

## TWO NEW WHITE-FLOWERED SPECIES OF *SOBRALIA* (ORCHIDACEAE) FROM COSTA RICA

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**Abstract.** Two new species of *Sobralia* from Costa Rica are described and illustrated, and their affinities are discussed. *Sobralia danjanzenii* is compared to *S. virginialis*, from which it is mainly distinct by the simple stems and the unscented flowers, with the lip blotched with yellow only within the throat. *Sobralia zebrina* is similar to *S. macrophylla*, but it has much longer stems, ovate leaves that are matte on the adaxial side, and the lip is white with pale stripes alternating with brownish yellow stripes in throat.

**Keywords:** Orchidaceae, Sobralieae, *Sobralia*, new species, Costa Rica

Sobralias are a difficult group to classify. The delicate flowers are short-lived, and nearly impossible to preserve in any way. Further, in disturbed areas, such as roadsides and where forests have been cut, one may find “hybrid swarms” where two or more species have hybridized, and no two plants are alike. This is rather frustrating for those of us who wish to put names on the plants. At the same time, it can be a wonderful windfall for the gardener. In the pure species, all plants of a given species normally flower on the same days at varying intervals (Dressler 1993: 318). These displays are impressive, but they last only a few hours, and the gaps between them are pretty boring. In the hybrid swarms, the plants have largely lost their synchronization. For example, in our block of *Sobralia* Ruiz & Pavón from La Laja, south of Paraíso de Cartago in central Costa Rica (please do not ask for a name), an area where most trees were cut some years ago, *Sobralia* plants are much more rewarding. They do not flower all year, but there are flowers every day for many weeks. As botanists, we really cannot begin to put names on the plants in a hybrid swarm. By analysis of DNA, one might be able to determine some of the species that are involved in the hybrid swarm, but a given plant might be 30% species A, 30% species B, 25% species C, and 15% species D, and so on, and each plant would probably differ from most of its neighbors in the percentages. Still, we hope that someone who really understands DNA will make such a study.

Quite apart from the hybrid swarms, there are many “good” species in less disturbed areas, and here, we propose to describe two white-flowered species that are quite distinctive. The white-flowered *Sobralia* species can be a headache for botanists. Some of them are albino mutants of species that normally have pink or purple flowers. Others normally produce only white flowers (usually with some yellow). In 1998, Dr. Daniel Janzen wrote to Dressler about

a plant that he had found on Volcán Cacao, in northern Costa Rica. Dressler was to attend a meeting in Heredia, so Dr. Janzen sent the plant to the meeting in May or June of 1998, and the plant (or most of it) was left in the Lankester Botanical Garden. Dressler has been living just around the corner from the Botanical Garden for a few years now, but until December 2011 he saw very few flowers on the plants from Volcán Cacao. Then, all of the plants flowered in December and January, and some were still flowering in March. Maybe Dressler had simply failed to look for *Sobralia* flowers in December and January. At the moment, we have two large plants of this species and two smaller ones. All of them have been flowering, but only occasionally has one of the larger plants produced two flowers on the same day. The two larger plants might be divisions of the plant that Dr. Janzen sent in 1998, though one of the plants lost its label recently, when the plants were being moved. In the last few years, Alexander Rojas has collected another plant from Volcán Cacao, and we have found another plant nearly 100 km further southeast, near Cabeceras, in the Cordillera de Tilarán. Clearly, we now have enough material to describe the new species.

1. *Sobralia danjanzenii* Dressler & Pupulin, *sp. nov.*  
TYPE: COSTA RICA. Guanacaste: Liberia-La Cruz, Parque Nacional Guanacaste, Volcán Cacao (northern end of Cordillera de Guanacaste), pressed from cultivation, 12 November 2011, R. L. Dressler 6291 (Holotype: USJ; Isotypes: USJ, JBL, CR). Fig. 1.

