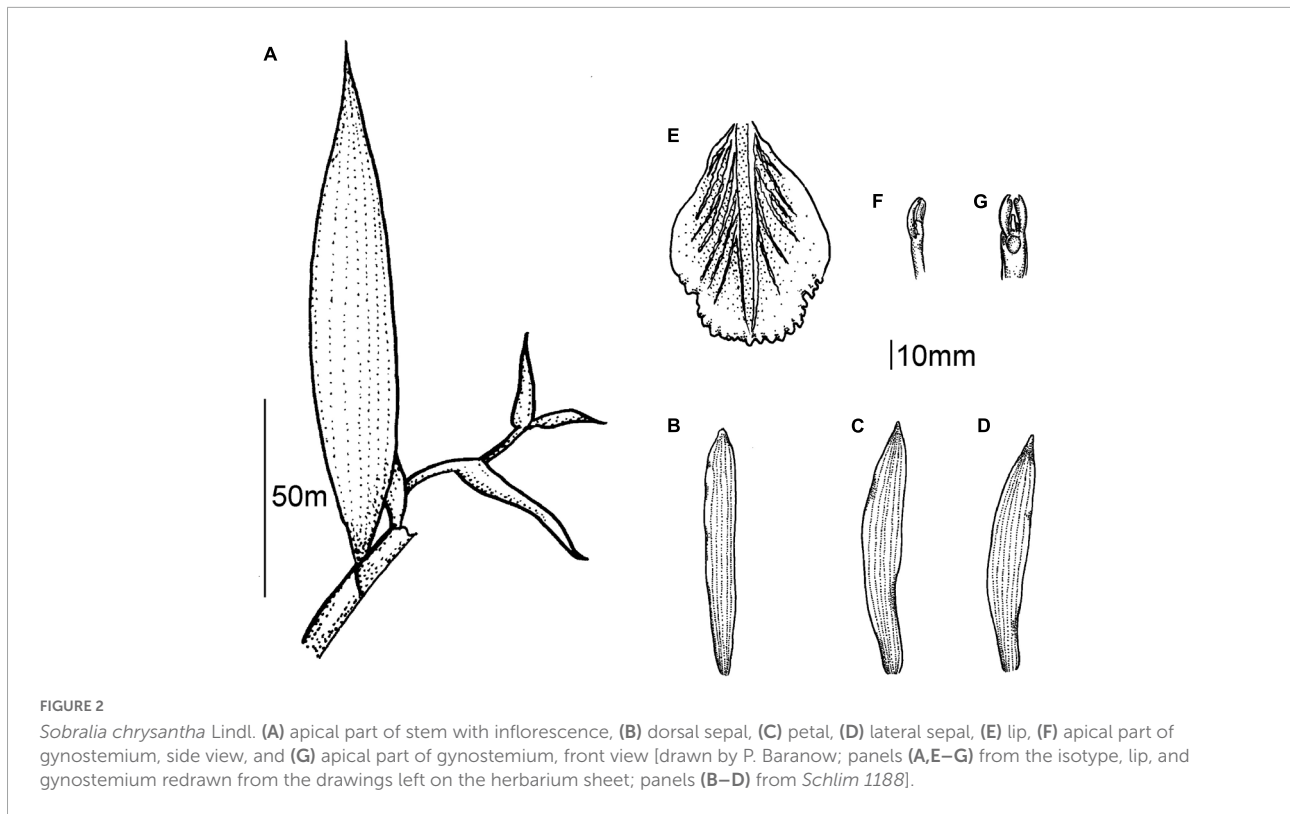


FIGURE 2

*Sobralia chrysantha* Lindl. (A) apical part of stem with inflorescence, (B) dorsal sepal, (C) petal, (D) lateral sepal, (E) lip, (F) apical part of gynostemium, side view, and (G) apical part of gynostemium, front view [drawn by P. Baranow; panels (A,E–G) from the isotype, lip, and gynostemium redrawn from the drawings left on the herbarium sheet; panels (B–D) from Schlim 1188].

toward base, without thickenings except the still middle rib. Gynostemium 52 mm long, clavate, staminodes oblong elliptic, straight, much exceeding the anther, with a deep wing at their back and an oblique emargination, apex falcate, blunt (Figure 2).

Ecology: Terrestrial. No data on flowering time.

Distribution: Colombia. Alt. 1220–2000 m.

Conservation status: EOO—CR, AOO—CR.

Representative specimens (Supplementary Map 2)—Colombia. Santander. Socorro. Alt. 1300–2000 m. 1849. *L.J. Schlim 1188* (W!, UGDA-DLSz!—drawing); Socorro. Alt. 1220 m. *L.J. Schlim 6* (K–L!).

It is interesting to note that Reichenbach's drawing accompanying the type specimen stored at W shows a very massive stelia which are apically bilobed, with the anterior lobe being somewhat longer and acute, and the posterior one shorter and rounded. In the materials examined we did not find stelia of this form.

*Sobralia chrysantha* resembles *S. liliastrum*-complex in habit and with a very long stelia much exceeding the anther apex but can be easily distinguished by the color of the flowers (yellow vs. white in *S. liliastrum* and its allies) and rounded apex of stelia (vs. acute in *S. liliastrum* complex).

### 3.1.1.3. *Sobralia chrysoleuca* Rchb. f.

Xenia Orchid. 2: 179. 1873. Type: BOLIVIA. *Sine loc.* S.A. Pearce 777 (Holotype: W! 21594, UGDA-DLSz!—drawing).

Erect plant, height unknown, probably well above 100 cm tall. Leaves 30 cm long and 4 cm wide, oblong lanceolate to linear-lanceolate, acuminate, coriaceous, strongly plicate. Inflorescence 12 cm long, ca. 15-flowered, rachis erect, nearly straight to somewhat flexuose. Floral bracts 25–30 mm long, triangular-lanceolate, acuminate. Ovary 30 mm long. Flowers white or light yellow with distinct, deep yellow or orange dot on the apical part of lip. Dorsal sepal 68 mm long, 18 mm wide, lanceolate, acute. Lateral sepals 60 mm long, 15 mm wide, oblong-lanceolate, inconspicuously oblique, acute. Petals 57 mm long, 25 mm wide, widely oblong or elliptic, somewhat oblique, acute. Lip 60 mm long, 45 mm wide, oblong, constricted below the middle and inconspicuously bilobed at the apex, margins in apical part irregularly crenate and crispate, disk with nine keels running along the central veins from base almost to the apex, base papillate. Gynostemium 36 mm long, slender but with large and wide, massive, wing-like, triangular, oblique, acute apical stelia, which distinctly exceeding the anther apex (Figure 3).

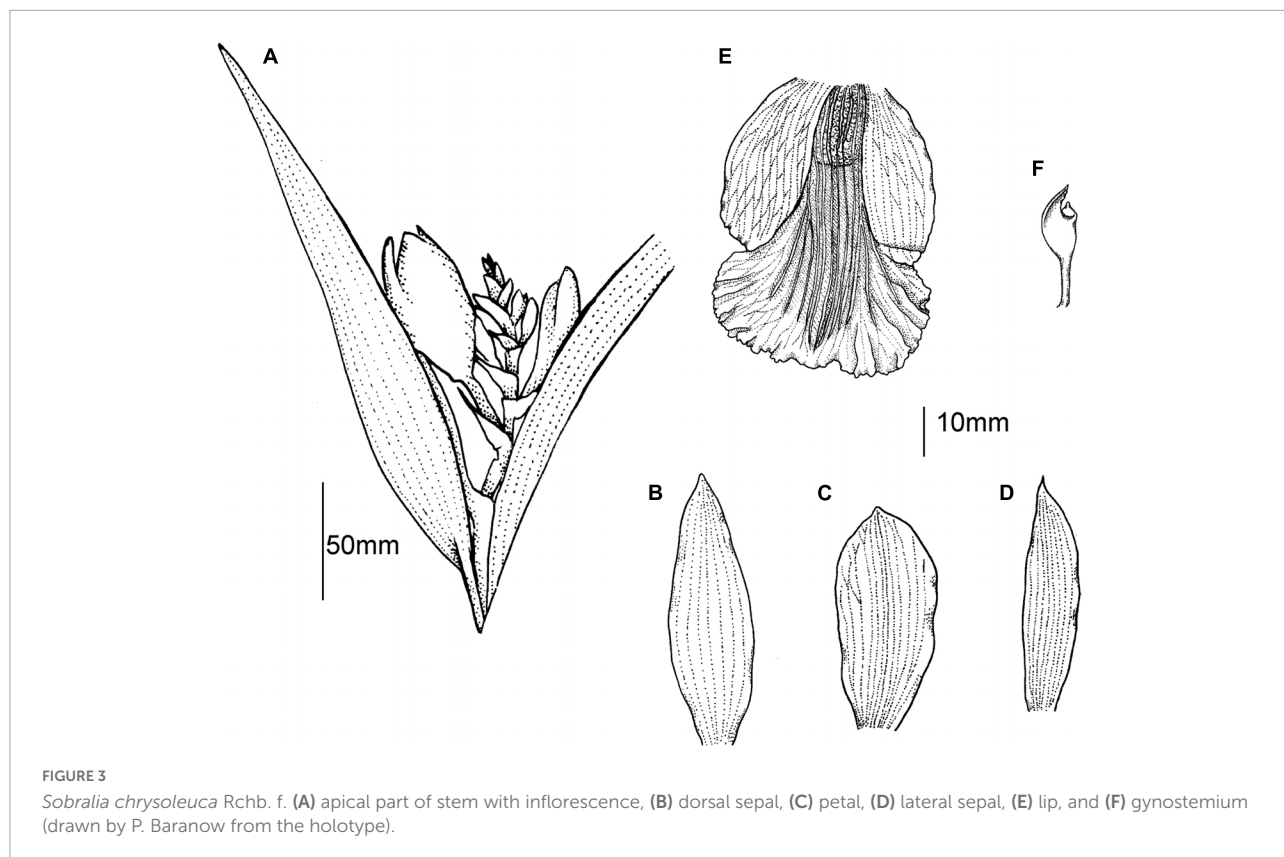
Ecology: Terrestrial.

Distribution. Bolivia.

Representative specimens—BOLIVIA. *Sine loc.* S.A. Pearce 777 (W!, UGDA-DLSz!—drawing).

Unique characters of this species are lip constricted near the middle, not found anywhere in the section *Racemosae*, and massive, horn-like, falcate stelia.

According to the note on the herbarium label of the type specimen, the flowers of the species may be white and yellow



colored. It may explain why the author compared the taxon with *Sobralia aurantiaca* (a synonym of *S. infundibuligera* with a compact inflorescence, hidden between the bracts, not similar to those of the section *Racemosae* representatives)—the taxa are similar in order to the flower color.

#### 3.1.1.4. *Sobralia liliastrum* Lindl.

Gen. Sp. Orchid. Pl.: 177. 1833. Type (designated by Baranow and Szlachetko, 2016: 339): Brazil. Bahia. P. Salzmann s.n. (Lectotype: K! 000293880—plant on the right side of herbarium sheet; Isolectotypes: K!, MO!, W-R!, NY!—photograph, UGDA-DLSz!—drawing). ≡ *Cattleya liliastrum* (Lindl.) Beer, Prakt. Stud. Orchid.: 212. 1854.—Garay and Dunsterville. Venezuelan Orchids Illustrated 322. 1959.—Baranow and Szlachetko, Pl Syst Evol. 302: 338. 2016.—Szlachetko et al. Materials to the Orchid Flora of Colombia 3: 250. 2020.

= *Sobralia liliastrum* var. *alba* Lindl., Fol. Orchid. 5 (Sobralia): 4. 1854. Type: not designated

= *Sobralia liliastrum* var. *rosea* Lindl., Fol. Orchid. 5 (Sobralia): 4. 1854. Type: not designated.

= *Sobralia liliastrum* f. *maior* Hoehne, Relat. Commiss. Linhas Telegr. Estratég. Matto Grosso Amazonas 5, Bot. 4: 23, pl. 74. 1912; Type: not designated.

Plants up to 300 cm tall, caespitose, erect, terete, the base with the remains of sheaths, the apex leafy, perfectly smooth,

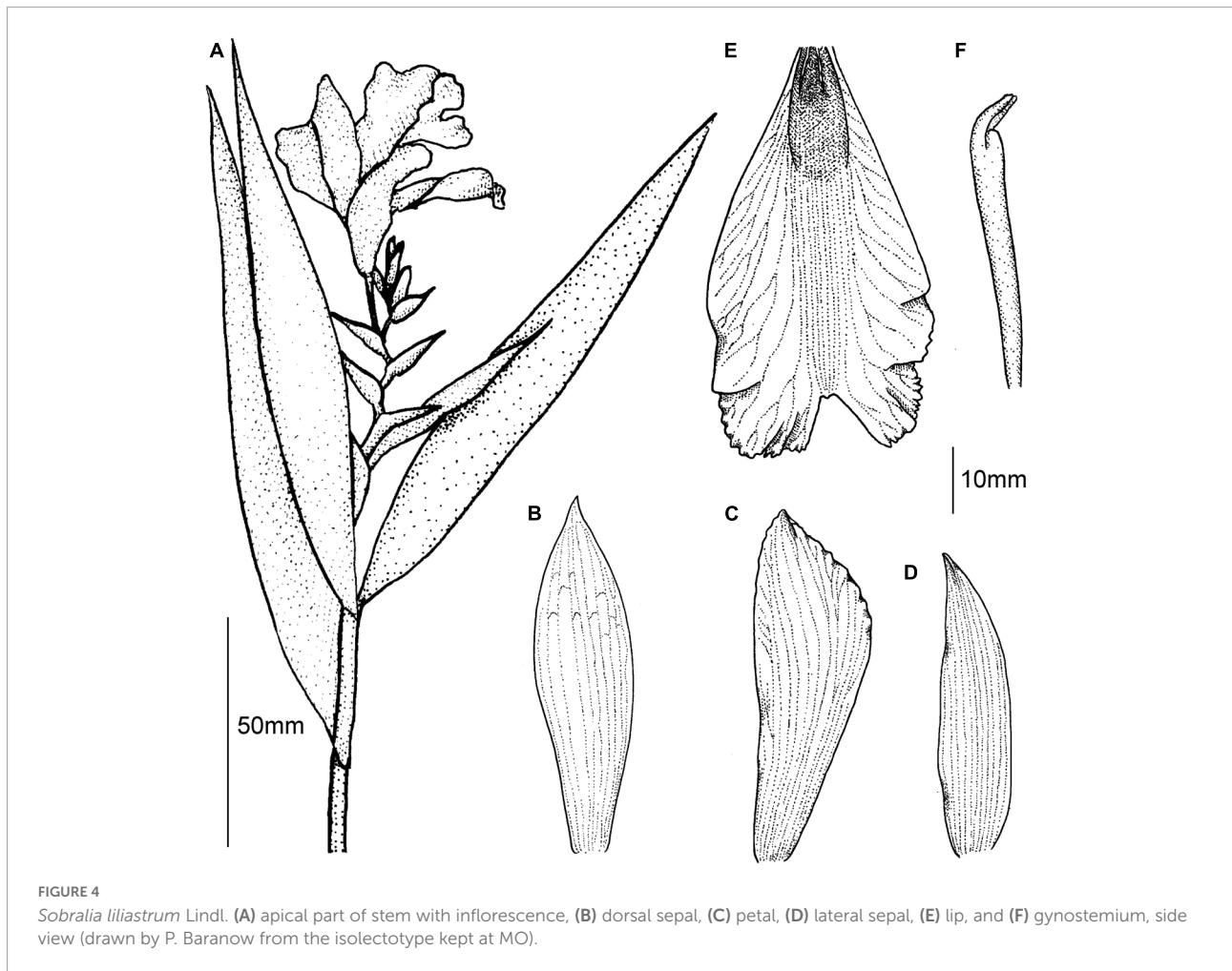
light green. Leaves up to 22 cm long and 4 cm wide, lanceolate to narrowly lanceolate, long acuminate, prominently veined on the underside, plicate. Inflorescence terminal, elongate, racemose, fractiflex, laxly few-flowered. Flowers produced in succession, large, white, lip with yellow throat. Dorsal sepal 58–70 mm long, 11.5–15 mm wide, oblong oblanceolate, acuminate, somewhat fleshy, and thick. Lateral sepals 58–70 mm long, 11.5–15 mm wide, oblong oblanceolate, acuminate, subfalcate, somewhat fleshy and thick, lightly carinate dorsally. Petals 55–70 mm long, 16–21 mm wide, oblong elliptic, subobtuse to subacute, slightly falcate, thin, finely sulcate dorsally. Lip 60–62 mm long, 43–54 mm wide, suborbicular-subflabellate in general outline, widest above the middle, obscurely 3-lobed, truncate at the apex, the apical margin erose, soft, thin, more or less undulate, sometimes with obscurely keeled lateral veins, often papillate at the base. Gynostemium 48 mm long with apical lanceolate-subfalcate, acute stielidia much exceeding the anther apex.

Ecology: Terrestrial along lowland rivers, in savannas, and on steep embankments with subxerophytic plants. Flowering throughout the year (Figure 4).

Distribution: Venezuela, Guyana, Suriname, French Guiana, Brazil. Alt. up to 2255 m.

Conservation status: EOO—LC, AOO—EN.

