

The other scraps of material mounted on the same sheet have deltoid-ovate acuminate somewhat hastately toothed leaves and bear heads about 8 mm. long. They also are somewhat pubescent and seem uniform with each other. This part of the material, which may be styled Element B, clearly belongs to the *M. scandens* group but certainly not to the real *M. scandens* L. of North America. From the rather deeply tawny pappus and from the form, size and position of the bractlet, the writer would infer that these scraps of Element B came possibly from Brazil but more probably from some part of the Old World and were referable to *M. CORDATA* (Burm. f.) Robinson rather than to any of the other segregates of *M. scandens* here described.

Therefore, it is probable that this Element B, which happily does not have any nomenclatural significance in the interpretation of *M. cissampelina*, is merely some non-pertinent material by oversight subsequently mixed during the mounting with the original plant stated by the label to have been collected in Santo Domingo by Coulon in 1802, and referable, as we have seen, to *M. cordifolia*.

IV. STUDIES IN THE BROMELIACEAE,—V.

BY LYMAN B. SMITH.

(Plates I–III.)

THE present paper is chiefly the result of studies made in the summer of 1933 in the herbaria of the Royal Botanic Gardens at Kew (K), the British Museum of Natural History (BM), and Cambridge University (Cam). I am also indebted to the following institutions and individuals for lending me important material or procuring photographs or duplicates for me: the United States National Museum (US), the New York Botanical Garden (NY), the Field Museum of Natural History (FM), the Missouri Botanical Garden (Mo), the University of California (Cal), the Berlin Herbarium (B), the National Museum of Prague, the Rijks Herbarium of Leiden, the Botanical Museum of Munich (Mun), the National Museum of Natural History of Buenos Aires (BA), and Don Cornelio Osten of Montevideo, Uruguay (Ost).

I am obliged to Mr. J. E. Dandy of the British Museum and to Dr. T. A. Sprague of the Kew Herbarium for important suggestions on nomenclatorial points. Dr. Castellanos of the National Museum of Buenos Aires and Don Cornelio Osten have given me much helpful

advice on the *Bromeliaceae* of northern Argentina and adjacent regions.

In making new combinations, I am publishing only those which have been necessitated by the process of determining material. In other cases it seems better to wait until the validity of the species can be checked by an examination of the types.

Ananas comosus (L.) Merrill var. **microstachys** (Lindm.), comb. nov. *A. microstachys* Lindm. in Svensk. Ak. Handl. xxiv. no. 8, 39, t. 7, fig. 20-23 (1891). *A. sativus* var. *microstachys* Mez in Mart. Fl. Bras. iii. pt. 3, 294 (1892).

In accepting Merrill's combination as the correct name for the common pineapple of cultivation, it becomes necessary to have a new combination to designate the primitive wild variety.

Aregelia, see **Neoregelia**.

Bakerantha, nom. nov. *Bakeria* André, Rev. Hort. lxi. 84 (1889), non Seem. (1864).

Bakerantha tillandsioides (André), comb. nov. *Bakeria tillandsioides* André, ibid.

Catopsis (**Eucatopsis**) **cucullata**, spec. nov., acaulis: foliis rosulatis, tenuibus, ad 22 cm. longis, minutissime punctato-lepidotis; vaginis late ellipticis sed haud distinctis; laminis subtriangularibus, acutis apiculatisque, basi 2 cm. latis: scapo decurvo, vaginis late ovatis, acutis, internodia superantibus: inflorescentia simplici vel paupere paniculata, pendula; in inflorescentia paniculata bracteis primariis late ovatis, acutis, quam spicae suberectae multo brevioribus: spicis ad 10 cm. longis; bracteis florigeris suberectis, late ovatis, acutis, 10-15 mm. longis, flores bene superantibus, apice cucullato-incurvis, tenuibus, nervatis, obscure punctato-lepidotis vel glabris: floribus hermaphroditis; sepalis late obovatis, asymmetricis, 10 mm. longis; petalis quam sepala paulo longioribus; staminibus manifeste inaequalibus; stylo brevissimo. Pl. III, figs. 3-5.

MEXICO: VERA CRUZ: Banderilla, Jilotepic, Jalapa, alt. 1300-1550 m., 1888, *Com. Geogr. Explor. Rep. Mex.* 366 (FM, TYPE; G).

This species is unusual for *Catopsis* in having its flowers hooded by the bracts. The flowers are perfect but the stamens are distinctly unequal. This combination of characters conflicts with the generally accepted definition of the subgenus *Eucatopsis*, but in the case of at least two species the definition is obviously in error. Hooker's illustration of *Tillandsia nitida* in the Exotic Flora t. 218 has been cited as the original of a species assigned to *Eucatopsis*, yet the figure plainly shows the stamens unequal. Harms illustrates another species of the subgenus, *Catopsis nutans*, with the same character of unequal

stamens.¹ Obviously the relative lengths of the stamens must be abandoned as a distinction between the two subgenera of *Catopsis*.

Dyckia Meziana Kuntze. This little-known species is illustrated here to show its more important technical characters and to give a comparison with the nearly related *D. pulquinensis* Wittm. Pl. III, figs. 11–13.

Dyckia microcalyx Bak. var. **Ostenii**, var. nov., foliis haud ultra 20 cm. longis, margine fortiter spinosis; lamina basi ad 3 cm. lata: inflorescentia laxa, in typo simplici: floribus magnis; sepalis ad 6 mm. longis. Pl. III, fig. 16.

ARGENTINA: MISIONES: on rocks on the banks of the Yguazú, Yguazú Falls, 1915, *Osten & Rojas* 8097 (Ost, TYPE; phot. G).

Dyckia pulquinensis Wittm. The closest relative of this species is *D. Meziana* Kuntze, not *D. hamosa* Mez as Wittmack suggested. *D. hamosa* has the stamens included while *D. pulquinensis* and *D. Meziana* have them conspicuously exerted, and are practically identical in habit. In fact there is little to distinguish the two species except the form of the petals, and until further material appears it will always be a question whether the distinction really holds. Pl. III, figs. 6–10.

