

THE GENUS *CESTRUM* IN GUATEMALA¹

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THROUGH THE COURTESY of the Arnold Arboretum I have been enabled to study a collection of Solanaceae made in Guatemala by Dr. Alexander F. Skutch, who is to be congratulated not only upon the keenness of his collecting but the excellence of his specimens as well. Inasmuch as six new species of *Cestrum* were represented in the collection, the following short synopsis of the genus in Guatemala was prepared. However, the recent appearance of a comprehensive monograph of the genus by Dr. P. Francey² has necessitated the rewriting of certain portions in order to include the new species described by him. One of the new species collected by Dr. Skutch has been described on other material as *C. guatemalense* Francey. No other changes have been found necessary, except that I follow Dr. Francey in referring certain specimens, which I had previously called *C. megalophyllum* Dunal, to *C. Baenitzii* Lingelsh. These two species are, admittedly, too close and should perhaps be considered only varietally distinct.

The species of Guatemala are all of restricted altitudinal range, four (*C. Baenitzii*, *C. panamense*, *C. scandens*, and *C. nocturnum*) being wide-ranging species found from sea-level up to 1000 meters altitude, rarely up to 1500 in *C. nocturnum*. Eight (*C. dumetorum*, *C. lanatum*, *C. aurantiacum*, *C. elegantissimum*, *C. Skutchii*, *C. Franceyi*, *C. cobanense*, and *C. luteovirescens*) are species of middle elevations (1000 to 2000 meters) and are, except the first two, confined to Guatemala. Five (*C. fraternum*, *C. formosum*, *C. guatemalense*, *C. dasyanthum*, and *C. Regelii*) are montane species, endemic in western Guatemala and Chiapas.

In addition to the material of the genus in the Arnold Arboretum and the U. S. National Herbarium, I have had also the advantage of studying the Mexican and Central American specimens in the Gray Herbarium, the loan of which is gratefully acknowledged.

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²*Candollea* 6: 46-398 (1935) and 7: 1-132 (1936).

KEY TO THE SPECIES

- Stems, leaves and calyces stellate-tomentose3. *C. lanatum*.
 Stems, leaves and calyces glabrous or hairy, the hairs sometimes
 branched but not stellate.
 Corolla tube hairy 4. *C. dasyanthum*.
 Corolla tube glabrous.
 Filaments appendiculate.
 Corolla tube 9–11 mm. long5. *C. dumetorum*.
 Corolla tube 15–23 mm. long.
 Corolla orange; calyx lobes prominent, mucronate....
 2. *C. aurantiacum*.
 Corolla greenish-yellow, white or purplish; calyx lobes
 minute, deltoid or rounded.
 Leaves linear or linear-lanceolate, not more than 2.6
 cm. wide, usually 4 to 7 times as long; flowers
 sessile, borne in fascicles at the ends of short
 branches.
 Calyx lobes deltoid; leaves linear-lanceolate
 14. *C. luteovirescens*.
 Calyx lobes low and rounded; leaves linear ..13. *C. Skutchii*.
 Leaves not linear or linear-lanceolate, 3 cm. wide or
 more, 2–4 times as long; flowers sessile or pedi-
 cellate, borne in loose panicles.
 Leaves dimorphic, those in the axils minute, orbicu-
 lar, sessile and stipule-like; larger leaves gla-
 brous, with 17–20 pairs of primary veins;
 calyx and rhachis purple12. *C. elegantissimum*.
 Leaves not dimorphic, the larger with not more
 than 13 pairs of primary veins; calyx and
 rhachis green.
 Filaments and appendages densely pilosulous;
 calyx 3.5–4 mm. long. Leaves with at least
 a few hairs on midrib and primary veins.
 Flowers with long pedicels and short peduncles
 7. *C. fraternum*.
 Flowers with very short pedicels and long
 peduncles8. *C. Franceyi*
 Filaments and appendages glabrous; calyx 3 mm.
 long or less.
 Mature stems and petioles densely puberulous;
 mature leaves puberulous on the midrib
 beneath9. *C. cobanense*.
 Mature stems, petioles and leaves glabrous.
 Appendage of the filament deeply bipartite;
 inflorescences terminal, dichotomously
 branched, the flowers pedicellate
 10. *C. evanidum*.