Representative specimens (Supplementary Map 3)—Colombia. Amazonas. Araracuara. Sabana de la Angostura. Alt. 400 m. 21 December 1951. H. Garcia Barriga and R.E. Schultes



14143 (COL!); Río Caquetá. La Pedrera. Cerro de Cupati. Alt. 240–580 m. 30 September 1952. *H. Garcia Barriga* 14529 (COL!); Corregimiento La Pedrera, comunidad Bocas del Pira, sabana “Vasewai,” margen derecha del Río Apaporis, approx. 10 min en bote de la comunidad Bocas del Pira Río arriba, resguardo Yaigoje-Apaporis.  $0^{\circ}27'05''S$ ,  $70^{\circ}14'40''W$ . Alt. 240 m. 31 March 2009. *J. Betancur*, *D. Cardenas*, *D. Tanimuca*, and *E. Tanimulka* 13995 (COL!); Araracuara. Río Caquetá. 1 April 1976. *C. Sastre and H. Reichel* D. 5182 (COL!). Caquetá. Sierra de Chiribiqueta, Campamento Sur. Al. SW del Campamento, entre este y los primeros de la meseta.  $0^{\circ}55'N$ ,  $72^{\circ}45'W$ . Alt. 350–400 m. 7 July 1990. *P. Franco*, *J. Estrada*, *J. Fuertes* and *P. Palacios* 3237 (COL!, US!); Sierra de Chiribiquete. Mesa encima de la Cueva de las Pinturas,  $1^{\circ}05'N$ ,  $72^{\circ}40'W$ . Alt. 740–760 m. 21 August 1992. *P. Palacios* 2417 and *P. Franco*, *O. Rangel*, and *J. Betancur* (COL!–sterile); Sierra de Chiribiquete. Campamento Norte. Prox. del campamento.  $1^{\circ}7'N$ ,  $72^{\circ}50'W$ . Matorrales de sabana. 6 December 1990. *J.M. Cardiel*, *S. Castroviejo*, *G. Galeano* and *F. Gonzalez* 1010 (COL!); Sierra de Chiribiquete. En la *via* del Campamento a la Cueva de Pinturas.  $1^{\circ}05'N$ ,  $72^{\circ}40'W$ . Alt. 600 m. 17 August 1992. *P. Franco* 3718 and *O.*

*Rangel*, *P. Palacios*, and *J. Betancur* (COL!). Chocó. Alrededores de Coredo. 22 October 1946. *R. Romero Castañeda* 519 (COL!). Guainia. Poblacion el Remanes. Cerros de Mavicure y Pajarito a orillas del Río Inírida, 40 km de Puerto Inírida. 1978. *F. Sarmiento* 1084 (COL!); Correg. de San Felipe, Río Negro. Alrededores de la pista de aterrizaje. Alt. 100 m. 28 September 1977. *M. Pabon E.*, *J. Espina*, and *C. Dominguez* 228 (COL!); Caserio de Sta Rita, Río Guainia. Alt. 100 m. 15 October 1977. *M. Pabon E.*, *J. Espina*, and *C. Dominguez* 337 (COL!). Guaviare. Mesa La Lindosa, Cerrito a 15–20 km al S de San José del Guaviare. Alt. 400–600 m. 13–15 December 1950. *J.M. Idrobo* and *R.E. Schultes* 656 (COL!); Mpio. San José del Guaviare. Carretera de San José a Puerto Arturo, km 3, alrededores de la finca Santa Gertrudis,  $2^{\circ}28'20''N$ ,  $72^{\circ}41'30''W$ , Alt. 280 m. 21 January 1996. *R. Lopez* and *O.J. Rodriguez* 976 (COAH!, MO!); San José del Guaviare. Antigua represa. Alt. 200–250 m. 27 December 1993. *C. Sastre* and *J.P. Robin* 9194 (COL!); San José del Guaviare. Ciudad Perdida o Ciudad de Piedra. Alt. 250–300 m. 28 December 1993. *C. Sastre* and *J.P. Robin* 9218 (COL!). Meta. Serranía de La Macarena, margen izquierda del Río Guayabero, a 10 km abajo de Caño Lozada. Alt. 500 m. 16



January 1959. *P. Pinto E., H. Bischler, and R. Jaramillo M.* 206 (COL!, P!); Reserva Nacional de la Macarena, southernmost slope of Macarena Mts, immediate to the Río Guayabero. Alt. 250–300 m. 25 January 1968. *J. Thomas, J. Hernandez C., and P. Pinto E.* 1589 (P!). Vaupés. Río Macu-Parana, tributary of the Río Papuri. 8 August 1943. *P.H. Allen* 3047 (COL!); Yapoboda, 10 December 1943. *P.H. Allen* 3224 (MO!); Bacuraba Cachoeira (the first major cataract on the Vaupés East of Mitú). Alt. 200 m. 4 November 1944. *P.H. Allen* 3311 (MO!); Env. of Río Mitú, dry arid slopes of the Cerro of Mitú, El Cerro de Guacamaya, 30 October 1976. *E.W. Davis* 201 (COL!, U!); Río Pira Paraná (tributary of Río Apaporis, between 0°15'S, 70°30'W and 0°25'N, 70°30'W, 6 September 1952. *R.E. Schultes and I. Cabrera* 17232 (U!, US!, UGDA-DLSz!–copy); Yurupari, orilla Vaupés, 350 km arriba de Mitú. Alt. 220 m. 24 September 1939. *J. Cuatrecasas* 6961 (COL!); Río Vaupés, cachivera de Yurupari. Alt. 400 m. 24–26 October 1952. *H. Garcia Barriga* 14935 (COL!); Río Vaupés, Mitú and vicinity. September–October 1966. *R. Schultes* 24344 (COL!); Mitú and vicinity. Río Parana-Pichuna, savanna at major rapids, 6 September 1976. *J.L. Zarucchi* 1957a (COL!); Desembocadura del Ariari con el Río Guayabero. Cabana del Incora “Bocas del Ariari,” 21 February 1969. *P. Pinto E. and C. Sastre* 942 (COL!, P!); Vicinity of Mitú. Trail to Cerro Mitú. Caatinga forest. Alt. 200–250 m. 2 October 1991. *J. Kress, J. Betancur, C. Roesel, and R. Echeverry* 91–3336 (COL!); Río Vaupés, Cerro de Circasia, entre el Río Ti y Namu. Alt. 380–450 m. 30 October 1952. *H. Garcia Barriga* 15028 (COL!); Río Kubiyu, Cerro de Canenda. Alt. 380–680 m. 2–4 November 1952. *H. Garcia Barriga* 15074 (COL!); Caño Cubiyú. Comunidad Indígena La Sabana. 1°15'N, 70°51'W. Alt. 200 m. 26 April 1993. *S. Mandrinan, G. Ngan, and J. Page* 1175 (COL!, NY!); Riberas del Río Inirida (69°45'W), sitio Raudal Alto o Mariapiri, margen derecha. Alt. 180 m. 3 February 1953. *A. Fernandez* 2121 (COL!); Cerro Mitú. Alt. 400–450 m. 4 September 1959. *B. Maguire, C.K. Maguire, and A. Fernandez* 44097 (COL!); Río Kuduyari. Yapoboda, sandstone savanna near headwaters. 5 October 1951. *R. E. Schultes and I. Cabrera* 14243 (COL!); The same loc. 18 November 1952. *R.E. Schultes and I. Cabrera* 18497 (COL!); Serrania de Taraira. 10 km al NW del raudal de la Libertad. 0°53', 69°45'W. Bosque de caatinga. Alrededores del campamento. Alt. 250 m. 31 August 1993. *J. Rodriguez* 183 (COL!); Serrania de Taraira. 10 km al NE del raudal de la Libertad. 0°58'S, 69°45'W. Alt. 250 m. 2 August 1993. *R. Cortes and J. Rodriguez* 764 (COL!); Cerro de Chiribiquete, a un lado del Río Macaya, terreno muy pedregoso. 17 January 1944. *G. Guitierrez and R.E. Schultes* 683 (NY!). Vichada. Parque Nacional Natural, “El Tupparo,” on granitic outcrops between the mouth of the Río Tupparo to Raudal Maipures along the Río Orinoco, 5°12'N, 67°50'W. Alt. 90–130 m. 1 March 1985. *J.L. Zarucchi and C.E. Barbosa* 3521 (MO!). **Venezuela.** Amazonas. Río Sipapo entre Isla Lencho y Boca del Cuao. Mpio Autana, 4°54'–5°3'N, 67°34'–67°46'W. 28 January 1997. *A. Castillo* 4474 (MO!); Dpto Atabapo, Sabana

Graminosa arbustiva en altiplanicie (Cerro Paru), 4°34'N, 65°31'W. Alt. 590 m. February 1992. *A. Chaviel* 205 (MO!); Dpto Atures, Serrania de la Coromoto, Sector “El Tobagin,” a 37 km al S de Pto. Ayacucho. 5°24'N, 67°35'N. Alt. 80–200 m. 19 January 1989. *N. Cuello* 344 (MO!); Dpto Atabapo, Zona de Lomerio con Sabana Arbustiva y Altiplanicie con Herbazal Subarbustivo Tepuyano. 3°33'N, 64°29'W. Alt. 1400 m. November 1991. *Y. Fernandez and M. Yanez* 856 (MO!); Por debajo del Salto Remo, 110–71 km por arriba del Guayapo. 4°34'N, 67°18'W. Alt. 120 m. May 1989. *E. Foldats and J. Velazco* 9462 (MO!); Dpto Atabapo, Alto Río Orinoco, 15 km al W de la Esmeralda, Cerro Baraco. 3°8'N, 65°41'W. Alt. 300 m. 1 March 1990. *G.G. Aymard and L. Delgado* 8283 (MO!); 9 km northeast of San Carlos de Río Negro. 1°57'N, 67°3'W. Alt. 120 m. 25 November 1977. *R.L. Liesner* 3582 (MO!); 10 km NE of San Carlos de Río Negro. 1°54'N, 67°00'W. Alt. 120 m. 28 January 1980. *R.L. Liesner* 8830 (MO!); 2 km east of San Carlos de Río Negro. 1°55'N, 67°5'W. Alt. 120 m. 13 November 1977. *R.L. Liesner* 3421 (MO!); 10 km NE of San Carlos de Río Negro, (ca. 20 km S of confluence of Río Negro and Brazo Casiquiare), 1°56'N, 67°03'W. Alt. 120 m. 24 April 1979. *R.L. Liesner* 6947 (MO!); Atures, Río Coro-Coro, W of Serrania de Yataje, 6–8 km N of settlement of Yutaje, 5°41'00"N, 66°07'30"W. Alt. 320 m. 23 February 1987. *R.L. Liesner and B. Holst* 21326 (MO!); Dpto Atures, 1 to 2 km E of Río Coro-Coro, W of Serrania de Yataje, 8 km N of settlement of Yutaje, 5°41'30"N, 66°07'30"W. Alt. 600–650 m. 25 February 1987. *R.L. Liesner and B. Holst* 21383 (MO!); “El Tobogan de la Selva,” 35 km south of Puerto Ayacucho. Alt. 85 m. 21 February 1979. *T. Plowman* 7702 (F!); Caño Cupaven, Río Orinoco at mouth of Río Atabapo. Alt. 150 m. 11 May 1954. *J. Silverio Level* 82 (F!, MO!); Camino San Carlos de Río Negro-Solano, 10–22 February 1989. *B. Stergios, K. Kubitzki, G. Aymard, and E. Melguiero* 13396 (MO!, US!); Río Negro, Piedra Ignea, Cerro Aratityope, 2°10'N, 65°34'W, approx. 70 km al SSW de Ocamo, con richuelos afluente al Río Manipitare. Alt. 990–1670 m. 24–28 February 1984. *J.A. Steyermark, P. Berry, and F. Delascio* 130051 (U!); Río Negro, piedra ignea, Cerro Aratitiope, approx. 70 km al SWW de Ocamo, 2°10'N, 65°34'W. Alt. 990–1670 m. 24–28 February 1984. *J.A. Steyermark, P. Berry, and F. Delascio* 130051 (MO!); Dept. Atabapo, Cerro Duida. 3°40'N, 65°45'W. Alt. 1400 m. 10 February 1982. *J.A. Steyermark, M. Guariglia, N. Holmgren, J.L. Luteyn, and S. Mori* 126433 (MO!, K!); Atabapo, sabanas y bisques ubicados al pie nor-oriental y oriental del Cerro Cucurito, ribera SE del medio Caño Yagua. 3°36'N, 66°34'W. Alt. 120 m. 8 December 1978. *O. Huber and S.S. Tillett* 2941 (K!, U!); Bolivar. Roscio, 3 km S of El Pauji. 4°30'N, 61°35'W. Summit of mountain bordering N side of “El Abismo,” thick low rocky scrub. Alt. 1050 m. 19 October 1985. *B.K. Holst and R.L. Liesner* 2355 (MO!, U!); Río Negro, Slope of Cerro Aracamuni. Aracamuni. Quebrade Camp, in area of rapids flowing over laja (stone), 1°24'N 65°38'W. Alt. 600 m. 20 October 1987. *R.L. Liesner and F. Delascio* 22240 (MO!, U!);

Transecta entre conucos al. E de Santa Rosa de Ucata, passando por bosque humedo, hast arbustal de arena blanca al. E de este pobiado, 4°24'N, 67°46'W. Alt. 80–85 m. 23 October 1989. G.A. Romero and E. Melguiero 2235 (K!, MO!); Cerro granitico al. E del Raudal Gavilan, caminando ca 2 horas desde la parcel. 5°37'N, 67°22'W. Alt. 100 m. 1 February 1991. G.A. Romero, E. Melguiero, and C. Gomez 2291 (MO!); Laja granitica al. E del Raudal Gavilancito, vegetation en pequenas depresiones y grietas en la piedra, 5°37'N, 67°22'W. Alt. 80–100 m. 9 February 1992. G.A. Romero, E. Melguiero, and C. Gomez 2365 (MO!); Esmeralda Ridge, between Esmeralda and base of Cerro Duida. Alt. 150 m. 21 August 1944. J.A. Steyermark 57744 (F!); Atabapo, Boca de Mesaque. 3°04'N, 67°06'W. Alt. 80 m. November 1989. J. Velasco 953 (MO!). Bolivar. Along highway between Santa Elena and Icabaru 103 km SW of Santa Elena, 16 km NE of Icabaru, near bridge. 4°20'N, 62°45'W. Alt. 750 m. 24 July 1982. T.B. Croat 54045 (MO!); By main road, ca 11 kms E of Kavanayén. Alt. 1200 m. 26 July 1983. R. Kral Wit and A.C. Gonzalez 70462 (MO!); Gran Sabana, ca 15 km WSW of Karaurin Tepui, Quebrada Tanuan. 5°19'N, 61°04'W. Alt. 950 m. 1 May 1988. R.L. Liesner 24119 (MO!); 17 km E of El Pauji by road and 64 km W of Santa Elena by road, 4 km N of highway. Río Las Ahallas, 4°30'N, 61°30'W. Alt. 850 m. 29 October 1985. R.L. Liesner 19122 (MO!); 3 km S of El Pauji, Morichal, 4°30'N, 61°35'W. Alt. 900 m. 19 October 1985. R.L. Liesner and B.K. Holst 18811 (MO!); 17 km E of El Pauji by road and 64 km W of Santa Elena by road, 4 km N of highway. Río Las Ahallas, 4°30'N, 61°30'W. Alt. 850 m. 1 November 1985. R.L. Liesner 19311 (MO!); Sabana de Arekuna, E margin of lower Río Caroni. 6°31'N, 62°53'W. Alt. 520 m. 29 August 1983. G.T. Prance and O. Huber 28316 (MO!); N de Raudalito, Río Sipapo. Alt. 120 m. 10 October 1988. G.A. Romero and F. Guanchez 1631 (MO!); Km 146 al. sur de El Dorado. Alt. 1280 m. 15–18 November 1978. J.A. Steyermark, J.L. Luteyn and M.L. Lebron-Luteyn 117553 (MO!); Gran Sabana, between Mission of Santa Teresita de Kavanayén northwest to Río Karuai, on large mes. Alt. 1220 m. 26 October 1944. J.A. Steyermark 59387 (F!); Sororopan tepui, crest of cerro between east and west end. Alt. 2255 m. 14 November 1944. J.A. Steyermark 60117 (F!).

**Guyana.** Upper Mazurani River Region. Karowtipu Mountain. 5°45'N 60°35'W. Alt. 1000 m. 21 April 1987. B.M. Boom and D. Gopaul 7567 (MO!); Holitipu, trail betw. camp and airstrip and surrounding area. 05°59'N 61°03'W. Alt. 1100 m. Tepui savanna and gallery forest. 7 February 1996. D.H. Clarke 1037 (NY!, U!); Paruima, 5 km N, Auratoi Savanna. 05°51'N 61°05'W. Alt. 760 m. 21 July 1997. D.H. Clarke et al. 6137 (U!); Cuyuni-Mazaruni Region. Pakaraima Mts., 12 m waterfall, large Partang River tributary, 12.7 km NE Imbaimadai. Scrub forest merging with riparian gallery forest. 5°48'N 60°14'W. Alt. 700 m, 25 May 1992. B. Hoffman 1868 and C.L. Kelloff, G. Gharbarran, and S. Sprague (NY!, US!); Kaieteur savanna. 1936. G. Hollister s.n. (NY!); Pakaraima Mts. Mt. Latipu, top (Mazaruni R.), 5°57'N 60°38'W. Alt. 900 m. 10 November

1979. P.J.M. Maas and L.Y.T. Westra 4208 (U!); Pakaraima Mts., Mt. Aynatoi (sandstone). 5°55'N 61°W. Dry sandstone rocks near falls. 16 October 1981. P.J.M. Maas et al. 5781 (COL!, MO!, U!); Kaieteur Plateau, 12 May 1944. B. Maguire and D.B. Fanshawe 23419 (NY!, U!); Fleuve Oyopack, Savane roche, Roche Canari zozo, rive gauche. 8 July 1969, R.A.A. Oldeman 332 (U!); **French Guiana.** Region de la Haute Crique Armantabo, bas Oyapock, 21 February 1981. J.J. de Granville 165 (U!). **Brazil.** Amazonas. Rio Tuari (afuente de Rio Negro), Lago Uirauacu (=Passaro Grande em Lingua Geral), 0°20'N, 67°20'W. 13 November 1987. M.L. Kawasaki 144 (U!, US!); Rio Uapes, Panure, catinga. 15 November 1947. J.M. Pires 1026 (COL!, US!). Bahia. Santa Cruz Cabralia, Mata costeira. 5 November 1966. R.P. Balem and R.S. Pinheiro 2841 (F!); Marau, resting. 18 January 1967. R.P. Balem and R.S. Pinheiro 3180 (F!); Una-Ilheus. 39°02'W, 15°07'S, Alt. 70 m. 25 December 1975. P. Bamps 5053 (U!); Ba. Lancois. Rio Mueugezinho, Proximo a BR-242. Em direcao a Serra Brajao. Alt. 1000 m. 20 December 1984. A. Furlan et al. 37123 (K!). Km 10, Ponta-Olivacea road, Mpio Ilheus, 14°50'S, 39°2'W, Alt. 30–50 m. 10 February 1985. A. Gentry and E. Zardini 50008 (MO!); Coastal Zone, 16 km S of Cumuruxatiba, 39°15'W, 17°13'S. Alt. 0–50 m. 18 January 1977. R.M. Harley 18095 (K!, U!); Mato Grosso, margem direita de R. Juruena, morrinio da cochoeira de S. Joao da Barra. 10 June 1977. N.A. Rosa and M.R. Santos 2081 (MO!, U!); Mun. Lencois, BR-242, 3–8 km W del desvio a Lencois. 12°28'S, 41°22'W, Alt. 880 m. 26 November 1992. R. Mello-Silva and J. Vicente 5800 (K!, F!, MO!); Mun. Itabuna, 10 km S de Pontal (Ilheus), camino a Olivenca, local de extraccion de arena, 14°54'S, 39°02'W. Alt. 50 m. 4 December 1992. R. Mello-Silva and J. Vicente 5583 (K!); Mpio de Castro Alves, Serra da Jiboia, 12°51'11"S, 39°29'19"W. 8 July 1992. L.P. de Quieroz, S. Mayo, M. Nadruz, T.S.N. Sena, and M.L.S. Guedes 2946 (K!); Mun. de Una, Estrada Ilheus-Una, ±30 km au Sul de Olivenca, 15°12'S, 39°03'W. Alt. 40 m. 2 December 1981. G.P. Lewis and A.M. de Carvalho 722 (K!); Moun. De Ilheus, Estrada Olivenca, Villa Brasil, a 7 km de Olivenca. Restinga. 13 January 1981. A.M. Carvalho and J. Gatti 485 (K!); BA-Estrada Macuge-Andarai. 17 December 1984. A.M. Giulietti et al. 36893 (K!); Mun. Lencois, Trilha Lencois-Capao, 12°33'34"S, 41°24'66"W. Alt. 650 m. 28 January 1997. B. Stanard, S. Atkins, E. Saar, L. Passos, and M.L. Guedes 4581 (K!); Mun. Lencois, Morro da Chapadinha, Chapadinha, divisa com Brejoes, 12°27'00"S, 41°25'00"W. Alt. 750 m. 24 November 1994. E. Melo et al. 1328 (K!); Olivenca km 21 para a Faz. Ipiranga ao Norte. 10 October 1972. T.S. Santos 2456 (P!); Mun. Lencois, Chapadinha, Lencois, proximo ao Rio Mucugezinho, 12°27'44"S, 41°25'12"W. Alt. 810 m. 27 September 1994. G. Stam, A.M. Giulietti, and H.P. Bautista 922 (K!); Mun. Lencois, Serra da Chapadinha, 12°27'41"S, 41°25'16"W. Alt. 900 m. 05 January 1996. A.M. de Carvalho et al. 2178 (K!). Para: Maraba, Alro de Serra, arredores do N5. 12 May 1982. A. Mesquita, R.B. Gilberto, and L. Marinho 116 (F!, K!, MO!); Sete Varas airstrip on Rio Curua, 0°95'S, 54°92'W. 6

August 1981. *J.J. Strudwick, G.L. Sobel et al.* 4343 (K!); Maraba, Serra de Carajas. 12 May 1983. *N.L. Meneses s.n.* (K!); Mpio de Ameirim, reserva florestal da SEMA, 0-1°S, 52-53°W. 10 October 1987. *A.S. Tayares* 117553 (MO!). Rio de Janeiro. *sine loc.* *V. Soares* 435 (K!). Roraima. Estrada Manaus-Caracarai km 130, campina das Pedras. 25 May 1974. *W. Rodrigues, A. Loureiro, and D. Coelho* 9308 (MO!). **BOLIVIA.** Santa Cruz. Vallegrande Prov., Corosito, 2 km al. S de los Sitanos. 18°52'5''S, 64°57'0. Alt. 1400 m. 2 September 1989. *I.G. Vargas* 286 (F!, MO!).

