

latissime obovatis, asymmetricis, 10 mm. longis; stylo 1 mm. longo. Tab. I, fig. 8-10.

MEXICO: CHIAPAS: Mt. Ovando, alt. 1250-2370 m., July 1938, *Matuda 2570* (Mich., TYPE; G).

In my treatment in the North American Flora, staminate plants of *Catopsis triticea* run down to the vicinity of *C. Wangerini*. They differ from *C. Wangerini* in their elongate scapes, subsimple inflorescence and larger flowers. Pistillate specimens run down to the vicinity of *C. cucullata*, from which they differ in their erect inflorescence and straight floral bracts.

Nidularium rubrum Beer var. **albiflorum**, var. nov., corolla omnino alba, ex sicco ad 32 mm. longa.

BRAZIL: SÃO PAULO: São Paulo, Feb. 1938, *Doering in Inst. Biol. S. Paulo 39201* (S. Paulo, TYPE; phot. G).

EXPLANATION OF PLATES.

PLATE I.

- Fig. 1. PITCAIRNIA BIFLORA L. B. Smith (*Sandeman s.n.*), leaf $\times \frac{1}{2}$.
- Fig. 2. Same, upper scape and inflorescence $\times \frac{1}{2}$.
- Fig. 3. Same, expanded sepal $\times 1$.
- Fig. 4. PITCAIRNIA PATENTIFLORA L. B. Smith (*Tate 213*), flower $\times 1$.
- Fig. 5. TILLANDSIA CAPITATA Griseb. var. GUZMANIOIDES L. B. Smith (*Matuda 2308*), inflorescence $\times \frac{1}{2}$.
- Fig. 6. Same, spike $\times 1$.
- Fig. 7. Same, posterior sepals $\times 1$.
- Fig. 8. CATOPSIS TRITICEA L. B. Smith (*Matuda 2570*), pistillate plant $\times \frac{1}{4}$.
- Fig. 9. Same, flower $\times 1$.
- Fig. 10. Same, expanded sepal $\times 1$.

3. PLANTAE MEXICANAE,—I.

BY LYMAN B. SMITH AND BERNICE G. SCHUBERT.

THE paper here presented is the first in a proposed series of studies on Mexican plants. It is the purpose of the authors to publish in this form, from time to time, notes on species previously described but poorly defined or misunderstood, or descriptions of new entities, with illustrations wherever possible.

In this paper new species of *Cassia*, *Brongniartia*, *Begonia*, *Ipomoea* and *Breweria* are presented and reidentification is made of an early-described *Begonia*. The larger number of new species is described from material collected by Mr. G. B. Hinton, although

two of the *Begonia* species are typified by Guatemalan material collected by Mr. A. F. Skutch.

The authors are indebted to Dr. W. R. Maxon of the United States National Herbarium and Dr. C. C. Gregg of the Field Museum of Natural History for the generous loan of type specimens for comparison.

CASSIA stenosepala, spec. nov., fruticosa (?), 1.5 m. alta; caule lineato, sparse strigoso, cum pilis basi tumidis; foliis petiolatis, 6–9 cm. longis; petiolo 2–3 cm. longo; rhachi valde lineata, sparse strigosa, cum glandula unica clavata; stipulis bracteisque mox deciduis, ignotis; petiolulis 2.6 mm. longis, sparse strigosis; foliolis 2–4-jugis subellipticis, superne glabris, subtus moderate longo-strigosis, marginibus ciliatis, apice obtusis, mucronatis, basi parum attenuatis; inflorescentia racemosa sparse pilosa, ca. 15 cm. longa; pedicellis floriferis 10 mm., fructiferis 15 mm. longis, subangulatis, sparse pilosis, floribus numerosis; sepalis subaequalibus, 7 mm. longis, 1.2–2.4 mm. latis, lineari-lanceolatis, acutis vel obtusiusculis, parum pilosis, marginibus pallidioribus; petalis subaequalibus, 8–9.5 mm. longis, 5.5 mm. latis, obovatis, retusis, valde atrovenosis; staminibus 7, antheris basifixis, conicis cum poris apicalibus, ca. 6 mm. longis, staminodiis 3, spathulatis, 2–3 mm. longis, 1.2 mm. latis, basi attenuatis in filamentis tenuibus; ovario glabro; leguminibus compressis, glabris, immaturis, 4.5–5 cm. longis, 4–5 mm. latis, seminibus ignotis. Tab. I, fig. 11–15.

MEXICO: MEXICO: dist. Temascaltepec, Nanchititla, by the water, Aug. 31, 1934, *Hinton et al.* 6530 (G, TYPE).

Cassia stenosepala, a member of the segregate genus *Earleocassia* Britton, is most closely related to *C. arida* Rose (*E. arida* (Rose) Britton) according to the key in the North American Flora (xxiii. 247 (1930)). The distinctive characters of the two species may be summarized in the following manner:

Inflorescence 1–several-flowered; stem and branches loosely vil-	
lous; legume long-pubescent.....	<i>C. arida</i> .
Inflorescence long-racemose, many-flowered; stem and branches	
pilose; legume glabrous.....	<i>C. stenosepala</i> .