Appendage of the filament entire or merely notched; inflorescences chiefly axillary, not dichotomous, the flowers sessile

11. *C. nocturnum*.

Filaments exappendiculate.

Leaves hairy beneath. Montane species.

Calyx lobes long, subulate, green; corolla bright yellow

1. *C. Regelii*.

Calyx lobes short, broadly deltoid, purple; corolla yellowish, tinged with purple

19. *C. guatemalense*.

Leaves glabrous beneath.

Corolla bright yellow; flowers relatively long-pedicellate; montane species.

Corolla tube 2–2.5 mm. broad near the middle, not over 3 times as long as the calyx, gradually enlarged upwardly 17. *C. formosum*.

Corolla tube about 1 mm. broad near the middle, at least 5 times as long as the calyx, abruptly expanded near the summit 18. *C. pacayense*.

Corolla pale yellowish-green; flowers sessile or subsessile, corolla tube not over 1 mm. broad near the middle, at least 5 times as long as the calyx. Lowland species.

Leaves attenuate at base, broadest above the middle

6. *C. Baenitzii*.

Leaves rounded or nearly acute at base, broadest below the middle.

Corolla small, the tube not more than 14 mm. long, the lobes 4 mm. long 15. *C. panamense*.

Corolla large, the tube 17–20 mm. long, the lobes 7–9 mm. long 16. *C. scandens*.

1. ***Cestrum Regelii*** Planchon in Fl. des Serres, 9: 229, pl. 946 (1854).

Habrothamnus aurantiacus Regel, Ind. Sem. Hort. Turic. 1850 Coll. 4. note, fide Walp. Ann. 3: 176 (1852). Not *Cestrum aurantiacum* Lindl. (1844).

Cestrum chiapense Brandegees in Univ. Calif. Publ. Bot. 6: 192 (1915).

Cestrum jacaltenanginum Loesener in Verh. Bot. Ver. Brandenb. 65: 98 (1923).

Francey has attempted to maintain these three species as distinct, but the characters given to separate them seem not to hold in the material at hand. An additional species, which should perhaps have been included in the key, is *Cestrum psittacinum* Stapf (Curtis Bot. Mag. 152: pl. 9158. 1926), founded on cultivated material of unknown origin. This is very likely a native of Guatemala, for its relationship with *C. Regelii* is close. It differs in having bicolorous corollas (the tube

orange, the lobes green), in having shorter calyx lobes, and also in having the flowers borne in non-bracteate racemes.

I have seen the following specimens of *C. Regelii*: CHIAPAS: Cerro del Boqueron, *Purpus* 7170 (type collection of *C. chiapense*). GUATEMALA: Plains near Tecpam, Chimaltenango, *Skutch* 488. Jacaltenango, Huehuetenango, *Seler* 2641 (type collection of *C. jacaltenanginum*).

2. ***Cestrum aurantiacum*** Lindley in Bot. Reg. **30**: Misc. 71 (1844).

Cestrum chaculanum Loesener in Verh. Bot. Ver. Brandenb. **65**: 97 (1923).

Cestrum paucinervium Francey in Candollea, **6**: 101 (1935). —

Synon. nov.

Cestrum aurantiacum var. *chaculanum* Francey in op. cit. 104. —

Synon. nov.

Francey has recognized several varieties of *C. aurantiacum*, as well as a new species (*C. paucinervium*) of this alliance. Of the latter I have examined a specimen of the type collection, and have not been able to separate it from typical *C. aurantiacum* either by leaves or inflorescence. The varieties are based on the size of leaves, petioles, and calyces. These differences seem artificial; but when the relative length of calyx and corolla is used as a means of separation, all the Guatemalan specimens are seen to have the corolla three times the length of the calyx or more. On the other hand, all the Costa Rican specimens have a corolla not more than twice as long as the calyx. This consistency in such an important character, coupled with the geographic separation of the two, shows that Klotzsch was very likely correct in considering that the Costa Rican plants represent a distinct species, *Cestrum Warszewiczii*.