Along with *Sobralia elisabethae* and *S. granitica*, it creates a group of unique species characterized by narrow leaves and white flowers with various ornamentation on the lip disk.

*S. liliastrum* is similar to *S. granitica*, but has larger flowers (58–62 mm long flower segments vs. 40–45 mm in *S. granitica*), the color of the lip keels (orange vs. light yellow in *S. granitica*), the raised keels (only the central keel notably raised in *S. liliastrum* vs. with two, subparallel keels at base, the disk with 9 erose-denticulate thickened keels in *S. granitica*), and the presence of pseudopollen on the *S. liliastrum* lip. The flower segments of *S. elisabethae* and *S. liliastrum* are similar in size, but they differ in lip details. In the former species, the lip is adorned with thickenings along veins running from a pair of keel-like, crenulate basal calli nearly to the apex, sometimes the thickenings are not visible in the center of the lip but distinct in its apical part anyway.

### 3.1.1.5. *Sobralia elisabethae* R.H. Schomb.

Verh. Vereins. Beförd. Gartenbaues Königl. Preuss. Staaten 15: 137. 1841. Type (designated by [Romero-González, 2003: 129](#)): Venezuela. Bolivar. Vicinity of Mount Roraima, 1836, *R.H. Schomburgk* 1059 (Lectotype: BM!, Isolectotypes: BM!, K!, P, W! 7463).—Baranow and Szlachetko. The taxonomic revision of the *Sobralia* Ruiz & Pay. (Orchidaceae) in the Guianas (Guyana, Suriname, French Guiana). *Pl Syst Evol.* 302: 338. 2016.—Szlachetko et al. Materials to the Orchid Flora of Colombia 3: 253. 2020.

Plants 50–90 cm high, caespitose, erect, slender. Leaves numerous, up to 26 cm long and 2.5 cm wide, narrowly lanceolate, long-acuminate, suberect. Inflorescence 6–10 cm long, terminal, laxly 5–8-flowered, rachis fractiflex. Flowers opening successively, white, with yellow lip throat and keels. Floral bracts 8–40 mm long, ovate-lanceolate. Pedicel and ovary 34 mm long, slender. Dorsal sepal 50–60 mm long, 10–13 mm wide, narrowly lanceolate, acute to acuminate. Lateral sepals 55–65 mm long, 14–16 mm wide, lanceolate, subfalcate, acute. Petals 50–60 mm long, 10–13 mm wide, narrowly lanceolate, acute, subfalcate. Lip 60 mm long, 35–40 mm wide, oblong ovate in general outline, more or less notched at the apex, crenulate and undulate along margins, especially in the apical half, with thickenings along veins running from a pair of keel-like, crenulate basal calli nearly to the apex, sometimes the thickenings not visible in the center of lip but distinct in its

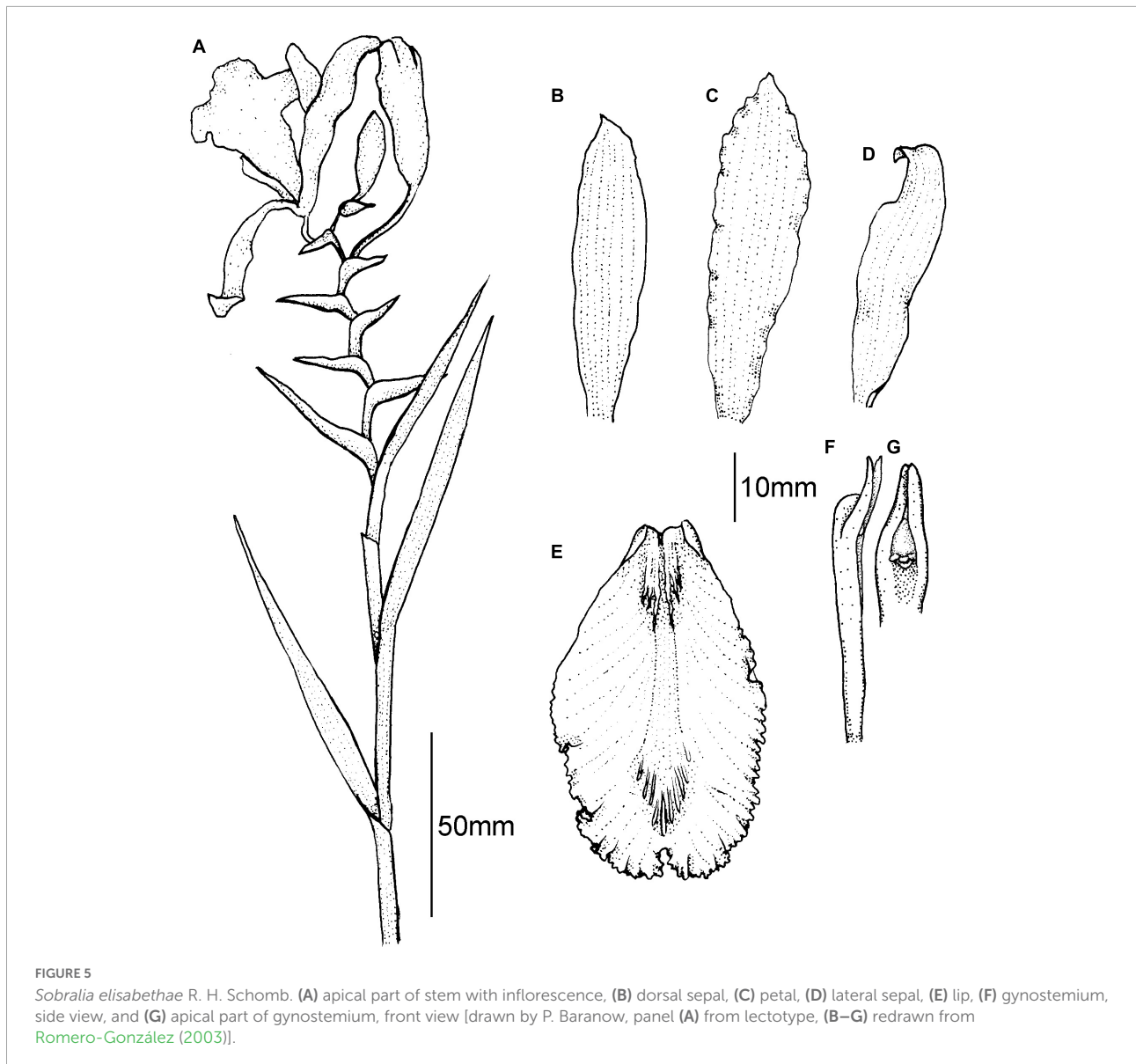
apical part anyway. Gynostemium ca 30–40 mm long, apical wings 10–15 mm long, distinctly exceeding the column apex, linear, slightly falcate, acute ([Figure 5](#)).

Ecology: Terrestrial or lithophytic in savannas, among rocks, xerophytic forests, and disturbed forests next to the roads. Flowering throughout the year.

Distribution: Venezuela, Ecuador, Colombia, Brazil, French Guiana, Guyana, Peru. Alt. up to 900 m.

Conservation status: EOO—LC, AOO—EN.

Representative specimens ([Supplementary Map 4](#))—**Colombia.** Amazonas. Corregimiento departamental de la Pedrera. Margen izquierda del Río Caquetá, Cerro Yupati. 1°17'49''S, 69°37'03''W. Alt. 200–400 m. 6 August 1997. *D. Cardenas, C. Marin, R. Lopez, and N. Rodriguez* 8528 and 8563 (COAH!); Santa Isabel, sitio sabanas de Solarte. 1°05'S, 71°10'W. 4–6 December 1996. *M.V. Arbelaez, U. Matapi, and N. Matapi* 681 (COAH!); Araracuara. 3 March 1986. *P. Palacios and B. Plazas* 1164 (COAH!). Caquetá. Araracuara. Orilla del Río Caquetá, balcon del Diablo. 0°36'S 72°24'W. 19 November 1993. *D. Cardenas, G. Gangi, and J. Manaidego* 4135 (COAH!); Parque Nacional Natural Chiribiquete. Río Cunare, Raudal del Tubo. 0°26'N 72°30.5'W. 3 February 1992. *N. Hernandez and N.C. Penuela* CHI69 (COAH!); Solano, margen izquierda del Río Caquetá, Sitio Paujil (Area del Caño Paujil), 10 km al. NO de Araracuara. 0°45'–0°48'S, 72°20'–72°25'W. Alt. 100–350 m. 10 November 1992. *V. Arbelaez and V. Hernandez* 326 (COAH!); Cabaceras del Río Mesay. 1–6 Mar. 1980. *M.C. Pabón* 971 (COAH!). Guainía. Trocha Nabuquen. 2°51'127''N, 65°38'339''W. Alt. 500 m. 25 February 1995. *M.P. Etter, A. Munoz, L. Baptiste, and A. Repizzo* 508 (COAH!); Inrida. Resguardo indigena Almidon-Ceiba, a 4 km NE de la comunidad La Ceiba, camino a Cn Vitina. En bosquico xerofitico transicional entre el bosque de altura y la sabana, sobre superfi. 3°39'20.3''N, 67°23'40.3''W. Alt. 80–90 m. 20 October 1998. *E. Cordillo-R. et al.* 372 (MO!). Guaviare. Mpio. San José del Guaviare. Serrania La Lindosa. Bosque intervenido a orillas de la carretera. Alt. 220–250 m. 5 March 1994. *D. Cardenas and G. Trujillo* 4348 (COAH!); Mpio. San José del Guaviare. Carretera de San José a Puerto Arturo, km 3, alrededores de la finca Santa Gertrudis, zona de afloramientos rocosos, 02°28'20''N, 72°41'30''W. Alt. 280 m. 21 January 1996. *R. Lopez, D. Giraldo C., and H. Salgado* 952 (COAH!); Mpio. San José del Guaviare. En inmediaciones de Ciudad de Piedra, Serrania La Lindosa, carretera San José-El Caprichio, 02°28'28''N, 72°41'48''W. Alt. 290 m. 19 November 1995. *R. Lopez, D. Giraldo C., and H. Salgado* 829 (COAH!). Meta. Mpio. La Macarena. Serrania de La Macarena, Caño Canoas, cercanias a los chorros, formaciones de roca desnuda del Escudo Guayanes. 2°28'–29'N, 70°44'W. Alt. 255–280 m. 31 December 2005. *J. Betancur, J. Aguirre, J. Contreras, and M. Rodriguez* 11993 (COL!). Vaupés. Mitú & vicinity, along Río Vaupés between Río Ti and Rapids of Mandi, 23 September 1976. *J.L. Zarucchi* 2115 (K!); Mpio Mitú. Camino entre la comunidad



Mitú Cachivera y el cerro Guacamaya, 1°11'40"N, 70°14'24"W. Alt. 180–370 m. 24 September 2007. D. Cardenas, Z. Cordero, N. Salinas, and A. Zuluaga 21087 (COAH!); Mpio. Mitú. Comunidad de Monford, via Monford-Mitú km 4. Sabaneta varillal a catinga de 8–10 m de altura, 0°37'17"N, 69°44'56.4"W. Alt. 160–170 m. 30 September 2007. D. Cardenas, Z. Cordero, N. Salinas, and A. Zuluaga 21334 (COAH!); Mpio. Mitú. Sector compredito entre el cerro Guacamaya y Caño Sangre. 1°12'N, 70°14'W. Alt. 200–300 m. June 2008. N.R. Salinas and L.F. Jaramillo 718 (COAH!); Serranía de Taraira, 6 km al. N-W del raudal de la Libertad, Coord. 0°58'S, 69°45'W. Alt. 250 m. 27 July 1993. R. and J. Rodrigues 609 (COAH!); Mpio. Mitú. Cabeceras de Caño Cuduyari, comunidad de Wacuraba, margen derecha del cano. Camino que conduce de la comunidad a la sabana de Yapoboda. 1°22'23"N 70°54'30"W.

Alt. 200–400 m. 16 May 2006. D. Cardenas, R. Pena, and A. Rivera 18723 (COAH!); Corregimiento departamental de Yavarate, comunidad de Bogotá-Cachivera, camina a Acaricuara. 0°49'45.3"N, 70°03'50.6"W. N. Castano, N. Salinas, A. Zuluaga, and W. Estrada 2737 (COAH!). **Venezuela.** Amazonas. Atabapo, Cerro Huachamacari, E slope. 3°49'N, 65°42'W. Alt. 600–700 m. 3 November 1988. R.L. Liesner 25736 (U!); Santa Lucia, Pedra de Cucui. 28 October 1967. Farney et al. 1822 (K!); Base occidental del Cerro Yapacana, 3°38'N 66°52'W. Alt. 100 m. 10 December 1978. O. Huber and Tillett 3023 (K!); Rios Pacimoni–Yatua, Casiquiare, 26 September 1957. B. Maguire et al. 41583 (K!); Bolivar. Vicinity of Mount Roraima, 1836. R.H. Schomburgk 1059 (BM!, K!, Pl!, W-R!, W-R!–drawing); Atabapo. Falda del extremo norte del Cerro Duida. 3°40'N 65°45'W. Alt. 800–900 m. 6 February 1982.

J.A. Steyermark et al. 126106 (BM!, K). **Guyana.** Utshi R. trail to Santa Elena, Venezuela, 05°39'N 61°09'W. Alt. 980 m. 31 January 1996. D.H. Clarke 942 (NY!, U!); Cuyuni-Mazaruni Mts. Karowrieng River, 0.5–1 km SE Maipuri Falls, trail to rock drawings, 5°40'N, 60°13'W, Alt. 625–650 m, 15 October 1992. B. Hoffman 3021 with T. Henkel and H. Kennedy (NY!); 3 km SE of S end of Haiamatipu, above Kobadoi Savanna, 5°27'N 60°39'W, 549–610 m. 16 June 1991. T. McDowell et al. 4619 (NY!, U!). **French Guiana.** Cochoeira das Arraras, esatingas entre rio Vaupes e Arary. 3 November 1945. R. Lemos Froea 21310 (K!, US!); **Brazil.** Amapa. Rio Araguari, downriver from Porto Platon. 21 September 1961. J.M. Pires, Wm. Rodrigues, and G.C. Irvine 51146 (U!). Ad flumina Casiquari, Kasiva et Pacimoni. 1853–4. R. Spruce 3014 (BM!). Amazonas: Amza camp N5, 6°4'S, 50°08'W, Alt. 700–750 m. 12 May 1982. C.R. Sperling, R.S. Secco, M. Condon, A.L. Mesquita, B.G.S. Ribeiro, and L.R. Marinho 5609 (K!, MO!); Maraba, Alto de Serra, arredores do N5, solo de canga (ferro). 12 May 1982. R. S. Secco et al. 116 (MO!); Marraba, Serra dos Canajas. 2 April 1977. M.G. Silva and R. Bahia 2991 (K!); Rio Negro, near mouth of Rio Xie, Vista Alegre, opposite Sao Marcelino, 0°55'N, 67°13'W. 21 October 1987. P.J.M. Maas, D.W. Stevenson, C. Farney, J.F. Ramos, and R.P. Lima 6832 (U!).

The species is very similar to *Sobralia granitica* in flower structure. They can be distinguished by the size of the flowers—flowers of the latter species are smaller (40–45 vs. 50–65 mm long in *S. elisabethae*). Additional differences can be observed in flower color—*S. elisabethae* has a white lip with a yellow throat and reddish orange keels, while *S. granitica* has a hyaline white lip with pale yellow, elevated keels.

### 3.1.1.6. *Sobralia granitica* G.A. Romero & Carnevali

Harvard Pap. Bot. 5 (1): 184. 2000. Type: Venezuela. Amazonas. Municipio Atabapo, Caño Ucata, Cerro Lombriz, 9 December 1994, G.A. Romero and S. Llamozas 3016 (Holotype: VEN; Isotypes: AMES!, K!, SEL).—Szlachetko et al. Materials to the Orchid Flora of Colombia 3: 254. 2020.

Stems caespitose, cane-like, up to 130 cm high, terete, erect, basal internodes up to 15 cm long, leafless, apical internodes up to 2 cm long, leafy. Leaves 12 cm long, 1.5 cm wide, narrowly lanceolate, long-acuminate, rigidly coriaceous, articulate with their sheaths, the sheaths 3 cm long, tightly clasping the stem. Inflorescence terminal, sessile, elongating with age, fractiflex, successively single-flowered, subtended by a foliaceous, articulate bract, up to 5 cm long, not including the sheath. Flowers showy, with submembranaceous, widely spreading perianth segments, lasting only 1 day, sepals white, the tips greenish–yellow petals and lip hyaline white, disk of lip light yellow. Floral bracts non-articulate, up to 17 mm long, subimbricating lanceolate, long-acuminate. Pedicellate ovary up to 18 mm long. Dorsal sepal up to 40 mm long and 8 mm wide, narrowly elliptic to linear-elliptic, acute, with a short apiculus. Lateral sepals 42 mm long, 9 mm wide, narrowly elliptic

to linear-oblongate, acute, with short apiculus, somewhat oblique. Petals up to 40 mm long and 13 mm wide, obovate-lanceolate, acute, oblique, margins of apical half undulate. Lip up to 45 mm long and 33 mm wide, oblong obovate to pyriform in outline, apically rounded, emarginate, margins above basal third undulate-crispate, the base with two, 5 mm long, subparallel keels, basally in close proximity, forming a small cavity beneath, the disk with 9 erose-denticulate thickened keels, dilated at the apex, the central five subtriangular. Gynostemium up to 30 mm long, semiterete, slender, somewhat clavate, with a pair of lateral, falcate, acute steldia at the apex, much exceeding the anther apex, up to 6 mm long, anther white, pollinia white yellow (Figure 6).

Ecology: Litophytic or terrestrial on granitic outcrops and edges of white-sand shrubland. Flowering in February, March, November, and December.