*Sobralia danjanzenii* is somewhat similar to *S. virginialis* F. Peeters & Cogn. from the Colombian Andes, but the latter has branching stems (vs. simple) and strongly fragrant (vs. unscented) flowers with the yellow-orange basal blotch extending almost to the apex (vs. the blotch yellow and the apical margins pure white).

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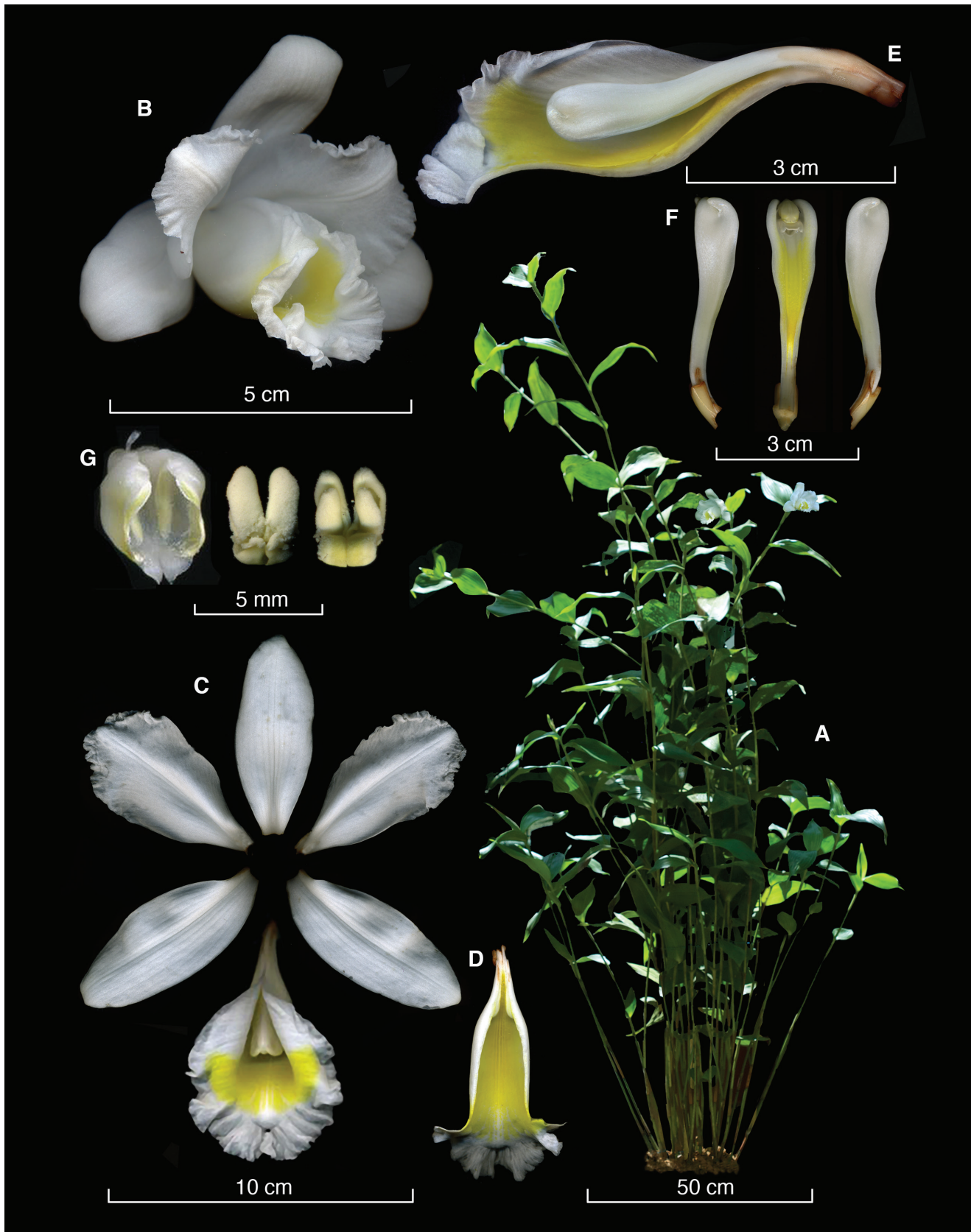


