

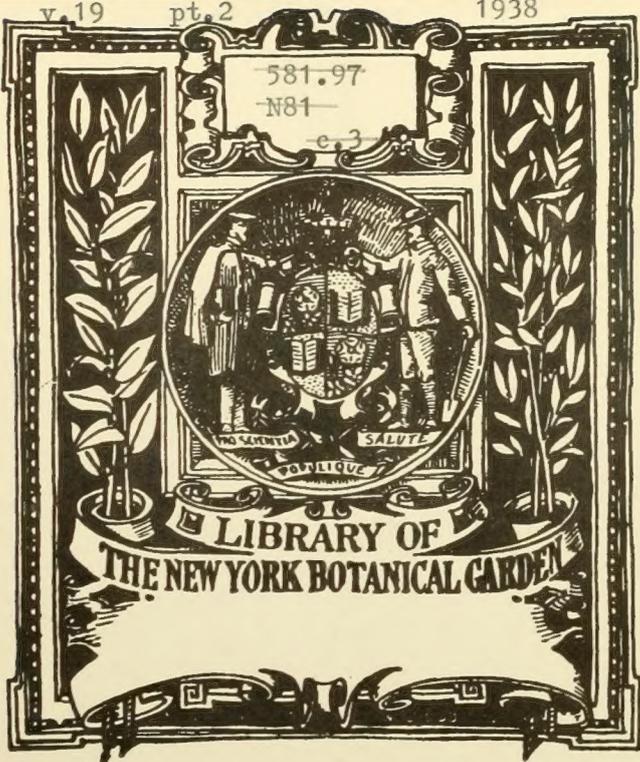
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HERB.
XN .072

v. 19

pt. 2

1938



VOLUME 19

PART 2

NORTH AMERICAN FLORA

(XYRIDALES)

BROMELIACEAE

LYMAN BRADFORD SMITH



Subscription Price, \$3.35

Separate Copies, \$4.50

PUBLISHED BY

THE NEW YORK BOTANICAL GARDEN

DECEMBER 27, 1938

Family BROMELIACEAE

BY LYMAN BRADFORD SMITH

Herbs or rarely shrubby perennials, mostly epiphytic. Roots usually present, but often serving merely as holdfasts in the epiphytic species. Leaves spirally arranged, usually basal, dilated-sheathing below, simple, entire or spinose-serrate, bearing peltate scales at least when young, and these serving to hold moisture. Inflorescence simple or paniculate, of spikes or racemes, usually bearing brightly colored conspicuous bracts. Flowers perfect or functionally dioecious, that is, with both stamens and pistil but only one functional. Perianth heterochlamydeous, the sepals and petals free or connate. Stamens 6 in 2 series; filaments free, or joined to the petals or to each other. Style 3-parted. Ovary superior to inferior, 3-celled. Placentae axile, extending the length of the cell or variously reduced. Fruit capsular or baccate. Seeds naked, winged, or plumose. Embryo small, situated at the base of the copious mealy endosperm.

Ovary wholly or in part superior; fruit a capsule; seeds variously appendaged.

Seeds with entire appendages, not plumose; leaves often spinose-serrate; ovary wholly or partly superior; plants almost always terrestrial.

Seeds plumose; leaves always entire; ovary nearly or quite superior (except in *Glomeropitcairnia*); plants chiefly epiphytic.

Ovary wholly inferior; fruit baccate, fleshy to coriaceous; seeds naked; leaves usually spinose-serrate; plants chiefly epiphytic.

Subfamily 1. PITCAIRNIOIDEAE, p. 61.

Subfamily 2. TILLANDSIOIDEAE, p. 98.

Subfamily 3. BROMELIOIDEAE, p. 201.

Subfamily 1. PITCAIRNIOIDEAE.

Herbs or rarely shrubby perennials, terrestrial, or rarely subepiphytic in *Pitcairnia*. Leaves often spinose-serrate. Flowers perfect or in *Hechtia* functionally dioecious. Ovary superior or partly so. Seeds with entire appendages, not plumose.

Flowers perfect.

Ovary wholly superior.

Seeds broad, with wing surrounding at least three sides; large coarse plants; flowers large.

Seeds more or less elongate, long caudate-appendaged at each pole; low, rather delicate plants; flowers less than 1 cm. long.

Ovary only partly superior; flowers large and showy; seeds long-caudate in most species.

Flowers functionally dioecious, inconspicuous, never more than 15 mm. long; ovary from wholly superior to very slightly so.

1. PUYA.

2. LINDMANIA.

3. PITCAIRNIA.

4. HECHTIA.

1. PUYA Molina, Sagg. Chili 160, 351. 1782.

Pourretia R. & P. Prodr. 46. 1794.

Connellia N. E. Brown, Trans. Linn. Soc. II. 6: 66. 1901.

Perennial, usually long-caulescent, simple or branching, coarse, often several meters high. Leaves densely rosulate, usually spinose-serrate with very large coarse teeth. Inflorescence simple or compound. Flowers showy. Sepals free, much shorter than the petals. Petals free, usually spreading at anthesis, naked or rarely with paired vertical folds. Stamens nearly or quite included. Filaments free. Ovary wholly superior, glabrous. Style slender,

elongate. Capsule septicidal or loculicidal, or both together forming six divisions. Seeds many, each with a single wing surrounding it on at least three sides.

Type species, *Puya chilensis* Molina.

1. *Puya dasylirioides* Standley, Jour. Wash. Acad. 17: 159. 1927.

Plant large, 1–2.5 m. high; leaves in a dense basal rosette, stiff, 3–6 dm. long or more; sheaths suborbicular, 7–8 cm. wide, inflated but firm, closely and finely serrate near the summit; blades narrowly triangular, 5 cm. broad at base, subulate-acuminate, thick, yellow-green, glabrous above, densely and finely white-lepidote below, spinose-serrate with coarse blackish teeth 4–5 mm. long and 1–4 cm. apart; scape stout, erect; scape-bracts densely imbricate, the lower foliaceous, the upper nearly or quite entire, with shorter blades and brown membranaceous sheaths, sparsely arachnoid-villous; inflorescence a spiciform panicle, densely cylindrical, 3 dm. long or more, 5–7 cm. in diameter; primary bracts ovate-lanceolate, acuminate, the lowest about 6 cm. long, slightly exceeding the flowers, dark-brown, membranaceous, strongly nerved, short-tomentose; branches short, densely few-flowered; floral bracts ovate, broadly acute, about equaling the pedicels, brown-tomentose; pedicels stout, about 1 cm. long, thinly brownish-tomentose; sepals ovate-oblong, obtuse, 12 mm. long, striate, thinly tomentose; capsule subglobose, about 12 mm. long, short-beaked; seeds very numerous, the body blackish-brown, 2 mm. long, finely reticulate, the wing broad and produced about equally on all sides.

TYPE LOCALITY: Near Santa Maria de Dota, Province of San José, Costa Rica, altitude 2000–2100 meters.

DISTRIBUTION: KNOWN only from the type locality.