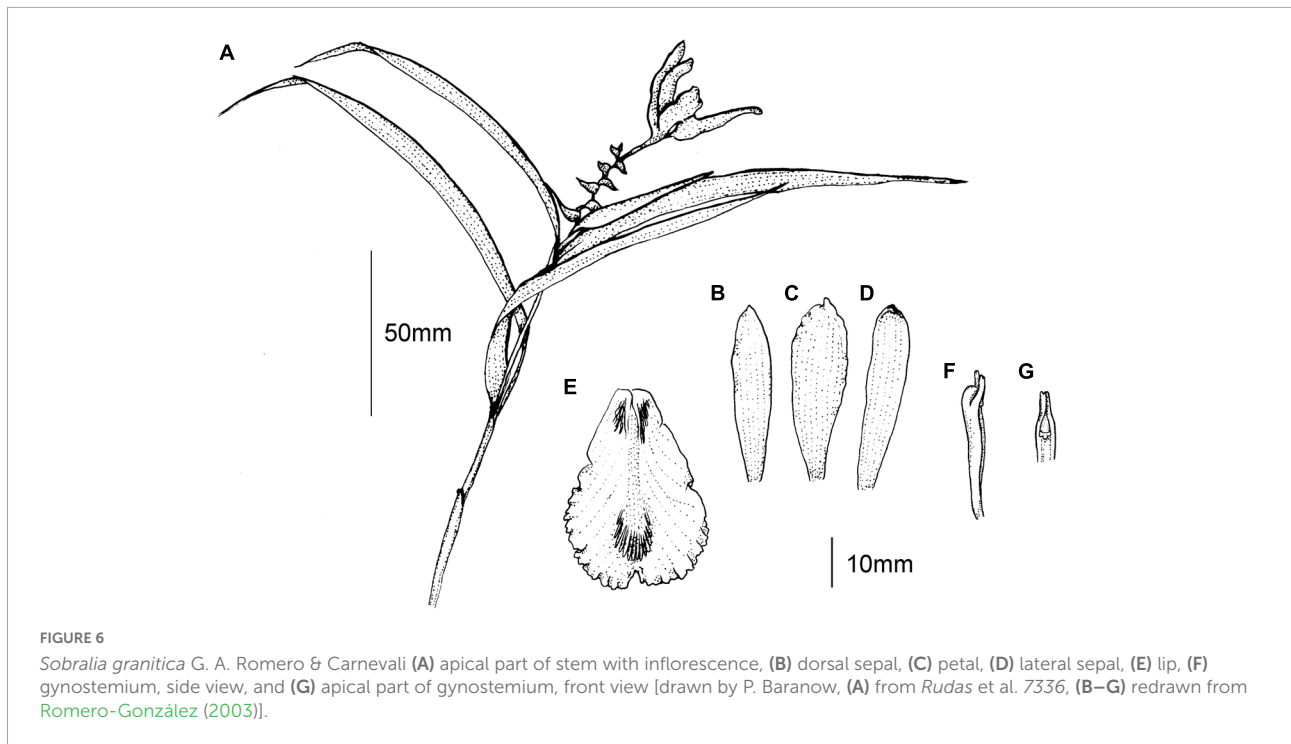
Distribution: Colombia, Venezuela. Alt. 90–350 m.

Conservation status: EOO—LC, AOO—EN.

Representative specimens (Supplementary Map 5)—

**Colombia.** Guainía. Mpio. Pto Inírida. Comunidad El Remanso. Cerro de Mavicure. Formaciones vegetales sobre roca gramítica, 3°27'N 67°58'W. Alt. 300 m. 25 March 1998. A. Rudas, A. Prieto, D. Angel, C. Cardenas, and M. Celis 7336 (COAH!, MO!). Guaviare. PNN Nukak, San José del Guaviare, Inspec. del Tomachipan, Río Inrida, Caño Cocui, Cerro Cocui, Sabaneta on Roca, 2°08'11.8"N, 71°09'41.2"W. Alt. 350 m. 11 February 1996. M.P. Cordoba, A. Etter, and H. Mendoza 2191 (COAH!); Mpio. San José del Guaviare. Vereda la Pizarra, Camino la Lindosa-La Recebera. December 2005. V. Pinoz and D. Cardona 438 (COAH. **Venezuela.** Amazonas. Mpio. Atures. Bosque-laja en Cerro “Uchonhua” (lengua Piaroa), a unos 5 km al N del caserío San Pedro de Catanipo, a unos 60 km al SE de Puerto Ayacucho. 5°41'N, 67°11'W. Alt. 120–150 m. 9 November 1980. F. Guanchez 366 (TFAV, VEN); Cerro de afloramiento granítico a 3 km al N del Cesario Piaroa “Bablilla de Pintado,” al S de Puerto Ayacucho. 5°32'N, 67°31'. Alt. 90–110 m. 26 March 1981. F. Gunachez 953 (TFAV, VEN); Cerro granítico al El del Raudal Gavilan. 5°37'N, 67°22'W. Alt. 100 m. 1 February 1991. G.A. Romero, C. Gomez, and E. Melgueiro 2291 (AMES!, TFAV, VEN); Mpio. Atabapo. Caño Ucato, Cerro Lombiz. 9 December 1994. G.A. Romero and S. Llamozas 3016 (VEN, AMES!, K, SEL). Bolivar. Cerro San Boja. Alt. 100–300 m. 12 December 1955. J.J. Wurdack and J.V. Monachino 39809 (AMES!, NY, VEN).

*Sobralia granitica* is similar to *S. liliastrum*, but it differs in the smaller size of the flowers, (floral segments length of *S. granitica* is 40–45 mm while in *S. liliastrum* 58–62 mm), the color of the keels (light yellow in *S. granitica* vs. orange in *S. liliastrum*), the raised keels (vs. only the central keel notably raised in *S. liliastrum*), and the absence of pseudopollen on the lip (vs. present in *S. liliastrum*). The plants are easily distinguishable in the field, but only with careful examination



of the keels, they can be told apart in herbarium material (Romero-González, 2003).

### 3.1.1.7. *Sobralia luerorum* Dodson

Orquideología 21 (1): 33. 1998. Type: ECUADOR. Azuay. Cuenca to Guarumales, between dam and casa de Maquinas, Alt. 1500 m. 9 March 1985. C.H. Dodson, P. Dodson, C., and J. Luer 15872 (Holotype: RPSC!; Isotypes: AMES, QCA, QCNE—illustration of type).—Szlachetko et al. Materials to the Orchid Flora of Colombia 3: 255. 2020.

Plants up to 350 cm tall, robust, caespitose, stem cane-like, surrounded for the basal portion with clasping sheaths. Leaves up to 35 cm long, 10 cm wide, elliptic to elliptic-lanceolate, coriaceous, acuminate, distichous, plicate, heavily veined on the underside, clasping the stem at the base, articulated to leaf-sheath surrounding the stem. Inflorescence up to 20 cm long, fractiflex, with a large, spathe-like bract at each node, the flowers produced singly in succession over prolonged periods with flowering concurrent throughout the population. Sepals and petals white, the lip white heavily splashed with red–purple on the lamina and in the throat, veins in the lip yellow. Dorsal sepal up to 75 mm long and 20 mm wide, narrowly oblong, acute. Lateral sepals up to 70 mm long and 22 mm wide, narrowly elliptic, oblique, and acute. Petals up to 70 mm long and 22 mm wide, oblong-ovate, obtuse, apical margins more or less erose. Lip up to 70 mm long and 40 mm wide, elliptic, retuse at the apex, with a pair of shallow lamellae in the throat, margins entire

or inconspicuously dentate-erose, undulate. Gynostemium 26–30 mm long, slender at the base, expanded on each side toward the apex to form falcate horn-like apical stelia (Figure 7).

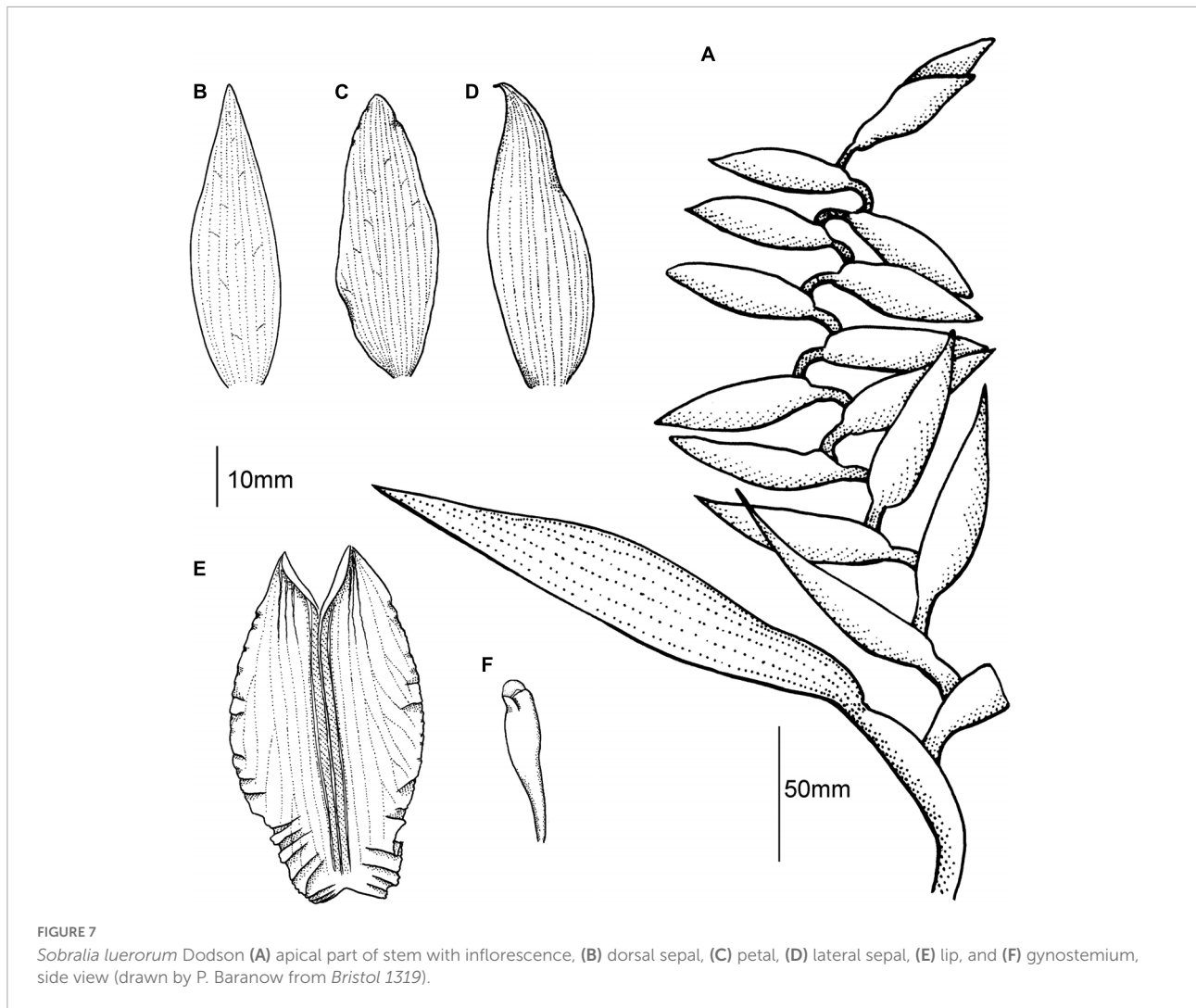
Ecology: Epiphytic or terrestrial on road cuts and embankments. Flowering in January–April, August, and November.

Distribution: Colombia, Ecuador. Alt. 1500–2200 m.

Conservation status: EOO—LC, AOO—EN.

Representative specimens (Supplementary Map 6)—**Ecuador**. Azuay. Cola de San Pablo, Noreste de Paute en el Río Paute, Entre Guarumales y el tunel. Alt. 1500 m. 9 March 1985. C. and P. Dodson, C. and J. Luer and A. Hirtz 15782 (AMES!, RPSC!); Quebrada Chorro Blanco, Río Paute Valley, 8 km SE of the Paute Dam at Amaluza, 78°33'W. 2°38'S. Alt. 1700 m. 3 February 1988. U. Molau, B. Eriksen, and M. Fredrikson 2882 (MO!). Napo. Km 117–134, Quito-Tena, beyond Cosanga at Cordillera de Guacamayo. Alt. 1900–2100 m. 17 January 1990. C.H. Dodson and T. Neudecker 19193A (MO ex RPSC!). Tungurahua. Baños–Puyo road near Río Negro, border with Santiago-Zamora. Alt. 1200 m. 24 April 1980. A. Gentry and C. Bonifaz 28740 (MO!). **Colombia**. Antioquia. Mpio Briceno. Vereda San Fermin, 2–3 km sobre la via Ventanas (Mpio Yaruma) Briceno, 7°10'N, 75°30'W. Alt. 1700–1900 m. 3 November 1990. R. Callejas and M.V. Arbelaez 9603 (AMES!, NY!). Putumayo. Valle de Sibundoy, 1 km S Balsayaco. Alt. 2200 m. 20 August 1963. M.L. Bristol 1319 (AMES!).

*Sobralia luerorum* is similar to *S. gloriosa*, but can be distinguished by the larger flowers of thinner texture, white sepals and petals, the lip with red–purple splashing



on the lamina and throat (in *S. gloriosa* sepals are yellow to brown, the petals are white to yellow and lip is white with purple striation), the elliptic-retuse lip (vs. broadly elliptic and bilobed at the apex lip in *S. gloriosa*), and a pair of calli in the throat of the lip inconspicuous (rather than large and conspicuous, as in *S. gloriosa*).

According to the protologue, the specimens of *S. luerorum* reach up to 200 cm in height. However, some of the examined herbarium collections (e.g., *C. and P. Dodson*, *C. and J. Luer and A. Hirtz 15782*) and the plants cultivated in our living collection allow us to verify the information and state, that the stems can reach up to 350 cm.

### 3.1.1.8. *Sobralia gloriosa* Rchb.f.

Xenia Orchid. 2: 178. 1873. Type (designated by [Garay, 1978: 122](#)): Ecuador. Pichincha. From the forest of the Western side of Pichincha, Alt. 2300 m. Sep. *W. Jameson 32* (Lectotype: W! 21547).—Garay in Harling and Sparre. Fl. Ecuador. Orchid. 9:

123. 1978.—Szlachetko et al. Materials to the Orchid Flora of Colombia 3: 256. 2020.

Plants over 200 cm tall. Leaves up to 37 cm long and 12 cm wide, ovate to ovate-elliptic, long-acuminate. Inflorescence up to 30 cm long, rachis fractiflex, loosely many-flowered. Floral bracts up to 80 mm long, cymbiform, the lowermost ovate-lanceolate, acute, the upper ones obtuse, longer than the ovary. Pedicellate ovary up to 22 mm long, cylindrical, glabrous. Flowers produced in succession, rather fleshy, creamy white with purple striation on lip. Dorsal sepal up to 60 mm long and 15 mm wide, ovate-lanceolate to oblong lanceolate, acute, dorsally mucronate, the margins involute and undulate. Lateral sepals up to 50 mm long and 18 mm wide, connate for 5 mm basally, obliquely ovate-lanceolate to oblong lanceolate, acute, mucronate dorsally, with involute and undulate margins. Petals up to 60 mm long and 20 mm wide, oblong obovate to narrowly elliptic, obtuse, with crenulate and undulate margins above. Lip up to 50 mm long and 40 mm wide, rhombic-elliptic in general outline, obscurely 3-lobed, lateral lobes erect, enfolding the

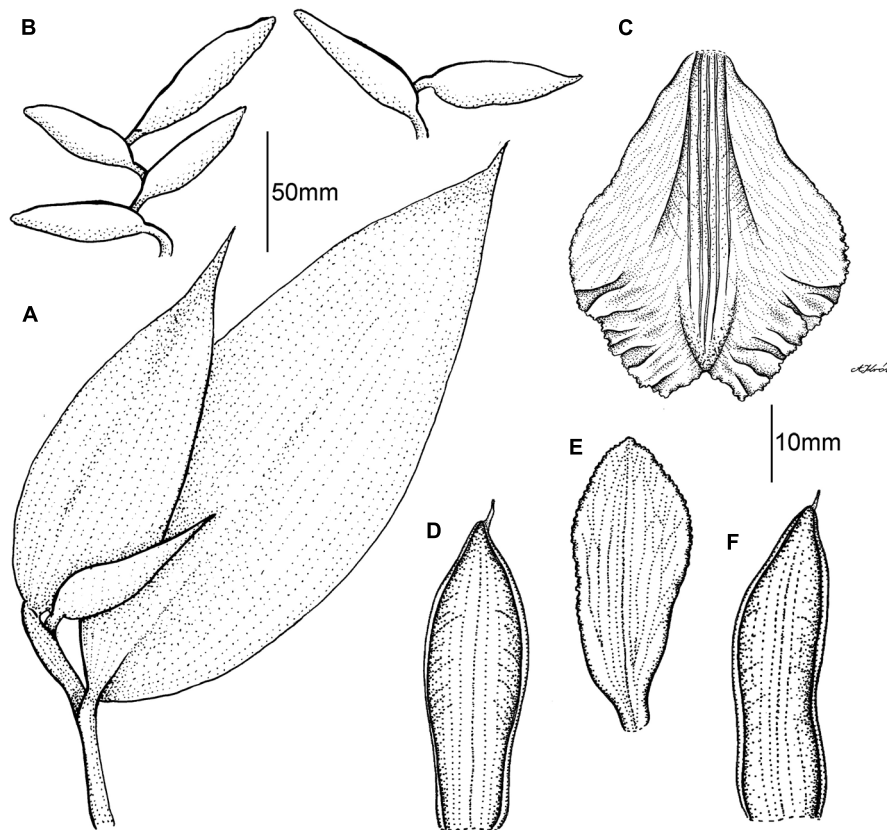


FIGURE 8

*Sobralia gloriosa* Rchb. f. (A) apical part of stem, (B) fragments of the inflorescence, (C) lip, (D) dorsal sepal, (E) petal, and (F) lateral sepal [drawn by P. Baranow (A,B) and A. Król (C–F) from the lectotype].

column, rounded at apex; middle lobe suborbicular in outline, bilobed apically with wavy-crispate margin; disk obliquely bicallose at the base and with 5–7 parallel verrucose thickened veins from the base to the apex. Gynostemium up to 40 mm long, clavate, steldia do not exceed the anther apex (Figure 8).

Ecology: Terrestrial on steep embankments in wet montane cloud forest. Flowering throughout the year.

Distribution: Ecuador, Colombia, Peru (Garay, 1978). Alt. 1800–2300 m.

Conservation status: EOO—VU, AOO—EN.