CASSIA tortuosa, spec. nov., arbor, 5 m. alta, ramulis tortuosis, sparse vel moderate pubescentibus, internodiis brevibus; foliis 2–8 cm. longis, petiolatis; petiolo 10–18 mm. longo; rhachi valde striata, magna pro parte glabra, striis pubescentibus, cum glandula unica clavata supra jugum infimum et saepe glandula apicali;

stipulis linearibus, pubescentibus, 6–7 mm. longis; petiolulis pilosis, 2 mm. longis; foliolis 6–8-jugis, ellipticis, 18–35 mm. longis, basi parum attenuatis, apice obtusis mucronatis, marginibus ciliatis, undique glabris nervo centrali excluso; bracteis mox deciduis; pedunculis axillaribus, bifloris; pedicellis 15–18 mm. longis, lineatis, sparse pilosis; floribus valde irregularibus; sepalis 5, duobus exterioribus ca. 4 mm. longis, 2.6 mm. latis, parum pubescentibus, marginibus ciliatis, tribus interioribus multo majoribus, obovatis, foris pilosis, intus basi parum pilosis, marginibus ciliatis; petalis aureis (fide *Hinton*), foris pubescentibus, duobus exterioribus maximis, brevi-unguiculatis, semiorbiculatis, 16 mm. longis, 8 mm. latis, tribus interioribus multo minoribus, parum obovatis, unguiculatis, ca. 7.5 mm. longis, ca. 3.5 mm. latis, unguicula ca. 3 mm. longis; antheris staminum 3 inferiorum incurvis, ca. 8 mm. longis, tenuiter rostratis, filamentis 3 mm. longis, pilosis, antheris 4 intermediorum ca. 6 mm. longis, rostro biporoso vix prominulo, filamentis brevibus, staminodiis 3, parvis, in laminam obovatam dilatatis; ovario piloso; legumine 3.5–11 cm. longo, 0.8 cm. lato, parum piloso, seminibus numerosis, latis planisque. Tab. I, fig. 16–18.

MEXICO: MEXICO: dist. Temascaltepec, Nanchititla, on a barranca, June 11, 1934, *Hinton 6144* (G, TYPE).

Cassia tortuosa has affinities with the segregate genus *Peiranisia* Raf., but is not referable to any species of that group because of its extremely unequal petals (see Pl. I, fig. 18). The two outer petals, at maturity, are about twice as long and broad as the three inner petals. *C. Quiedondilla* M. Micheli has much larger flowers with a tendency toward unequal petals but does not approach our species very closely.

BRONGNIARTIA proteranthera, spec. nov., arbor, 3–4 m. alta; ramis glabris; foliis imparipinnatis, rhachi longe denseque strigosa, foliolis 7, ovato-acuminatis, juventute dense strigosis, maturitate ignotis; stipellis rudimentariis ad floccum pilorum rubrorum reductis; stipulis obovatis, subtus reticulatis et longe strigosis, supra brevior et sparse strigosis, apice obtusiusculis, basi attenuatis, 10–15 mm. longis, 6–10 mm. latis, in inflorescentia bracteis simulantibus; pedicellis axillaribus solitariis plus minusve denso-pilosis, floriferis 4 mm., fructiferis 8 mm. longis, apice articulatis; bracteolis vel subulatis et ca. 0.6 mm. longis, vel ad floccum capillorum reductis; floribus caeruleo-nigris (fide *Hinton*) calycis ca. 1 cm. longis, foris glabris, intus flocculosis, lobis lanceolatis, acuminatis,

tribus inferioribus ad medium liberis; corollis ca. 15 mm. longis, vexillo suborbiculato, leviter retuso, alis semiobovatis, unguiculatis, carinis semiobovatis, basi attenuatis, unguiculatis; ovariis glabris; leguminibus compressis, ellipticis, 4 cm. longis, 1.6 cm. latis, glabris. Tab. I, fig. 19-23.

MEXICO: GUERRERO: dist. Coyuca, on hill, Pungarabato, April 24, 1934, *Hinton et al.* 5947 (G, TYPE); same locality, May 10, 1935, *Hinton et al.* 7750 (G).

Brongniartia proteranthera is particularly notable because its flowers mature before its leaves. In this respect it is similar to *B. oligosperma* Baillon and *B. nudiflora* Watson. From the former species *B. proteranthera* differs in its arboreal habit, glabrous branches, fewer leaflets, smaller calyces and longer glabrous legumes. From the latter, our species differs chiefly in indument, which is yellow in *B. nudiflora*, and in its arboreal habit.

After considerable study the authors have concluded that the character of inflorescence-type which Rydberg¹ has made the basis for the primary division in his key, is largely a function of the maturity of the plant. That is, the flowers of *Brongniartia* species are always axillary but the floral leaves often mature late or remain abortive. There appear to be three characteristic types of flowering: 1) represented by *B. podalyrioides*, in which at least the upper floral leaves are abortive and each group of pedicels is subtended by stipules which resemble bracts; 2) represented by *B. proteranthera*, *B. nudiflora* and *B. oligosperma*, in which the flowers begin to mature somewhat before the leaves, and 3) represented by *B. Benthamiana* and the majority of the species, in which leaves are produced before flowering occurs or simultaneously with the developing flowers.

The inflorescence-type throughout the genus, then, is essentially the same and the degree and time of leaf development is the distinctive character.

BRONGNIARTIA cuneata, spec. nov., arbor 3 m. alta; ramis glabriusculis; foliis breviter petiolatis, imparipinnatis, 6-15 cm. longis, rhachi sparse strigosa; petiolis 6-11 mm. longis; foliolis (9)-17-23, cuneatis, breviter petiolulatis (petiolulis 1-3 mm. longis), apice cuspidatis, 15-26 mm. longis, 6-15 mm. latis, juventute tenuibus et sparse strigosis, maturitate coriaceis, glabris vel cum pilis paucissimis, valde reticulatis; stipulis mox deciduis, ignotis; pedicellis axillaribus, binis, 15-30 mm. longis, strigosis,

¹ Rydberg, P. A., N. Am. Fl. xxiv. 186-188 (1923).

apice articulatis, bracteolis ad annulum capillorum reductis; calycis ca. 1 cm. longis, foris strigosis, intus flocculosis, lobis lanceolatis, acuminatis, tribus inferioribus ad medium liberis, corollis 13–15 mm. longis, vexillo latissime ovato, emarginato, alis semiobovatis basi biauriculatis, carinis oblique obovatis, auriculatis; ovario glabro; leguminibus compressis, subellipticis, interne substantia spongiosa vestitis, 3–4.5 cm. longis, 1.5–2 cm. latis, mox dehiscentibus; seminibus 2–3, oblongo-ellipticis, ca. 10 mm. longis, 5 mm. latis, appendiculatis. Tab. II, fig. 1–6.