FIGURE 1. *Sobralia danjanzenii*. Lankester Composite Digital Plate. **A**, habit; **B**, flower; **C**, dissected perianth; **D**, lip, the lateral lobes removed; **E**, column and lip, lateral view (the lip longitudinally sectioned); **F**, column: lateral, ventral and three quarters views; **G**, anther cap and pollinarium (dorsal and ventral views). Based on *Dressler 6291*.

An erect *herb* rooting in humus and loose soils; *roots* 3–6 mm in diameter; *stems* 75–170 cm, 4–5 mm in diameter basally, 3.5–5 mm distally, the *sheaths* mottled with purple spots, especially apically; *leaves* ovate, acuminate, with 9–11 keeled veins beneath, 15–26.5 × 4–8.6 cm; *inflorescence* ellipsoid, 3.5–5 × 0.8–1.2 cm, with 2–3 subtending foliar bracts 6–13 × 1.8–5.2 cm; *bracts* 6–13 × 1.8–5.2 cm; *ovary* sessile, 1.1–2.5 cm; *sepaline tube* 4–8 mm, usually slightly pinkish; *sepals* white, with midvein greenish without and apex a bit darker, *dorsal sepal* elliptic-oblong to oblanceolate, obtuse, apiculate, 5.5–6.7 × 2.1–2.7 cm; *lateral sepals* ovate-lanceolate or oblanceolate, obtuse, apiculate, 6.5–9 × 2.2–2.7 cm; *petals* white, narrowly obovate, or oblong-elliptic, obtuse, 5–6.5 × 2.3–3.5 cm; *lip* subquadrate-subobovate, white, with yellow in throat, 3.2–4 × 3–3.8 cm, basal calli

7–9 mm; base of lip with 2 or 3 low ridges, the median vein much the largest and the outer veins quite small; *column* 35–38 × 4.5–6 mm laterally, 5–5.9 mm dorsoventrally, lateral arms 3–5 × 2–3 mm; *anther cap* elliptic, cucullate, 2-celled; *pollinarium* of 4 soft, mealy pollinia, bent in the middle, in two symmetrical pairs of different size, not sharply distinct from the caudicles.

**Paratypes:** Costa Rica. Guanacaste: Abangares, Area de Monteverde, atajo detrás de Las Cabeceras, 10°22'06.9"N 84°51'68.4"W, ca. 1100 m, 26 mayo 2007, pressed from cultivation, Nov. 2011, *R. L. Dressler 6920* (USJ, CR). Guanacaste: Abangares, camino entre San Rafael y Las Nubes de río Chiquito, 1 km antes del pueblo de Las Nubes, 1268 m, 10°21'24.5"N 84°51'14.6"W, bosque pluvial montano bajo, epífitas en árboles de finca ganadera, 7 Agosto 2010,