Representative specimens (Supplementary Map 7)—

**Ecuador.** Carchi. Trail from Rafael Quindis mountain finca to Río Verde and short distance up Río Verde, 0°52'N, 78°8'W. Alt. 1890 m. 28 November 1987. W.S. Hoover and S. Wormley 1873 (MO!); Ridge to NE of Rafael Quindis mountain finca, 0°52'N, 78°8'W. Alt. 2000 m. 29 November 1987. W.S. Hoover 2024 (MO!); Trail from Rafael Quindis mtn finca to Río Verde and short distance up Río Verde, 0°52'N, 78°8'W. Alt. 1890 m. 28 November 1987. W.S. Hoover and S. Wormley 1872 (MO!). Imbabura. 8 km east of Lita on road to Ibarra and 8 km up road from Cachaco to Santa Rosa de Cachaco to an elev 1150 m

and hiked up ridgeline to 1550 m alt. 19 January 1987. C.H. Dodson, A. Hirtz, D. Benzing C., and J. Luer 16886 (RPSC!). Pastaza. On roadside at km 70 Baños to Puyo. Alt. 1900 m. 18 February 1963. L.B. Thien 2270 (F!). Pichincha. km 88–92, Quito-Sto Domingo. Alt. 1200 m. 4 July 1979. C.H. Dodson, M. Fallen and P. Morgan 7776 (RPSC!); Road from Quito to Santo Domingo via Chiriboga, 8 December 1986. C.H. Dodson and E. Hagsater 16702 (RPSC!); Reserva Florística-Ecológica Río Guajalito, km 59 de la carretera antigua Quito-Sto Domingo de Los Colorados, a 3.5 km al NE de la carretera, estribaciones occidental del Volcan Pichincha. 0°13'53"S, 78°48'10"W. Alt. 1800–2200 m. 28 December 1985. J. Jaramillo 8312 (MO!); Chiriboga road, old Santo Domingo-Quito road, 31 km northeast of Alluriquin, Alt. 6000 ft. 5 August 1980. R.P. Saulea et al. 4000 (AMES!); along road Nanegal-Nanegalito. Alt. 1200–1500 m. 9 July 1991. H. van der Werff, B. Gray, and G. Tipas 12264 (MO!). **Colombia.** Valle del Cauca. Along road between San José del Palmar and Ansermanuevo. 4°49'N, 76°09'W. Alt. 1960 m. 12 May 1983. T.B. Croat 56717 (COL!, MO!, NY!); Mpio. El Cairo. Vereda El Pacifico, 10 km desde el desvío a San José del Palmar de la carretera Albán-Cartago.



4°48'42"N, 76°10'16"W. Alt. 1867 m. 29 December 2007. *R. Arevalo, J. Betancur, N. Salinas, L. Clavijo, and A. Zaluaga* 804 (COL!); Hacienda Tokio, behind microwave tower, ca 10 km S of Queremal, 3°30'N, 76°42'W. Alt. 2000 m. 26 February 1983. *A. Gentry, A. Juncosa, and F. Gomez* 40817 (COL!, MO!). Valle/Choco: Mpio El Cairo, Correg. Boqueron, Vereda Las Amarillas, Serrania de Los Paraguas, along road to and beyond Cerro del Ingles, 17–23 km W of El Cairo, 4°45'N, 76°20'W, Alt. 1750–2050 m. 13 May 1988. *J. L. Luteyn, P. Silverstone-Sopkin, M. Dolores Hereida, and N. Paz* 12274 (AMES!). Valle: Alt. 2000 m. May 1939. *E. Dryander* 2359 (US!).

Along with *Sobralia luerorum*, *S. gloriosa* has strongly fractiflex rachis which allows to separate the two species from the other representatives of the section with broad leaves (over 5 cm width). The taxa can be distinguished by flower color and lip protuberances. The differences between them are indicated in the notes concerning *S. luerorum*.

### 3.1.1.9. *Sobralia ruckeri* Linden & Rchb.f.

Bonplandia (Corrientes) 2: 278. 1854. Type: Colombia. *Sine prec. loc. L.J. Schlim* 1203 (Holotype: W!, UGDA-DLSz!—drawing).—Garay & Dunsterville. Venezuelan Orchids Illustrated 406. 1959.—Szlachetko et al. Materials to the Orchid Flora of Colombia, 3: 257. 2020.

= *Sobralia charlesworthii* hort., Gard. Chron. 353. 1910. Type: cult. ex *Charlesworth* (Holotype: K! 000364502).

Plants up to 300 cm tall, robust, stem up to 1.5 cm in diameter, erect, leafy, growing in dense clumps, slightly compressed or subterete. Leaves up to 35 cm long and 12 cm wide, lanceolate to ovate-lanceolate, attenuate, the uppermost leaves tend to be somewhat cymbiform in the basal part, sheaths spacious, ribbed. Inflorescence up to 6-flowered, several of which can be out simultaneously; strongly sinuous and stout, subterete. Floral bracts basally cymbiform and in their apical portion almost identical to the leaves but smaller—up to 200 mm long, getting progressively smaller toward the apex of raceme. Pedicellate ovary varies in length from 30 mm in apical flowers up to 100 mm in the basal ones. Sepals very dark magenta–purple, sepals fairly intense rose–purple with a pale mid-vein, petals rose–purple with a pale mid-vein, lip dorsally rose–purple grading to a very dark wine–purple at the apex, ventrally with a large patch of light rose–purple at the base, changing abruptly to very dark wine–purple for the remainder. Dorsal sepal up to 85 mm long and 25 mm wide, ligulate-lanceolate to linear-oblongate, acute, mucronate, fleshy, basally connate with lateral sepals. Lateral sepals up to 85 mm long and 20 mm wide, oblongate, acute, mucronate, more or less falcate. Petals up to 85 mm long and 33 mm wide, widely oblongate or oblong obovate, oblique, firm but much thinner than the sepals, the thin margin of the apical third variably undulate. Lip 80 mm long, 60 mm wide, ovate to elliptic, axis strongly thickened ventrally into a yellow ridge that starts from the thick, finely sulcate,

transverse thickenings that prevent the spreading of the base of the lip, the axial ridge lightly grooved, rather soft, rugulose, in apex finely bullate, white. Gynostemium ca 35 mm long. Stelidia linear, acute, slightly exceeding the gynostemium apex (Figure 9).

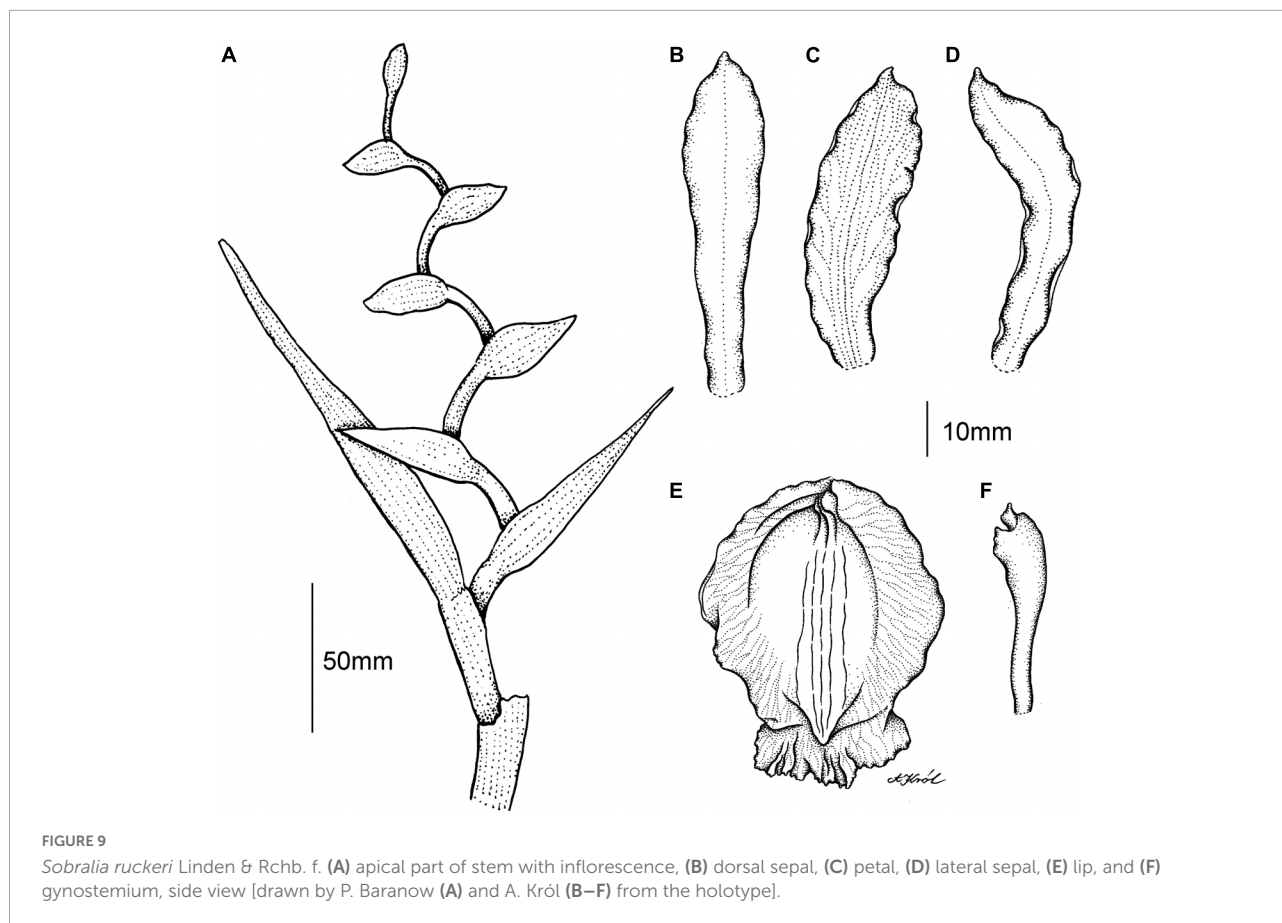
Ecology: Terrestrial at the edges of forests and clearings. Flowering from February till April and in September.

Distribution: Colombia, Venezuela. Alt. 1200–2400 m.

Conservation status: EOO—LC, AOO—EN. Representative specimens (Supplementary Map 8)—Colombia. Antioquia. Region de Murri, road between Nutibara and La Blanquita, 14.3–17.5 km from centro of Nutibara, 6°45'N, 76°23'N, 1620–1860, 10 February 1989. *J.M. Mc Dougal, D. Restrepo, and D.S. Sylva* 3853 (MO!); Mpio. Frontino. Corregimiento Nutibara, Cuenca alta del Río Cuevas. Alt. 1640 m. 11 April 1987. *D. Sanchez et al.* 1048 (MO!); Mpio. Frontino. Corregimiento Nutibara, Cuenca alta del Río Cuevas. Sobre tulud, 2 m de alto. Alt. 1640 m. 11 April 1987. *F.J. Roldan, J. Betancur et al.* 1048 (COL!, NY!); Mpio. Frontino. Corregimiento Nutibara, Cuenca alta del Río Cuevas. Alt. 1750 m. 14 April 1987. *D. Sanchez et al.* 1139 (COL!, MO!, NY!). Boyacá. Mpio. Duitama. Trayecto entre la vereda El Carmen y Virolin. 21 September 1994. *J.L. Fernandez-Alonso, C. Ariza, A. Baena, J. Gomez, A. Espinoza, A. Pico, D. Riano, and D. Sarmiento* 12070 (COL!); Carretera Duitama. Charala, 65 km de Duitama. Adelante de Virolin. 9 June 1972. *G. Lozano C.* 2228 (COL!). Norte de Santander. Ocaña. Alt. 1700–2000 m. *L.J. Schlim* 1203 (W!). Putumayo. Entre el Pepino y Mocoa. Cerca al Río Putumayo. Alt. 1200 m. 11 January 1963. *A. Fernandez P.* 6015 (COL!). Santander. Gambita. Alt. 2400 m. 12 February 2010. *M. Ospina H.* 1611 (COL!). Valle del Cauca. Km 18 y km 20 de la carretera de Cali a Buenaventura entrado por la finca Zingara. Cumbre de la Cordillera occidental. Alt. 1500–2000 m. 28 February 1988. *I. Cabrera R. and H. van der Werff* 15766 (MO!). Venezuela. Zulia. Sierra de Perijá, Loma arriba de la quebrada del Río Omira-kuna (Tumuriasa), cerca de la frontera Colombo-Venezolana suroeste de Pishikakao e Iria hacia la Mision de Scurpo. Alt. 1980 m. 27 March 1972. *J.A. Steyermark, G.C.K., and E. Dunsterville* 105664 (AMES!).

The characteristic leaves which are gradually getting smaller toward the apical part of the stem and fluently transform into leaf-like floral bracts are unique among the whole genus and allow us to distinguish the species at the first glance. The features, along with the shape and color of the floral segments, especially the lip, prompted the decision to synonymize *S. charlesworthii* under the name *S. ruckeri*. Such a concept was mentioned in the description of *S. charlesworthii*—it suggests that *S. charlesworthii* may be just a form of *S. ruckeri*.

The only species that could be misidentified with *Sobralia ruckeri* is *S. splendida*, but the latter taxon differs in the protuberances present on the lip surface. The details are listed in the notes concerning *S. splendida*.



### 3.1.1.10. *Sobralia gambitana* Baranow, Szlach. & Kindlmann, *sp. nov.*

Type: COLOMBIA. Santander. Mnio Gámbita, vereda El Palmar. Alt. 2500 m. 12 May 1982. A. Becerra and M. Constanza 23 (Holotype: COL! 256896, UGDA-DLSz!—drawing).

Similar to *S. tamboana* in habit and flower structure. However, it can be separated by the pair of thickenings at the base of lip—they are fused together in the new species while in *S. tamboana*, they are separated. The two species differ also in the color of flowers—they are lilac with purple lip edges and yellow at the center in the new entity. In *S. tamboana*, flowers are pale yellow with a red-brown wash inside the throat of the lip and a red-brown spot on the lamina of the lip. Moreover, *S. gambitana* is two times as tall as *S. tamboana* (ca 250 cm vs. 120 cm) while its floral segments are distinctly smaller than those of *S. tamboana* (60–66 vs. 78–92 mm).

Etymology: Named in allusion to Colombian Municipio Gámbita, where the type material was collected.

Plants ca 250 cm tall. Leaves 13–14 cm long, 1.8–2.5 cm wide, oblong elliptic linear-lanceolate, acuminate, basally cuneate, strongly plicate. Inflorescence ca. 4 cm long, rachis flexuose, glabrous. Flowers lilac, lip with purple edges and a yellow line in the center. Floral bracts up to 20 mm

long, becoming smaller toward the rachis apex, lanceolate-cymbiform, acuminate. Ovary 10–11 mm long, cylindrical. Dorsal sepal 66 mm long, 22 mm wide, lanceolate or elliptic-lanceolate, shortly acuminate. Lateral sepals 60 mm long, 20 mm wide, oblong elliptic, shortly acuminate, inconspicuously oblique. Petals 62 mm long, 36 mm wide, obovate, linear and falcate basally, acute, margins slightly crenate. Lip 60 mm long, 50 mm wide, rhombic-elliptic in outline, deeply concave basally, margins of apical half undulate, base with two united keels running up to one-third of the lip. Gynostemium 37 mm long, slightly falcate, club-like, apical stelidia triangular, falcate, acute, not exceeding the anther (Figure 10).

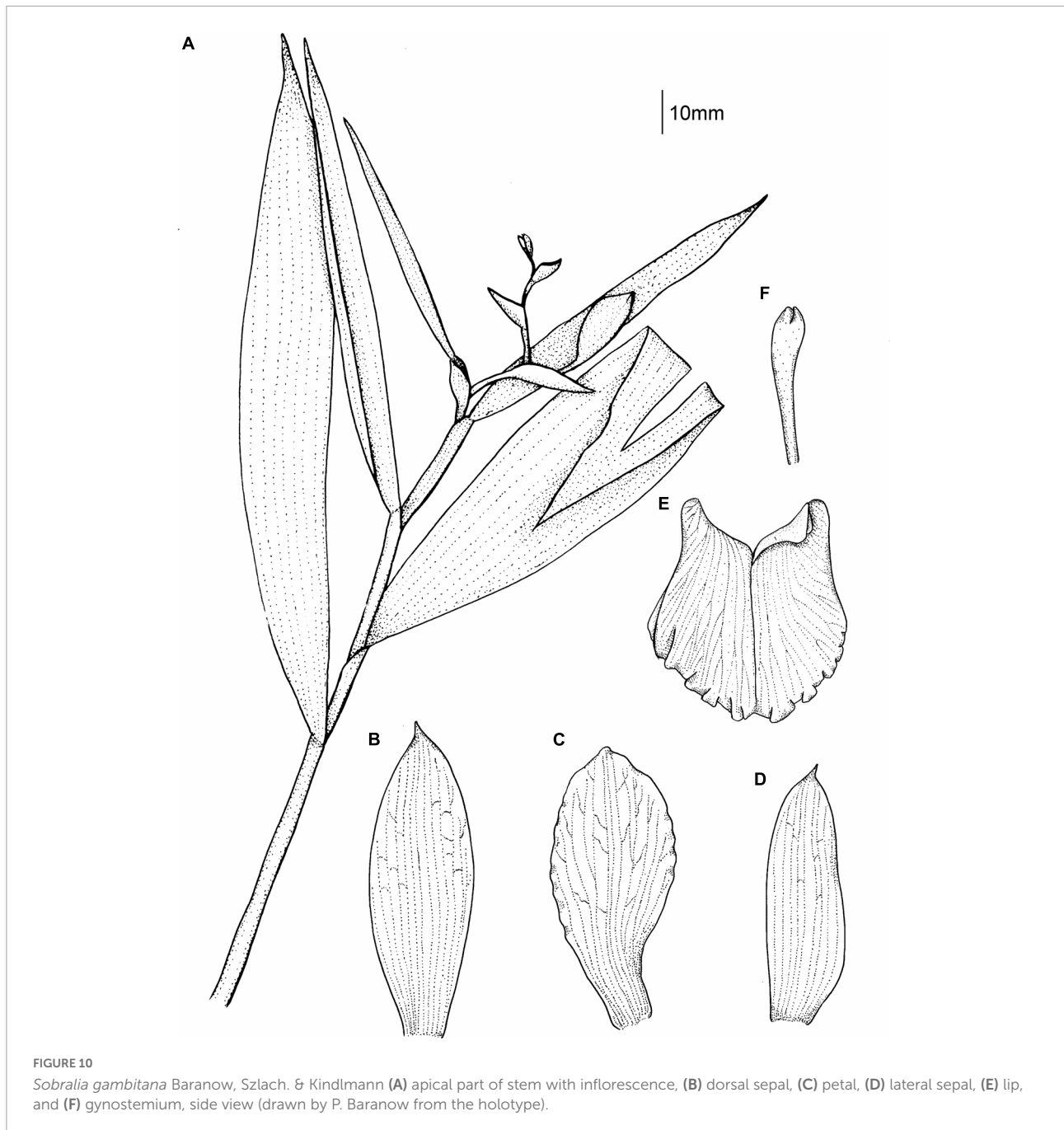
Ecology: No data. Flowering in May.

Distribution: Colombia (Santander). Alt. 2500 m.

Conservation status: EOO—CR, AOO—CR.

Representative specimens (Supplementary Map 9)—Colombia. Santander. Mnio Gámbita, vereda El Palmar. Alt. 2500 m. 12 May 1982. A. Becerra and M. Constanza 23 (COL! 256896, UGDA-DLSz!—drawing).

The descriptions of the new taxon on the basis of a single collection may be doubtful, but in this case, we have the combination of the morphological features and flower color that convince us that the collection deserves the status of a separate species.



*Sobralia gambitana* is similar to *S. tamboana* in habit and flower structure. However, it can be separated by the position of the lip basal thickenings. In the new species, the two basal ridges are fused together while in *S. tamboana* they are separated. The two species differ also in flower color—the new species are lilac with purple lip edges and yellow at the center. In *S. tamboana* flowers are pale yellow with a red-brown wash inside the throat of the lip and a red-brown spot on the lamina of the lip.