Guzmania R. & P. In a previous paper² I noted the apparent weakness of the distinction between *Guzmania* and *Sodirola* but owing to an almost complete lack of material of the latter genus I refrained from reducing it for fear that there might be better distinctions as yet unnoted. Since that time I have examined the types of seven of the eight species of *Sodirola* and an isotype of the eighth, and am now convinced that *Sodirola* does not merit generic rank.

In the first place *Sodirola* is not homogeneous, and to retain it even as a section or subgenus it would be necessary to remove *S. dissitiflora* and *S. Sprucei*. Their sepals are cucullate and closely convolute at anthesis, as in *Guzmania musaica*, not straight and flaring as in typical *Sodirola*. Furthermore they are not caulescent, although the caulescent habit has been considered as characterizing all species of *Sodirola*.

In the second place *Sodirola* in its original sense has only its flaring sepals to distinguish it from *Guzmania*. The caulescent habit long thought to be distinctive of *Sodirola* is shown equally well by *Guzmania angustifolia* which has sepals quite unlike *Sodirola*. It is hard to see why flaring sepal-blades should separate *Sodirola* from *Guzmania*,

¹ Harms in Engl. & Prantl, Nat. Pflanzenf. 2 Aufl., xv a. 131, fig. 48 D (1930).

² Contrib. Gray Herb. xcvi. 19 (1932).

when flaring petal-blades full as conspicuous fail to separate *Phytarrhiza* from *Tillandsia*.

The following brief synopsis will serve to make the necessary transfers and illustrate the relations of the species in the typical *Sodiroa* group, while adding citations previously unnoted:

1. Inflorescence subcorymbose: flowers closely aggregated.
2. Sepals 3–7 cm. long: leaf-blades with several strong nerves.
3. Leaf-sheaths deep chestnut-brown.
4. Sepals triangular-acute. Colombia, Ecuador.....*G. Pearcei*.
4. Sepals broadly obtuse. Costa Rica, Colombia.....*G. obtusiloba*.
3. Leaf-sheaths but little darker than the blades. Colombia.....*G. caricifolia*.
2. Sepals not more than 2 cm. long: leaf-blades with a single strong median nerve. Colombia.....*G. graminifolia*.
1. Inflorescence spiciform. Colombia.....*G. Kalbreyeri*.

G. Pearcei (Bak.), comb. nov. *Sodiroa Pearcei* Bak. Journ. Bot. xxv. 53 (1887).

COLOMBIA: CAUCA: western Andes of Popayan, alt. 1400–1800 m., Lehmann 5306 (B, phot. G).

G. obtusiloba, nom. nov. *Sodiroa Andreana* Wittm. Pl. Lehm. in Engl. Bot. Jahrb. xi. 57 (1889), non *Guzmania Andreana* Mez in DC. Mon. Phan. ix. 936 (1896).

COSTA RICA: La Hondura de San José, alt. 1300 m., 1933, Valerio 702 (FM, phot. G).

G. caricifolia (André), comb. nov. *Sodiroa caricifolia* André ex Bak. Journ. Bot. xxv. 53 (1887).

G. graminifolia (André), comb. nov. *Sodiroa graminifolia* André ex Bak. Journ. Bot. xxv. 54 (1887). *S. Trianae* Mez in DC. Mon. Phan. ix. 888 (1896).

It should be noted that while André gave *S. caricifolia* and *S. graminifolia* as the only species when he described *Sodiroa* in Bull. Soc. Bot. France, xxiv. 167 (1877), he said specifically that he was not going to describe the species until later.

Mez's description of the peculiarly abrupt transition from sheath to blade in the scape-bracts of *S. graminifolia* allows him to separate *S. Trianae*, but an examination of the types shows the two species to be identical, and the strange bracteal characters merely the result of drying and inrolling inaccurately observed.

G. Kalbreyeri (Bak.), comb. nov. *Sodiroa Kalbreyeri* Bak. Brom. 141 (1889).

G. dissitiflora (André), comb. nov. *Sodiroa dissitiflora* André, Enum. 5 (1888).

G. Sprucei (André), comb. nov. *Sodirola Sprucei* André, Enum. 5 (1888). *G. rosea* L. B. Smith in Contrib. Gray Herb. cii. 147 (1933). In *G. Sprucei* the leaves are ligulate and the sepals are about 5 cm. long, while in *G. dissitiflora* the leaves are narrowly triangular and the sepals are only about 3 cm. long. The character of relative length of bracts and sepals formerly used to distinguish these species has become quite useless with the appearance of material additional to the types.

G. angustifolia (Bak.) Wittm. *G. caulescens* Mez & Sodiro in Bull. Herb. Boiss. ser. 2, v. 112 (1905). The typical material of *G. angustifolia* as shown at Kew varies from very short-caulescent to distinctly caulescent, but the leaves are never truly rosulate. This eliminates any distinction for the later *G. caulescens*.

G. Cornuaulti (André) Mez. This species must be excluded from *Guzmania* henceforth. See under **Tillandsia Turneri**.

G. gloriosa André. *G. columnaris* Mez & Sodiro, Bull. Herb. Boiss. ser. 2, v. 113 (1905). *G. gloriosa* should not have been transferred to *Thecophyllum*.¹ André dissected and sketched the type when he collected it, and his illustration in Brom. André, t. 17, figs. C1 and 3 clearly shows a gamopetalous naked corolla. He described it as "breviter trilobata." Unfortunately the flowers have deteriorated so badly that it is impossible to check André's findings, but until he is proven wrong it would seem unwise to contradict the statement of so careful and accurate an observer as he.

In my provisional key to *Guzmania*,² *G. gloriosa* runs down to 33. *G. columnaris* from whose description it shows no essential distinction. *G. gloriosa* is now known from the following material:

COLOMBIA: CALDAS: epiphytic in forest, "Pinares," above Salento, alt. 2800–3100 m., 1922, Pennell 9362 (G). ECUADOR: PICHINCHA: Perucho, near Quito, alt. 1830 m., 1876, André 3791 (K, TYPE; phot. G); woods, west of Mt. Pichincha, Sodiro 45 (hb. Mez, type of *G. columnaris*, not seen).