In Guatemala *Cestrum aurantiacum* is a common species of middle elevations from 1300 to 2000 meters. The berries (not seen by Francey) are white, ellipsoidal, and very large. I have seen the following specimens from Guatemala, not cited by Francey: Coban, *Tuerckheim* 26a, 8433. Guatemala, *Tonduz* 625; *Hayes* s. n. Santa Rosa, *Cook & Doyle* 232. Santa Maria, *Kellerman* 5579. Volcán Fuego, *Donnell Smith* 2678. Without locality, *Heyde* 95. Santa María de Jesus Nepto, Quetzaltenango, *Skutch* 893.

3. ***Cestrum lanatum*** Martens & Galeotti in Bull. Acad. Brux. **12**²: 146 (1845).

A distinctive species, found in Guatemala at elevations of 1200 to 1500 meters.

4. ***Cestrum dasyanthum*** Donnell Smith in Bot. Gaz. **23**: 11 (1897).

A species of apparently restricted range. I have examined the following collections: Between San Martín and Todos Santos, Huehuetenango, *Nelson* 3622 (type); *Seler* 2632. San Juan Atitlán, Huehuetenango, *Skutch* 1157, 1178.

5. ***Cestrum dumetorum*** Schlechtendal in *Linnaea*, 7: 61 (1832).

A widely dispersed species, found in southern Guatemala in the Departments of Guatemala, Santa Rosa, and Amatitlán, at altitudes of 1000 to 1500 meters.

6. ***Cestrum Baenitzii*** Lingelsheim in *Fedde, Rep. Spec. Nov.* 7: 248 (1909).

Following Hemsley, the specimens cited below have previously been identified as *Cestrum macrophyllum* Vent., but that species has appendiculate filaments and is more closely allied to *C. laurifolium*. In Guatemala *C. Baenitzii* is found only near sea-level in the eastern part. The following collections have been studied. Quiriguá, Izabal, *Standley* 24481, 24533. Cubilquitz, Alta Verapaz, *Tuerckheim* 8558. Finca Sepacuité, Alta Verapaz, *Cook & Griggs* 845.

7. ***Cestrum fraternum*** Morton, sp. nov.

Frutex 2.4 m. altus; rami teretes, juniores puberuli, mox glabri; petioli 2.2 cm. longi, glabri; lamina foliorum elliptica, usque ad 16.5 cm. longa et 5.5 cm. lata, membranacea, apice acuminata, basi acuta vel obtusa, supra glabra, subtus costa et venis primariis parce puberula, venis primariis 10–13-jugis; inflorescentiae terminales et axillares, rachibus gracilibus puberulis, bracteis minutis caducis, pedicellis ca. 3 mm. longis; calycis tubus viridis, campanulatus, ca. 3.5 mm. longus et 2 mm. latus, glaber, lobis minutis late deltoideis plus minusve mucronatis ca. 0.5 mm. longis margine puberulis; corollae tubus pallide flavidus, interdum externe purpureo-tinctus, glaber, ca. 20 mm. longus, basi ca. 1.8 mm. latus, sursum sensim ampliatus sed non inflatus, fauce non contractus, ca. 5 mm. diam., lobis reflexis late ovatis, ca. 4 mm. longis et 3 mm. basi latis apice longe mucronatis; filamentorum pars libera ca. 3.5 mm. longa, glabra, basi appendiculata appendicula minuta rotundata pilosula, filamentorum pars adnata pilosula; stylus 18 mm. longus, paullo exsertus; fructus ignotus.

Type in the U. S. National Herbarium, no. 1,642,529, collected in moist thicket at Nebaj, Dept. of Quiché, Guatemala, altitude 2340 meters, Nov. 16, 1934, by A. F. Skutch, no. 1682 (isotype in Herb. Arnold Arb.).