*Sobralia gambitana* is two times as tall as *S. tamboana* (ca 250 cm vs. 120 cm) while its floral segments are distinctly smaller

than those of *S. tamboana* (60–66 mm vs. 78–92 mm). The two species differ also in the size of leaves and rachis of the inflorescence. The detailed comparison is presented in [Table 1](#).

It looks like *S. tamboana*, but has relatively larger floral bracts and more slightly fractiflex inflorescence than *S. gambitana*.

### 3.1.1.11. *Sobralia tamboana* Dodson

Orquideología 21 (1): 44. 1998. Type: ECUADOR. Esmeraldas. Lita to San Lorenzo, Km 6, Alt. 650 m. 29

TABLE 1 Comparison of *Sobralia gambitana* Baranow, Szlach. and Kindlmann and *S. tamboana* Dodson.

Characters	<i>Sobralia gambitana</i>	<i>Sobralia tamboana</i>
Plant height	250 cm	120 cm
Leaves length	13–14 cm	26 cm
Leaves width	1.8–2.5 cm	8 cm
Inflorescence length	4 cm	12 cm
Ovary	10–11 mm	40 mm
Dorsal sepal size	66 mm × 22 mm	92 mm × 28 mm
Dorsal sepal shape	Lanceolate or elliptic-lanceolate	Narrowly oblong-elliptic
Dorsal sepal apex	Shortly acuminate	Acute
Lateral sepals size	60 mm × 20 mm	80 mm × 30 mm
Lateral sepals shape	Oblong elliptic	Obliquely oblong ovate
Lateral sepals apex	Shortly acuminate	Acute
Petals size	62 mm × 36 mm	78 mm × 30 mm
Petals shape	Obovate	Obliquely oblong-elliptic
Petals apex	Acute	Obtuse
Lip size	60 mm × 50 mm	80 mm × 40 mm
Lip shape	Rhombic-elliptic	Oblong-elliptic
Lip basal keels arrangement	United	Separated

December 1990. *C. H. Dodson and T. and P. M. Dodson* 19096 (Holotype: RPSC!; illustration of type).

Plants up to 120 cm tall, caespitose, rhizome short, stems cane-like, surrounded in the basal portion with clasping sheaths. Leaves up to 26 cm long and 8 cm wide, elliptic, chartaceous, acuminate at the apex, distichous, plicate, and heavily veined on the underside. Inflorescence ca 12 cm long, lightly flexuose with large, spathe-like bract at each node, the flowers produced singly in succession over prolonged periods with flowering concurrent throughout the population. Ovary ca 40 mm long. Flowers pale yellow with a red-brown wash inside the throat of the lip and a red-brown spot on the lamina of the lip. Sepals free to the base. Dorsal sepal 92 mm long, 28 mm wide, narrowly oblong-elliptic, acute. Lateral sepals to 80 mm long and 30 mm wide, obliquely oblong ovate, acute. Petals to 78 mm long and 30 mm wide, obliquely oblong-elliptic, obtuse, lightly reflexed at the apex, margins slightly crenate in the apical half. Lip up to 80 mm long and 40 mm wide, oblong-elliptic in general outline, upper half more or less deltoid, flared, retuse at the apex, concave, throat with a pair of shallow lamellae. Gynostemium 40 mm long, slender at the base, flattened on the underside, expanded on each side toward the apex to form falcate, horn-like stelia (Figure 11).

Ecology: Epiphytic or terrestrial on road cuts and embankments. Flowering in March and December.

Distribution: Ecuador. Alt. 250–650 m.

Conservation status: EOO—CR, AOO—CR.

Representative specimens (Supplementary Map 10)—**Ecuador**. Lita to San Lorenzo, Km 6, Alt. 650 m, 29 December 1990. *C.H. Dodson and T., and P.M. Dodson* 19096 (RPSC!); Km 5, Lita to El Cristal, Alt. 250 m. 26 March 1993. *C.H. Dodson and G. Carnevali* 19243 (RPSC!).

Similar to *Sobralia rosea* but distinguished by flexuose inflorescence, the pale yellow flowers with a diffuse red-brown spot and the lack of low, parallel lamellae on the lip lamina.

### 3.1.1.12. *Sobralia splendida* Schltr.

Repert. Spec. Nov. Regni Veg., Beih. 7: 44. 1920. Type: Colombia. *Sine prec. loc. M. Madero* (B†).—Szlachetko et al. Materials to the Orchid Flora of Colombia 3: 258. 2020.

Plants up to 300 cm tall, stem erect, leafy, growing in dense clumps, slightly compressed or subterete. Leaves 40–45 cm long, 9–10 cm wide, elliptic, acuminate, basally cuneate. Inflorescence 10–12 cm long. Rachis flexuose, glabrous. Flower color unknown. Floral bracts up to 90 mm long, lanceolate-cymbiform, acuminate. Ovary 40 mm long, cylindrical. Sepals basally connate together for one-fourth of their length. Dorsal sepal 85–90 mm long, 20 mm wide, oblong-ligulate to oblanceolate, acute. Lateral sepals 85–90 mm long, 20 mm wide, oblong-ligulate, acute, oblique. Petals 85–90 mm long, ligulate-oblanceolate, acute, slightly wider, and thinner in texture than the sepals, subfalcate. Lip 90 mm long, 40 mm wide, oblong ovate in outline above cuneate base, margins of apical half undulate, base with two parallel keels running up to its middle, the central vein in the central part of the lip ornamented with lamella, each of the protuberances with parallel rows of papillae on both sides. Gynostemium 57 mm long, slightly curved, apical stelia oblong-falcate, not exceeding the anther (Figure 12).

Ecology: Terrestrial.

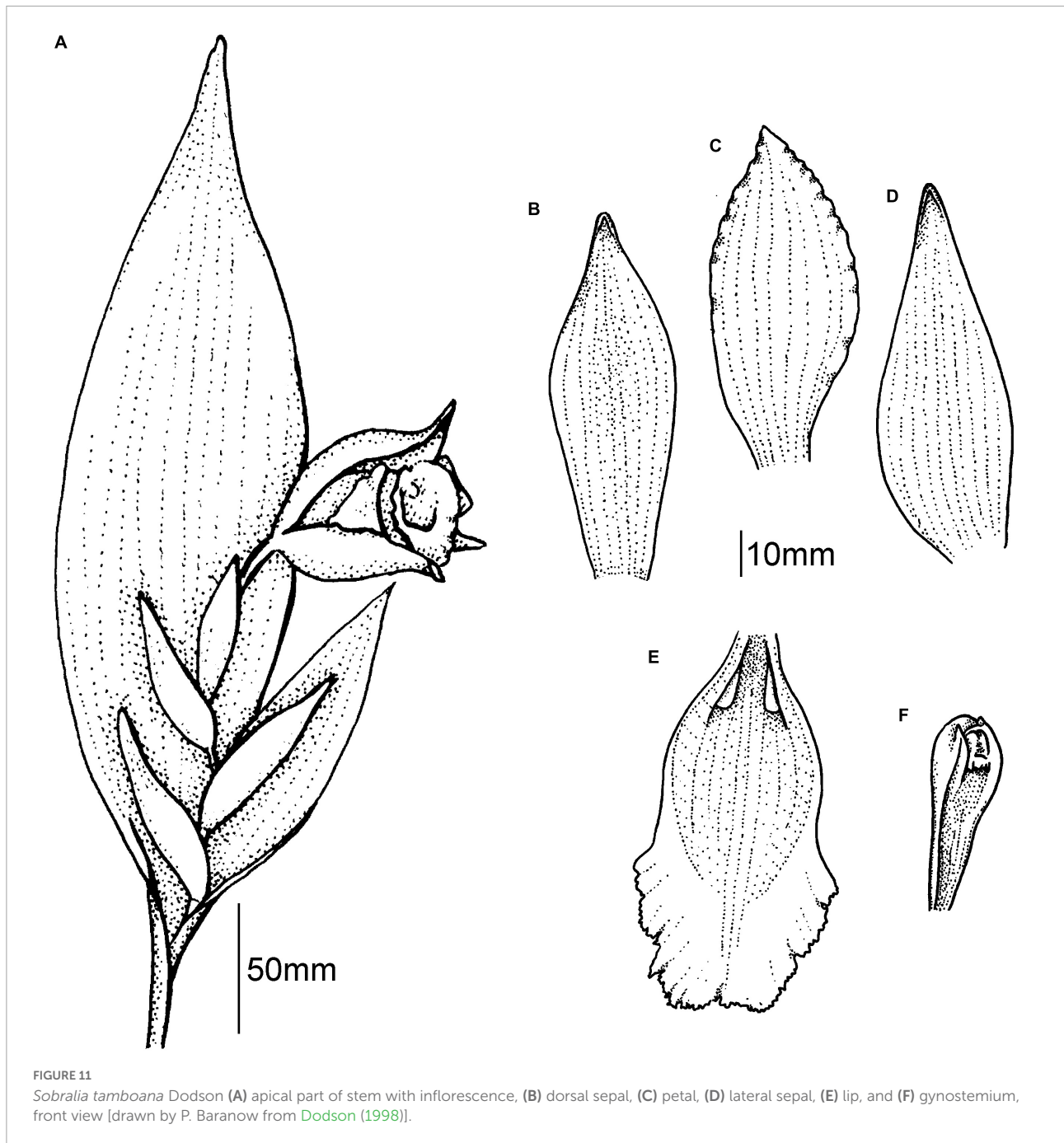
Distribution: Colombia. Alt. 500 m.

Representative specimens—**Colombia**. Cauca. Alt. ca. 500 m. *M. Madero* (B†).

According to *Schlechter* (1920), this species is similar to *Sobralia ruckeri*, from which it differs by the lip structure, i.e., by the presence of the prominent, high papillae arranged in the rows running on both sides of each of the ridge of the lip. Our study supports his observations. The other species similar in lip form and gynostemium morphology to *S. splendida* is *S. hoppii*. In the former species, the lip base is ornamented with two lamellae running to its middle and the central vein in the central part is ornamented with lamella as well. In the latter, the lip has two basal keels, and the median vein is thickened, with two additional thickenings near the middle.

### 3.1.1.13. *Sobralia hoppii* Schltr.

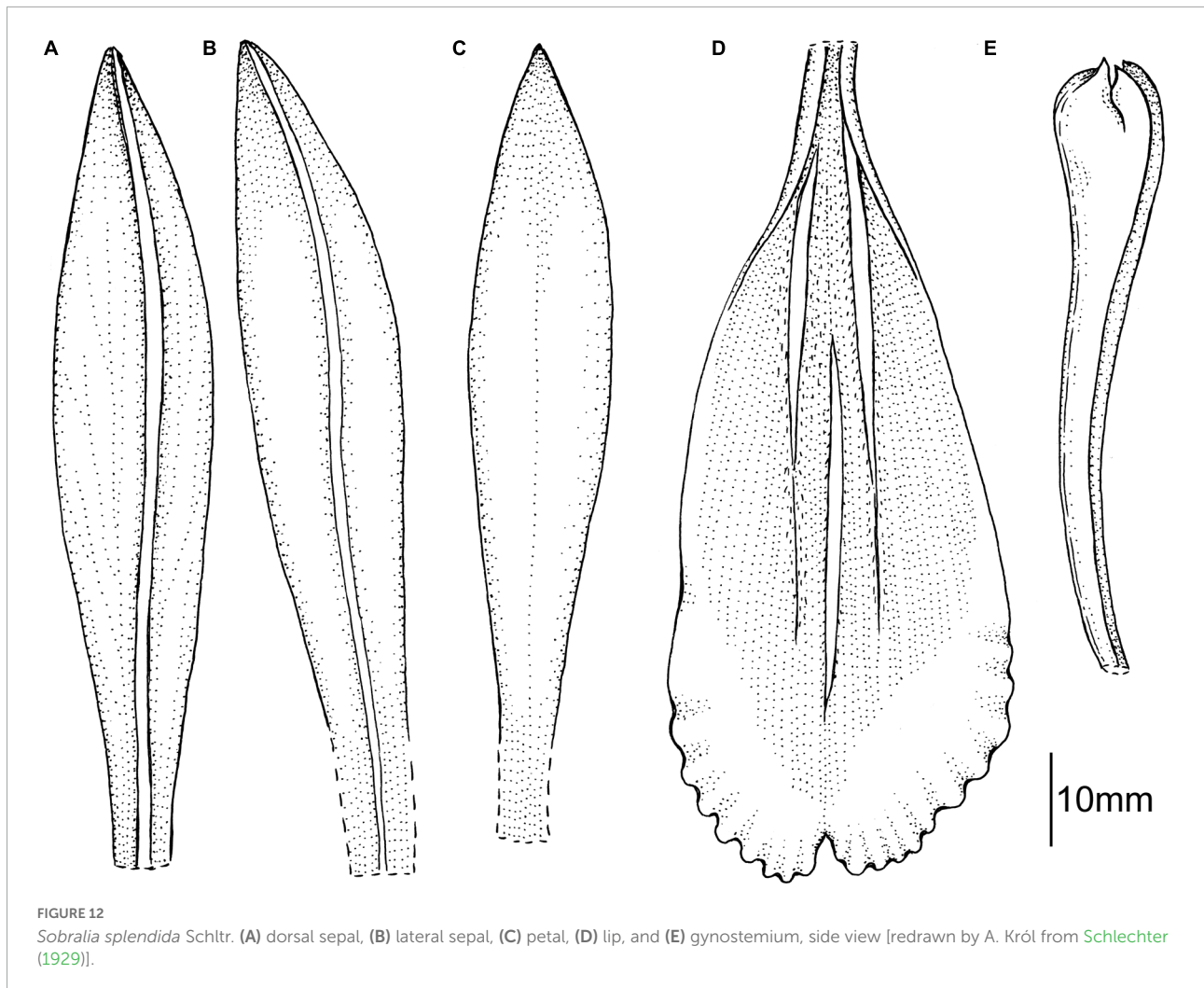
Repert. Spec. Nov. Regni Veg., Beih. 27: 13. 1924. Type (designated here): Colombia. Caqueta. Ostkordillere, Putumayo-Gebiet, Alt. 3000 m. September 1922, *W. Hopp* 164 (B†); Von Buenaventura bis Juntas. Alt. to 300 m. 21 July



1881. *W. Hopp* 753 (Neotype: W!, UGDA-DLSz!–drawing).—Szlachetko et al. *Materials to the Orchid Flora of Colombia* 3: 259. 2020.

Plants probably 150 cm tall, erect, robust, glabrous. Leaves 23–30 cm long, 7.5–11 cm wide, elliptic, acuminate, many-veined, coriaceous, stiff. Raceme up to 35 cm long, 5–12-flowered, rachis flexuose, glabrous, or sparsely furfuraceous. Flowers rather large, pure white or yellowish-white. Floral bracts up to 130 mm long, ovate, long-acuminate. Ovary 32 mm long, glabrous. Dorsal sepal 60–83 mm long,

10–14 mm wide, oblong-ligulate, acuminate. Lateral sepals 60–83 mm long, 10–14 mm wide, obliquely oblong-ligulate, acuminate. Petals 52–83 mm long, 22 mm wide, obliquely oblong, obtuse to subobtuse, with more or less undulate margins. Lip 52–85 mm long in total, 30–40 mm wide when expanded, unguiculate, ovate to oblong ovate in the general outline above, more or less pandurate toward apical quarter, emarginate, undulate in front, with 2 basal keels, median vein thickened, with two additional thickenings near the middle. Gynostemium 37–67 mm long, steldia



relatively obscure, obliquely triangular, shorter than anther (Figure 13).

Ecology: Terrestrial. Flowering in May, July, and in September.

Distribution: Colombia. Alt. 300–3000 m.

Conservation status: EOO—CR, AOO—CR.

Representative specimens (Supplementary Map 11)—**Colombia**. Caquetá. Putumayo-Gebiet, Ostkordillere. Alt. 3000 m. September 1922. *W. Hopp* 164 (Schlechter, 1924). Chocó. Mpio. Carmen del Atrato. Carretera Quibdó–Carmen del Atrato. 5°43.6′–43.5′N, 76°36.2′–18.4′. Alt. 80–510 m. 11 May 2007. *R. Arevalo, J. Betancur, S. Hoyos, and E. Renteria* 740 (COL!). Valle del Cauca. Von Buenaventura bis Juntas. Alt. to 300 m. 21 July 1881. *W. Hopp* 753 (W!, UGDA-DLSz!—drawing).

According to Schlechter (1924), this species resembles *Sobralia rosea* and can be easily misidentified with it, but has smaller, pure white or yellowish-white flowers. In the form of the

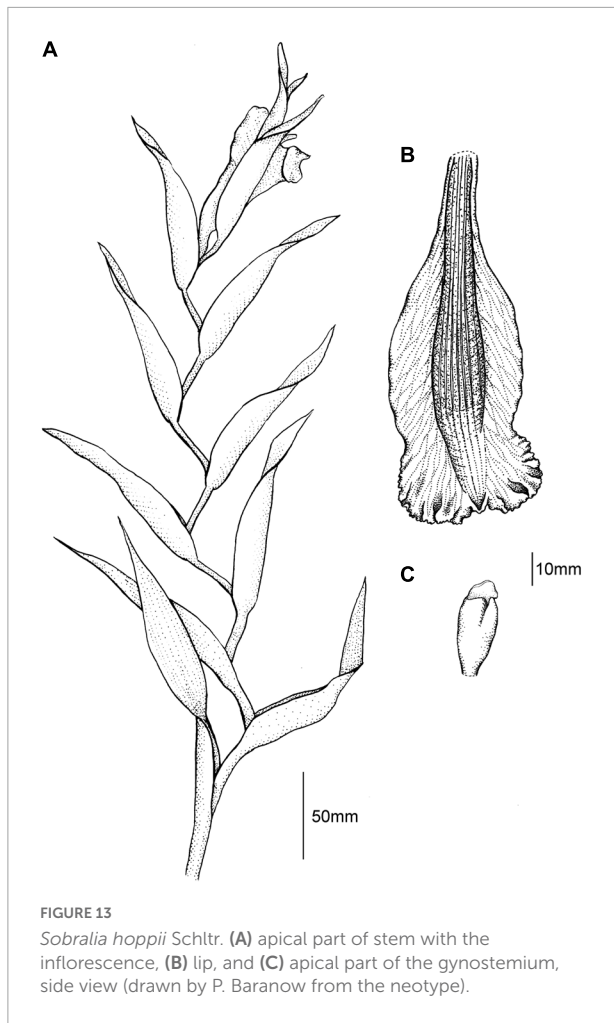
lip and its callosities, the species is easily distinguishable from all other taxa of this group.

As the original collection is not available—we assume it could have been destroyed during World War II—we decided to designate the neotype for the species. We have chosen the only existing collection of the species gathered by Hopp (no. 753), who was also the collector of the original type material. Besides, the selected collection is well documented by the drawings left in Vienna and UGDA herbaria.