2. *LINDMANIA* Mez, in DC. Monog. Phan. 9: 535. 1896.

Low, slender, terrestrial herbs. Leaves entire or remotely serrulate. Scape erect, slender. Inflorescence laxly paniculate, bipinnate or tripinnate. Floral bracts minute. Flowers small, white or green. Sepals free, squamiform. Petals much longer than the sepals, free, naked, elliptic. Stamens free. Ovary wholly superior, glabrous. Placentae extending practically the whole length of the ovary. Style slender, equaling the stamens. Capsule septicidal or loculicidal. Seeds slenderly fusiform, with the wing reduced to two caudate appendages, one at each end.

Type species, *Anoplophytum guianense* Beer.

1. *Lindmania micrantha* (Lindl.) L. B. Smith, Contr. Gray Herb. 104: 77. 1934.

Pitcairnia micrantha Lindl. Bot. Reg. 29: Misc. 44. 1843.
Cottendorfia neogranatensis Baker, Handb. Bromel. 129. 1889.
Lindmania neogranatensis Mez, in DC. Monog. Phan. 9: 538. 1896.
Lindmania flaccida Standley, Jour. Wash. Acad. 13: 364. 1923.

Flowering plant 3–7 dm. high; leaves entire, constricted above the sheath; blades lanceolate, acuminate, 30 cm. long, 4 cm. wide, thin, glabrous above, densely furfuraceous-lepidote below; scape slender and erect; scape-bracts lanceolate or lance-ovate, thin; inflorescence amply bipinnate, up to 26 cm. long, arachnoid; branches curved-ascending, many times longer than their subtending bracts; floral bracts ovate, acuminate, slightly longer than the pedicels; flowers secund and nutant; sepals triangular-ovate, obtuse, 3–4 mm. long; petals narrowly elliptic, obtuse, 7–9 mm. long; style slender, elongate; stamens distinctly shorter than the petals.

TYPE LOCALITY: Rio de Janeiro, Brazil.

DISTRIBUTION: Oaxaca and Salvador; also in Colombia and Brazil.

NOTE: This species was described from cultivated material supposedly imported from Brazil, but the origin of the type is by no means certain.

3. *PITCAIRNIA* L'Hér. Sert. Angl. 7. 1788. Nomen conservandum.

Hepetis Sw. Prodr. 4, 56. 1788.
Conanthes Raf. Fl. Tell. 4: 24. 1838.
Neumannia Brongn. Ann. Sci. Nat. II. 15: 369. 1841.

- Lamproconus* Lemaire Jard. Fleur. 2: pl. 127. 1852.
Cochliopetalum Beer, Flora 37: 347. 1854.
Phlomostachys Beer, Bromel. 16, 45. 1857.
Orthopetalum Beer, Bromel. 17, 70. 1857.
Pepinia Brongn.; André, Ill. Hort. 17: 32. 1870.
Melinonia Brongn.; E. Morren, Cat. Bromél. Liége 10. 1873.

Plants mostly terrestrial, rarely epiphytic, mostly stemless, but a few species definitely caulescent. Leaves fasciculate or imbricate and many-ranked along a stem, entire or spinose-serrate, the sheath small, often bulbous-thickened, the blades linear to lanceolate with a definite petiole or narrowly triangular, sometimes dimorphic with some blades reduced to horny spinose-serrate spines, deciduous in several Mexican species. Inflorescence simple or compound. Flowers perfect, pedicellate to subsessile. Sepals free, acute or obtuse. Petals free, slightly zygomorphic in most species, naked or appendaged on the inside near the base. Stamens from slightly exerted to shorter than the petals, the anthers linear. Ovary usually superior for most of its length; style filiform, equaling the petals. Ovules many, usually caudate. Capsule septicidal in most of the North American species. Seeds caudate at both ends or rarely with an annular wing.

Type species, *Pitcairnia bromeliaefolia* L'Hér.

Petals naked; leaf-blades not more than 18 mm. wide, linear, usually deciduous; inflorescence simple; species of Mexico and Central America.

Pedicels not over 2 mm. long.

Sepals 5 cm. long.

Sepals not over 3 cm. long.

Inflorescence lax, at least toward the base.

Sepals lanceolate, acute; inflorescence lax throughout; flowers subdistichous.

Sepals narrowly lanceolate, acuminate; inflorescence dense toward the apex; flowers many-ranked.

Inflorescence dense throughout.

Blades of the lower scape-bracts equaling the inflorescence; floral bracts covered with a membrane of coalesced scales.

Blades of all the scape-bracts much shorter than the inflorescence; indument of the floral bracts of distinct scales.

Scape-bracts lance-triangular, exposing much of the scape.

Scape-bracts broadly ovate, ample, concealing the scape.

Pedicels much more than 2 mm. long.

Petals 8-9 cm. long; sepals 25-35 mm. long.

Petals glabrous, red; inflorescence lax.

Petals tomentose at apex, white; inflorescence rather dense.

Petals 4-6 cm. long; sepals not over 30 mm. long.

Flowers polystichous, not at all secund.

Lower floral bracts subfoliaceous, much exceeding the flowers.

Lower floral bracts vaginiform, shorter than the flowers.

Petals white.

Petals red.

Floral bracts equaling or shorter than the pedicels.

Floral bracts distinctly exceeding the pedicels.

Sepals, at least the posterior ones, alate.

Sepals not more than carinate.

Floral bracts exceeding all but the uppermost sepals.

Floral bracts all much shorter than the sepals.

Flowers secund.

Pedicels nearly or quite terete; floral bracts mostly about half as long as the pedicels.

Pedicels alate with the bases of the sepals; floral bracts exceeding the pedicels.

Petals appendaged at base or else the leaf-blades over 30 mm. wide.

Flowers stout, subsessile or on stout pedicels; floral bracts ample, usually exceeding the sepals; inflorescence simple; species of Mexico and Central America.

Pedicels distinct, much slenderer than the ovary.

Leaves entire.

Inflorescence sessile or nearly so.

Inflorescence long-scapose.

Sepals oblong.

Sepals elliptic, asymmetric.

Floral bracts exceeding the sepals; flowers erect at anthesis.

Floral bracts about equaling the sepals; flowers spreading at anthesis.

1. *P. saxicola*.
2. *P. Purpusii*.
3. *P. Calderonii*.
4. *P. Roseana*.
5. *P. Micheliana*.
6. *P. cylindrostachya*.
7. *P. Tuerckheimii*.
8. *P. Hintoniana*.
9. *P. puberula*.
10. *P. Schiedeana*.
11. *P. flexuosa*.
12. *P. Karwinskyana*.
13. *P. monticola*.
14. *P. ringens*.
15. *P. Palmeri*.
16. *P. pteropoda*.
17. *P. tabulaeformis*.
18. *P. recurvata*.
19. *P. membranifolia*.
20. *P. maidifolia*.