8. ***Cestrum Franceyi*** Morton, nom. nov.

Cestrum pedunculatum Francey in Candollea, 7: 66 (1936). Not Sessé & Mocino (1894).

I have seen no material of this species other than two sheets of the type collection, *Tuerckheim* 833, from Pansamala.

9. ***Cestrum cobanense*** Francey in Candollea, 6: 372 (1935).

I have examined two sheets of the type collection (*Tuerckheim* II. 2372) and find this to be a well-marked species.

10. ***Cestrum evanidum*** Morton, sp. nov.

Frutex gracilis; rami teretes, juniores puberuli, mox glabri; petioli usque ad 1.4 cm. longi, glabri; folia juniora utrinque puberula, mox glabrata; lamina ovato-lanceolata, usque ad 13 cm. longa et 5 cm. lata, membranacea, apice acuminata, basi rotundata, venis secundariis 6–10-jugis; inflorescentia terminalis, pedunculata, dichotome ramosa, rhachibus gracilibus, glabris, viridibus, ebracteatis; calyx viridis, campanulatus, minimus, ca. 2 mm. longus, glaber, 5-costatus, basi plus minusve longe stipitato-pedicellatus, lobis parvis deltoideis aequalibus; corolla viridis, glabra, tubo angusto 20–23 mm. longo basi ca. 0.6 mm. lato sursum sensim ampliato et usque ad 3 mm. lato, fauce non contracto, lobis lanceolatis ca. 5 mm. longis; filamenta recta, glabra, appendiculata, appendicula magna bipartita glabra.

Type in the U. S. National Herbarium, no. 1,642,528, collected at Finca Moca, Dept. Suchitepequez, Guatemala, alt. 960 meters, Jan. 7, 1935, by A. F. Skutch, no. 2071A (isotype in Herb. Arnold Arb.).

The following specimen, distributed as *Cestrum nocturnum*, is also referred to *C. evanidum*: Acatepeque, Dept. Zacatepequez, Guatemala, alt. 1290 meters, *Donnell Smith* 2681.

The closest relationship of *Cestrum evanidum* is perhaps with *C. nocturnum*, a species which, in spite of its wide range, is relatively constant in appearance and essential characters. The inflorescences of *C. nocturnum* are chiefly axillary, are not dichotomous, and are usually without an obvious peduncle, characters which easily distinguish that species from *C. evanidum*, which has strictly terminal, dichotomously branched, pedunculate inflorescences. The calyx of the latter is obviously 5-ribbed and rather long-stipitate at base, but that of *C. nocturnum* is ribless and usually almost sessile. The filament appendages of *C. nocturnum* are sometimes inconspicuously notched, but are never deeply partite into two subulate lobes as in *C. evanidum*.

11. ***Cestrum nocturnum*** Linné, Sp. Pl. 191 (1753).

A common lowland species occurring from sea-level up to 1500 meters elevation.

12. ***Cestrum elegantissimum*** Morton, sp. nov.

