

**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***

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RESUMEN. Se presenta una discusión de las secciones o grupos de *Sobralia*, basada en las secciones nombradas por Brieger. Se describen cuatro especies nuevas de Panamá y Costa Rica: *S. gloriana*, una especie escasa y muy llamativa del área de El Valle de Antón, pariente de *S. atropubescens* pero de flores más grandes y de coloración amarilla; *S. mariannae*, una planta pequeña del bosque nuboso de Cerro Jefe, con flores blancas y pelos gruesos en el labelo; *S. crispissima*, pariente cercana de *S. lindleyana*, que se extiende desde Panamá hasta el sur de México, y *S. nutans*, una especie distintiva de la Sección *Globosae*, de Panamá.

ABSTRACT. The sectional classification of *Sobralia* is discussed, based on a system proposed by Brieger, and four new species of *Sobralia* are described from Panama and Costa Rica, *S. crispissima*, *S. gloriana*, *S. nutans* and *S. mariannae*.

Sobralia is a conspicuous element in the orchid flora of the American tropics that remains poorly known. The delicate, ephemeral flowers are often showy, but unless they are prepared carefully and dried quickly they make very poor pressed specimens. Even flowers in alcohol may disintegrate with time. Since botanical classification is traditionally based on dried material, *Sobralia* has been much neglected. To achieve a better understanding of this group, we should, ideally, study living material. The sectional classification is here discussed, and four new species from Panama and Costa Rica are described.

THE SECTIONS AND GROUPS WITHIN *SOBRALIA*

Lindley (1854) divided *Sobralia* into 3 sections, A, B and C. Reichenbach (1873) used the Sections *Eusobralia* and *Brasolia* for two South American groups, but the selection of *S. dichotoma* Ruiz & Pavón as lectotype of the genus by Angely (1973: p. 1268) nullified this and made Section *Brasolia* Rchb.f. a synonym of Section *Sobralia*. Now, Brieger (1983) has published some additional sectional names, and names are now available at least for the three main groups listed by Lindley. Brieger's names are validly published and clearly typified, but there are several species and complexes that do not fit well in Brieger's classification. It might be premature to publish new sectional names at this time. That can wait until we have information on phylogeny from

molecular studies.

Brieger separates Sections *Sobralia* and *Racemosae* by the position of the inflorescence, lateral in Sect. *Sobralia* and terminal in *Racemosae*. However, one may sometimes find both terminal and upper lateral inflorescences on the same stem. Dr. Dodson suggests the relative bract length as a much better and clearer way to distinguish what appear to be two distinct groups (pers. comm.).

Brieger (1983) creates a section *Intermediae* for *S. fragrans* Lindl., but that species seems closely allied to *S. bletiae* Rchb.f., *S. mucronata* Ames & C. Schweinf. and others, so I tentatively apply the name *Intermediae* to a complex of species with smaller flowers and inflorescences. Brieger includes *S. crocea* (Poepp. & Endl.) Rchb.f. in Sect. *Globosae*, but it is very unlike *S. candida*, so I place it with the *Intermediae* for now.

It should be noted that the photograph labelled as *S. fragrans* in Brieger (1983), is actually *S. callosa* L.O. Williams, treated by Brieger as *Lindsayella amabilis*, while the photograph labelled as *S. candida* could well be *S. fragrans*.

The Section *Abbreviatae* is much the largest group, with perhaps 50 known species.

As here delimited, the members of *Sobralia* Section *Globosae* have narrow, acuminate leaves, the column is very narrow basally, and the bract cluster increases in length as flowers are produced, often

reaching 3-4 cm in length. This group includes only a few species, treated in more detail below.

Sobralia luteola Rolfe, with a very condensed raceme, may be allied to Section *Intermediae*, though the inflorescence is strikingly different. *Sobralia macrophylla* Rchb.f. and its allies, with the bract cluster largely hidden, may not be a phylogenetic group, though the plants are easily recognized, with or without flowers. *Sobralia undatocarinata* C. Schweinf. and its allies, with loose bract clusters and 2-5 relatively durable flowers produced simultaneously, is quite distinctive, and a few close allies remain to be named. Both *S. amabilis* (Rchb.f.) L.O.