- Leaves spinose-serrate at least toward base or apex.
 Flowers secund-spreading; floral bracts shorter than the sepals.
- Flowers polystichous, erect; floral bracts exceeding the sepals.
 Pedicels very short and nearly as thick as the ovary.
 Leaf-blades oblanceolate, 125 mm. broad; sepals 45 mm. long.
 Leaf-blades lanceolate or linear-lanceolate, 30-85 mm. wide.
 Petals naked.
- Leaves entire.
 Sepals lanceolate, acuminate, 4 cm. long; corolla arching-decurved at anthesis.
 Sepals oblong, obtuse and apiculate, not over 3 cm. long; corolla erect at anthesis.
- Leaves spinose-serrate along the petioles.
 Sepals 22 mm. long; flowers 4-ranked.
 Sepals 33 mm. long; flowers 8-ranked.
- Petals appendaged at base.
 Leaves entire.
 Floral bracts broadly acute, often apiculate, appressed; inflorescence obtuse.
 Floral bracts acuminate, more or less divergent; inflorescence subacute.
- Leaves spinose-serrate along the petioles.
 Floral bracts with distinct spreading blades.
 Floral bracts without distinct blades, merely divergent.
- Flowers slender, slenderly pedicellate in most species; floral bracts shorter than the sepals or else narrow.
 Fruit with the lower half indehiscent and sterile; plant slenderly caulescent.
- Fruit completely dehiscent and fertile; plant stemless or with a short stout rhizome.
- Plant not over 2 dm. high; scape short or none; petal-appendage sacciform; green leaf-blades deciduous.
- Plants usually larger; scape elongate; petal-appendage liguliform.
 Inflorescence subcorymbose, few-flowered; floral bracts 6-8 cm. long.
- Inflorescence usually racemose or paniculate; floral bracts much smaller.
- Flowers secund; inflorescence simple.
 Sepals alate-carinate.
 Sepals ecarinate.
 Inflorescence dense; floral bracts much exceeding the pedicels.
 Inflorescence lax; floral bracts mostly shorter than the pedicels.
 Leaf-blades linear-lanceolate, 3 cm. wide; sepals 24 mm. long.
 Leaf-blades linear, 1 cm. wide; sepals 16 mm. long.
- Flowers polystichous or, if secund, the inflorescence compound.
 Racemes dense especially toward the apex, spiciform; uppermost bracts exceeding the pedicels.
 Floral bracts broadly ovate.
 Floral bracts lanceolate.
- Racemes lax throughout.
 Sepals 34-35 mm. long.
 Leaves dimorphic, the green blades deciduous.
 Leaves all alike, persistent.
 Sepals not over 25 mm. long.
 Sepals subalate-carinate.
 Sepals not subalate.
 Leaves plicate; branches of the inflorescence divided.
 Leaves even, except for a median channel.
 Petals with a well developed basal scale; leaf-blades rarely more than 3 cm. wide, not clearly petiolate.
 Leaves of the fertile rosette dimorphic and the inflorescence simple or few-branched; species of Hispaniola.
 Sepals acute; petals red.
 Sepals obtuse; petals yellow or cream.
 Leaves of the fertile rosette homomorphic or the inflorescence richly compound.
21. *P. Brittoniana*.
 22. *P. macrochlamys*.
 23. *P. oblanceolata*.
 24. *P. Carioana*.
 25. *P. ochroleuca*.
 26. *P. imbricata*.
 27. *P. Hemsleyana*.
 28. *P. densiflora*.
 29. *P. Wendlandi*.
 30. *P. atrorubens*.
 31. *P. petiolata*.
 32. *P. punicea*.
 33. *P. heterophylla*.
 34. *P. longibracteata*.
 35. *P. secundiflora*.
 36. *P. Werckleana*.
 37. *P. oaxacana*.
 38. *P. cubensis*.
 39. *P. spicata*.
 40. *P. albucaefolia*.
 41. *P. Theae*.
 42. *P. carnea*.
 43. *P. Glymiana*.
 44. *P. Valerii*.
 45. *P. Fuertesii*.
 46. *P. Samuelssonii*.

- Petals yellow; species of Mexico.
Ovules obliquely winged; scape-bracts equaling or shorter than the upper internodes. 47. *P. amblyosperma*.
- Ovules long-caudate; scape-bracts exceeding all the internodes. 48. *P. xanthocalyx*.
- Petals red; species of the West Indies.
Pedicels 15-30 mm. long; species of Jamaica.
Leaves 15 mm. wide; at least the lowest floral bracts of the terminal raceme equaling or exceeding the pedicels. 49. *P. bromeliaefolia*.
- Leaves up to 32 mm. wide; all the floral bracts much shorter than the pedicels. 50. *P. platyphylla*.
- Pedicels not over 12 mm. long.
Flowers erect or suberect; leaves all alike.
Sepals broadly acute or subobtusate; leaf-blades not more than 2 cm. wide.
Sepals 18-24 mm. long. 51. *P. angustifolia*.
- Sepals 14-16 mm. long. 38. *P. cubensis*.
- Sepals acuminate; leaf-blades often 3 cm. wide, entire or subentire. 52. *P. latifolia*.
- Flowers spreading or nutant, often secund; leaves dimorphic. 53. *P. gracilis*.
- Petals naked or with two very minute auricles; leaf-blades up to 7 cm. wide, with distinct petioles. 54. *P. Kalbreyeri*.

1. *Pitcairnia saxicola* L. B. Smith, Contr. Gray
Herb. 117: 29. 1937.

Pitcairnia fulgens A. Dietr. Allg. Gart. 19: 137. 3 My 1851. Not *P. fulgens* Dietr. 1837, nor *P. fulgens* Decaisne, Ja 1851.

Pitcairnia splendens Warsc.; A. Dietr. Allg. Gart. 19: 176. 31 My 1851. Not *P. splendens* Poit. 1836.

Hepetis splendens Mez, in DC. Monog. Phan. 9: 974. 1896.

Stemless, 4-5 dm. high; rhizome bulbiform-thickened; leaves all alike, 3-5 dm. long; sheaths triangular-ovate, tomentulose-lepidote or glabrous with age; blades narrowed at the base but not truly petiolate, deciduous along a straight transverse line, linear, acuminate, 15 mm. wide, glabrous at maturity, the extreme base armed with antrorse spines 1.5 mm. long; scape conspicuous, stout, densely white-lanate; scape-bracts strict, densely imbricate, broadly ovate, acute, subglabrous; inflorescence simple, densely subracemose, slenderly subellipsoid, obtuse, up to 2 dm. long, 6 cm. in diameter; rhachis densely farinose, completely concealed; floral bracts densely imbricate, broadly ovate, acute, 5-6 cm. long, much exceeding the pedicels and but slightly shorter than the sepals, glabrous; flowers strict; pedicels 2 mm. long, densely lanate; sepals linear, acuminate, 5 cm. long, 5 mm. wide, sharply carinate, slightly lanate at the base; petals linear, 7 cm. long, slightly unequal, about equaling the stamens, bright-red, naked; ovary almost wholly superior; ovules long-caudate.

TYPE LOCALITY: Guatemala.

DISTRIBUTION: Known only from the type collection.

2. *Pitcairnia Purpusii* L. B. Smith, Contr.
Gray Herb. 117: 27. 1937.