G. longipetala (Bak.) Mez. A dissection of the flowers of this species shows a gamopetalous naked corolla, indicating that it should be retained in *Guzmania*, not in *Thecophyllum*. As the floral bracts are somewhat shorter than the sepals the species runs down to *G. acorifolia* in my key. It differs from that species in its very elongate primary bracts, 2-flowered spikes and membranaceous floral bracts.

Lindmania Mez. The following synopsis includes several changes in taxonomy and brings the treatment of the whole genus up to date:

¹ Mez in Bull. Herb. Boiss. ser. 2, iii. 131 (1903).

² Contrib. Gray Herb. xcvi. 19 (1932).

1. Flowers neither secund nor nutant.
2. Inflorescence tripinnate.
3. Inflorescence arachnoid, amply tripinnate.
4. Stamens longer than the petals.....1. *L. Pearcei*.
4. Stamens shorter than the petals: leaf-blades serrulate toward base.....2. *L. albicans*.
3. Inflorescence subglabrous, barely tripinnate: leaves entire, petiolate.....3. *L. petiolata*.
2. Inflorescence scanty bipinnate, glabrous: leaves not at all constricted between sheath and blade.....4. *L. guianensis*.
1. Flowers secund or nutant, usually both.
5. Leaf-blades serrulate, at least toward base.
6. Leaf-blades serrulate for most of their length, pungent: scape-bracts serrulate: flowers 5 mm. long.....5. *L. Weddelliana*.
6. Leaf-blades serrulate only toward base, filiform-acuminate: scape-bracts entire: flowers 3 mm. long.....6. *L. Rusbyi*.
5. Leaf-blades entire.
7. Inflorescence arachnoid to villous: floral bracts acuminate, mostly longer than the pedicels.
8. Inflorescence merely arachnoid: floral bracts not much longer than the pedicels.....7. *L. micrantha*.
8. Inflorescence densely villous: floral bracts more than twice as long as the pedicels.....8. *L. villosula*.
7. Inflorescence glabrous: floral bracts merely acute, mostly shorter than the pedicels.
9. Flowers scarcely 5 mm. long.....9. *L. Weberbaueri*.
9. Flowers 8-9 mm. long.
10. Sepals obtuse: leaves up to 25 cm. long.....10. *L. penduliflora*.
10. Sepals acute: leaves much shorter.....11. *L. gracilis*.

1. ***L. Pearcei*** Mez in DC. Mon. Phan. ix. 537 (1896). *Cottendorfia Pearcei* Bak. Brom. 128 (1889).

BOLIVIA: near Butuco, July 1865, *Pearce* (BM, TYPE; phot. G).

I do not know why Mez considered that this specimen came from Colombia. The label gives no other locality than "Butuco" which I have been unable to find, but at the date given, Pearce must have been in Bolivia judging by the data on other specimens.

2. ***L. albicans*** (Griseb.) Mez in DC. Mon. Phan. ix. 537 (1896). *Cottendorfia albicans* Griseb. Symb. Argent. 330 (1879).

ARGENTINA: SALTA: Dept. Oran, Barranco de Rio Blanco near the Rio Seco below San Andres, 1873, *Lorentz & Hieronymus* 502 (NY, B, phot. G); 288 (NY).

3. ***L. petiolata*** Mez, Bull. Herb. Boiss. ser. 2, iv. 864 (1904).

PERU: PUNO: terrestrial in forest, near Tambo Isillame on the way from Sandia to Chunchusmayo, alt. 1000 m., *Weberbauer* 1210 (B, TYPE; not seen).

4. ***L. guianensis*** (Beer) Mez in DC. Mon. Phan. ix. 537 (1896). *Anoplophytum guianense* Beer, Brom. 44 (1857).

BRITISH GUIANA: BERBICE: upper Corentyne River, *Schomburgk* 20 (K, phot. G); 1564 (Mez!).

5. **L. Weddelliana** (Brongn.) Mez in DC. Mon. Phan. ix. 538 (1896). *Cottendorfia Weddelliana* Brongn. ex Bak. Brom. 129 (1889).

BOLIVIA: LA PAZ: prov. Yungas, damp meadows, *Weddell* 4233 (Paris, TYPE; not seen).

6. **L. Rusbyi** Mez in Engl. Bot. Jahrb. xxx. Beibl. 67, 6 (1901).

PERU: CUZCO: Pumachaca, Santa Ana Valley, alt. 1400 m., 1931, *F. L. Herrera* 3316 (G). BOLIVIA: LA PAZ: Noryungas, subtropical region, Polo-Polo near Coroico, alt. 1100 m., 1912, *Buchtien* 3674 (NY); Prov. Yungas, *Bang* 2571 (NY, TYPE; G, FM, K).

It should be noted that the collector of the type of this species was Bang, and not Rusby as given in the original description.

7. **L. micrantha** (Lindl.), comb. nov. *Pitcairnia micrantha* Lindl. Bot. Reg. xxix Misc. 44 (1843). *Cottendorfia neogranatensis* Bak. Brom. 129 (1889). *Lindmania neogranatensis* Mez in DC. Mon. Phan. ix. 538 (1896). *L. flaccida* Standl. in Journ. Wash. Acad. Sci. xiii. 364 (1923).

MEXICO: OAXACA: Sierra Madre, 1927, *K. Reiche* 566a (Mun, phot. G). SALVADOR: AHUACHAPÁN: moist shaded bank, vicinity of Ahuachapán, alt. 800–1000 m., 1922, *Standley* 19786 (US, type of *L. flaccida*; G, NY). COLOMBIA: without further locality, *Jurgensen* 389 (K, type of *L. neogranatensis*; phot. G). BRAZIL: FEDERAL DISTRICT: Rio de Janeiro, 1841, *C. Smith* (cult. Cam, TYPE; phot. G).

Hitherto *Pitcairnia micrantha* Lindl. has been assigned to the synonymy of *P. suaveolens* Lindl., but from the description alone it is quite evident that this could not be the case with the flowers of *P. micrantha* so much smaller. The origin of the type is rather open to doubt, since the plant was discovered only after its arrival in England and may not have come from Brazil as supposed. However, even if it did, the resulting range would not be wholly without precedent in the family and later collections may show a more nearly continuous range. Until quite recently *Lindmania* was not known outside of South America. Then Standley extended its known range north to Salvador, and now the appearance of Reiche's specimen establishes it in southern Mexico.