Williams and *S. callosa* (*Lindsayella amabilis*) are superficially similar and probably pollinated by hummingbirds, but they are very distinct in their details. Indeed, *S. callosa* has pollinia very like those of *Elleanthus*, and may have the best claim to generic status of any of the anomalous groups.

Ames and Schweinfurth (1937) emphasized the basal callus as being similar to the basal calli of *Elleanthus*, but nearly all species of *Sobralia* have a callus or a pair of calli at the base of the lip, on which the base of the column appears to rest; of course, the basal calli of *Sobralia* may well be homologous with those of *Elleanthus*.

SUMMARY OF SECTIONS, ANOMALOUS GROUPS AND SPECIES

1. Inflorescence racemose, with prominent internodes
 2. Floral bracts shorter than pedicel and ovary Section *Sobralia* [Type: *S. dichotoma* Ruiz & Pavón, aprox. 13 species]
 2. Floral bracts longer than pedicel and ovary Section *Racemosae* Brieger [Type: *S. rosea* Poepp. & Endl., aprox. 8 species]
1. Inflorescence condensed, with very short internodes
 3. Rachis of inflorescence conic, exposed, with flowers and buds exposed simultaneously *S. luteola*
 3. Rachis of inflorescence concealed by bracts, the bracts forming a cone-like structure
 4. Bract clusters continuing growth, flowering over long period
 5. Bract clusters growing in length Section *Globosae* Brieger [Type: *S. candida* (Poepp. & Endl.) Rchb.f., 3-4 species]
 5. Bract clusters growing in girth *S. valida*
 4. Bract clusters flowering only one season, not enlarging appreciably after flowering starts
 6. Bract clusters basally concealed by sheaths of inflorescence bracts (upper leaves); the exposed apices of floral bracts wide, obtuse or retuse *S. macrophylla* complex
 6. Bract clusters basally concealed or not; apices of floral bracts narrow, acute or acuminate
 7. Bract clusters 3-6 cm
 8. Bract clusters compact, usually producing 1 flower at a time; tube of lip subequal to blade or longer Section *Abbreviatae* Brieger [Type: *S. fimbriata* Poepp. & Endl., 45-50 species]
 8. Bract clusters loose, often producing 2-several flowers simultaneously; tube of lip much shorter than blade
 9. Lip with conspicuous undulate keels; all flowers at once, lasting 3-4 days *S. undatocarinata* complex (3-5 species)
 9. Lip without conspicuous, undulate keels; flowers ephemeral, 1-2 at a time *S. amabilis*
 7. Bract clusters less than 2 cm, usually producing 1 or 2 flowers at a time
 10. Pollinia flattened, without distinct caudicles Section *Intermediae* Brieger [Type *S. fragrans* Lindl., 10-15 species]
 10. Pollinia obovoid, attached to distinct caudicles *S. callosa* (*Lindsayella amabilis*)

NEW SPECIES

Sobralia crispissima Dressler, sp. nov. FIG. 1

HOLOTYPE: PANAMÁ. Chiriquí: al oeste de Volcán, carretera a Río Sereno; alt. 1200 m; 25 ago. 2001, sépalos y pétalos blancos, labelo amarillo-anaranjado con manchas rojas. A. Maduro & E. Olmos 223 (MO, Isotypes, PMA, FLAS).

Sobraliae lindleyanae Rchb.f. similis, foliis majoribus et floribus brevioribus, labello margine valde undulato (crispo), marginibus falcatis appendicibus columnae integris dignoscenda.