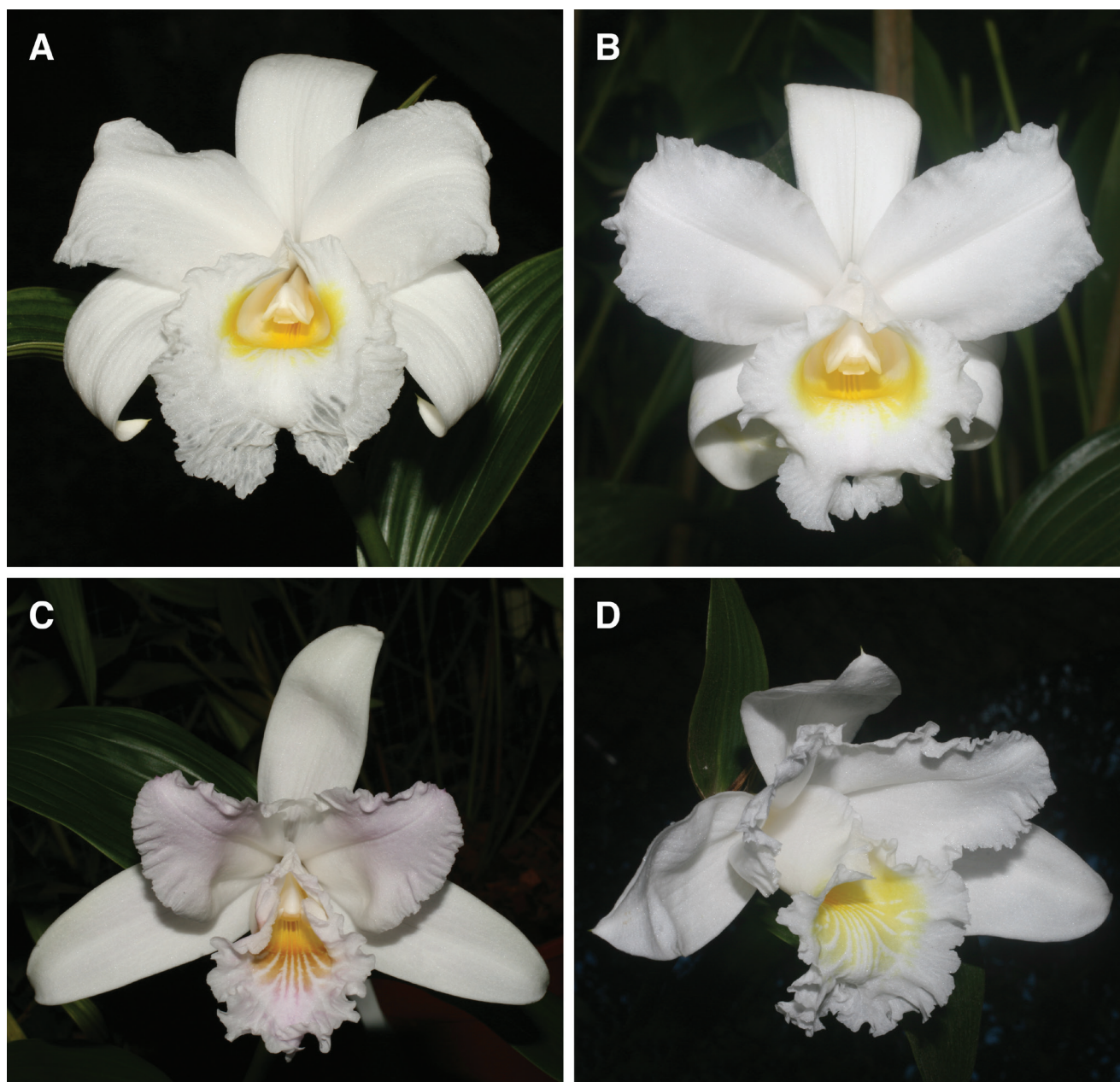


FIGURE 2. **A**, *Sobralia danjanzenii* (Fernández 302); **B**, *S. danjanzenii* (Rojas 7922); **C**, *S. zebrina*, photo of the flower from the plant that served as the holotype (Dressler 7332); **D**, *S. zebrina* (Dressler 7334). All photos by K. Dressler.

*M. Fernández 302* & *D. Bogarín* (USJ, JBL) (Fig. 2A); same collecting data, *M. Fernández 303* & *D. Bogarín* (JBL).

**Distribution and Ecology:** The species is known only from the humid forests of the Cordillera de Guanacaste in northern Costa Rica to the Cerros de Turrubares south of San José, in central Costa Rica, but it can also be expected from southern Nicaragua. Fig. 3.

**Eponymy:** The specific epithet honors the evolutionary ecologist and biologist Daniel “Dan” H. Janzen, whose efforts greatly promoted the conservation of the Área de Conservación Guanacaste in Costa Rica, one of the most successful habitat restoration projects in the world.