8. **L. villosula** Harms, Notizblatt, x. 794 (1929).

BOLIVIA: LA PAZ: on rocks, Beni River Valley, alt. 1000 m., 1921, *Rusby* 393 (NY); COCHABAMBA: Incachaca to San Antonio, alt. 1600 m., 1926, *Werdermann* 2120 (B, TYPE; phot. G).

9. **L. Weberbaueri** Mez in Fedde Rep. Spec. Nov. xii. 417 (1913). *Cottendorfia Rusbyi* Bak. in Bull. Torrey Bot. Club, xxix. 697 (1902), not *Lindmania Rusbyi* Mez (1901).

PERU: JUNÍN: wooded slope, La Merced, alt. 600–700 m., 1923, *Macbride 5352* (G, FM); dense forest, Rio Paucartambo Valley, near Perene Bridge, alt. 700 m., 1929, *Killip & Smith 25326* (US, NY); AYACUCHO: Prov. Huanta, on rocks at margin of rain forest, 1910, *Weberbauer 5635* (B, TYPE; phot. G). BOLIVIA: LA PAZ: Yungas, alt. 2000 m., 1885, *Rusby 2541* (NY, type of *Cottendorfia Rusbyi*; phot. G).

10. **L. penduliflora** (C. H. Wright) Stapf in Bot. Mag. cl. t. 9029 (1924); Castellanos in An. Mus. Nac. Hist. Nat. B. A. xxxvi. 52, t. 3 (1929). *Catopsis penduliflora* C. H. Wright in Kew Bull. 197 (1910).

PERU: without further locality, *Forget* (K, TYPE). ARGENTINA: SALTA: Oran, Rio Blanco, alt. 600 m., 1928, *Venturi 7600* (G); Tartagal, 1925, *Schreiter 26/1232 in hb. BA* (Castellanos!); JUJUY: Sierra Santa Barbara, San Pedro, alt. 750 m., 1929, *Venturi 9721* (G, NY).

11. **L. gracilis** (Rusby), comb. nov. *Catopsis gracilis* Rusby in Bull. N. Y. Bot. Gard. vi. 489 (1910).

BOLIVIA: LA PAZ: Guanai, alt. 500 m., 1901, *R. S. Williams 738* (NY, TYPE; phot. G); near Santa Ana, Bopi, alt. 500 m., 1921, *O. E. White 1086* (NY).

L. brevifolia (Griseb.) Hauman = *ABROMEITIELLA BREVIFOLIA* (Griseb.) Castellanos. See Castellanos in An. Mus. Nac. Hist. Nat. B. A. xxxvi. 371 (1931).

L. chlorantha (Speg.) Hauman = *ABROMEITIELLA BREVIFOLIA* (Griseb.) Castellanos. See Castellanos, *ibid.*

Neoregelia, nom. nov. *Aregelia* Mez in DC. Mon. Phan. ix. 4, 61 (1896), non O. Kuntze. Kuntze proposed *Aregelia* as a nomen novum for *Nidularium*, so that its typification must be identical with that of *Nidularium*. Consequently it is not allowable to use *Aregelia* for a genus segregated from typical *Nidularium* as Mez did. The substitution of *Neoregelia* for the *Aregelia* of Mez includes the following new combinations:

N. ampullacea (E. Morr.), comb. nov. *Nidularium ampullaceum* E. Morr. Belg. Hort. xxx. 242 (1880). *Aregelia ampullacea* Mez in DC. Mon. Phan. ix. 64 (1896).

N. concentrica (Vell.), comb. nov. *Tillandsia concentrica* Vell. Fl. Flum. 134 (1825), Icones, iii. t. 133 (1827). *Aregelia concentrica* Mez in DC. Mon. Phan. ix. 81 (1896).

N. eleutheropetala (Ule), comb. nov. *Nidularium eleuthero-petalum* Ule, Verhandl. Bot. Ver. Brandenb. xlviii. 131 (1907). *Aregelia eleutheropetala* Mez ex L. B. Smith in Contrib. Gray Herb. xcvi. 5 (1932).

N. laevis (Mez), comb. nov. *Aregelia laevis* Mez, Fedde Rep. Spec. Nov. xii. 411 (1913).

N. Morreniana (Ant.), comb. nov. *Karatas Morreniana* Ant. Phyto-Iconogr. t. 35 (1884). *Aregelia Morreniana* Mez in DC. Mon. Phan. ix. 72 (1896).

N. sarmentosa (Regel), comb. nov. *Nidularium sarmentosum* Regel, Gartenflora, xix. 268 (1870). *Aregelia sarmentosa* Mez in DC. Mon. Phan. ix. 66 (1896).

Var. **chlorosticta** (Bak.), comb. nov. *Karatas chlorosticta* Bak. Brom. 7 (1889). *Aregelia chlorosticta* Mez in DC. Mon. Phan. ix. 65 (1896).

N. spectabilis (Moore), comb. nov. *Nidularium spectabile* Moore in Gard. Chron. 8 (1873). *Aregelia spectabilis* Mez in DC. Mon. Phan. ix. 70 (1896).

Pitcairnia Archeri, spec. nov., brevissime caulescens, 7 dm. alta: foliis quaquaversis, minutissime perobscureque punctulato-lepidotis, dimorphis, exterioribus squamiformibus, late ovatis, integris, interioribus fere 1 m. longis, super vaginam in petiolum elongatum spinososserratum contractis, lamina lanceolata, integra, ad 6 cm. lata: scapo erecto, bracteis ellipticis obtecto: inflorescentia simplicissima, dense spicata; bracteis florigeris late ellipticis, fulgide rubris, dense imbricatis, subcoriaceis: floribus sessilibus; sepalis linearibus, nullo modo carinatis, ad 4 cm. longis, quam bracteas florigeras multo longioribus, ab initio albis, mox apici nigrescentibus; petalis intus nudis, verisimiliter per anthesin quam sepala brevioribus. Pl. III, figs. 20-21.

COLOMBIA: Chocó: terrestrial, La Concepción, 15 km. east of Quibdo, alt. ca. 75 m., 1931, *W. A. Archer 2078* (US, TYPE; phot. G).