Roots 6-8 mm in diameter; stems 20-40 cm, ca. 5 mm wide, slightly compressed; sheaths striate; leaves 5 or 6, 9-14 x 3.5-5.4 cm, ovate, slightly attenuate, acute; inflorescence terminal, with floral bracts con-

cealed in infundibuliform sheaths of inflorescence bracts (upper leaves with reduced blades) with 1 or 2 additional reduced blades of floral bracts exposed, blade of lower inflorescence bract 7-11.5 x 2.2-3.5 cm, blade of upper inflorescence bract ca. 2.5 x 2 cm; *ovary* and pedicel ca. 20 mm. Sepals and petals white, lip orange-yellow with red spots; *sepals* 3.5-4.5 x 0.9-1.2 cm, oblong or oblong-ob lanceolate, apiculate; *petals* 3.5-4.5 x 1-1.5 cm, oblong-ob lanceolate, obtuse or apiculate; *lip* 3-4 x 3-3.8 cm, broadly obovate, emarginate, blade strongly reflexed to near middle of tube, with a single rounded basal callus ca. 4.5 x 4 mm, pilose distally, with 3 low ventral keels basally, margin of blade strongly crisped-undulate; *column* ca. 1.8 cm, with porrect, falcate arms (or "wings").

Sobralia lindleyana Rehb.f. is common as terrestrial or lithophyte in the Llanos del Volcán, north of Hato del Volcán. This new and related species was recently found to the west of Volcán, in forested areas, and very similar plants without flowers were found to the east, usually growing epiphytically. When I noted that this species resembled *S. lindleyana*, Erick Olmos said "No, *S. lindleyana* is the species in the Llanos, its leaves are smaller and the flowers larger," which nicely summarizes the differences between these species. Reichenbach's drawing of *S. lindleyana* is suggestive of *S. crispissima*, but the type specimen is clearly the familiar species of the Llanos. The flowers of *S. crispissima* are somewhat smaller than those of *S. lindleyana*, and the tube is proportionately shorter. These plants may be distinguished from *S. lindleyana* by the following key.

- 1. Leaves 5-6 cm long; sepals and petals 5.5-6 cm long; tube of lip subequal to sepals and petals; blade of lip spreading, but not reflexed; column arm serrate-dentate dorsally *S. lindleyana*
- 1. Leaves 10-14 cm long; sepals and petals 3.5-5 cm long; tube of lip distinctly shorter than sepals and petals; blade of lip reflexed, reaching the middle of the tube; column arm entire dorsally *S. crispissima*

The epithet *crispissima* refers to the strongly wavy margins of the lip.

PARATYPES: MÉXICO. Chiapas: Ocosingo, ca. 8.5 km del camino Monte Líbano-Nahá, tomando el camino a Villa las Rosas y El Pozo Ocotol (PEMEX), aprox. 87.2 km al E de Ocosingo, ca. 940 m, 16°55'N, 91°33'W, Selva mediana perennifolia, de montaña con *Talauma*, *Quercus* y *Terminalia*, sépalos y pétalos blancos, labelo amarillo con manchas

café-rojizo, fecha de colecta 7 ago 1992, prensado de material cultivado 24 sept. 1997, M. A. Soto, R. Solano y L. Izquierda 6958 (AMO, FLAS). NICARAGUA. Jinotega: Cerro Grande, elev. 3950 ft., Nov., A. A. Heller 1314 (SEL); Matagalpa: Finca Bavaria, 4100 ft., A. A. Heller 4980 (SEL). COSTA RICA. Cartago: below Pavones on road from Turrialba to Siquirres, 25 Aug. 1963, C. H. Dodson 2516 (SEL).

Sobralia (Abbreviatae) gloriana Dressler, sp. nov.

FIG. 2, 3

HOLOTYPE: PANAMA. Coclé: Area de El Valle de Antón, Alt. 800-1000 m. 23 julio 2001, sépalos y pétalos amarillo pálido, bañados por rojo-castaño, bordes y vena media amarillos, labelo rojo-rosado con borde rosado pálido y quillas amarillas. A. Maduro & E. Olmos 212 (MO, Isotype PMA).

Herba epiphytica foliis ellipticis, floribus ab glomere bractearum conico-ellipsoideo productis, luteis, sepalis petalisque castaneo-ferrugineo aspersis, sepalis ellipticis vel lanceolato-ellipticis, petalis oblongo-lanceolatis, labello obovato quinque carinis humilis ornato.