Frutex 3.6 m. altus; rami teretes, glabri; folia dimorpha; petioli usque ad 1.2 cm. longi, glabri, supra canaliculati; lamina foliorum majorum oblongo-lanceolata, usque ad 16 cm. longa et 5 cm. lata, papyracea, apice longe et acriter acuminata, basi acuta vel obtusa vel rotundata, glabra, venis primariis utrinque elevatis 17–20-jugis ex costa angulo fere 90° egredientibus subrectis marginem versus furcatis, ramulis alteris utroque latere conjunctis; folia minora axillaria minuta, auriculiformia, stipuliformia, orbicularia, usque ad 1 cm. longa, petiolo nullo; inflorescentia terminalis, usque ad 13 cm. longa et 11 cm. lata, paniculata, ramulis infimis basi foliis auriculiformibus suffultis, rhachibus atropurpureis gracilibus puberulis, pilis hyalinis numerosis multiseptatis flaccidis interdum fortasse glanduliferis, bracteis atropurpureis linearibus vel lineari-subulatis parce puberulis plus minusve persistentibus, pedicellis brevibus 1–1.5 mm. longis crassiusculis parce puberulis; calyx atropurpureus, tubo cum pedicello continuo poculiformi ca. 2.5 mm. longo et 2 mm. lato extus pilos paucos gerente, lobis 5 regularibus deltoideis minutis ca. 0.8 mm. longis acuminatis margine dense puberulis; corolla flavescenti-viridis, haud purpurascens, tubo glabro ca. 21 mm. longo anguste tubuloso basi recto ca. 1.5 mm. lato, faucem versus paullo inflato ca. 2.5 mm. lato, fauce contracto ca. 2 mm. lato glabro, lobis patulis lanceolatis ca. 6 mm. longis et ca. 2 mm. latis acutis marginibus introflexis albis externe puberulis; filamenta (pars libera) 3 mm. longa, glabra, basi perspicue appendiculata appendiculis obtusis vix pilosulis, filamentorum parte adnata pilos paucos gerente; ovarium glabrum, perspicue stipitatum; stylus 18.5 mm. longus, glaber, sursum granuliferus; baccae non suppetunt.

Type in the U. S. National Herbarium, no. 1,642,527, collected in forest at Finca Moca, Dept. of Suchitepequez, Guatemala, altitude 1320 meters, Jan. 7, 1935, by A. F. Skutch, no. 2071 (isotype in Herb. Arnold Arb.).

13. ***Cestrum Skutchii*** Morton, sp. nov.

Frutex 1.5 m. altus; rami teretes, glabri; petioli usque ad 1 cm. longi, glabri; lamina foliorum linearis, usque ad 16 cm. longa et 2.6 cm. lata, membranacea, apice longe acuminata, basi acuta vel obtusa, glabra, venis primariis 15–20-jugis, marginem versus anastomosantibus, utrinque paullo elevatis; inflorescentiae axillares (et terminales?), densae, subspicatae, 3–9-florae, rhachibus atropurpureis glabris crassiusculis, bracteis atropurpureis linearibus fere glabris, pedicellis obsoletis ca. 0.5 mm. longis glabris; calycis tubus atropurpureus, tubulosus, 3.4–5 mm. longus, 2.25 mm. latus, glaber, lobis minutis rotundatis 0.4

mm. longis margine puberulis; corollae tubus albus, plus minusve purpureo-tinctus, glaber, 21 mm. longus, anguste tubulosus, basi ca. 1.5 mm. latus, sursum gradatim ampliatus sed non ventricosus, fauce non contractus, ca. 3.75 mm. latus, lobis albis vix purpureo-tinctis recurvatis late ovatis ca. 5 mm. longis et 3.75 mm. latis, margine introflexo latissimo externe puberulo; filamentorum pars libera 4 mm. longa, glabra, basi perspicue appendiculata appendiculis obtusis pilosulis, pars adnata pilosula; ovarium glabrum, stipitatum; stylus ca. 1.9 cm. longus; baccae non suppetunt.

Type in the U. S. National Herbarium, no. 1,642,526, collected in second growth thicket on the Volcán Zunil, Dept. of Quezaltenango, Guatemala, alt. 1710 meters, Aug. 8, 1934, by A. F. Skutch, no. 988 (isotype in Herb. Arnold Arb.).

14. **Cestrum luteovirescens** Francey in Candollea, 6: 349 (1935).

I have studied three specimens of the type collection, *Donnell Smith* 2679 from Capetillo.

15. **Cestrum panamense** Standley in Jour. Wash. Acad. 15: 460 (1925).

Cestrum racemosum var. *panamense* Francey in Candollea, 6: 274 (1935).

I am inclined to treat the present species as valid, in spite of its reduction by Francey to a variety of the Peruvian *C. racemosum*. In addition to the characters by which Francey separates the two, it may be pointed out that *C. racemosum* is a shrub only about a meter high, and that *C. panamense* is always a tree and often a very large one, up to 24 meters high, with a trunk three-fourths of a meter in diameter.