This species is unusual in combining sessile flowers with exserted sepals, and also in having cleistogamous flowers. Probably it should be placed in *Neumannia*, although such action would necessitate a redefinition of that subgenus.

Puya Herzogii Wittm. At one time I was inclined to reduce this species to the synonymy of *P. Brittoniana* because it was evidently conspecific with the Kuntze specimen cited by Mez under that species. However, on locating the type of *P. Brittoniana*, I find it quite distinct from the Kuntze specimen. Thus *P. Herzogii* remains a valid species and its occurrence, thus far evident, is as follows:

BOLIVIA: LA PAZ: prov. Inquisivi, rocky hillsides, Pongo de Quime, alt. 3800-3900 m., 1921, *O. E. White 197* (NY, G); COCHABAMBA: Tunari Mt., alt. 3600 m., 1892, *Kuntze* (NY, phot. G); at tree line above Incacorral, alt. 3300 m., 1911, *Herzog 2269* (Leiden, TYPE; B, phot. G).

Puya nana Wittm. It is difficult to believe that this species is not a *Greigia* until one dissects a flower, so close is the habital simi-

larity. It is by far the most extreme case of reduction of floral axes in the whole genus. Pl. III, figs. 14-15.

Tillandsia Barclayana Bak. in Journ. Bot. xxv. 239 (1887). *T. lateritia* André, Enum. 6 (1888); Brom. André, 76, t. 21 (1889). The following material convinces me that *T. Barclayana* and *T. lateritia* are not specifically distinct:

ECUADOR: Los Rios: epiphytic, in tropical zone, Sabanetas, 1876, André 4057 (K, type of *T. lateritia*; phot. G); GUAYAS: woods of Valdivia, 1836, Barclay 622 (BM, TYPE; phot. G); epiphytic, Balao, 1892, Eggers 14582 (Mun); ORO: Portovelo (Gold Mine near Zaruma), alt. 600-1000 m., 1923, Hitchcock 21247 (G).

Tillandsia Castellani, spec. nov., saxicola, distincte caulescens, florifera usque ad 15 cm. alta, verisimiliter pulvinata: caule ramoso: foliis caulem distiche vaginantibus, ad 45 mm. longis; vaginis latissime ovatis, valde nervatis, extus dense lepidotis, margine ciliato-lepidotis; laminis sublinearibus, teretibus, 2-3 mm. in diametro, pungentibus, dense pruinoseque cinereo-lepidotis: scapo manifesto, terminali vel pseudoaxillari, nudo, glabro, gracili: inflorescentia 1-2-flora; bracteis florigeris ovatis, late acutis, glabris, valde nervatis, quam sepala bene brevioribus: sepalis aequaliter subliberis, lanceolatis, obtusis vel late acutis, ad 9 mm. longis, glabris, nervatis; petalis stylo staminibusque ignotis: capsula anguste cylindrica, 15-25 mm. longa. Pl. III, figs. 17-19.

ARGENTINA: CÓRDOBA: Capilla del Monte, Los Paredones, 1922, Castellanos 1576 (G, TYPE); same, alt. ca. 1000 m., 1918, Osten 13474 (Ost); Cuesta de Atlantina, 1921, Castellanos (G); SAN LUIS: Quebrada de Ramo in San Francisco, 1925, Castellanos 25/618 in hb. BA (G).

It is indeed a pleasure to dedicate this species to Dr. Alberto Castellanos, who has not only done much himself to advance the knowledge of Argentine *Bromeliaceae*, but has also been extremely generous in extending help to others.

Tillandsia Castellani probably belongs to the section *Diaphoranthema*, in which case it is related to the group of species centering on *T. myosura*, but differs at once in having the floral bracts distinctly shorter than the sepals. It is also possible that it might belong in section *Phytarrhiza* in the vicinity of *T. crocata*, but this is less likely. Here again the relatively short floral bracts are distinctive.

Its characters are suggestive of a cross between *T. myosura* and *T. capillaris*, but the specimens appear too uniform for such a hybrid origin.

Tillandsia didisticha Bak. in Journ. Bot. xxvi. 16 (1888). *Guzmania complanata* Wittm. Mededell. Rijks Herb. xxix. 92 (1916). As

already noted in Contrib. Gray Herb. xcvi. 34 (1932), Wittmack's species could scarcely belong to *Guzmania*. An examination of the type of *Guzmania complanata* shows that the petals have run together in drying so as to simulate a gamopetalous corolla, yet the claws are definitely overlapping and may be separated by careful dissection. They were obviously distinct when fresh.

The sepals may be either glabrous or quite plentifully lepidote or any stage in between in *T. didisticha*. In *Herzog 1201*, the type of *Guzmania complanata*, they are plentifully lepidote.

Tillandsia Leiboldiana Schdl. in Linnaea, xviii. 414 (1844). *T. lilacina* Mez in DC. Mon. Phan. ix. 806 (1896). *Tillandsia Leiboldiana* was originally described as having its stamens included, and it undoubtedly belongs to the section *Allardtia* although Mez placed it under *Platystachys* in his monograph. In returning the species to *Allardtia* no good specific distinction appears to separate the later *T. lilacina*.

Tillandsia paleacea Presl, Rel. Haenke. i. 125 (1827). *T. fusca* Bak. in Journ. Bot. xvi. 240 (1878). *T. scalarifolia* Bak. in Journ. Bot. xxv. 235 (1887). *T. Schenckiana* Wittm. in Engl. Bot. Jahrb. xi. 63 (1889). *T. lanata* Mez, Bull. Herb. Boiss. ser. 2, v. 109 (1905). *T. favillosa* Mez in Fedde Rep. Spec. Nov. iii. 43 (1906). Pl. II.

The identity of *Tillandsia paleacea* has long been in doubt, although the original description was full enough to give an idea of its probable relationships. Recently through the kindness of the National Museum at Prague I have received a photograph of the type collected in Chile by Haenke. From the photograph it is immediately evident that it is a wide-spread somewhat variable Andean species which has been passing under a number of names. The later names of course must lapse, since the material to which they have been applied now proves confluent.