Roots 3-5 mm in diameter; *stems* 20-80 cm, 2.5-4 mm wide, slightly compressed; *sheaths* striate, with very short bristles to ca. 0.5 mm on both sheaths and stem; *leaves* several, 8.5-11 x 3.7-4.3 cm, elliptic, short-acuminate, strongly plicate; sheaths verruculose; *inflorescence* terminal, bract cluster ellipsoid, ca. 3 x 0.8 cm, largely concealed by sheaths of upper leaves (or foliar bracts); *ovary* and pedicel 20-25 mm; Sepals and petals pale yellow, flushed with purplish brick red, sepals with yellow median stripe, petals with broader median stripe and yellow margins, lip dull purple with yellow keels in throat; *sepals* 5-6 x 1.4-1.8 cm, elliptic or lance-elliptic, apiculate; *petals* 4-5 x 1.6-1.8 cm, oblong-ob lanceolate; *lip* 5.2-6.2 x 3.5-4 cm, cuneate, obovate, basal ridges 9 x 2 mm, with 5 low ventral keels, 3-4 of these reaching nearly to apex, margin distally undulate; *column* 2.6-3.2 cm.

When I first saw this attractive *Sobralia*, I thought it might be a natural hybrid between *S. atropubescens* and some other species with yellow or white flowers. Now several plants of this kind have appeared, all from the area of El Valle de Antón, and it is surely a distinct species, though not very common. It is evidently related to *S. atropubescens*, but the flowers are larger and much more attractive with a distinct color



FIGURE 1. *Sobralia crispissima* Dressler. Flower, from the type locality. Photograph by K. Dressler.



FIGURE 2. *Sobralia gloriana* Dressler. A flower, Finca Drácula, Panama. Photograph by K. Dressler.



FIGURE 3. *Sobralia gloriana* Dressler. A flower cultivated in Florida. Photograph by K. Dressler.



FIGURE 4. *Sobralia mariannae* Dressler. A flower, somewhat faded, Cerro Jefe, Panama. Photograph by K. Dressler.



FIGURE 5. *Sobralia nutans* Dressler. Several inflorescences, some now form part of *Maduro y Olmos* 236, Bocas del Toro, Panamá. Photograph by K. Dressler.



FIGURE 6. *Sobralia nutans* Dressler. Flower, El Valle Chiquito, near El Valle de Antón, Panama. Photograph by E. Olmos.

pattern. One hopes that it will be propagated from seed, and become more widely available for orchid collections and gardens.

The epithet *gloriana* honors Licenciada Gloria Maduro, the charming wife of Andrés Maduro. Since she was foolish enough to marry a rabid orchid nut, she deserves, at the very least, that there be an attractive new species named in her honor.

Sobralia (Intermediae) mariannae Dressler, *sp. nov.*

FIG. 4

HOLOTYPE: PANAMA. Panamá, Cerro Jefe, flowered in cult. 24 May 2002, epiphyte, flower white, callus yellow, brown at base, fragrant, *R. L. Dressler 6352*, (MO).

Herba epiphytica caule supra medium foliato, foliis ovatis acuminatis, inflorescentia pedunculo superposita, sepalis oblongis, petalis ellipticis, labello obovato sex carinis trichomatibus crassiusculis quasi digitiformibus ornatis.

Epiphytic or terrestrial, caespitose, *roots* 1.5-2.5 mm, *stems* 28-60 x 0.15-0.2 cm. *Leaves* 4.5-7 x 1.5-2 cm, elliptic-ovate, acuminate, closely spaced at mid-stem and more widely spaced above; sheaths verrucose. *Inflorescence* terminal, with a reduced foliar bract (sometimes two) 2-3 x 0.8-1.6 cm whose inflated sheath covers much of the bract cluster; bract cluster 2-2.5 x 0.4-0.5 cm, about half concealed by sheath of foliar bract, bracts glabrous; *ovary* and pedicel 15-22 mm; flower white, callus yellow, brown at base; *dorsal sepal* 2.7 x 0.67 cm, oblong, apiculate; *lateral sepals* 2.5 x 0.85 cm, oblong-elliptic; *petals* 2.3-2.4 x 0.8 cm, elliptic, acute or apiculate; *lip* 2.5 x 2.1 cm, broadly obovate, 3-lobed distally, with 1 rounded basal callus, 6 yellow keels from base, these short-pilose, reaching near apex, midlobe 6 x 11 mm, retuse; *column* c. 8 x 3 mm.