I have seen the following collections: Colomba, Dept. Quetzaltenango, *Skutch* 2000, 2024. Uaxactun, Petén, *Bartlett* 12175, 12743. Quiriguá, Izabal, *Standley* 23767, 24144. San Carlos, *Rojas* 207. Telemán, Alta Verapaz, *Donnell Smith* 1672. Near Patalul, *Kellerman* 5821.

16. **Cestrum scandens** Vahl, Eclog. Amer. 1: 24 (1796).

Cestrum perilambanon Loesener in Verh. Bot. Ver. Brandenb. 65: 98 (1923).

I have seen two collections from Guatemala: Chiquimula, altitude 165 meters, *Seler* 3381 (type collection of *C. perilambanon*). Cuyuta, Dept. Escuintla, 60 meters altitude, *Donnell Smith* 2081.

17. **Cestrum formosum** Morton, sp. nov.

Frutex gracilis, erectus, 4.5 m. altus; rami teretes, glabri; petioli satis longi, 17–23 mm. longi; lamina foliorum elliptica, usque ad 9 cm. longa

et 3.5 cm. lata, papyracea, apice acuminata, basi acuta vel obtusa, plerumque obliqua, utrinque glabra, venis primariis 9–11-jugis prominulis; inflorescentiae terminales et axillares, laxae, pauciflorae, pedunculatae, pedunculo usque ad 1.8 cm. longo, rhachibus glabris, bracteis linearibus glabris, pedicellis 4–5 mm. longis; calycis tubus viridis, campanulatus vel subturbinatus, ca. 4.5 mm. longus, 3.5 mm. latus, glaber, lobis minutissimis vix 0.25 mm. longis costa percurrente; corollae tubus luteus, glaber, crassiusculus, ca. 14 mm. longus, basi 2.5 mm. latus, sursum sensim ampliatus sed non inflatus, fauce non contractus, hic ca. 4.5 mm. latus, lobis patulis vel recurvatis crassis late ovatis ca. 4.5 mm. longis et 3.5 mm. basi latis apice mucronatis; filamentorum pars libera brevis, ca. 2 mm. longa, glabra, exappendiculata, pars adnata pilosula; stylus crassus, 12 mm. longus, paullo exsertus; fructus ignotus.

Type in the U. S. National Herbarium, no. 1,642,530, collected in bushy growth on the south slope of Volcán Atitlán, Dept. of Suchitepequez, Guatemala, altitude 2400 meters, Jan. 14, 1936, by A. F. Skutch, no. 2143 (isotype in Herb. Arnold Arb.

18. ***Cestrum pacayense*** Francey in *Candollea*, 6: 90 (1935).

Cestrum Kellermanii Francey in op. cit. 89. — **Synon. nov.**

I do not find any significant points of difference between these two species, the types of which have kindly been lent to me by the Field Museum. In leaf characters *C. pacayense* is almost identical with *C. formosum*, but the floral structure is different.

19. ***Cestrum guatemalense*** Francey in *Candollea*, 6: 98 (1935).

I believe that the present species must be referred to the section *EUCESTRUM*, as neither by calyx nor corolla does it correspond with the definition of the section *HABROTHAMNUS*, in which it is placed by Francey. The Skutch specimens cited below had been identified by me as a new species and distributed under a manuscript name. I have seen the following specimens: Hacienda Chaucol, alt. 3300 meters, *Nelson* 3645, 3666 bis (type collection). Chichavac, Chimaltenango, alt. 2490 meters, *Skutch* 27 and 754.

19a. ***Cestrum guatemalense*** var. ***gracile*** Morton, var. nov.

A var. *typica* calycis tubo puberulo, corollae tubo graciliore longiore (20 mm.) differt.

Type in the U. S. National Herbarium, no. 1,335,349, collected at Calél, Dept. Totonicapám, Guatemala, alt. 2550 meters, Nov. 1891, by W. C. Shannon (*Donnell Smith* no. 282).

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