MEXICO: GUERRERO: dist. Coyuca, on hill, Alborejo, July 19, 1934, *Hinton 6311* (G, TYPE); from same tree, July 5, 1935, *Hinton 8019* (G); by the trail, Alborejo, Aug. 11, 1935, *Hinton 8727* (G).

B. cuneata seems to be allied to the *Foliosae* of Rydberg (see N. Am. Fl. vol. xxiv., pp. 186–197), and in this group is most closely related to *B. pauciflora* Rose. Our species differs from the latter in having narrowly cuneate leaflets and biauriculate wing-petals.

BRONGNIARTIA funiculata, spec. nov., fruticosa, 1–2 m. alta; ramis glabris; foliis imparipinnatis, 3–15 cm. longis, petiolatis; stipulis glabris vel ciliatis, reticulatis, semihastatis, 5–26 mm. longis, 3–12 mm. latis; petiolis 5–15 mm. longis, rhachi subangulata, glabriuscula vel sparse pilosa; foliolis 3–13, ellipticis, ovatis vel obovatis, mucronatis, prominenter reticulatis, undique glabris vel sparse longo-pilosis; petiolulis 1–1.5 mm. longis, rugosis; stipellis 0.8–1.0 mm. longis, subulatis; pedicellis 10–17 mm. longis, glabris, apice articulatis, plerumque 1–4 in axillis, foliis floralibus saepe ad stipulas geminatas reductis; bracteolis abortivis; calycis subcylindricis, 7–8 mm. longis, foris glabris, intus flocculosis, lobis lanceolatis, acuminatis, tribus inferioribus ad medium liberis, duobus superioribus connatis fere ad apicem; corollis ca. 1 cm. longis, vexillo suborbiculato, alis suboblongis, basi unguiculatis, carinis semiobovatis, unguiculatis; ovario glabro; leguminibus compressis, 20–25 mm. longis, ca. 15 mm. latis, rugulosis; seminibus oblongis, immaturis 3 mm. longis, ca. 1 mm. latis, funiculis ca. 2 mm. longis. Tab. II, fig. 7–11.

MEXICO: MEXICO: dist. Temascaltepec, Luvianos, oak woods, Dec. 25, 1933, *Hinton et al. 5397* (G, TYPE); Tejupilco, Sept. 3, 1932, *Hinton 1591* (G).

B. funiculata is related to *B. podalyrioides* HBK., from which it differs in size of calyx and corolla, and size and shape of legume:

Legume oblong, 4-9-seeded, stipe shorter than calyx..... *B. podalyrioides*.
 Legume more than half as broad as long, 2-4-seeded, stipe
 slightly longer to twice as long as calyx..... *B. funiculata*.

Brongniartia funiculata appears to be intermediate between *B. podalyrioides* and *B. proteranthera* in regard to leaf-development. On the type specimen, *Hinton et al.* 5397, the legumes are in the axils of fully developed leaves; on the other hand, on *Hinton* 1591, the flowers are sometimes borne in the axils of developed leaves, but often the pedicels are subtended by the bract-like stipules only; and the position, terminal or lateral, of the flowers, seems to bear no relation to the degree of leaf development.

BEGONIA Section **Cylindrobegonia**, sect. nov., tepalis masculinis 4, staminibus numerosis, filamentis in columna cylindrica connatis, superne liberis, antheris subaequalibus, obovatis, retusis, bilocularibus, loculis obliquis. Tepalis femineis 5, subaequalibus, stylis 3, profunde bifidis, stigmatibus spiraliter cinctis. Ovario 3-loculato, elongato, placentis bipartitis, undique ovuliferis; capsulis elongatis, gracilibus, longo-pedicellatis, alis inconspicuis. Floribus paucis, axillaribus. Species unica. Affinis sectionibus *Barya* et *Podandra*.

BEGONIA (§CYLINDROBEGONIA) **cylindrata**, spec. nov., herbacea monoica; foliis petiolatis, anguste semicordatis, plus minusve 5-lobatis, denticulato-serratis, supra glabratis, subtus brevipilosis, pustulatis, 4-10 cm. longis, 1.3-3.2 cm. latis; stipulis lineari-lanceolatis, puberulis, ciliatis, ad 6 mm. longis, 2 mm. latis; petiolis lineatis, moderate pilosis, 2-6 cm. longis; bracteis parvis, ciliatis, 1-3.5 mm. longis; floribus paucis, axillaribus, plerumque binis; tepalis masculinis 4, duobus exterioribus obovatis vel suborbiculatis, 8 mm. longis, 6-8 mm. latis, apice leviter laceratis ciliatisque, duobus interioribus ellipticis, marginibus integris, ca. 6 mm. longis, ca. 3 mm. latis, staminibus numerosis, ut in sectionis descriptione; tepalis femineis 4 vel 5, subaequalibus, ellipticis vel obovatis, 4-8 mm. longis, 3.4-4 mm. latis, subintegris vel ciliato-denticulatis; ovariis stylisque ut in sectionis descriptione, pedicellis floriferis, 0.8-2 cm. longis, fructiferis 2-5 cm. longis, lineatis, moderate hirsutis; capsulis elongatis, 18-37 mm. longis, 3-7 mm. diametro (alis inclusis), sparse brevi-hirsutis cum pilis septatis; alis duabus minoribus angustioribus, tertio subapice expanso tum angusto ad pedicellum. Tab. II, fig. 12-15.

MEXICO: MEXICO: dist. Temascaltepec, Pantoja, Oct. 24, 1933, *Hinton* 5042 (G, TYPE).