This species is frequent in the cloud forest on Cerro Jefe. Until recently, we had only a field-collected plant in which the flowers are poorly preserved, but we have found a single flower *in situ* (photo) that was preserved in alcohol, permitting a much more complete description. Even without flowers, the plants are very distinctive, with the leaves closely spaced at mid-stem (1-3 cm apart), with a much longer internode (6-10 cm) above. This species, then, has a distinct peduncle, much like that of *S. fragrans*. This distinctive species may well occur in other areas

of cloud forest in eastern Panama. The epithet honors Marianne Akers, an enthusiastic orchid student in Panama, who has collected the only other pressed specimen I have seen.

OTHER SPECIMEN SEEN: from the type locality, *M. Akers 488-28* (SEL).

Sobralia (Globosae) nutans Dressler, *sp. nov.*

FIG. 5-7

HOLOTYPE: PANAMÁ. Bocas del Toro: Km. 63, al norte de Fortuna, alt. 1050 m, 9 sep. 2001, terrestre; flores péndulas, blancas o crema, sépalos amarillentos por fuera, labelo crema con manchas rojo-castaño por fuera, por dentro amarillo en las quillas, con manchas rojo-castaño. *A. Maduro & E. Olmos 236* (MO, Isotypes PMA, SEL).

Herba terrestris foliis ellipticis acuminatis, floribus pendulis ab glomere bractearum elongato in tempo crescenti productis, sepalis petalisque ellipticis, labello ovato obscure trilobato septem carinis ornato, tribus internis basi humili lobulis altis in apice, externis omnino crenato-undulatis.

Terrestrial, *roots* 3-5 mm in diameter; *stems* 60-130 cm, 3-4 mm wide, slightly compressed; *sheaths* striate; *leaves* several, 20-36 x 2.5-4.7 cm, elliptic, acute to long-acuminate, strongly plicate; *inflorescence* terminal, gradually elongating, producing 1-3 pendent flowers at a time, to 4 cm. long; *ovary* and pedicel 20-25 mm; *floral bracts* c. 18 x 5-6 mm, lance-ovate, closely spaced; sepals at first yellowish-green, petals and lip cream, lip with red-brown spots without, keels yellow with red-brown spots near midline; *sepals* 28-31 x 8.6-10.5 mm, elliptic, apiculate, lateral sepals carinate; *petals* 26-36 x 8-10.5 mm, elliptic, apiculate; *lip* 22-23 x 18 mm, ovate, weakly 3-lobed, midlobe markedly undulate, with incurved margins; basal callus ca. 2 x 2 mm, 2-parted; keels 7, the 3 inner keels are low in the basal half and then form erect fin-like lobes 2-2.5 mm tall, to 4 mm long, there is then a crenate-undulate keel on each side, followed by a shorter, similar keel on each side; *column* c. 13 mm, very narrow basally, c. 4 x 4 mm distally, wing-like teeth ca. 2 x 1.3 mm, porrect; *capsule* 10.5 x 1 cm.

In addition to the features given below in the key, *S. nutans* is rather larger than the other species of the section. The margins of the midlobe are somewhat folded in over the terminal lobes of the keels. The epithet,