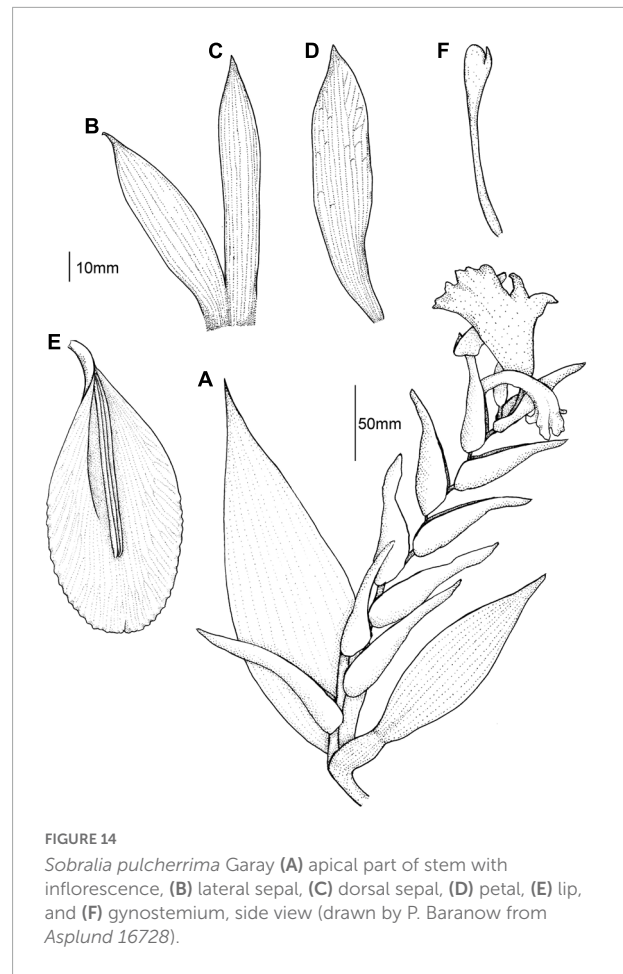
#### 3.1.1.14. *Sobralia pulcherrima* Garay

*In* Harling & Sparre, *Fl. Ecuador* 9: 128. 1978. Type: Ecuador. Pichincha: road Nanegal–Nanegalito, Alt. 1200–1550 m. *G. Harling and L. Andersson* 11571 (Holotype: GB; Isotype: AMES 00104326; K–drawing!).—Szlachetko et al. *Materials to the Orchid Flora of Colombia* 3: 260. 2020.

= *Sobralia lindenii* Grignani, *Lindenia* 13: t. 5855. 1895, *not hort.* Type: *no data*.



Plants up to 400 cm tall, caespitose. Stem erect, rather robust, lower half leafless, completely enclosed by remnants of leaf sheaths, leafy above. Leaves up to 33 cm long and 9 cm wide, ovate-lanceolate or elliptic-lanceolate, long-acuminate, gradually tapering to a more or less rounded base, sessile and articulated with glabrous sheaths, plicate. Inflorescence up to 30 cm long, sessile, elongating with age, flexuous, loosely few-flowered. Flowers 1 or 2 at a time produced in succession, large, showy, white with dark purple veins on the lip disk. Floral bracts up to 100 mm long, ovate-lanceolate, cymbiform, erectly spreading with arcuate tips. Pedicellate ovary up to 30 mm long. Dorsal sepal up to 105 mm long and 30 mm wide, oblanceolate-oblong, subfleshy, acute or abruptly acuminate, somewhat tapering toward the base, more or less undulate, connate with lateral sepals for up to 15 mm. Lateral sepals up to 105 mm long and 30 mm wide, lanceolate to oblanceolate-oblong, subfleshy, acute or abruptly acuminate, somewhat tapering toward the base, margins undulate. Petals up to 105 mm long and 30 mm wide, oblanceolate-obovate, acute, subfalcate, with more or less undulate margins. Lip up to



115 mm long and 65 mm wide, ovate-elliptic in general outline, with a tubular base, then flabellate spreading in front, very undulate-crispate, bilobed in front with erose denticulate margin, disk with 3 lamellae running from the base to the middle, the median lamella erect, high-carinate, the lateral ones appressed to the disk, on both sides of lamellae veins thickened and barbate. Gynostemium up to 65 mm long, clavate, arcuate, bifalcate, steldia as long as anther (**Figure 14**).

Ecology: Terrestrial in lowland and premontane forest edges. Flowering throughout the year.

Distribution: Ecuador, Colombia. Alt. up to 2000 m.

Conservation status: EOO—LC, AOO—EN.

Representative specimens (**Supplementary Map 12**)—**Ecuador**. Carchi. Approx. 3 km above Maldonado. Alt. 1550 m. *B. Boyle and J. Bradford 1854* (MO!); Maldonado to Chical, km 3. Alt. 1410 m. 30 April 1993. *C.H. Dodson 19084* (RPSC!). Esmeraldas. Lito to San Lorenzo, km 4. Alt. 230 m. 26 March 1994. *C.H. Dodson and G. Carnevali 19235* (RPSC!). Pastaza. Puyo-Napo road. 11–18 October 1975. *P.M. Syngé 9* (K!). Pichincha. near the bridge over the Río Pilaton between Chiriboga and Santo Domingo de

los Colorados. Alt. 1100 m. 1 July 1955, *E. Asplund* 16728 (AMES!); About 65 miles SW of Quito. 12 November 1969. *P. Clark s.n.* (F!); Road Nanegal to Nanegalito. Alt. 1200–1550 m. *G. Harling and L. Andersson* 11571 (GB; AMES!, K–drawing!); Santo Domingo–Quito Road, 8 km northeast of Santo Domingo. Alt. 76 m. 29 July 1980. *R.P. Saulea, M. Ragan, H. Luther, R. Wunderlin, B. Hansen, L. Davenport, and J. Wiersema* 3799 (AMES!, MO!, U!); Route Tandayapa–Nanegalito, Fundacion Maquipucuna, 00°00'S, 78°40'W. Alt. 1400 m. 24 January 1996. *F. Billet and B. Jadin* 6700 (MO!). Zamora–Chinchipe. Cordillera del Cóndor, vertiente occidental. Cuenca del Río Tundayme. Carretera hacia el destacamento militar Condor Mirador. Formacion rocosa arenisca, suelo arenoso. 3°37'48"S, 78°26'50"W. Alt. 1690–2000 m. 21 March 2006. *W. Quizhpe and F. Luisier* 2034 (MO!).

**Colombia.** Chocó. Road between Medellín and Quibdó at km 134.5. 5°46'N, 76°20'W. Alt. 1070 m. 13 April 1983. *T.B. Croat* 55918 (MO!); Carretera Tutunendo–El Carmen. Entre km 135 y 120. Alto Río Atrato. Alt. 800–1200 m. 29 April 1979. *E. Forero, R. Jaramill M., H.Y. Bernal, H. Leon, and M.M. Pulido* 6091 (COL!, P!); Hoya del Río San Juan. Arriba de Palestina, entre Quebrada La Sierpe (Palestina) y Quebrada El Quicharo. 4°10'N, 77°10'W. 27 Mar. 1979. *E. Forero, R. Jaramillo M., L.E. Forero P., and Hernandez N.* 4103 (COL!, MO!); Río Yuto between Lloró and La Vuelta. Alt. 100 m. 18 January 1979. *A. Gentry and E. Renteria* A. 17426 (COL!); Ca 15 km W of Siete. 6 January 1979. *A. Gentry and E. Renteria* A. 23718 (COL!, MO!); Río Yuto between Lloró and La Vuelta. Alt. 100 m. 18 January 1979. *A. Gentry and E. Renteria* A. 24348 (COL!, P!); Hwy. Bolivar–Quibdó, near km 135, 5°50'N, 76°20'W. Alt. 975 m. 28 October 1983. *A. Juncosa* 1122 (MO!, NY!). Valle del Cauca. Mpio Dagua. Corregimiento El Danubio, Alto Anchicaya. Alt. 200 m. 19 June 1984. *W. Devia* A. 568 (MO!); Río Anchicaya near CVC hydroelectric plant, 3°40'N, 76°50'W. Alt. 400–500 m. *A. Gentry* 35656 (COL!, MO!); Carretera from Buenaventura to Cali, km 20. 4 June 1982. *H. Murphy* 573 (COL!, MO!); Along the road El Queremal–La Elsa. On steep slopes. 15 February 2011. *D. Szlachetko, A. Niessen and M. Moreno s.n.* (UGDA–DLSz–spirit!); Between Buenaventura and Cali on old highway, 5 km S of Río Sabaletas along steep soggy bank along road, 3°44'N 76°57'W. Alt. 145 m. 10 February 1990. *T.B. Croat and J. Watt* 70413 (CUVCI, MO!).

This species resembles *Sobralia rosea* but can be distinguished by the flower color—*S. pulcherrima* always has a white lip with broad white margins and the disk is prominently purple-veined. *S. rosea* is always with a narrow, white margin while the whole disk is crimson-purple with white radiating veins. *S. pulcherrima* is limited in distribution to the western foothills of the Andes, while *S. rosea* can be found on the eastern

foothills of the Andes. Both species while pressed and dried out can be separated by the lip details. The lip disk of *S. pulcherrima* has three lamellae running from the base to the middle, and the median one is high-carinate. On the contrary, the lip disk of *S. rosea* from the base to the center is transversed by 5–7 low, parallel ridges, with fine, radiating, white veins in the center.

### 3.1.1.15. *Sobralia rosea* Poepp. & Endl.

Nov. Gen. Sp. Pl. 1: 54, t. 93. 1836. Type (designated by Szlachetko et al.:261. 2020): Peru. *Sine loc.* *E.F. Poeppig* 1076 (Lectotype: W! 47809, Isolectotype: W! 47808).—Schweinfurth. Orchids of Peru 74. 1958.—Garay in Harling & Sparre. Fl. Ecuador. Orchid. 9: 133. 1978.—Szlachetko et al. Materials to the Orchid Flora of Colombia 3: 261. 2020.

=*Sobralia lindenii* Hort., Gard. Chron. 18: 424. 1895. Type: Introduced from tropical America, flowered by *T. Lawrence* in 1894 and *C. J. Lucas* in 1895 (Holotype: K!).

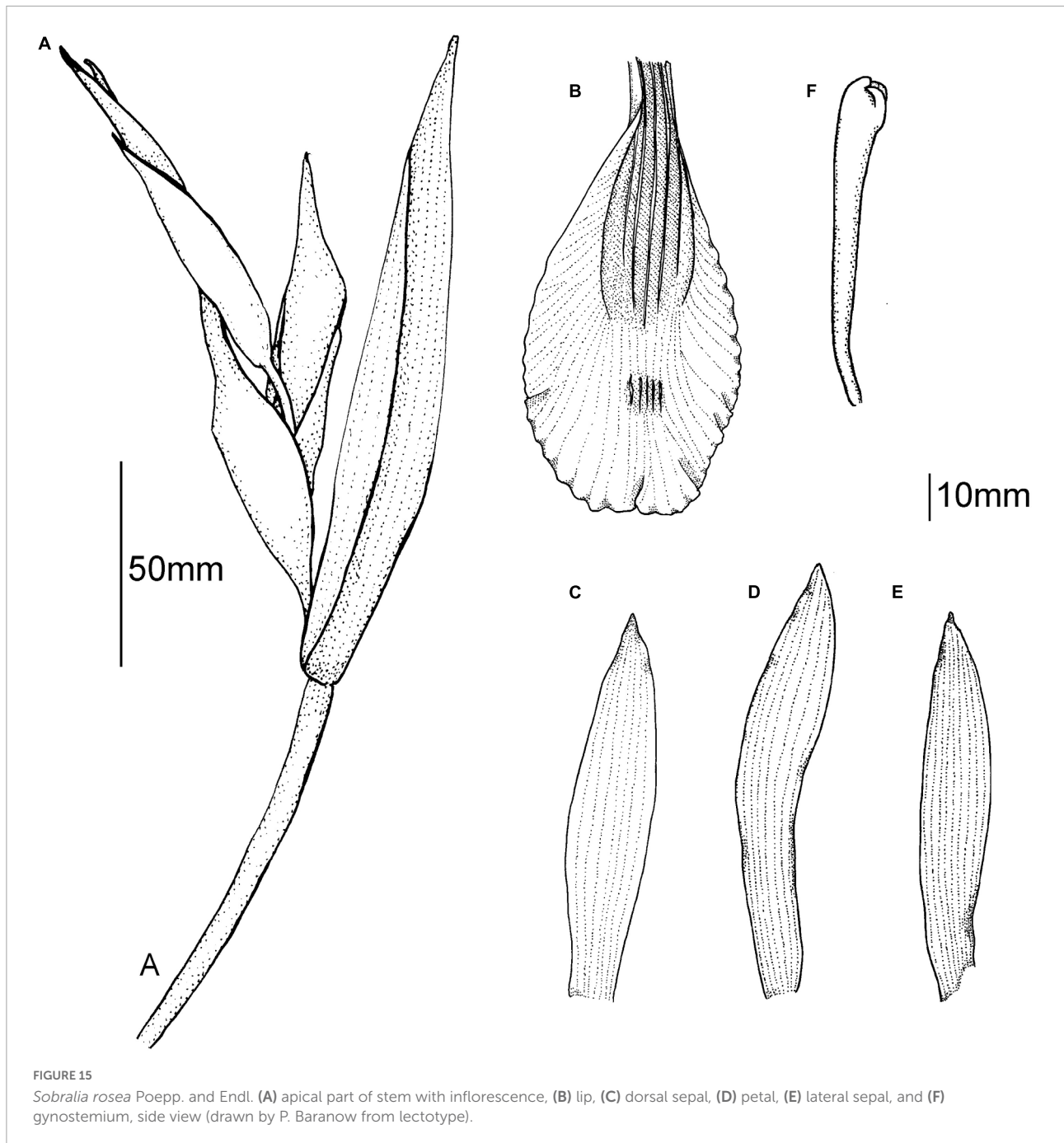
Plants up to 150 cm tall. Stem erect, robust, canelike, leafless below, many-leaved above. Leaves up to 35 cm long and 8 cm wide, lanceolate, long-acuminate, sessile on glabrous sheaths. Inflorescence up to 15 cm long, sessile, few-flowered, flexuosus. Flowers 1 or 2, produced in succession, rather thin in texture, pale rose color, the main disk of lip dark purple–magenta with narrow white margin and transversed by white veins. Floral bracts up to 90 mm, cymbiform, ovate, acute to acuminate. Pedicellate ovary up to 25 mm long, cylindric, glabrous. Dorsal sepal up to 100 mm long and 20 mm wide, narrowly oblanceolate, acute, dorsally fleshy, subulate, basally connate with lateral sepals for up to 10 mm. Lateral sepals up to 100 mm long and 20 mm wide, narrowly oblanceolate, acute, dorsally fleshy, subulate. Petals up to 100 mm long and 25 mm wide, oblanceolate-elliptic, obtuse to acute, with somewhat undulate margin. Lip up to 110 mm long and 55 mm wide, oblong ovate to ovate-elliptic in outline, tubular in a natural position, then expanding in a suborbicular, bilobed, frontal blade, when expanded, from a cuneate base obovate, undulate, crispate in front, retuse to deeply bilobed at apex, disk transversed in center by 5–7 low, parallel ridges which are confluent at base, where on both sides subpubescent or papillose. Gynostemium up to 55 mm long, clavate, arcuate, stielidia shorter than anther (**Figure 15**).

Ecology: Terrestrial in forest edges and steepy river sides. Flowering throughout the year.

Distribution: Ecuador, Colombia, Peru, Brazil. Alt. from sea level up to 3300 m.

Conservation status: EOO—LC, AOO—EN. Representative specimens (**Supplementary Map 13**)—Ecuador. Azuay. Cola de San Pablo, Norriente de Paute en el Río Paute. Alt. 1300 m. 9





March 1985, C. and P. Dodson, C. and J. Luer, and A. Hirtz 15779 (RPSC!). Esmeraldas. Along Río Lita in the vicinity of the village of Lita. Alt. 600–650 m. 8 September 1976, T.B. Croat 38937 (MO!); Km 11 Lita to San Lorenzo. Alt. 760 m. 12 May 1990, C.H. Dodson, A. Gentry, B. Boyle, and D. Rubio 18241 (RPSC!); Along road under construction from Lita to Alto Tambo (21 km). Alt. 750–820 m. 19 May 1987, C.H. Dodson, H. van der Werff, and W. Palacios 17130 (RPSC!). Los

Rios. Quevedo-Latacunga road, km 46 from Quevedo, 79°11'W. 0°55'S. Alt. 600 m. 4 April 1973, L. Holm-Nielsen, S. Jeppesen, B. Lojtnant, and B. Ollgaard 2896 (AMES!, K!, MO!). Carchi. Road Tulcán to Maldonado via Paramo El Angel, km 74. Alt. 1750 m. 1 August 1985, C.H. Dodson and A. Embree 16192 (RPSC!); Between Chical and Peñas Blancas trailside and forest edge, valley of San Juan on Colombia border. Alt. 1100–1250 m. 25 September 1979, A. Gentry and G. Shupp 26476 (MO!).