**Phenology:** Plants of *S. danjanzenii* have been observed in flower in July and August, and from November to March. The species probably flowers erratically throughout the year.

**Additional material examined:** Costa Rica. Guanacaste: Liberia, Parque Nacional Guanacaste, Volcán Cacao, A. Rojas 7922 (photo, JBL) (Fig. 2B). San José: Turrubares, San Luis, San Rafael, Cerro Turrubares, orillas de la Quebrada Pital, camino a Llano El Caite, 9°48'17.7"N 84°28'00.4"W, 897 m, bosque pluvial premontano, en bosque secundario, 28 Julio 2010, *M. Fernández 191*, *D. Bogarín*, *R.L. Dressler* & *C. Smith* (photo, JBL).

About a year ago, we visited Cerro Turrubares, west and a bit south of San José in Central Pacific. There we found a colony of *Sobralia* and brought a few plants to cultivate in the Lankester Botanical Garden, but at first we did not feel sure that all of the plants in the population had white flowers. One of them flowered profusely, but the others were reluctant. In January we found a plant from Cerro Turrubares in flower, and on the same day there was a

plant from Volcán Cacao in flower. The two flowers were essentially identical, so now we feel sure that most of the plants from Cerro Turrubares are *Sobralia danjanzenii*, giving *S. danjanzenii* a rather wide distribution for a “new species.” None of the flowers of *S. danjanzenii* produced in cultivation at Lankester Botanical Garden had a scent perceptible to the human nose.

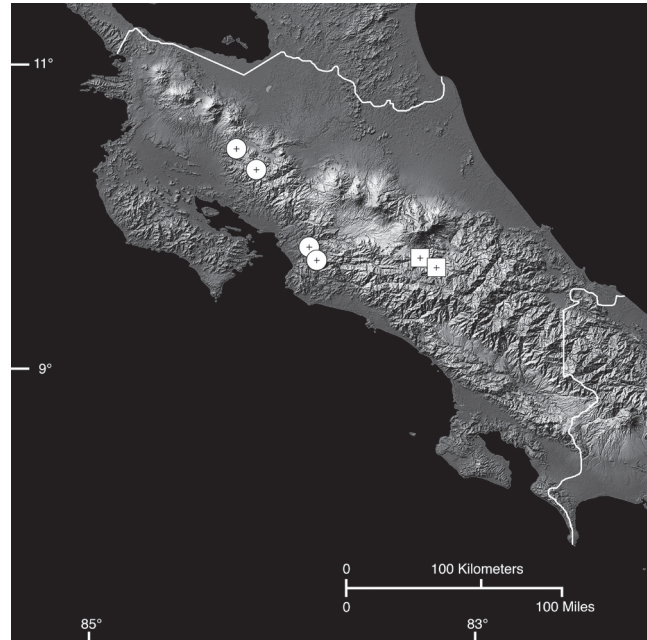


FIGURE 3. Distribution of *Sobralia danjanzenii* (circles) and *S. zebrina* (squares).

#### ZEBRA STRIPES ON A *SOBRALIA* FLOWER

One of the larger plants received from Ademar Silveira from a region northwest of Tapantí in Paraíso, Cartago had flowered generously. To our surprise, these white flowers had a patch of stripes, narrow white stripes alternating with brownish yellow stripes of variable width. We had never seen such stripes on a *Sobralia* flower, and we then started to think of the epithet *zebrina*. Then a plant from Alto de Araya near Orosi of Cartago produced a pattern of stripes, but the patch of stripes was near the opening of the throat, rather than at the base of the throat. The second plant has not flowered again, but the first plant has flowered repeatedly, and the patch of stripes is quite variable in its position, sometimes being near the base, and sometimes near the apex of the column.