Stemless, 55 cm. high; leaves numerous, bulbous-rosulate; sheaths broadly ovate, 4 cm. long, dark-castaneous, glabrous; blade, deciduous along a straight transverse line, linear, acu-

minate, 5-7 dm. long, 17 mm. wide, glabrous above, sparsely pale-floccose-lepidote beneath, entire; scape erect, 3.5 mm. in diameter, floccose; scape-bracts large, ovate with long subfiliform blades, exceeding the internodes, floccose, green; inflorescence simple, laxly spicate, subdistichously flowered, 23 cm. long, densely white-floccose; rhachis flexuous; floral bracts ovate, acute or acuminate, chartaceous, prominently nerved, the lower equaling or exceeding the sepals, the rest much shorter; flowers suberect, subsessile; sepals lanceolate, acute, 25 mm. long, the posterior ones carinate; petals linear, 6 cm. long, naked, red; stamens included; style exerted; ovary almost wholly superior; ovules caudate.

TYPE LOCALITY: On shaded rocks, creek east of Monserrate, Chiapas.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 2, f. 20, 21.*

3. *Pitcairnia Calderonii* Standley & Smith; L. B. Smith, Contr. Gray Herb. 98: 8. 1932.

Stemless, half a meter high; rhizome covered with old leaf-sheaths and forming a pseudobulb; leaves dimorphic, some persistent with nearly setiform, brown, uncinately serrate blades, others with the blades deciduous in the dry season, narrowly lanceolate, up to 3 dm. long, 16 mm. wide, entire, glabrous above, below floccosely white-lepidote; scape stout, erect, floccose-lepidote; scape-bracts foliaceous, much exceeding the internodes; inflorescence simple, floccose-lepidote, 2 dm. long, dense toward the apex, laxer below; floral bracts lanceolate, acuminate, large, the lower exceeding the sepals; flowers erect, up to 6 cm. long, short-pedicellate; sepals narrowly lanceolate, acuminate, 28 mm. long, strongly carinate, white-lepidote; petals linear, obtuse, naked, red, about equaling the stamens; anthers 8 mm. long; ovary two-thirds superior.

TYPE LOCALITY: Volcano of Izalco, Sonsonate, Salvador.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Contr. Gray Herb. 98: *pl. 3, f. 1, 2.*

4. *Pitcairnia Roseana* L. B. Smith, Contr. Gray Herb. 117: 27. 1937.

Leaf-sheaths unknown; blades deciduous along a straight transverse line, linear, acuminate, 4 dm. long, 13 mm. wide, entire above the line of cleavage, glabrous above, beneath densely subtomentose with pale linear scales; scape straight, 5 mm. in diameter, closely and densely white-lanate; scape-bracts erect, densely imbricate, broadly ovate, covered with a membrane of pale coalesced scales, the lowest with long narrow subfoliaceous blades which equal the inflorescence; inflorescence simple, densely cylindrical, 24 cm. long, 2 cm. in diameter; floral bracts erect, broadly ovate, acuminate, exceeding the sepals, subcoriaceous, nerved or nearly even, covered with a pale membrane of coalesced scales; flowers erect, sessile; sepals lanceolate, acute, 22 mm. long, densely white-floccose, the posterior ones strongly carinate; petals linear, 5 cm. long, red, naked; stamens included; ovary more than three-fourths superior; ovules caudate.

TYPE LOCALITY: Durango.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 2, f. 22, 23.*

5. *Pitcairnia Micheliana* André, Rev. Hort. 73: 576. 1901.

Plants stemless, aggregated, propagating by basal offshoots, 3-4 dm. high; leaves many in a large pseudobulb; sheaths suborbicular, deep-castaneous; blades dimorphic, some reduced to brown strict coarsely retrorse-serrate spines, others green, linear, filiform-acuminate, pendent, 5-7 dm. long, 7-10 mm. wide, glabrous above, sparsely and finely white-spreading-tomentose below; scape erect, slender, sparsely floccose, soon glabrous; its bracts erect, lanceolate or the lowest foliaceous, subulate-acuminate, sparsely tomentose-lepidote, the upper ones exposing the scape; inflorescence simple, densely spicate, cylindrical, 8-12 cm. long; floral bracts ovate-lanceolate, acuminate, barely shorter than the sepals, submembranaceous, thickened at the base, sparsely floccose or glabrous; flowers sessile, erect or nearly so; sepals lance-ovate, acu-

minate, 20–25 mm. long; petals ligulate, acute, naked, 45–50 mm. long, 7 mm. wide; stamens equaling the petals or slightly exserted; ovary almost wholly superior; ovules long-caudate.

TYPE LOCALITY: Near Inguaran, Michoacán, on rocks, altitude between 500 and 800 meters.

DISTRIBUTION: Michoacán.

ILLUSTRATION: Rev. Hort. 73: *pl.* opp. 576.

6. *Pitcairnia cylindrostachya* L. B. Smith, Contr.

Gray Herb. 117: 25. 1937.

Stemless, up to 4 dm. high; leaves numerous, bulbous-rosulate; sheaths broadly ovate, 4 cm. long, dark-castaneous, glabrous, lustrous; blades deciduous along a straight transverse line, linear, acuminate, 3–5 dm. long, 14 mm. wide, glabrous above, pale-floccose-lepidote beneath; scape erect, 4 mm. in diameter, floccose-lepidote; scape-bracts erect, densely imbricate and almost wholly concealing the scape, floccose-lepidote, the lowest subfoliaceous, the highest broadly ovate and acuminate; inflorescence simple, densely and slenderly cylindric, 10–15 cm. long, 15–20 mm. in diameter, floccose-lepidote; floral bracts erect, densely imbricate, broadly ovate and acuminate, up to 3 cm. long, equaling or exceeding the sepals, broadly convex, subcoriaceous, pale-rose, subeven; flowers subsessile, slender; sepals lanceolate, acuminate, 22–25 mm. long; petals linear, 6 cm. long, red, naked; ovary almost wholly superior; ovules long-caudate.

TYPE LOCALITY: Rocky bluffs of barranca near Guadalajara, Jalisco.

DISTRIBUTION: Vicinity of Guadalajara.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl.* 2, *f.* 14, 15.

7. *Pitcairnia Tuerckheimii* Donn. Smith, Bot. Gaz. 13: 190. 1888.

Hepetis Tuerckheimii Mez, in DC. Monog. Phan. 9: 974. 1896.

Plant stemless, 4–6 dm. high; leaves many in a dense pseudobulb; sheaths broadly ovate to suborbicular, dark-brown, lustrous, soon glabrous; blades dimorphic, the outer ones reduced to dark-brown, flat, retrorsely serrate spines, the inner ones green, deciduous along a straight transverse line, linear, acuminate, 25 cm. long, 1 cm. wide, furfuraceous-ochraceous-lepidote, soon glabrous above; scape erect, slender, floccose-lepidote, its bracts foliaceous, longer or shorter than the internodes; inflorescence simple, laxly racemose, subsecund, 20–25 cm. long; axis slender, slightly flexuous, sparsely floccose; floral bracts ovate, acute or acuminate, exceeding the pedicels, thin, floccose; flowers suberect to spreading; pedicels slender, about 1 cm. long; sepals lanceolate, acute, slightly asymmetric, 25–30 mm. long, glabrous; petals linear, obtuse, naked, 8 cm. long, glabrous, red; stamens barely exserted; anthers linear, 15 mm. long; ovary more than half superior; ovules long-caudate.