Cotopaxi. Tenefuerte, km 52 Quevedo-Latacunga. Alt. 800–900 m. 9 April 1984, *C.H. Dodson and W. and M. Thurston 14216* (RPSC!); Tenefuerte. Río Pilalo, km 52–53, Quevedo, Latacunga. Alt. 750–1300 m. 21 February 1982, *C.H. Dodson and A.H. Gentry 12726* (RPSC!). Morona-Santiago. Indanza-Limón (General Plaza). Alt. 1300–1600 m. 23 March 1974, *G. Harling and L. Andersson 12753* (AMES!). Napo. Reserva Biologica Jatun Sacha. Río Napo, 8 km al. E de Misahualli. 1°04'S, 77°36'W. Alt. 450 m. 24 April–5 May 1987, *C.E. Ceron M. 1302* (MO!); Laguna Anangu, N side, 00°31'S, 76°24'W. Alt. 250 m. 25 January 1985, *B. Ollgaard 57158* (MO!). Napo-Pastaza. Valley of Río Pastaza and adjacent uplands. Alt. 1060–1500 m. 17 April 1945, *W.H. Camp E-2382* (AMES!); Mera. 1 March 1940, *H. Lugo M. 7* (B!, MO!). Pastaza. Along the highway between Shell and Mera. Alt. 1000 m. 18 March 1988, *B. Boom and D. Beardsley 8442* (US!); Pastaza Canton, Estacion experimental Pastaza, via Puyo–Macas, Trama km 31.5–33 Puyo Macas, borde del carretero. 1°30'S, 77°56'W. Alt. 1040 m. 16 February 2002, *J. Caranqui, M. Melampy, and J. Lara 399* (MO!); Cantón Arajuno, bosque protector Pablo Lopez del Oglan Alto y Estacion Cientifica de la Universidad Central de Ecuador, 1°19.25'S, 77°41.19'W. Alt. 600 m. 5 March 2006, *C.E. Ceron, C.I. Reyes, and L. Marcelo Vargas 56657* (MO!); Along the road between Puyo and Baños, 2.7 km W of Mera, 4.6 km W of Shell, 1°27'S, 78°50'W. Alt. 1110 m. 5 May 1984, *T.B. Croat 59084* (MO!); Puyo-Puerto Napo road. 25 December 1972, *R.H. Williamse 16* (U!); Hacienda San Antonio Baron von Humboldt, 2.5 km Norte de Mera en carretera a Baños-Puyo. Alt. 1050–1300 m. 23 March 1985, *C.H. Dodson and L.M. Bermeo 15604* (AMES!, K!, MO!); Mara, road cut near Mangayacu. Alt. 1100 m. 28 January 1956, *E. Asplund 19085* (AMES!, B!, K!); Hacienda San Antonio Baron von Humboldt, 2 km al. Norte de Mera, 1°27'S, 78°06'W. Alt. 1100 m. 20 February 1985, *W. Palacios, M. Baker and J. Zaruma 62* (RPSC!). Pichincha. El Chaupi, along the road to Iliniza. Alt. 3300 m. 19 April 1967, *B. Sparre 15645* (US!); Los Rios. Km 90, Camino Viejo via Chiriboga, Quito-Santo Domingo. Alt. 1100 m. 7 April 1984, *C.H. Dodson and W. and M. Thurston 14173* (RPSC!); along the river just outside the town of Mindo on the new road to Liloa. Alt. 1300 m. *C.H. Dodson, E. Hagsater, and A. Hirtz 16669* (RPSC!); Km 40–51 on road Santo Domingo de los Colorados-Quito, forested slopes along Río Pilaton, 0°55'S, 78°55'W. Alt. 1100–1400 m. 14 June 1973, *L. Holm-Nielsen, S. Jeppensen, B. Lojtnant, and B. Ollgaard 7154* (AMES!). Sucumbíos. Río San Miguel o Sucumbios, Santa Rosa y los alrededores. Alt. 380 m. 7–8 April 1942, *R.E. Schultes 3559* (COL!); Tungurahua. Río Verde Grande. Alt. 1500 m. 30 March 1956, *E. Asplund 20049* (AMES!); Baños-Puyo, km 35. 1°24'S, 78°12'W. Alt. 1170 m. 11 February 1978, *P. Bamps 6232* (MO!); Between Baños and Río Verde. Alt. 1680 m. 29 April 1951, *P. R. Bell 812* (BM!); Valley of Pastaza River, between Baños and Cashurco, 8 h east of Baños. Alt. 1300–1800 m. 25 September 1923, *A.S. Hitchcock 21754* (AMES!, US!); Río Estancias, near Río Negro, southern

side of Río Pastaza, 3 March 1969, *H. Lugo S. 621* (AMES!, MO!); Along Pastaza River below Machay. Alt. 1350 m. 18 March 1939, *C. W. Penland and R.H. Summers 113* (AMES!); Río Verde. 21 April 1971, *H. Lugo S. 1770* (AMES!, MO!); Along road from Baños to Puyo from Río Blanco to Puyo. Alt. 700–1800 m. 23 February 1963, *L.B. Thien 2302* (F!). Zamora-Chinchipe. Road Loja-Zamora, km 54, 78°59'W. 4°02'S. Alt. 1300 m. 18 April 1973, *L. Holm-Nielsen, S. Jeppesen, B. Lojtnant, and B. Ollgaard 3774* (AMES!, K!, MO!); Río Negro, Rd. Baños-Puyo. Alt. 1500 m. 15 October 1984, *C.H. and P.M. Dodson, and A. Hirtz 15370* (RPSC!); Road Loja to Zamora, km 48. Alt. 1400 m. 17 May 1867, *B. Sparre 16344* (US!). Zamora-Chinchipe. Road Loja-Zamora, El Retorno-Zumbi. Alt. 1000 m. May 1985, *D. Dalessandro 460* (RPSC!). **Colombia.** Antioquia. Hillsides near Puente Linda, 5 km above Río Samana. Alt. 1000 m. 26 July 1960, *F.A. Barkley and G. Gutierrez V. 35345* (AMES!); Río Grande. April 1947, *Bro Daniel 4000* (US!). Cauca. El Tambo, Parque Nacional Natural Munchique, vereda La Romelia, la Gallera. Alt. 2835 m. 26 July 1993, *C. Barbosa et al. 8588* (COL!, MA!). Chocó. Río San Juan, cercenias de Palestina. Alt. 5–50 m. 12–14 March 1944, *J. Cuatrecasas 16942* (AMES!, F!); Km 55 de la carretera Ansermanueve-San José del Palmar. Alt. 1700–1950 m. 19 March 1980, *G.C. Lozano and J. Diaz 3229* (COL!, F!). Nariño. Mpio Tumaco. La Guayacana. 27 June 1951, *R. Romero Castañeda 2909* (COL!, MO!). Mpio. Barbacoas. Chucunes via La Planada a 1 km antes de llegar a la reserve. Alt. 1800 m. 10 March 1995, *G. Lozano, J.L. Fernandez Alosno, and E. Morales 6878* (COL!); Mpio. Barbacoas. Correg. Junin. Via Junin-Barbacoas. Alt. 960–1100 m. 14 March 1995, *G. Lozano, J.L. Fernandez Alosno, and E. Morales 6977* (COL!); Barbacoas. Corregimiento Santander (Buenavista) a Barbacoas (Vertiente del Río Telembi). Alt. 840 m. 3–5 August 1948, *H. Garcia Barriga 13188* (COL!); Km 68 del Ferrocarril Tumaco-El Diviso. 28 July 1952, *R. Romero Castañeda 3334* (COL!); Frontera Colombo-Ecuadoriana. Selva higrofila del Río San Miguel. Margenes del Río entre los afluentes Churruyaco y Bermejil. Alt. 350–400 m. 12 December 1940, *J. Cuatrecasas 11015* (COL!). Putumayo. Valle de Sibundoy. Alt. 2500–3000 m. 1963, *C. Krauss 51* (COL!); Río Pepino, carretera a 10 km de Mocoa. Bosque alto. Alt. 850 m. 6 January 1957, *M. Ospina H. 117a* (COL!); Margenes del Río Guamues entre San Antonio y la desembocadura, 20 December 1940, *J. Cuatrecasas 11220* (COL!); Vertiente oriental de la cordillera, entre Sachamates y San Francisco de Sibundoy, Planada de Minchoy. Alt. 2100 m. 30 December 1940, *J. Cuatrecasas 11439* (F!, US!); Entre San Francisco y El Pepino. Alt. 1900–2400 m. 2 August 1961, *A. Fernandez-Perez 5853* (COL!); Mpio Villa Garzón. Carretera a Puerto Asis. 1°10'N, 76°34'W. Alt. 1350 m. 3–4 May 1994, *J.L. Fernandez A., A. Camero, and E. Mesa 11467* (COL!, MO!); Río Pepino, carretera a 10 kms de Mocoa. Alt. 850 m. 6 January 1957, *M. Ospina H. and J.M. Idrobo 117* (AMES!); Mpio. Mistrató. Hacia San Antonio del Chami. Quebrada Sutu y Empalados. Alt. 1700–1800 m. 26 April 1992, *G.C. Lozano*

and *Estudiantes Introduccion Systematica* 6382 (COL!); Cerro de Portachuelo, entre Mocoa y Sacchamates. Alt. 1600–2000 m. 9 December 1942, R.E. Schultes and C.E. Smith 3049 (COL!, K!, NY!, US!). Valle del Cauca. Costa del Pacifico, Río Cajambre, Barco. Alt. 5–80 m. 21–30 April 1944, J. Cuatrecasas 17250 (AMES!, COL!, F!); Chichito, Western Cordillera. Alt. 1600 m. November 1937, E. Dryander 1994 (US!); Wooded cliffs of Río Dagua. Alt. 80–100 m. 6–8 May 1922, E.P. Killip 5057 (AMES!, NY!); Boca del Lobo, Buenaventura Bay. 9 June 1944, E.P. Killip and J. Cuatrecasas 38985 (F!, US!); Km 80 Cali-Buenaventura. Alt. 350 m. 1 July 1965, C.H. Dodson and H. Hills 3215 (F!); Cerca a la Elsa. Alt. 1250 m. 5 August 1966, S. Espinal T. 1903 (AMES!, CUVC!); Queremal, Crece el Saludos. 20 January 1980, I. Guarín O. 63 (COL!); New road Cali-Buenaventura, La Pesuõa, 14 February 2011, D. Szlachetko, C. Uribe, and M. Moreno 9036 (UGDA-DLSz-spirit!). **Venezuela.** Táchira. Between la Providencia and San Vicente de la Revancha, southwest of Santa Ana. Alt. 1650 m. 8 January 1968, J.A. Steyermark and G.C.K. and E. Dunsterville 100533 (AMES!). **Peru.** Amazonas. Bagua Prov. Yamayakat bosque de Rivera. 4°55'S, 78°19'W. Alt. 320 m. 31 January 1996, N. Jaramillo, M. Jaramillo, and D. Chamit 1024 (MO!); Bagua Distr. Aramango, Soldado Oliva, 5°18'S, 78°20'W. Alt. 600 m. 6 February 1999, R. Vasquez, C. Vargas C., J. Yactayo, and E. Palomino 26046 (MO!); Central Cordilleras of the Andes. Alt. 2700–3300 m. 30 March 1938, L. Williams 7603 (AMES!, F!). Cusco. Marcapata. Alt. 2000 m. 24 July 1957, C. Vargas C. 1168 (CUZ, F!); Cardena. Alt. 1020 m. 29–30 July 1946, C. Vargas C. 6194 (F!); Maniri. Alt. 1200–1900 m. 8 December 1962, C. Vargas C. 14064 (CUZ, F!). Huánuco. Cuchero, *Sine loc.* 1829, E.F. Poeppig s.n. (W! 47810); Bajando de Carpish a Tingo María. Alt. 2700–2900 m. 5 March 1947, R. Ferreyra 1817 (AMES!). Huánuco. Pampayacu. Hacienda at mouth of Chinchad Rio, Alt. 3500', 19–25 July 1923, J.F. Macbride 5017 (F!). Junin. Colonia Perené. Alt. 680 m. 30 March 1938, E.P. Killip and A.C. Smith 24948 (AMES!, F!, US!); Satipo Prov. Gran Pajonal, Chequitavo, 10°45'S, 74°23'W. Alt. 1200 m. 27 March 1984, D.N. Smith 6544 (MO!); Prov. Huánuco, Highway La Oroya-Tingo María, km 66 east of Huánuco. Alt. 1620 m. 8 March 1977, J.D. Boeke 1167 (MO!). Oxapampa. Cueva Grande, Estacion near Pozuzo. Alt. 3500', 23 June 1923, J.F. Macbride 4804 (F!). San Martín. Boqueron Pass, 92 km from Tingo María on highway to Pucallpa. Alt. 400 m. 16 December 1949–5 January 1950, H.A. Allard 2755 (US!); Tingo María. Alt. 625–1100 m. 30 October 1949–19 February 1950, H.A. Allard 22567 (US!); Across Río Tocache from Tocache Nuevo, road to Juanjuí. Alt. 500 m. 16 July 1982, A. Gentry, D. Smith and R. Tredwell 37640 (MO!); near Mayobamba. Alt. 1200–1600 m. March 1934, G. Klug 3602 (AMES!, F!, K!, MO!); Prov. Rioja, Rioja, Salida a Mashoyacu-Shucaqai. Bosque protection Amto Mayo, Toma de Agua, Quebrada Cuchachi, Alt. 1000 m. 15 July 1995, I. Sanchez Vega 8052 (F!); Prov. Mariscal Cáceres Dtto. Tocacho Nuevo (Muyuna de Huayrurillo) (margen derecha del Río Huallaga), 10

March 1971, J. Schunke V. 4753 (B!, F!, US!); Mariscal Cáceres, Tocache Nuevo. Camino al Caserío de Santa Rosa de Mishollo, 4 km de Puerto Pizana, 20 May 1971, J. Schunke V. 4916 (F!); San Roque. Alt. 1350–1500 m. January–February 1930, L. Williams 7795 (F!).

When *Sobralia lindeni* was described in 1895 from cultivated material upon which the description was based represented undoubtedly *S. rosea*. As a matter of fact, because of the great similarity in the general appearance of this species and *S. pulcherrima* the two have been combined in *Lindenia* in 1897 under *S. lindeni* as representing two distinct forms, those with white flowers and those with pale lilac or rose-colored flowers. The white-flowered form is the true *S. pulcherrima* (Garay, 1978).

## 3.2. Incertae sedis

### 3.2.1. *Sobralia augusta* Hoehne

Arq. Bot. Estado São Paulo 1: 128. 1944. Type: Brazil. Mato Grosso, Rio Juruena, Salto augusta, February 1912, F.C. Hoehne 5349 (SP).

The only material devoted to *S. augusta* that we could study is the drawing published in *Flora Brasílica* (Vol. XII, Table 51). Based on the illustration, we can suspect, that taxon is a synonym of *S. liliastrum*. However, until the type material will be available for analysis, we decide not to change its taxonomic status.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Author contributions

PB: herbarium material revision, data gathering, analysis of distribution, manuscript writing, figures, and maps. DS: herbarium material revision, data analysis, and manuscript writing. PK: analysis of the results and manuscript writing and editing. All authors contributed to the article and approved the submitted version.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fevo.2022.1058334/full#supplementary-material>

## References

- Bachman, S., Moat, J., Hill, A., de la Torre, J., and Scott, B. (2011). Supporting red list threat assessments with GeoCAT: Geospatial conservation assessment tool. *ZooKeys* 150, 117–126. doi: 10.3897/zookeys.150.2109
- Baranow, P. (2015). Taxonomic notes on *Sobralia* section abbreviatae (Orchidaceae) in colombia, with description of a new species. *Plant Syst. Evol.* 301, 41–60. doi: 10.1007/s00606-014-1053-5
- Baranow, P., and Szlachetko, D. L. (2016). The taxonomic revision of the *Sobralia* ruiz & pay. (Orchidaceae) in the guyanas (Guyana, Suriname, French Guiana). *Plant Syst. Evol.* 302, 333–355. doi: 10.1007/s00606-015-1266-2
- Baranow, P., Dudek, M., and Szlachetko, D. L. (2017). *Brasolia*, a new genus highlighted from *Sobralia* (Orchidaceae). *Plant Syst. Evol.* 303, 853–871. doi: 10.1007/s00606-017-1413-z
- Baranow, P., Rojek, J., Dudek, M., Szlachetko, D., Bohdanowicz, J., Kapusta, M., et al. (2022). Chromosome number and genome size evolution in *brasolia* and *sobralia* (Sobralieae, Orchidaceae). *Int. J. Mol. J. Sci.* 23:3948. doi: 10.3390/ijms23073948
- Brieger, F. G. (1983). "Subtribus sobraliinae," in *Die orchideen I*, Vol. 13, eds F. G. Brieger, R. Maatsch, and K. Senghas (Lieferung: Verlag Paul Parey), 780–800.
- Dodson, C. H. (1998). New orchid species and combinations from ecuador, fascicle 6. *Orquideologia* 21, 3–60.
- Dressler, R. (2002). The major sections or groups within *Sobralia*, with four new species from Panama and Costa Rica, *S. crispissima*, *S. gloriana*, *S. mariannae* and *S. nutans*. *Lankesteriana* 5, 9–15. doi: 10.15517/lank.v2i3.23088
- Dressler, R. L., Blanco, M. A., Pupulin, F., and Neubig, K. M. (2011). Proposal to conserve the name *Sobralia* (Orchidaceae) with a conserved type. *Taxon* 60, 907–908. doi: 10.1002/tax.603030
- Dunsterville, G. C. K., and Garay, L. A. (1959). *Venezuelan orchids illustrated 1*. London: Andre Deutsch.
- Garay, L. A. (1978). "Orchidaceae (cyripedioideae, orchidoideae, neottioideae)," in *Flora of ecuador* 9, eds G. Harling and B. Sparre (Göteborg: University of Göteborg and Swedish Museum of Natural History), 1–305.
- IUCN (2022). *The IUCN red list of threatened species. Version 2022-1*. Available online at: <https://www.iucnredlist.org> (accessed November 20, 2022).
- Kolanowska, M., Tsiftsis, S., Dudek, M., Konowalik, K., and Baranow, P. (2022). Niche conservatism and evolution of climatic tolerance in the neotropical orchid genera *Sobralia* and *Brasolia* (Orchidaceae). *Sci. Rep.* 12:13936. doi: 10.1038/s41598-022-18218-4
- Lindley, J. (1854). *Folia orchidacea, sobralia*. London: J. Matthews.
- Neubig, K. M., Whitten, W. M., Blanco, M. A., Endara, L., Williams, N. H., and Koehler, S. (2011). Preliminary molecular phylogenetics of *Sobralia* and relatives (Orchidaceae: Sobralieae). *Lankesteriana* 11, 307–317. doi: 10.15517/lank.v11i3.18286
- Pridgeon, A. M., Cribb, P., Chase, M. W., and Rasmussen, F. N. (2006). *Genera orchidacearum, epidendroideae*, Vol. 4, Part 1. Oxford: Oxford University Press.
- Reichenbach, H. G. (1873). *Xenia orchidacea*, Vol. 2. Leipzig: F. A. Brockhaus.
- Romero-González, G. A. (2003). The *Sobralia liliastrum* (Orchidaceae: Sobraliinae) complex in the venezuelan guyana. *Harvard Pap. Bot.* 8, 115–129.
- Schlechter, R. (1920). Die orchideenfloren der südamerikanischen kordillerenstaaten II. Colombia (II. Beschreibungen neuer arten). *Repert. Spec. Nov. Regni Veg. Beih.* 7, 37–161.
- Schlechter, R. (1924). Beiträge zur orchideenkunde von Colombia. I. orchidaceae hoppiana. *Repert. Spec. Nov. Regni Veg. Beih.* 27, 5–123.
- Schlechter, R. (1929). Figuren-Atlas zu den orchideenfloren der südamerikanischen kordillerenstaaten. *Repert. Spec. Nov. Regni Veg. Beih.* 57, 1–142.
- Szlachetko, D. L., Kolanowska, M., Baranow, P., and Dudek, M. (2020). *Materials to the orchid flora of colombia, orchidaceae, spiranthoideae – Cranichideae, vanilloideae*, Vol. 3. Glashütten: Koeltz Botanical Books.
- Thiers, B. (2022). *Index herbariorum: A global directory of public herbaria and associated staff*. New York Botanical Garden's Virtual Herbarium. Available online at: <http://sweetgum.nybg.org/science/ih/>; [www.natureearthdata.com](http://www.natureearthdata.com); [www.qgis.org/pl/](http://www.qgis.org/pl/)

### SUPPLEMENTARY MAP 1

Distribution map of *Sobralia paradisiaca* Rchb.f.

### SUPPLEMENTARY MAP 2

Distribution map of *Sobralia chrysantha* Lindl.

### SUPPLEMENTARY MAP 3

Distribution map of *Sobralia liliastrum* Lindl.

### SUPPLEMENTARY MAP 4

Distribution map of *Sobralia elisabethae* R. H. Schomb.

### SUPPLEMENTARY MAP 5

Distribution map of *Sobralia granitica* G.A. Romero & Carnevali.

### SUPPLEMENTARY MAP 6

Distribution map of *Sobralia gambitana* Baranow, Szlach. & Kindlmann.

### SUPPLEMENTARY MAP 7

Distribution map of *Sobralia luerorum* Dodson.

### SUPPLEMENTARY MAP 8

Distribution map of *Sobralia gloriosa* Rchb. f.

### SUPPLEMENTARY MAP 9

Distribution map of *Sobralia ruckeri* Linden & Rchb.f.

### SUPPLEMENTARY MAP 10

Distribution map of *Sobralia tamboana* Dodson.

### SUPPLEMENTARY MAP 11

Distribution map of *Sobralia hoppii* Schltr.

### SUPPLEMENTARY MAP 12

Distribution map of *Sobralia pulcherrima* Garay.

### SUPPLEMENTARY MAP 13

Distribution map of *Sobralia rosea* Poepp. & Endl.