Tillandsia* (§ *Platystachys*) *pueblensis, spec. nov., acaulis, 16–24 cm. alta: foliis rosulatis, dense pruinoseque griseo-lepidotis, exterioribus reductis, interioribus ad 16 cm. longis, saepissime recurvatis; vagina vix distincta, lamina anguste triangulari, basi ca. 10 mm. lata, involuta, pungenti: scapo erecto, brevi, vaginis inferioribus foliaceis, longe laminatis, vaginis superioribus lanceolatis, acutis, membranaceis, appresse lepidotis: inflorescentia simplicissima, lineari-lanceolata, laxe 5–7-flora, ad 9 cm. longa, 1 cm. lata; bracteis florigeris stricte erectis, anguste lanceolatis, acutis, imbricatis sed rhachin haud obtegentibus, 25–30 mm. longis, membranaceis, valde nervatis, appresse griseo-lepidotis, pulchre rubris: floribus subsessilibus; sepalis anguste lanceolatis, acutis, 20 mm. longis, membranaceis, nervatis,

carinatis, posticis inter sese ad 6 mm. connatis; petalis violaceis, 4 cm. longis, tubulose convolutis; staminibus styloque exsertis. Pl. III, figs. 1-2.

MEXICO: PUEBLA: Zapotitlan, 1912, *Purpus* 5856 (G, TYPE; FM, Mo, Cal).

In Mez's monograph this species keys down to *T. sublaxa*, from which it differs in its pruinose-lepidote leaves, lepidote floral bracts and connate posterior sepals.

Tillandsia Rusbyi Bak. Brom. 176 (1889). *T. Buchtieni* H. Winkler in Fedde Rep. Spec. Nov. vii. 107 (1909).

Tillandsia Turneri Bak. in Journ. Bot. xxvi. 144 (1888). *T. Cornuaulti* André, Enum. 8 (1888); Brom. André, 102, t. 33 (1889). *Guzmania Cornuaulti* André ex Mez in DC. Mon. Phan. ix. 925 (1896). A careful examination of *André 1764*, the type of *Tillandsia Cornuaulti*, shows that André was quite correct in considering it a *Tillandsia*. He illustrated the spike as distichous, a character unknown in *Guzmania*, to which Mez transferred it following some ms. of André. To be sure the spike portrayed had so few flowers that their ranking was not so evident as it might be, but the specimen itself shows much larger spikes and these are definitely distichous.

It is also significant that André's original sketch, made doubtless from fresh material, shows a corolla of distinct and naked petals.

The type of *T. Cornuaulti* agrees closely with that of *T. Turneri* which is the earlier name by some months. The primary bracts are relatively much larger in *T. Cornuaulti* but this is probably just because it is a young specimen as indicated by the undeveloped state of the petals shown by André.

Vriesia drepanocarpa (Bak.) Mez in DC. Mon. Phan. ix. 581 (1896). *Tillandsia drepanocarpa* Bak. in Journ. Bot. xxvi. 41 (1888). *Vriesia Dusenii* L. B. Smith in Contrib. Gray Herb. xcvi. 17, t. 5, fig. 3-4 (1932). Both Baker and Mez erred in their description of the type of *Vriesia drepanocarpa*, when they called the inflorescence simple. As a matter of fact the inflorescence consists of six spikes of two fertile flowers each, and what Baker and Mez considered floral bracts are in reality primary bracts. For a complete description of the species see under the later *V. Dusenii*. By the addition of *V. Dusenii* to its synonymy, *V. drepanocarpa* extends its range to include the state of Paraná as well as that of São Paulo. Pl. I.

EXPLANATION OF PLATES.

PLATE I.

VRIESIA DREPANOCARPA (Bak.) Mez (*Burchell 3596*), habit, showing compound inflorescence.

PLATE II.

TILLANDSIA PALEACEA Presl (*Haenke s. n.*), habit and enlarged inflorescence.

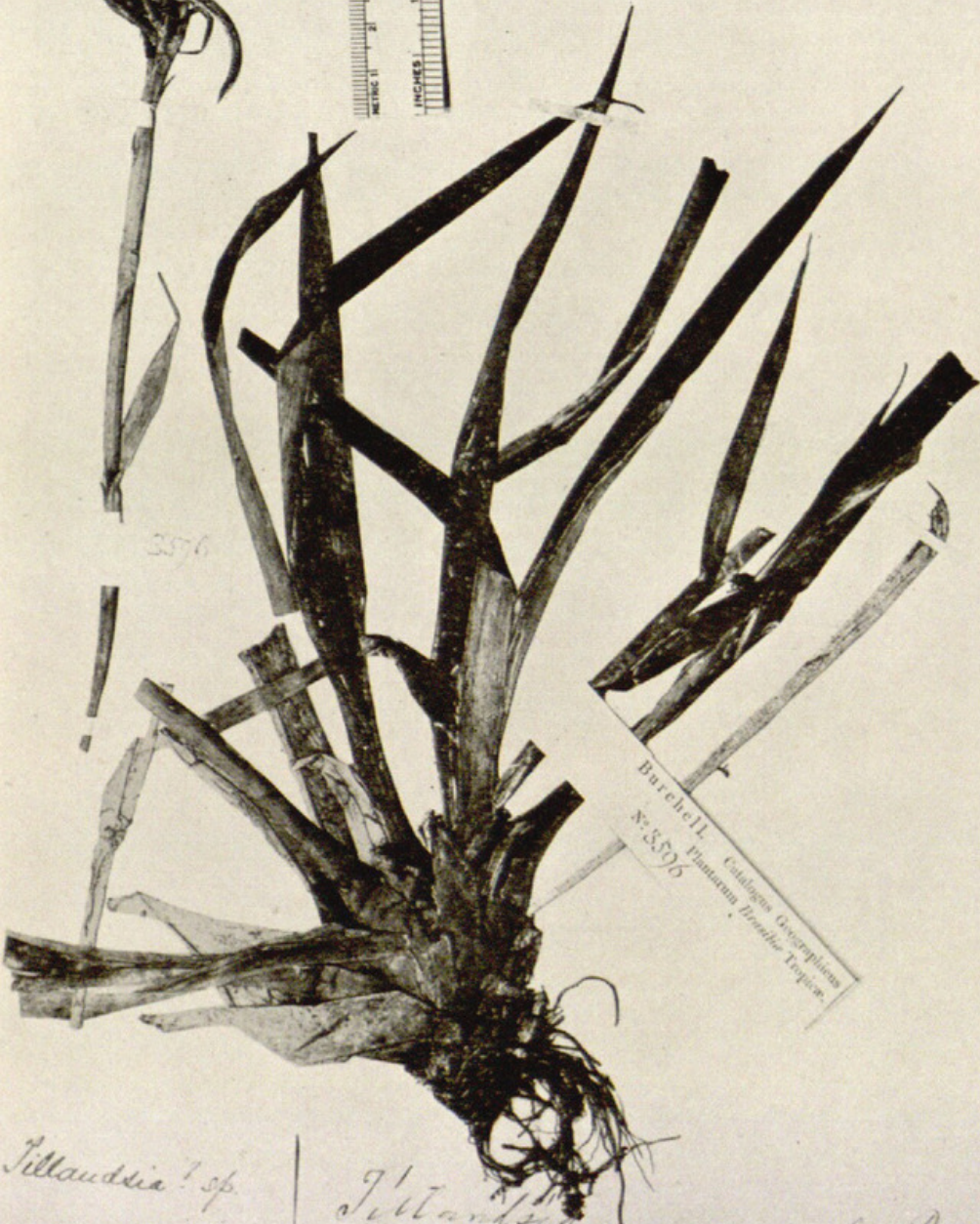
PLATE III.