TYPE LOCALITY: Rock-crevices, Santa Rosa, Dept. Baja Verapaz, Guatemala, altitude 1500 meters.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Bot. Gaz. 13: *pl.* 24.

8. *Pitcairnia Hintoniana* L. B. Smith, Contr. Gray

Herb. 114: 7. 1936.

Plant stemless, 8 dm. high, propagating by basal stolons; leaves many in a dense pseudobulb; sheaths broadly ovate, dark-brown, lustrous, pale-floccose-lepidote at first; blades dimorphic, some persistent, reduced to dark-brown retrorsely spinose-serrate spines, others green, deciduous along a straight transverse line, linear, acuminate, 4 dm. long, 13 mm. wide, glabrous above, pale-floccose-lepidote below, entire above the line of cleavage; scape erect, about 6 mm. in diameter, glabrous; scape-bracts erect, the lowest foliaceous, the others ovate, acute or acuminate, mostly shorter than the internodes; inflorescence simple, laxly racemose, 2 dm. long; axis stout, glabrous; floral bracts broadly ovate, apiculate, equaling or slightly shorter than the pedicels, submembranaceous, prominently nerved; flowers erect or divergent; pedicels slender, glabrous, 15–20 mm. long; sepals lance-oblong, asymmetric, acute, 35 mm. long, 7 mm.

wide, glabrous; petals ligulate, naked, 9 cm. long, 1 cm. wide, white, obtuse, tomentose-lepidote at the apex; stamens included; anthers linear, 15 mm. long; ovary more than half superior.

TYPE LOCALITY: Chorrera, Dist. Temascaltepec, Mexico [State], altitude 1230 meters.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 114: pl. 1, f. 8, 9.

9. *Pitcairnia puberula* Mez & Smith; Donn. Smith,
Bot. Gaz. 19: 264. 1894.

Hepetis puberula Mez, in DC. Monog. Phan. 9: 974. 1896.

Plant about 4 dm. high; leaves unknown but probably of the dimorphic deciduous type; scape erect, elongate, 4 mm. in diameter, densely white-floccose-lepidote; scape-bracts erect, densely imbricate and covering the lower half of the inflorescence, linear-lanceolate, acuminate, up to 2 dm. long, 18 mm. wide, entire, glabrous above, at first coarsely white-tomentose-lepidote below; inflorescence simple, racemose, cylindric, obtuse, nearly 2 dm. long, many-flowered, subclax toward the base, dense toward the apex; axis stout, angled, puberulent-lepidote; floral bracts like the scape-bracts, the lower ones much exceeding the flowers; flowers erect in fruit; pedicels stout, 4 mm. long, puberulent-lepidote; sepals narrowly triangular, acute, 21 mm. long, 5 mm. wide, ecarinate, subglabrous; petals linear, about 4 cm. long, naked; capsule acuminate, 18 mm. long, almost wholly superior; seeds caudate at both ends.

TYPE LOCALITY: Cenaguilla, Santa Rosa, Guatemala, altitude 1200 meters.

DISTRIBUTION: Known only from the type collection.

10. *Pitcairnia Schiedeana* Baker, Handb. Bromel. 95. 1889.

Hepetis Schiedeana Mez, in DC. Monog. Phan. 9: 974. 1896.

Plant stemless, 6 dm. high; leaves all alike, densely rosulate, entire; sheaths persistent, broadly triangular-ovate, dark-brown, forming a large ovoid pseudobulb, covered with a pale membrane of scales; blades linear, acuminate, up to 85 cm. long, 1 cm. wide, deciduous in summer by a straight transverse line just above the sheath, narrowed at the base, glabrous above, sparsely lepidote below; scape elongating in the dry season as the leaf-blades are falling, densely furfuraceous; scape-bracts erect, densely imbricate, foliaceous, filiform-acuminate, soon glabrous; inflorescence simple, racemose, many-flowered, 25 cm. long, lax toward the base, dense toward the apex, yellow; axis furfuraceous; floral bracts like the scape-bracts, the lowest one exceeding the sepals, narrowly lanceolate; flowers erect, nearly 5 cm. long; pedicels slender, strongly angled, 14 mm. long; sepals narrowly triangular, 2 cm. long, acute, ecarinate; petals white, naked; stamens included; capsule two-thirds superior, 16 mm. long, subovoid; seeds narrow, caudate on both ends.

TYPE LOCALITY: Hacienda de la Laguna, central Mexico.

DISTRIBUTION: Vera Cruz.

11. *Pitcairnia flexuosa* L. B. Smith, Contr.
Gray Herb. 114: 6. 1936.

Stemless, 25-45 cm. high; leaves many, forming an ellipsoid pseudobulb 5 cm. long; sheaths suborbicular, castaneous, lustrous, soon glabrous; blades dimorphic, some reduced to flat brown retrorsely serrate spines, others green, deciduous along a straight transverse line, linear, filiform-acuminate, over 25 cm. long, 3-4 mm. wide, sparsely and finely white-tomentose-lepidote, soon glabrous; scape erect, very slender, glabrous, its bracts ovate or lanceolate, small, the upper remote or exceeding the internodes by only their elongate filiform blades; inflorescence simple, laxly racemose, 1-2 dm. long, glabrous; axis slender, flexuous; floral bracts lanceolate, acuminate, from half as long as to nearly equaling the pedicels; flowers mostly ascending; pedicels slender, 10-15 mm. long; sepals very narrowly triangular, acuminate, 2 cm. long; petals ligulate, acute, naked, 4 cm. long, red; stamens about equaling the petals; anthers linear, 9 mm. long; ovary two-thirds superior; ovules long-caudate.

TYPE LOCALITY: Guayabal, Dist. Temascaltepec, Mexico [State], on cliff, altitude 790 meters.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 114: pl. 1, f. 7.

12. *Pitcairnia Karwinskyana* Schultes, in R. & S.
Syst. Veg. 7: 1239. 1830.

Pitcairnia jaliscana S. Wats. Proc. Am. Acad. 22: 456. 1887.

Hepetis Karwinskyana Mez, in DC. Monog. Phan. 9: 974. 1896.