The character of the staminate flowers of *B. cylindrata* indicates an affinity to the sections *Podandra* and *Barya*. Our species is distinguished from these, however, by its very numerous short stamens and long filaments which are basally adherent to all sides of a stout column. In *Podandra* the stamens are fewer in number with longer anthers and much shorter filaments fused to a column, while in *Barya* the filaments are essentially equal in length to the anthers and attached to all sides of an elongated slender column. *B. cylindrata* differs from species in the section *Barya* also in the character of the tepals of the staminate flowers which are differentiated into two series and range in shape from elliptic to obovate but never approach the characteristic lanceolate outline distinctive in *Barya*. In the pistillate flower the styles distinguish our section and species from *Barya*. In *Cylindrobegonia* the three stout styles are deeply bifid and spirally encircled by a stigmatic band. In *Barya* the extremely elongate styles are five times encircled by the bands of stigmatic papillae. In its capsule, however, the section *Cylindrobegonia* is clearly distinct not only from *Podandra* and *Barya* but also from all other sections of the genus in the New World. The capsule is elongate with three inconspicuous wings, one of which is slightly enlarged below the apex and tapers gradually so that at the base its width is no greater than that of the other two. Clearly then, *Begonia cylindrata* represents a section of the genus until now unrecognized.

BEGONIA (§HUSZIA (Klotzsch) Irmscher) MONOPHYLLA Pavon in DC. Prod. xv. pt. i, 284 (1864). *B. unifolia* Rose in Trelease in Rept. Mo. Bot. Gard. xv. 80 (1904).

Begonia monophylla is represented in the Gray Herbarium by a photograph of the type specimen labeled in Pavon's hand "de NE" [from Nueva España, i.e. Mexico]. When Trelease published *B. unifolia* Rose he suggested the affinity of that species to *B. monophylla* but, being unable to compare them, he felt that the two could not be identical and also implied doubt as to the origin of Pavon's specimen. According to Lasègue¹ a great number of Mexican plants in the herbarium of Ruiz and Pavon seem to have been part of the collection of Mociño and Sessé, which seems most probable; since, according to Hemsley,² "Pavon himself was never in Mexico, and there is evidence of his having dealt freely in the sale of dried plants." Assuming, then, that Pavon's plant did come from Mexico as indicated by his own annotation, the authors com-

¹ Lasègue, A., Musée Botanique de M. Benjamin Delessert, p. 522 (1845).

² Hemsley, W. B., Biol. Centrali-Am. Bot. iv. 120 (1887).

pared the photograph carefully with material of *B. unifolia* Rose and found no reason for treating this species as a distinct entity. By the shape, margin and venation of leaves and bracts, the two cannot be differentiated; and the capsules, variable in detail on single specimens, conform in general, in the isotype of *B. unifolia* and the type of *B. monophylla*. The other diagnostic characters not easily determined from a photograph are, according to the descriptions, in every way comparable between the two.

It seems wise, therefore, to consider *B. unifolia* Rose in Trel. as a synonym of *B. monophylla* Pav.

Material examined in addition to the photograph of the type:

MEXICO: MORELOS: Calcareous banks and ledges near Jojutla, 909 m., Aug. 30, 1902, *Pringle 8690* (G, isotype of *B. unifolia* Rose). GUERRERO: in cañon de la Mano Negra, near Iguala, Aug. 11, 1905, *Rose, Painter & Rose 9367* (G); limestone ledges, mountains near Iguala, 1212 m., Oct. 3, 1900, *Pringle 9225* (G). MEXICO: dist. Temascaltepec, cliffs, Bejucos, Aug. 19, 1933, *Hinton 4553* (G).

BEGONIA (§HUSZIA (Klotzsch) Irmscher) **extranea**, spec. nov., tuberosa, verisimiliter dioica, 3–5 dm. alta; caule fusco-pubescente, foliis palmati-7-nerviis, subreniformibus vel oblique cordatis cum lobo longissimo attenuato, 5–12-lobatis, serrulatis; petiolis 5–11 cm. longis, molle pubescentibus cum pilis multiseptatis ca. 0.2 mm. longis; foliis supra moderate tomentosis cum pilis adpressis eis petiolum similibus, in venis principiis longior, subtus etiam aliquid tomentosis cum pilis similibus sed longior (paene 1 mm. longo), marginibus ciliatis cum pilis gracilibus, longo-attenuatis, multiseptatis, atro-rufosis quum siccatis; stipulis late deltoideis, basi truncatis (6–9 mm. latis) apice laceratis vel valide fimbriatis, longo-ciliatis, 6–11 mm. longis, moderate hirsutis; inflorescentia cymosa; bracteis deltoideis vel paene oblongis vel longo-attenuatis, apicibus acutis vel fimbriatis cum marginibus ciliatis (1–3 mm. longis); bracteolis bracteis similibus sed minoribus; pedicellis dense hirsutis; tepalis masculinis 4, duobus exterioribus 7.5–8.5 mm. longis, 5.5–6.5 mm. latis, ovatis, apice fimbriatulis vel serrulato-ciliatis, duobus interioribus 7–8 mm. longis, 4–5 mm. latis, ovato-acutis, serrulato-ciliatis; staminibus numerosis, filamentis liberis, antheris obovatis, siccis nigris; tepalis femineis 4 vel 5, fimbriatulis vel serrulato-ciliatis, ovato-acutis, ca. 4 mm. longis, 3–3.5 mm. latis, dorso dense pubescentibus, stylis 3, bipartitis; ovariis 4 mm. longis, 3.5 mm. latis, dense hirsutis; capsulis visis valde immaturis. Tab. II, fig. 16–18.

MEXICO: MEXICO: dist. Temascaltepec, Volcan, 1460 m., July 8, 1932, *Hinton 993* (G, TYPE); JALISCO: shallow barranca, Hacienda San Marcos, alt. 1121 m., July 13, 1905, *Goldsmith 171* (staminate plant) (G).