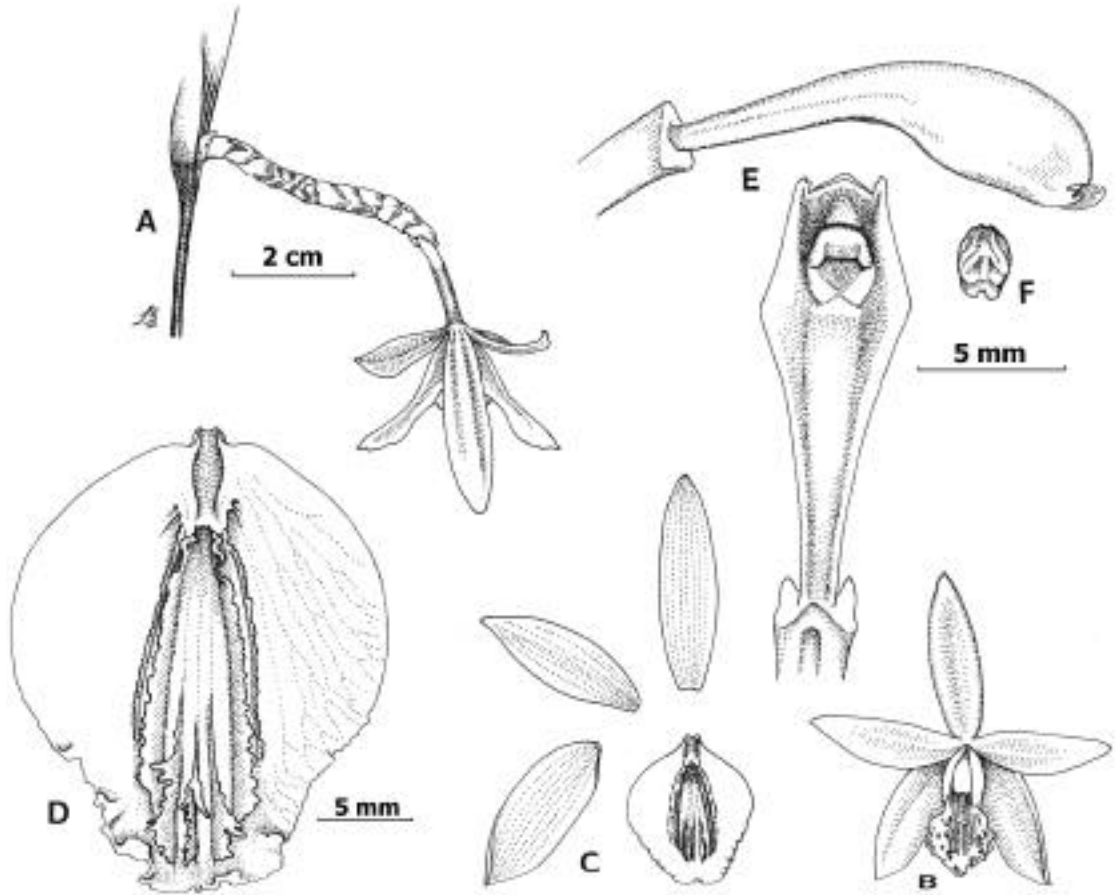


FIGURE 7. *Sobralia nutans* Dressler. A - Flower, natural position. B - Flower, front view. C - Flower parts, spread. D - Lip, spread. E - Column, lateral and ventral views. F - Anther.

nutans, refers to the nodding, or pendent, flowers.

PARATYPES: PANAMA. Bocas del Toro: same area as type, 850 m, 27 Oct. 1999, *R. L. Dressler & J. T. Atwood 6256* (MO, PMA). Coclé: Vicinity of La Mesa, beyond El Valle, on northern slope of Cerro Gaital, 8°37'N 80°07'W, 850-950 m, 12 July 1978, *G. McPherson 11227* (MO); El Valle de Antón, La

Mesa, 4 mi. E of El Valle, 8°36'N 80°07'W, 25 Mar. 1993, *T. Croat 74806* (MO).

Better material from Costa Rica may show that *Ingram & Ferrell 813* and other Costa Rican specimens of the Section *Globosae* represent a species distinct from *S. lancea*, or that *S. pardalina* is a synonym of *S. lancea*.

KEY TO THE SPECIES OF SECTION GLOBOSAE

- 1. Lip distinctly pandurate, with 2 crenate or undulate keels
 - 2. Leaves coriaceous; lip ecallose basally *S. lancea* Garay [Costa Rica, Colombia, Ecuador]
 - 2. Leaves thin, membranous; lip with "V"-like basal callus *S. pardalina* Garay [Ecuador]
- 1. Lip ovate or subovate, with 5-7 keels
 - 3. Lip with 7 keels, outer 2 keels on each side prominent, crenate-dentate throughout, 3 inner keels low in basal halves with prominent, erect apical lobules *S. nutans* Dressler [Panama]
 - 3. Lip with 5 low keels, all keels similar, dentate distally *S. candida* (Poepp. & Endl.) Rchb.f. [Venezuela, Colombia, Ecuador, Peru, Bolivia]

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