- Fig. 1. TILLANDSIA PUEBLENSIS L. B. Smith (*Purpus 5856*), habit $\times \frac{1}{4}$.
2. Same, posterior sepals $\times 1$.
3. CATOPSIS CUCULLATA L. B. Smith (*Com. Geogr. Explor. Rep. Mex. 366*), habit $\times \frac{1}{4}$.
4. Same, petal and stamens $\times 1$.
5. Same, pistil $\times 1$.
6. DYCKIA PULQUINENSIS Wittm. (*Herzog 1849*), leaf $\times \frac{1}{2}$.
7. Same, section of inflorescence $\times \frac{1}{2}$.
8. Same, sepal $\times 1$.
9. Same, corolla and stamens $\times 1$.
10. Same, pistil $\times 1$.
11. DYCKIA MEZIANA Kuntze (*O. Kuntze s. n.*), flower $\times 1$.
12. Same, sepal $\times 1$.
13. Same, petal $\times 1$.
14. PUYA NANA Wittm. (*Herzog 1856a*), inflorescence $\times \frac{1}{2}$.
15. Same, sepal $\times 1$.
16. DYCKIA MICROCALYX Bak. var. OSTENII L. B. Smith (*Osten & Rojas 8097*), flower $\times 1$.
17. TILLANDSIA CASTELLANI L. B. Smith (*Castellanos 1576*), habit $\times \frac{1}{2}$.
18. Same, young spike $\times 1$.
19. Same, fruiting spike $\times 1$.
20. PITCAIRNIA ARCHERI L. B. Smith (*Archer 2078*), inflorescence $\times \frac{1}{2}$.
21. Same, sepal $\times 1$.

Specimen in monographia Bromelliacearum citatum.

Vriesia drepanocarpa Mez
Peraff. similis aequae *Br. anathymae*, S. Korr

Bromel. 581 det. Carl Mez 1894.



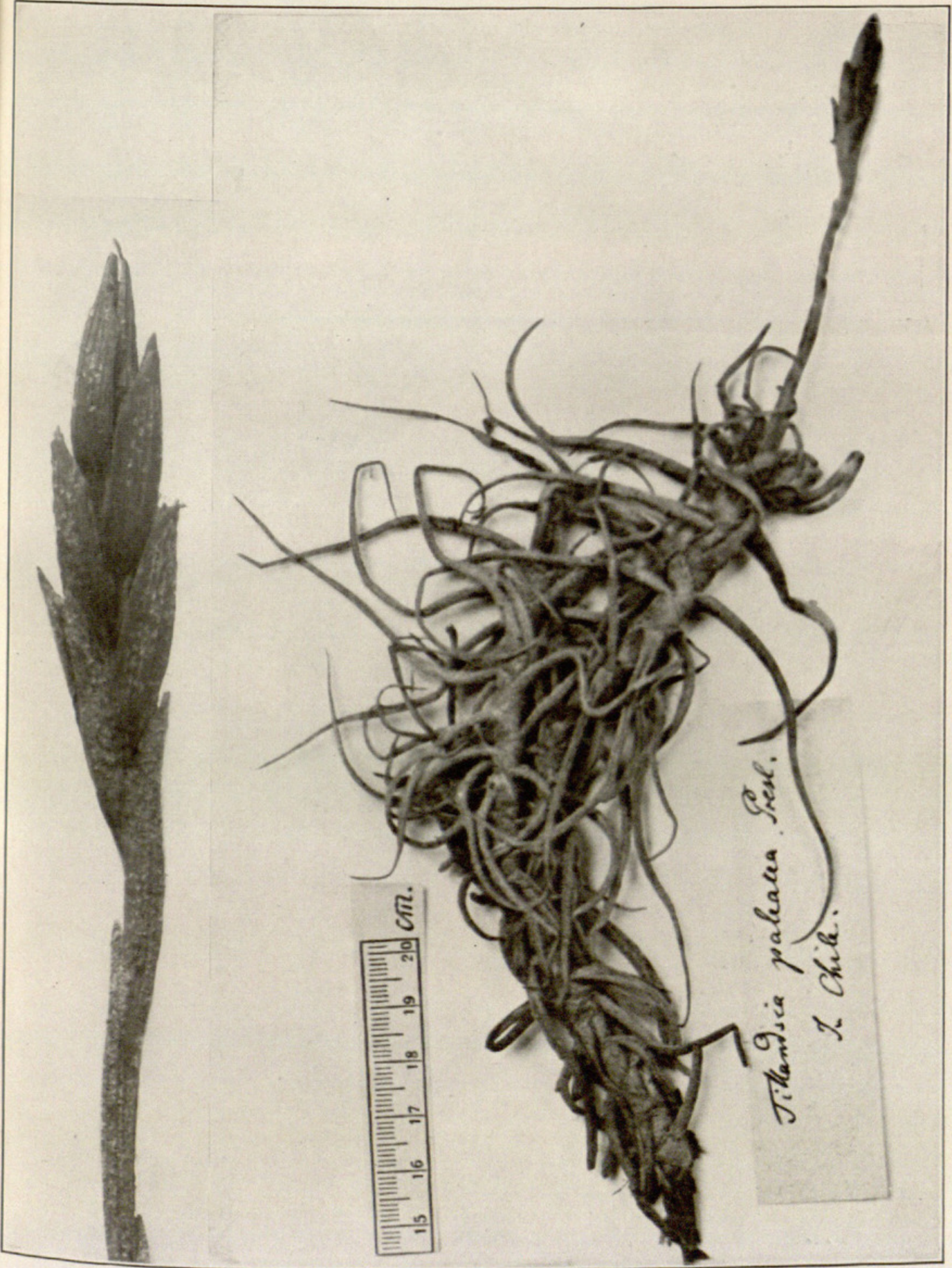
Burchell
N: 5596
Catalogus Geographicus
Plantarum Brasiliae Tropicae