We describe it here with the epithet already in use at the Lankester Botanical Garden:

2. *Sobralia zebrina* Dressler & Pupulin, *sp. nov.* TYPE: COSTA RICA. Cartago: Orosi, Purisil (southeast of Orosi), collected by A. Silveira, 16 Jan. 2011, pressed from cultivation, January 2012, *R. L. Dressler 7332* (Holotype: USJ; Isotypes: USJ, JBL, CR). Fig. 2C, 4.

*Sobralia zebrina* is similar to *S. macrophylla* Rehb.f., ranging from Costa Rica to Andean South America, but the stems of the former species are much larger (> 100 cm vs. <

50 cm long), the leaves are ovate (vs. elliptic), with the adaxial surface matte (vs. shiny), and the flowers have white sepals and petals, somewhat tinged with pale pinkish, with the throat of the lip marked with alternating pale and brownish yellow stripes (vs. flowers uniformly white to pale yellow).

An erect *herb* rooting in humus and loose soils; *roots* 5–6 mm in diameter; *stems* 1.2–3 m long, 5–9 mm in diameter; *sheaths* glabrous; *leaves* ovate, acuminate, plicate, 16–25 × 5–9 cm; *inflorescence* lance-elliptic, ca. 0.8 × 1.0 cm, often with a small leaf-like lateral bractlet; *ovary* 2.8–3.5 cm long; *sepaline tube* 1.5 cm long; *sepals* white, slightly pinkish, lanceolate; *dorsal sepal* elliptic, subacute to acuminate, 7.3–7.5 × 2.5–2.8 cm; *lateral sepals* elliptic, acute, 6.6–8 × 2.5–3.7 cm; *petals* white, (or very pale pinkish), obovate, obtuse to subacute, the distal margins crisp, 6.6–7 × 3–3.7 cm; *lip* broadly elliptic-ovate, 6.8–8 × 6.6–7 cm, 4.3–4.5 cm, in natural position; throat with pale stripes alternating with brownish yellow stripes; patch of stripes about 5.5–6.0 cm. in diameter; *column* 4.0–4.2 cm long, 4.0–5.0 mm wide, 9 mm dorsoventrally, with 2 yellow keels beneath about 2 cm long; *anther cap* elliptic-obovate, deeply cucullate, 2-celled; *pollinarium* of 4 soft, mealy pollinia, bent in the middle, in two symmetrical pair of slightly different size, not sharply distinct from the caudicles.