Plant stemless, 2.5–6 dm. high; leaf-sheaths broadly ovate, dark-brown, lustrous, forming a large pseudobulb; leaf-blades dimorphic, some persistent, setiform, brown, armed with numerous retrorse teeth 0.5–1 mm. long, others green, deciduous along a straight transverse line, linear, acuminate, 25 cm. long, 14 mm. wide, thin, glabrous or scantily floccose-lepidote below, only the persistent stub serrate; scape erect, 3–6 mm. in diameter, furfuraceous-lepidote to glabrous; scape-bracts erect, imbricate, broadly ovate, acuminate, furfuraceous-lepidote or glabrous; inflorescence simple, racemose, 1–3 dm. long, subdense; floral bracts erect, ovate, acuminate, 2–4 cm. long with the lower ones much exceeded by the sepals, subcoriaceous, sparsely appressed-lepidote to glabrous; flowers erect; pedicels up to 25 mm. long, usually angled; sepals narrowly triangular, acuminate, 25–30 mm. long, 5 mm. wide, glabrous, all or the posterior ones wing-carinate; petals linear, obtuse, 5–6 cm. long, naked, red, exceeding the stamens, not revolute at anthesis; anthers linear, 8 mm. long; ovary almost wholly superior; ovules short-caudate; seeds fusiform, long-caudate at both ends.

TYPE LOCALITY: "In calidis Cristo reipubl. Mexican."

DISTRIBUTION: Zacatecas, Nayarit, San Luis Potosí, and Jalisco.

ILLUSTRATION: Garden & Forest 1: f. 35.

13. *Pitcairnia monticola* Brand. Zoe 5: 197. 1905.

Plant stemless, 17–25 cm. high; leaves many in a dense subbulbous rosette, dimorphic, the outer ones reduced, dark-brown, coriaceous, less than 9 cm. long, with large suborbicular sheaths and small spinose-serrate blades, the inner ones with green linear blades 4 dm. long and 6 mm. wide, deciduous just above the sheath, entire but the summit of the sheath with a few spines; scape erect, slender, white-floccose; scape-bracts erect, densely imbricate, narrowly lanceolate, acuminate, bright-red, white-floccose; inflorescence simple, racemose, lax, white-floccose; floral bracts like the scape-bracts, suberect, all but the highest exceeding the sepals; flowers suberect; pedicels slender, up to 8 mm. long; sepals narrowly lanceolate, acuminate, 17–20 mm. long, bright-red, soon glabrous; petals 4 cm. long, naked; ovary more than three-fourths superior; seeds caudate on both ends.

TYPE LOCALITY: Growing on the ground about the summit of Cerro Colorado, Sinaloa.

DISTRIBUTION: Known only from the type locality.

14. *Pitcairnia ringens* Klotzsch; Link, Klotzsch, & Otto,
Ic. Pl. Rar. 63. 1842.

Pitcairnia montalbensis A. Dietr. Allg. Gart. 19: 138. 1851.

Hepetis ringens Mez, in DC. Monog. Phan. 9: 974. 1896.

Stemless, 4–9 dm. high; leaves about 20 in a dense bulbous rosette, 7–9 dm. long; sheaths broadly ovate or suborbicular, brown; blades linear, acuminate, 12 mm. wide, not at all contracted at base, deciduous along a straight transverse line, entire above the line of cleavage, glabrous at maturity; scape erect, over 1 cm. in diameter, white-lepidote; scape-bracts erect, exceeding the internodes, elliptic-lanceolate, acuminate, the upper ones 35 mm. long, white-floccose to glabrous; inflorescence simple, subdensely racemose, 2 dm. long; floral bracts lanceolate, acuminate, exceeding the pedicels; flowers divergent to spreading; pedicels slender, up to 1 cm. long; sepals lance-oblong, acute, 23 mm. long, scarcely or not at all carinate, minutely furfuraceous at the apex; petals linear, acute, 6 cm. long, exceeding the stamens, erect at anthesis, red, naked; ovary more than half superior; ovules long-caudate.

TYPE LOCALITY: Described from cultivation.

DISTRIBUTION: Central Mexico.

ILLUSTRATIONS: Link, Klotzsch, & Otto, Ic. Pl. Rar. pl. 25; Gartenflora 2: pl. 53.

15. *Pitcairnia Palmeri* S. Wats. Proc. Am. Acad. 22: 456. 1887.

Tillandsia secunda Sessé & Moc. Fl. Mex. ed. 2. 81. 1894.
Hepetis Palmeri Mez, in DC. Monog. Phan. 9: 974. 1896.

Plant stemless, very slender, 16–45 cm. tall; leaf-sheaths forming an ovoid pseudobulb; blades dimorphic, some persistent, brown, setiform, densely armed with slender retrorse teeth, others deciduous along a straight transverse line, green, linear, filiform-acuminate, 2 dm. long, 3 mm. wide, densely tomentose-lepidote below when young, only the persistent stub serrate; scape erect, 1.5–2.5 mm. in diameter, scanty lepidote; scape-bracts erect, exceeding the internodes, very narrowly triangular, setose-pungent, lepidote; inflorescence secundly racemose, few-flowered, lax, 6–16 cm. long; floral bracts erect, narrowly ovate-lanceolate, acuminate, all but the lowest half as long as the pedicels, scanty lepidote; flowers spreading to nutant; pedicels up to 15 mm. long, very slender, nearly or quite terete; sepals narrowly triangular, acuminate, 21 mm. long, 3.5 mm. wide, ecarinate, scanty lepidote; petals linear, acute, 4–5 cm. long, exceeding the stamens, naked, not recurved at anthesis; anthers 6 mm. long; ovary two-thirds superior.

TYPE LOCALITY: In crevices of shaded rocks, Rio Blanco, Jalisco.
 DISTRIBUTION: Jalisco.
 ILLUSTRATION: Garden & Forest 1: f. 38.

16. *Pitcairnia pteropoda* L. B. Smith, Contr.
 Gray Herb. 117: 26. 1937.

Stemless, nearly 3 dm. high; leaves many in a bulbous rosette; sheaths suborbicular, 2 cm. long, dark-castaneous, lustrous; blades dimorphic, some persistent, reduced to brown aculeate spines, others green, deciduous along a straight transverse line, linear, acuminate, 4–6 dm. long, 7–15 mm. wide, soon glabrous, entire above the line of cleavage; scape erect, 4 mm. in diameter, glabrous; scape-bracts erect, longer than the internodes but not completely concealing the scape, lanceolate or ovate, long-acuminate; inflorescence simple, rather laxly racemose, 11–16 cm. long, secund-flowered, glabrous with age; floral bracts erect, resembling the scape-bracts, 2 cm. long, exceeding the pedicels; flowers secundly spreading or slightly recurved; pedicels 10–14 mm. long, strongly flattened and with wings which extend up onto the bases of the sepals; sepals narrowly triangular, acuminate, 15–18 mm. long, prominently nerved; petals known only in a withered condition, 5 cm. long, naked; ovary three-fourths or more superior; ovules long-caudate at either end.

TYPE LOCALITY: Uruapan, Michoacán.
 DISTRIBUTION: Michoacán.
 ILLUSTRATION: Contr. Gray Herb. 117: pl. 2, f. 19.

17. *Pitcairnia tabulaeformis* Linden, Cat. 17: 5. 1862.

Hepetis tabuliformis Mez, in DC. Monog. Phan. 9: 974. 1896.