Tillandsia ? sp.

Tillandsia
(*Tillandsia*) *drepanocarpa* Burchell

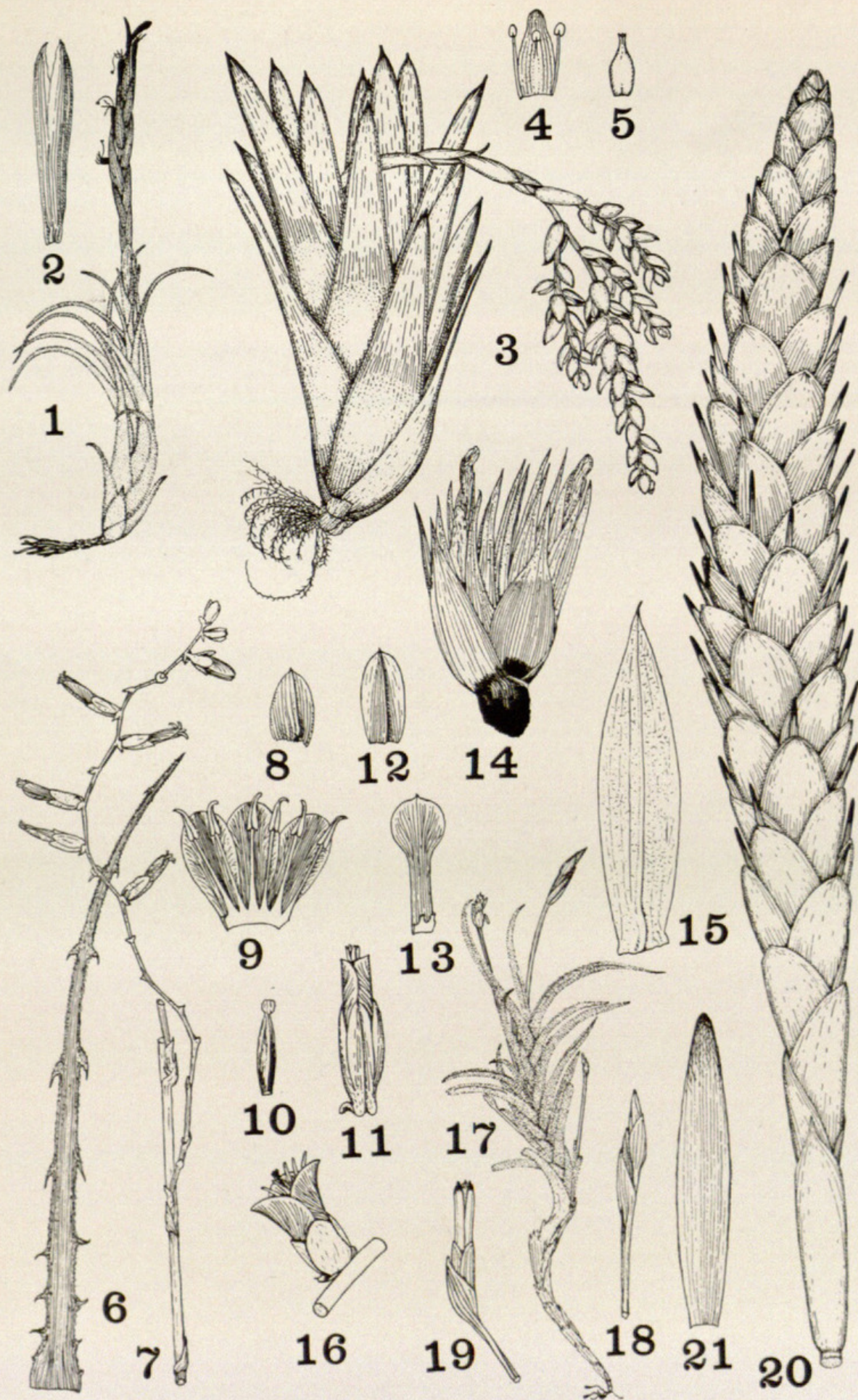


VRIESIA DREPANOCARPA (Bak.) Mez.



Tillandsia paleacea Presl.
L. Chik.

TILLANDSIA PALEACEA Presl.



Figs. 1-2, *TILLANDSIA PUEBLENSIS* L. B. Sm.; 3-5, *CATOPSIS CUCULLATA* L. B. Sm.; 6-10, *DYCKIA PULQUINENSIS* Wittm.; *D. MEZIANA* Kuntze; 14-15, *PUYA NANA* Wittm.; 16, *DYCKIA MICROCALYX* Bak. var. *OSTENII* L. B. Sm.; 17-19, *TILLANDSIA CASTELLANI* L. B. Sm.; 20-21, *PITCAIRNIA ARCHERI* L. B. Sm.



Smith, Lyman B. 1934. "Studies in the Bromeliaceae,--V." *Contributions from the Gray Herbarium of Harvard University* (104), 71–82.

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