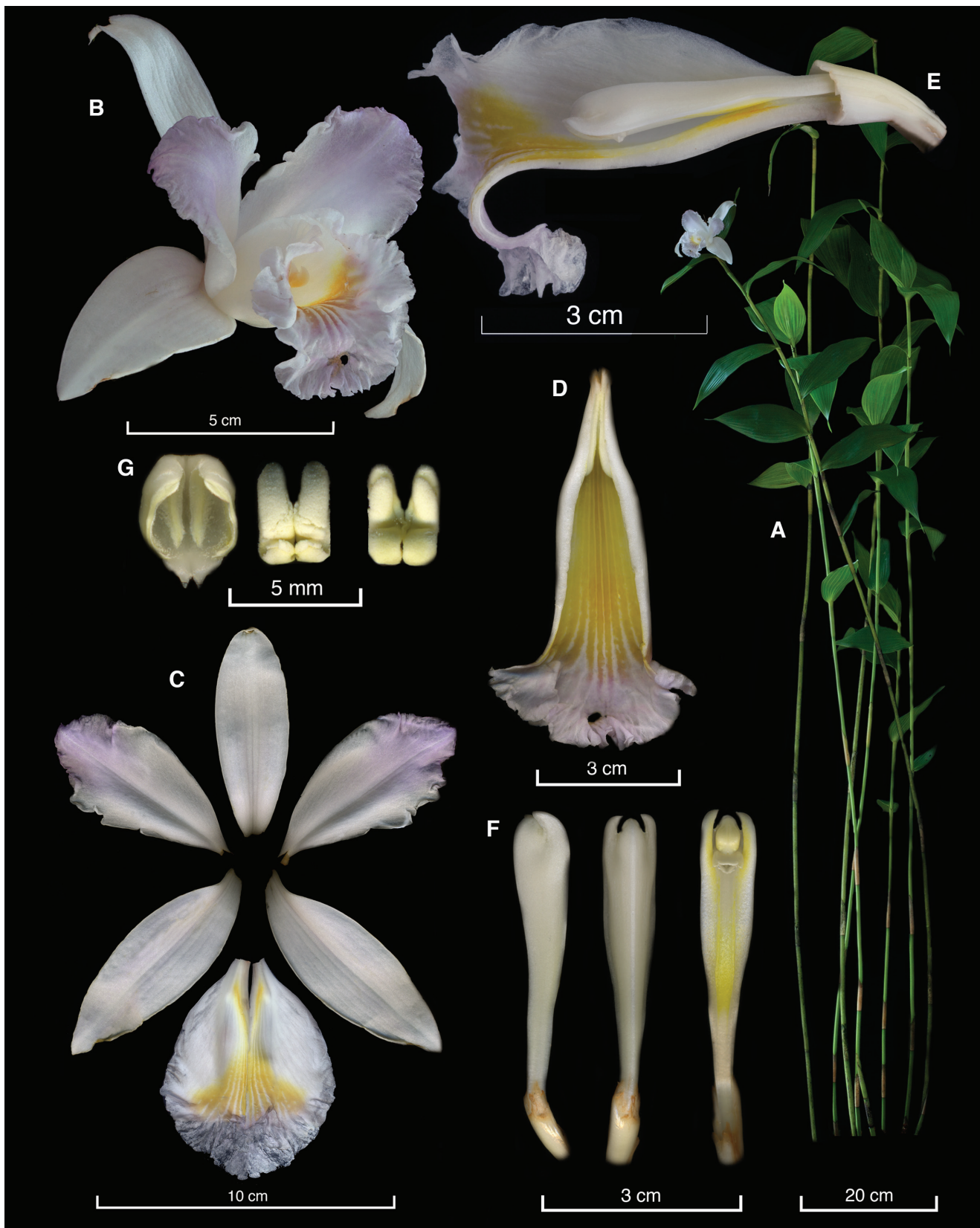


FIGURE 4. *Sobralia zebrina*. Lankester Composite Digital Plate. **A**, habit; **B**, flower; **C**, dissected perianth; **D**, lip, the lateral lobes removed; **E**, column and lip, lateral view (the lip longitudinally sectioned); **F**, column: lateral, dorsal and ventral views; **G**, anther cap and pollinarium (dorsal and ventral views). Based on *Dressler 7332*.

**Distribution and Ecology:** Known only from the wet premontane forests of the northern end of the Cordillera de Talamanca, where it is apparently uncommon. Fig. 3.

**Etymology:** From the botanical Latin *zebrinus*, zebrine, in reference to the alternating pale and brownish yellow stripes that recall the pattern of the skin of *Equus zebra* L. with its distinctive black and white stripes.

**Phenology:** Specimens of *S. zebrina* have been documented in flower in January, April, and June, which grossly correspond to the relatively “dry” season in central Costa Rica.

**Additional material examined:** Costa Rica. Cartago: Orosi, Purisil (southeast of Orosi), collected by A. Silveira, pressed from cultivation, 6 June 2012, *R. L. Dressler 7333* (USJ). Cartago: Paraíso, Guábata, Alto de Araya, Laguna de Carmela, ca. 9°48'N 83°49'W, 1380 m, 23 Apr. 2006, pressed from cultivation, 12 February 2012, *R. L. Dressler 7334* (USJ) Fig. 2D.

Both of the species treated here have white flowers. The lip of *S. danjanzenii* is yellow within, and remains yellow even when dry. The lip of *S. zebrina* has alternating stripes of white and brownish yellow, but the stripes soon fade when dry.

#### LITERATURE CITED

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