Plant stemless, barely 1 dm. high; leaves 20–30 in a dense flat rosette, all alike, persistent, 13–16 cm. long, entire, glabrous, very pale-green or yellowish-green; sheaths subovate, very short; blades oblong-spatulate, constricted above the sheath but not petiolate, acute, 3 cm. wide; scape none or very short and leafy-bracted; inflorescence 30–40-flowered, globose; floral bracts much shorter than the sepals, glabrous, the lower ones ovate and apiculate, the upper ones lanceolate; flowers often spreading or even reflexed; pedicels stout, glabrous; sepals oblanceolate, acute, 2 cm. long, 5 mm. wide, ecarinate; petals ligulate, obtuse, 6 cm. long, red, bearing a very deeply bilobed scale at the base; stamens and pistil nearly as long as the petals; ovary almost wholly superior; capsule slenderly ovoid, acute; seeds very slender, 1.5–2 mm. long, long-caudate on both ends.

TYPE LOCALITY: "Chiapas"; described from cultivation.
 DISTRIBUTION: Chiapas.
 ILLUSTRATIONS: Belg. Hort. 12: pl. 15, 16; Ill. Hort. 9: pl. 344; Floral Mag. 5: pl. 297; Bot. Mag. pl. 8410; Engler, Pflanzenreich 4²: f. 64.

18. *Pitcairnia recurvata* (Scheidw.) K. Koch, Ind.
Sem. Hort. Berol. 1857: App. 4. 1858.

Puya recurvata Scheidw. Allg. Gart. 10: 275. 1842.
Pitcairnia polyanthoides Brongn.; Decaisne, Rev. Hort. IV. 4: 244. 1855.
Pepernia recurvata E. Morren; Baker, Handb. Bromel. 110, as synonym. 1889.
Pitcairnia laenipetala Mez, in DC. Monog. Phan. 9: 382. 1896.
Hepetis recurvata Mez, in DC. Monog. Phan. 9: 974. 1896.
Hepetis laenipetala Mez, in DC. Monog. Phan. 9: 974. 1896.

Flowering plant 15 dm. high; rhizome elongate, cylindric, covered with the remains of the leaf-sheaths; leaves entire, dimorphic, some reduced to broadly triangular-ovate, acuminate, dark-brown sheaths, others with a deeply channeled petiole 2-5 dm. long and blade, linear-lanceolate, acuminate, up to 1 m. long, 4 cm. wide, glabrous above, white-furfuraceous below; scape erect, stout, white-furfuraceous; scape-bracts narrowly ovate, lepidote, becoming glabrous, the lower ones filiform-caudate, the upper ones equaling or distinctly shorter than the internodes; inflorescence racemose, many-flowered, lax, except toward the apex, 30-45 cm. long; floral bracts broadly ovate, acute, erect, distinctly shorter than the sepals, rose or green, coriaceous, soon glabrous; flowers suberect, over 1 dm. long; pedicels stout, up to 2 cm. long; sepals oblong, obtuse, apiculate, 20-25 mm. long, 6 mm. wide, strongly nerved; petals yellowish-white, bearing a coarsely incised scale at the base; ovary half superior; ovules caudate.

TYPE LOCALITY: "Brazil"; described from cultivation.
DISTRIBUTION: Vera Cruz and British Honduras; also in Colombia.
ILLUSTRATION: Mart. Fl. Bras. 3^o: pl. 85.

19. *Pitcairnia membranifolia* Baker, Handb. Bromel. 109. 1889.

Hepetis membranifolia Mez, in DC. Monog. Phan. 9: 974. 1896.

Flowering plant 3 dm. high; rhizome stout, tuberous; leaves persistent, few, the lower ones reduced to broadly ovate sheaths with slender subpungent apices; upper sheaths tubular-involute, elongate, sparsely and obscurely brown-lepidote; blades of the upper leaves elliptic, 15 cm. long, 4 cm. wide, entire, glabrous; scape well developed, white-tomentose; scape-bracts foliaceous; inflorescence few-flowered, densely racemose above, interrupted toward the base; axis tomentose; floral bracts erect, ovate, acute, exceeding the sepals, the upper ones 37 mm. long; flowers erect; pedicels short and stout; sepals subelliptic, obtuse, 20 mm. long, distinctly asymmetric, ecarinate; petals appendaged; mature capsule ovoid, obtuse, trisulcate, 15 mm. long, five-sixths superior; seeds caudate at both ends.

TYPE LOCALITY: Near Quebrada Honda, Costa Rica.
DISTRIBUTION: Known only from the type locality.

20. *Pitcairnia maidifolia* (Morren) Decaisne;
Planch. Fl. Serres 9: 151. 1854.

Puya maidifolia Morren, Ann. Soc. Agr. Bot. Gand 5: 453. 1849.
Puya Funkiana Linden, Cat. 5: 2. 1850.
Pitcairnia Funkiana A. Dietr. Allg. Gart. 19: 337. 1851.
Pitcairnia maydifolia Decaisne; Naudin, Rev. Hort. III. 5: 347. 1851.
Pitcairnia macrocalyx Hook. Bot. Mag. pl. 4705. 1853.
Pitcairnia zeifolia Koch & Sello; K. Koch, Ind. Sem. Hort. Berol. 1854: App. 11. 1855.
Phlomostachys Funkiana Beer, Bromel. 47. 1857.
Neumannia maidifolia K. Koch, Ind. Sem. Hort. Berol. 1856: App. 2. 1857.
Pitcairnia Funkii Wawra, It. Princ. S. Coburgi 1: 174. 1883.
Lampromorus maidifolius Lemaire; Baker, Handb. Bromel. 109, as synonym. 1889.
Vriesea tricolor Baker, Handb. Bromel. 109, as synonym. 1889.
Pitcairnia Oerstediana Mez, in DC. Monog. Phan. 9: 448. 1896.
Hepetis Funkiana Mez, in DC. Monog. Phan. 9: 973. 1896.
Hepetis maidifolia Mez, in DC. Monog. Phan. 9: 974. 1896.
Hepetis Oerstediana Mez, in DC. Monog. Phan. 9: 974. 1896.

Leaves entire, persistent, the outer reduced, subsquamiform, almost black, the inner developed, about 10 in a fasciculate rosette, distinctly petiolate; sheaths narrowly ovate, brown-lepidote; petioles up to 2 dm. long; blades lanceolate, acuminate, 5 dm. long, 6 cm. wide, glabrous at maturity; scape conspicuous, erect, more or less furfuraceous; lower scape-bracts foliaceous, exceeding the internodes, upper ones ovate, acuminate; inflorescence simple, densely

racemose before anthesis but lax afterwards, few-flowered to many-flowered, subcylindric, 10–45 cm. long; floral bracts broadly ovate, acute, 30–35 mm. long, about equaling the sepals, green or yellow, often tinged with bright-red; flowers spreading at anthesis, often subsecund; pedicels slenderer than the ovary; sepals asymmetric, broadly elliptic, obtuse, 26 mm. long, ecarinate, green or yellow, glabrous; petals linear, broadly acute, decurved at anthesis, unequal, 5–6 cm. long, barely exceeding the stamens, naked, white or greenish-white; anthers 1 cm. long; ovary almost wholly superior; seeds long-caudate at both ends.