Begonia extranea, a member of the Section *Huszia*, related as closely to *B. monophylla* Pav. in A. DC., perhaps, as to any other species of the section, is characterized by its densely hirsute ovary, the conspicuous red ciliation of the leaves and its apparent dioecism. The type specimen, *Hinton 993*, is, so far as the authors can determine, completely pistillate; whereas the plant, *Goldsmith 171*, from which part of the description was compiled, is purely staminate. The two specimens, in the same stage of maturity, seem perfectly comparable, and in morphological characters are virtually identical.

In the form of its tubers *B. extranea* resembles *B. ornithocarpa* Standley, but differs from this species in the type of its indument, the nature of inflorescence and the shape of its leaves.

BEGONIA (§MAGNUSIA (Klotzsch) Irmscher, subsection GIREOUDIA (Klotzsch) Irmscher) **falcata**, spec. nov., planta ca. 3 dm. alta; rhizomate 5 mm. crasso, foliis peltatis, 7-nerviis, oblique ellipticis ovatisve, acuminatis, apice ca. 1 cm. longo, integris vel obscure denticulatis, supra glabriusculis, subtus in venis rufo-hirsutis, 5.5–9 cm. longis, 3–6 cm. latis; stipulis lanceolatis longo-attenuatis, ca. 7 mm. longis; petiolis 7–18 cm. longis, rufo-hirsutis, pilis 2 mm. longis, multo-septatis; inflorescentia cymosa monoica; bracteis deciduis, scapo fere 2 dm. longo, moderate hirsuto, petiolis similibus; tepalis masculinis 2, 10 mm. longis, 10–13 mm. latis, late suborbiculatis, basi cordatis, subcarnosis, obscure venosis; staminibus numerosis, antheris oblongis, filamentis brevibus, pedicellis ca. 17 mm. longis, moderate rufo-hirsutis; tepalis femineis 2, suborbiculatis, 9–11.5 mm. longis, 11–12 mm. latis, pedicellis 15–16 mm. longis; ovariis parvo-hirsutis; stylis 3, bipartitis; capsulis basi obtusiusculis; ala unica, falcata, 15–20 mm. longa, 5–6 mm. lata; pedicellis ca. 2 cm. longis, obscure hirsutis. Tab. II, fig. 19–21.

GUATEMALA: dept. SUCHITEPEQUEZ: Volcán Atitlán, south slope, 1696 m., Oct. 22, 1934, *A. F. Skutch 1485* (G, TYPE).

Begonia falcata is distinguished, in the subsection *Gireoudia*, by its single well-developed falcate wing which is 3–4 times as long as broad. From its closest relative, *B. conchaefolia* A. Dietr., *B. falcata* is distinguished by having its styles fused well above the

ovary, by having only one wing developed (rather than three) and by a general tendency toward greater size and less abundant indument.

BEGONIA (§MAGNUSIA (Klotzsch) Irmscher, subsection GIREOUDIA (Klotzsch) Irmscher) **tinctoria**, spec. nov., planta ca. 3 dm. alta, rhizomate 5 mm. crasso; foliis petiolatis, 5-nerviis, oblique transverso-ellipticis, acuminatis, marginibus serrato-ciliatis (ciliis longissimis 3 mm. longis), supra glabriusculis, subtus pustulatis, 5.5–8.5 cm. longis, 3–4 cm. latis; stipulis ovatis, ca. 1 cm. longis, 0.8 cm. latis, apicibus capillaribus, longo-attenuatis, 5 mm. longis; petiolis 4–14 cm. longis, longo-ciliatis, ciliis foliorum similibus; inflorescentia cymosa, monoica; bracteis deciduis, non visis; caule florescente 21 cm. longo, sparse piloso, floribus incarnatis; tepalis masculinis 2, 9–10 mm. longis, 8–10 mm. latis, obovatis, antheris oblongis, quam filamenta longioribus; tepalis femineis 2, 7–9 mm. longis, 5–8 mm. latis, obovatis; pedicellis 1–3.5 cm. longis; ovariis glabris, stylis 3, bipartitis; capsulis, ca. 14 mm. longis, 12 mm. latis (alis inclusis), basi obtusis, alis 3, subaequalibus. Tab. II, fig. 22–24.

GUATEMALA: dept. SUCHITEPEQUEZ: Finca Mocá, epiphytic on stump in coffee plantation, 1454 m., Oct. 29, 1934, A. F. Skutch 1556 (G, TYPE).

Begonia tinctoria, another member of the subsection *Gireoudia*, is distinguished by the combination of characters which it possesses, rather than by any one distinctive feature. Its non-peltate leaves separate it immediately from several species in the subsection, whereas its entire leaves set it apart from other species such as *B. caroliniaefolia* Regel, which has digitate leaves, and *B. heracleifolia* Cham. & Schlecht., with deeply cleft leaves. Its green subcordate leaves separate *B. tinctoria* from *B. imperialis* Lem., which has brown-mottled cordate leaves, and its cymose inflorescence distinguishes it from *B. hydrocotylifolia*, which has a paniculate inflorescence.

BEGONIA (§BEGONIASTRUM A. DC.) **Hintoniana**, spec. nov., suffrutescens, caule lineata, hispidula vel glabra; foliis petiolatis, oblique subellipticis, cordatis, 5–6-nerviis, saepe multilobatis (11), saepe nullo modo, serratulo-ciliatis; petiolis 1–8 cm. longis, hispidis; foliis supra hispidulis vel punctatis, subtus similibus vel dense hispidis; stipulis bracteisque non visis; inflorescentia cymosa, monoica, bracteolis linearibus vel lineari-lanceolatis, fimbriatis, 3–4 mm. longis; pedicellis hirsutis vel glabris, 7–16 mm. longis; tepalis masculinis 4, duobus exterioribus duobus interioribus

similibus, 8–14 mm. longis, 5–6 mm. latis, subellipticis vel obovatis, apicibus acutis, grosse serratis, paginis dorsalibus femineis similibus, staminibus liberis; tepalis femineis 5, 6–11 mm. longis, 4–6 mm. latis, ovatis, acutis, grosse serratis, paginis dorsalibus plus minusve papillatis (saepe dense papillatis); stylis 3, stigmatibus dilatato-lunatis; capsulis cum ala unica plus minusve triangulata glabraque, capsulis ipsis dense papillatis. Tab. II, fig. 25–27.

MEXICO: MEXICO: dist. Temascaltepec, 1750 m., Oct. 10, 1932, *Hinton 2050* (G, TYPE); Ixtapan, 1000 m., Oct. 23, 1932, *Hinton 2284* (G).

Begonia Hintoniana seems to fall naturally in section *Begoniastrum* A. DC. between subsections *Eubegonia* Warb. and *Knesebeckia* (Klotzsch) Irmscher, according to the classification of Irmscher (in *Natürl. Pflanzenfam.* 2 Aufl. Bd. 21, p. 586 (1925)). The distinctive character of *Begonia Hintoniana* which makes its inclusion in either subsection difficult is the papillose character of the capsule and, often, of the perianth members. We have not found similar outgrowths on the capsules of any other species of *Begonia*.

BEGONIA (§BEGONIASTRUM A. DC., subsection KNESEBECKIA (Klotzsch) Irmscher), **asteroides**, spec. nov., herbacea, ± 7 dm. alta, caule glabra, costata; foliis tenuibus, petiolatis, 7-nerviis, oblique suborbiculatis subellipticisve, profunde sinu clauso cordatis, lobatis (tum venis primariis tum secundariis in lobis terminant) serrato-ciliatisque; in axillis foliorum bulbiferis; petiolis 4–11 cm. longis, costis hispidulis; foliis supra sparse minuteque squamosis, subtus similibus densiusque; stipulis magnis, aliquid pilosis, late lanceolatis, apice acutiusculis vel brevi-acuminatis, ca. 9 mm. longis, 4–5 mm. latis, prominenter nervatis, marginibus scariosis, sparse ciliatis; inflorescentia cymosa, monoica et etiam aliqui cum floribus masculinis solum; bracteis bracteolisque inconspicuis et mox deciduis; pedicellis tenuibus, 5–13 cm. longis, glabris; tepalis masculinis 4, uno exteriori ovato, obtuso, ca. 9 mm. longo, 6 mm. lato, uno secundo subelliptico, 10 mm. longo, 6 mm. lato, duobus interioribus obovatis, 7 mm. longis, 5 mm. latis, staminibus numerosis, maxima pro parte liberis; tepalis femineis 5, 3 mm. longis, 2.5 mm. latis, ovatis; capsulis glabris, immaturis 5 mm. longis, 3-alatis, alis 1.5 mm. latis. Tab. II, fig. 28–30.

MEXICO: MEXICO: dist. Temascaltepec: Tejupilco, 1340 m., Oct. 16, 1932, *Hinton 2206* (G, TYPE); Temascaltepec, rocky hill, 1900 m., Nov. 18, 1932, *Hinton 2428* (G).

Begonia asteroides, a member of the section *Begoniastrum* A. DC., subsection *Knesebeckia* (Klotzsch) Irmscher, possesses the characters typical of the subsection, as defined and illustrated by Klotzsch (*Begoniaceen-Gattungen und Arten*, Berlin, Abhandl. 1854, pp. 41, 42, t. II-C (1855)) and somewhat clarified by Irmscher (*Natürl. Pflanzenfam.* 2 Aufl. Bd. 21, p. 586 (1925)). Its aspect is made outstanding by the rather large axillary bulblets and the diffuse inflorescence, somewhat reminiscent of the woodland Asters.

BREWERIA elliptica, spec. nov., fruticosa; caule volubili, pilis albis dense induti; foliis petiolatis, ellipticis, 3–5.5 cm. longis, 2.5–4 cm. latis, mucronatis, basi minute obliquo, supra longe strigosis, subtus densius strigosis, venis prominulis; petiolis 8–9 mm. longis, dense strigosis; inflorescentiis axillaribus, cymosis, ad 11-floris; pedicellis 8–10 mm. longis, dense pilosis caulibus similibus; bracteis numerosis, pilosis, acuminatis, 3.5–7 mm. longis; sepalis aequalibus, ovato-acuminatis, longe strigosis, marginibus tenuioribus, ciliatis, 13–15 mm. longis, 5–6 mm. latis; corolla infundibuliformi, striis 5 longe fulvo-strigosis, 3.8–5.0 cm. longis; stylo bifido; stigmatibus capitatis; capsulis ignotis. Tab. II, fig. 31, 32.

MEXICO: MEXICO: dist. Temascaltepec, 1230 m., Oct. 14, 1932, *Hinton* 2176 (G, TYPE).

Breweria elliptica differs from *B. sulphurea* Brandege, its closest relative, in its very much larger flowers and its regularly much-branched cymose inflorescences, which are borne in the axils of leaves of the primary branches, rather than in the axils of leaves of secondary leafy branches.

IPOMOEA cordata, spec. nov., planta herbacea; caule volubili, glabriusculo; foliis petiolatis, petiolis 0.5–5.0 cm. longis, glabriusculis cum paucis pilis longis in apice paginae ventralis; foliis cordatis, glabris, acuminatis, ciliatis, 4.5–9.0 cm. longis, 3.0–8.5 cm. latis; inflorescentiis axillaribus, cymosis simplicissimis, pedunculis 4–5.5 cm. longis, ramis cymorum tenuibus, rectis et valde divaricatis, 2–3.8 cm. longis, tum pedunculis tum ramis glabris; bracteis minutis, squamiformibus; pedicellis 3–10 mm. longis, ad apicem incrassatis; sepalis subaequalibus, 4–5 mm. longis, 2–3 mm. latis, glabris, marginibus tenuibus, mucronatis, interioribus aliquid maioribus; corollis ca. 2 cm. longis, rubro-purpureis siccatis; capsulis ovoideis, 12–14 mm. longis, 6–9 mm. diametro; ovario 2-loculato; seminibus 4, puberulentis. Tab. II, fig. 33, 34.

MEXICO: GUERRERO: dist. Coyuca, Cutzamala, Nov. 15, 1934, *Hinton 6984* (G, TYPE).

Ipomoea cordata is closely related to *I. Tuerckheimii* Donn. Sm., from which it differs in its very simple, cymose inflorescences, its stouter pedicels, its larger, broader leaves and longer petioles.

EXPLANATION OF PLATES.

PLATE I.

- Fig. 11. *CASSIA STENOSEPALA* Smith & Schubert (*Hinton 6530*), leaf $\times \frac{1}{2}$.
- Fig. 12. Same, flower $\times 1$.
- Fig. 13. Same, petal $\times 2$.
- Fig. 14. Same, stamens and pistil $\times 2$.
- Fig. 15. Same, fruit $\times 1$.
- Fig. 16. *CASSIA TORTUOSA* Smith & Schubert (*Hinton 6144*), leaf $\times \frac{1}{2}$.
- Fig. 17. Same, fruiting branchlet $\times \frac{1}{2}$.
- Fig. 18. Same, flower $\times 1$.
- Fig. 19. *BRONGNIARTIA PROTERANTHERA* Smith & Schubert (*Hinton 5947*), fruiting branchlet $\times \frac{1}{2}$.
- Fig. 20. Same, calyx cut open $\times 1$.
- Fig. 21. Same, standard $\times 1$.
- Fig. 22. Same, wing $\times 1$.
- Fig. 23. Same, keel $\times 1$.

PLATE II.

- Fig. 1. *BRONGNIARTIA CUNEATA* Smith & Schubert (*Hinton 6311*), leaf $\times \frac{1}{2}$.
- Fig. 2. Same, flower $\times \frac{1}{2}$.
- Fig. 3. Same (*Hinton 8727*), fruit with one valve removed $\times \frac{1}{2}$.
- Fig. 4. Same (*Hinton 6311*), standard $\times 1$.
- Fig. 5. Same, wing $\times 1$.
- Fig. 6. Same, keel $\times 1$.
- Fig. 7. *BRONGNIARTIA FUNICULATA* Smith & Schubert (*Hinton et al. 5397*), leaf and fruit $\times \frac{1}{2}$.
- Fig. 8. Same (*Hinton 1591*), calyx cut open $\times 1$.
- Fig. 9. Same, standard $\times 1$.
- Fig. 10. Same, wing $\times 1$.
- Fig. 11. Same, keel $\times 1$.
- Fig. 12. *BEGONIA CYLINDRATA* Smith & Schubert (*Hinton 5042*), inflorescence $\times \frac{1}{5}$.
- Fig. 13. Same, capsule $\times 1$.
- Fig. 14. Same, pistillate flower $\times 2$.
- Fig. 15. Same, staminate flower $\times 2$.
- Fig. 16. *BEGONIA EXTRANEA* Smith & Schubert (*Goldsmith 171*), staminate plant $\times \frac{1}{5}$.
- Fig. 17. Same, staminate flower $\times 1$.
- Fig. 18. Same (*Hinton 993*), young pistillate flower $\times 1$.
- Fig. 19. *BEGONIA FALCATA* Smith & Schubert (*Skutch 1485*), plant $\times \frac{1}{5}$.
- Fig. 20. Same, staminate flower $\times 1$.
- Fig. 21. Same, fruit $\times 1$.
- Fig. 22. *BEGONIA TINCTORIA* Smith & Schubert (*Skutch 1556*), plant $\times \frac{1}{5}$.
- Fig. 23. Same, staminate flower $\times 1$.
- Fig. 24. Same, fruit $\times 1$.
- Fig. 25. *BEGONIA HINTONIANA* Smith & Schubert (*Hinton 2050*), plant $\times \frac{1}{5}$.

- Fig. 26. Same, staminate flower $\times 1$.
Fig. 27. Same, pistillate flower and young fruit $\times 1$.
Fig. 28. *BEGONIA ASTEROIDES* Smith & Schubert (*Hinton 2206*), lower leaf with axillary bulblet $\times \frac{1}{2}$.
Fig. 29. Same, pistillate flower and young fruit $\times 1$.
Fig. 30. Same, staminate flower $\times 1$.
Fig. 31. *BREWERIA ELLIPTICA* Smith & Schubert (*Hinton 2176*), leaf and inflorescence $\times \frac{1}{2}$.
Fig. 32. Same, gynoecium $\times 1$.
Fig. 33. *IPOMOEA CORDATA* Smith & Schubert (*Hinton 6984*), leaf and inflorescence $\times \frac{1}{2}$.
Fig. 34. Same, fruit $\times 1$.
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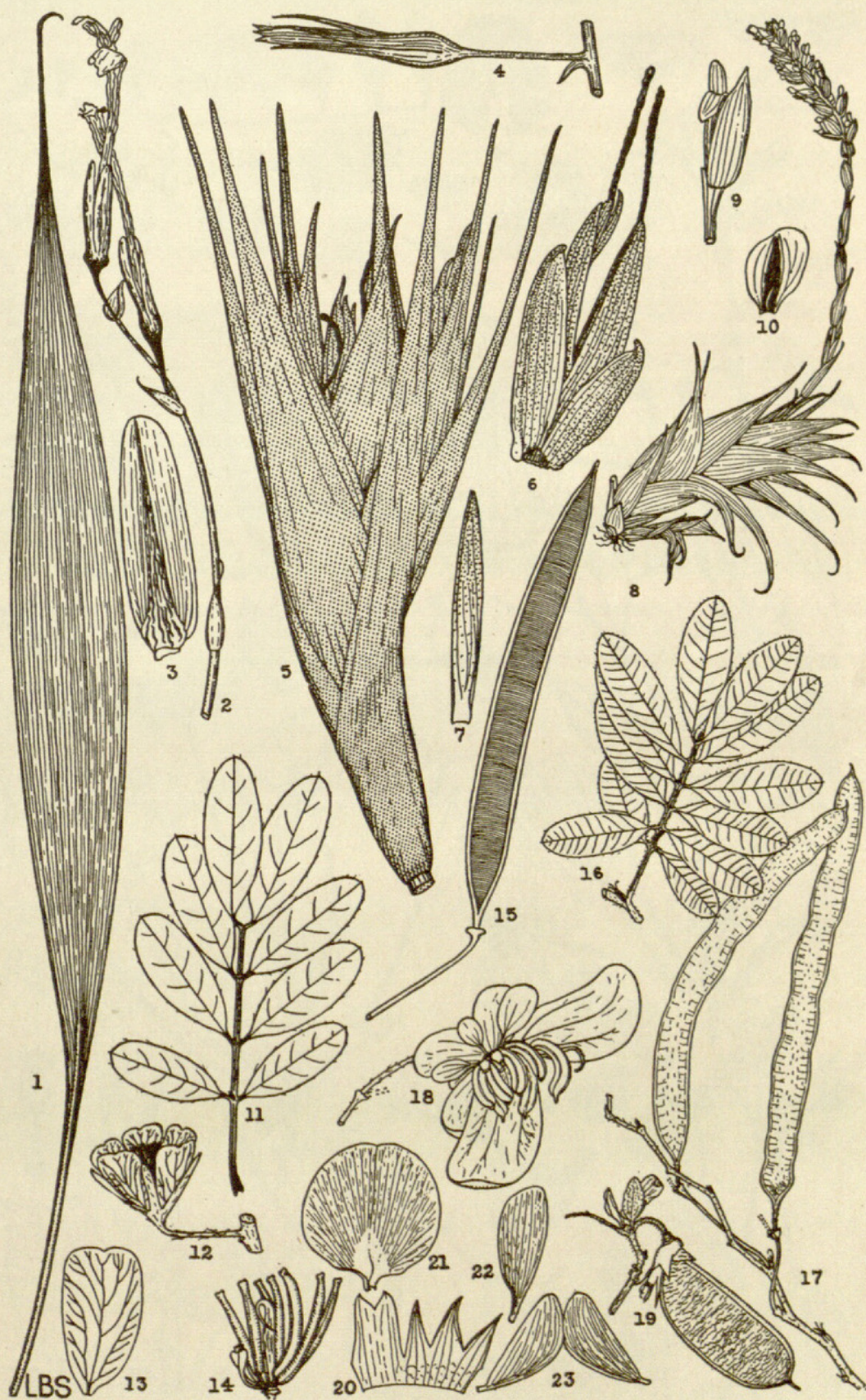
4. STUDIES IN THE IRIDACEAE,—I.

BY ROBERT C. FOSTER.

I. A CURRENT MISINTERPRETATION OF *GLADIOLUS* SUBGENUS *HEBEA* PERS.

AN endeavor to identify some unnamed specimens of *Gladiolus* in the Gray Herbarium resulted in the discovery that there is a discrepancy between the usual interpretation of *Gladiolus* subg. *Hebea* and that of some South African botanists, e.g., Mrs. H. M. L. Bolus in *S. Afr. Gard.* xix. 123 (1929) and Miss G. J. Lewis in *Pole Evans, Fl. Pl. S. Afr.* xiv. pl. 549 (1934). The concept of the South African botanists is that of a group with short, rather rigid, membranous, brown spathes, a short perianth-tube, unguiculate perianth-segments, apiculate anthers, retuse stigmas, wingless or very narrowly winged seeds, and corms with tunics prolonged upwards into long fibrous collars. About a dozen species sharing these characteristics have been segregated by them from *Gladiolus* as the genus *Hebea* (Pers.) Hedw. f. That these species are distinct from *Gladiolus* is, I am certain, correct, but a consideration of the concept of *Hebea* from the time of its first use indicates that that name should not be applied to them. As opposed to the South African view, most workers have regarded *Hebea* as a subgenus of *Gladiolus* containing about fifteen species, characterized by rather large, green, herbaceous spathes, a relatively short perianth-tube, unguiculate perianth-segments, non-apiculate anthers, entire or sometimes retuse stigmas, broadly winged seeds, and corms like those of true *Gladiolus*.

The name *Hebea* was first used by Persoon, *Syn. Pl.* i. 44 (1805), for a subgenus of *Gladiolus* L., containing six species. It was



Figs. 1-3, *PITCAIRNIA BIFLORA* L. B. Smith; 4, *PITCAIRNIA PATENTIFLORA* L. B. Smith; 5-7, *TILLANDSIA CAPITATA* Griseb. var. *GUZMANIODES* L. B. Smith; 8-10, *CATOPSIS TRITICEA* L. B. Smith; 11-15, *CASSIA STENOSEPALA* Smith & Schubert; 16-18, *CASSIA TORTUOSA* Smith & Schubert; 19-23, *BRONGNIARTIA PROTERANTHERA* Smith & Schubert.



Figs. 1-6, *BRONGNIARTIA CUNEATA* Smith & Schubert; 7-11, *BRONGNIARTIA FUNICULATA* Smith & Schubert; 12-15, *BEGONIA CYLINDRATA* Smith & Schubert; 16-18, *BEGONIA EXTRANEA* Smith & Schubert; 19-21, *BEGONIA FALCATA* Smith & Schubert; 22-24, *BEGONIA TINCTORIA* Smith & Schubert; 25-27, *BEGONIA HINTONIANA* Smith & Schubert; 28-30, *BEGONIA ASTEROIDES* Smith & Schubert; 31, 32, *BREWERIA ELLIPTICA* Smith & Schubert; 33, 34, *IPOMOEA CORDATA* Smith & Schubert.



Smith, Lyman B. and Schubert, Bernice G. 1939. "Plantae Mexicanae,--I." *Contributions from the Gray Herbarium of Harvard University* (127), 20–33.
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