TYPE LOCALITY: Described from cultivation.

DISTRIBUTION: Costa Rica; also in Colombia and Venezuela.

ILLUSTRATIONS: Ann. Soc. Agr. Bot. Gand *pl.* 239; Fl. Serres *pl.* 915; Gartenflora 4: *pl.* 113; Bot. Mag. *pl.* 4705, 6535; Engler, Pflanzenreich 4²: *f.* 65.

21. *Pitcairnia Brittoniana* Mez, in DC. Monog. Phan. 9: 451. 1896.

Hepetis Brittoniana Mez, in DC. Monog. Phan. 9: 973. 1896.

Pitcairnia flaviflora Standley, Jour. Wash. Acad. 17: 247. 1927.

Terrestrial or epiphytic, caulescent, 1–1.5 m. high; leaves over 1 m. long; sheaths ovate-triangular, small and inconspicuous, densely tomentose-lepidote, sparsely serrate toward the apex; petioles 15–40 cm. long, coarsely spinose-serrate; blades broadly oblanceolate, acute, 95 mm. wide, entire, soon glabrous; inflorescence 3–6 dm. long, dense, secund-flowered; axis sparsely and finely brown-tomentose-lepidote; floral bracts ovate, acute, much shorter than the sepals, thin and soon disintegrating; flowers secund-spreading; pedicels up to 8 mm. long, 1.5–2 mm. in diameter; sepals lanceolate, acuminate with an involute uncinat apex, more or less asymmetric, 30–35 mm. long, ecarinate, thick, coriaceous, dark-red, sparsely tomentose-lepidote toward the apex; petals ligulate, broadly obtuse, 4 cm. long, orange, bearing 2 narrow obliquely attached scales near the base; stamens and pistil included; ovary slightly more than half superior; ovules long-caudate.

TYPE LOCALITY: Bolivia.

DISTRIBUTION: Costa Rica; also in Bolivia.

NOTE: The two scales on the petal probably represent an extreme case of the common single bidentate scale in which the sinus has become so large that no connection is left between the two sides.

22. *Pitcairnia macrochlamys* Mez, Repert. Nov. Sp. 3: 6. 1906.

Leaves distinctly petiolate; sheaths short, triangular-ovate, deep-castaneous, covered with a thick coat of pale-brown coalesced scales; petioles 3 dm. long, entire, channeled, complicate; blades narrowly lanceolate, acuminate, 14 dm. long, 4 cm. wide, densely and minutely spinose-serrate toward the apex, submembranaceous, glabrous and bright-green above, covered beneath with a membrane of white coalesced scales; scape conspicuous, very stout, white-araneous, soon glabrous; scape-bracts appressed, lax, the upper ones just equaling the internodes, ovate, acuminate, white-lepidote, becoming glabrous; inflorescence simple, lax at the base where flowers are mature, densely spiciform toward the apex, 3 dm. long, 35 mm. in diameter; axis stout, white-araneous; floral bracts erect, broadly ovate, triangular-acute, 5 cm. long, much exceeding the sepals, chartaceous, even, densely and very closely pale-lepidote, becoming glabrous with age; flowers erect; pedicels much slenderer than the base of the ovary, 5 mm. long, subulate-angled along with the lower part of the ovary and white-araneous with it and the sepals; sepals sub-triangular, acute, carinate near the base, 34 mm. long; petals narrowly ligulate, 11 cm. long, exceeding the stamens, equaling the pistil, bearing a small scale at base; anthers 16 mm. long; ovary half superior; ovules distinctly caudate.

TYPE LOCALITY: Near Secanquim, Alta Verapaz, Guatemala, altitude 400 meters.

DISTRIBUTION: Known only from the type collection.

23. *Pitcairnia oblanceolata* L. B. Smith, Contr.

Gray Herb. 117: 26. 1937.

Undoubtedly caulescent; leaves few, erect; sheaths broadly ovate, 3–4 cm. long, dark-castaneous, covered with a thick membrane of brown scales; petioles distinct, stout, channeled,

densely armed with dark spines up to 3 mm. long; blades oblanceolate, acute, 85 cm. long, 125 mm. wide, flat with a narrow channel down the middle, glabrous; scape stout, 3 dm. long; scape-bracts erect, very densely imbricate, some subfoliaceous, others vaginiform, large, elliptic, caudate, covered with a brown membrane; inflorescence simple, densely spicate, cylindrical, 3 dm. long, 3 cm. in diameter; floral bracts strict, very broadly elliptic, acute, 8 cm. long, much exceeding the sepals, castaneous when dry, chartaceous; flowers short-pedicellate; sepals oblanceolate, broadly acute and apiculate, 45 mm. long, 10 mm. wide, membranaceous; petals and stamens not known.

TYPE LOCALITY: Cataracts of San Ramón, Costa Rica.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATION: Contr. Gray Herb. 117: *pl.* 2, *f.* 18.

24. *Pitcairnia Carioana* Wittm. Bot. Jahrb. 14: Beibl. 32: 4. 1891.

Hepetis Carioana Mez, in DC. Monog. Phan. 9: 973. 1896.

Leaves distinctly petiolate, entire; sheaths broadly triangular, covered with a buff membrane of scales toward the apex; petioles 2 dm. long, channeled; blades lanceolate, acuminate at both ends, 6 dm. long, 35 mm. wide, glabrous; scape erect, rather stout, shorter than the leaves, densely white-tomentulose; scape-bracts elongate, densely imbricate, elliptic-lanceolate, acuminate, glabrous except for the slightly tomentulose base; inflorescence very densely subspicate, 3 cm. in diameter; floral bracts narrowly elliptic-ovate, acuminate, 75 mm. long, much exceeding the sepals, membranaceous, glabrous dorsally, furfuraceous within; flowers up to 12 cm. long; pedicels very thick, 8 mm. long; sepals lanceolate, acuminate, about 4 cm. long, floccose; petals obtuse, naked, strongly decurved after anthesis; anthers 19 mm. long; ovary half superior; ovules long-caudate.

TYPE LOCALITY: Sta. Maria Ikbál, Guatemala.

DISTRIBUTION: Known only from the type locality.

25. *Pitcairnia ochroleuca* (Koch & Bouché) Baker,
Jour. Bot. 19: 306. 1881.

Neumannia ochroleuca Koch & Bouché; K. Koch, Ind. Sem. Hort. Berol. 1856: App. 2. 1857.

Hepetis ochroleuca Mez, in DC. Monog. Phan. 9: 974. 1896.

Leaves exceeding the inflorescence, entire, broadly but distinctly petiolate; blades lanceolate, acuminate, 8 dm. long, 45 mm. wide, coarsely appressed-lepidote or glabrous; scape stout, white-lanate; scape-bracts densely imbricate, elliptic, acuminate, scanty lepidote, the lower ones green, the upper ones tinged with brownish-purple; inflorescence simple, densely subspicate, sceptriiform, 25 cm. long, 25 mm. in diameter, many-flowered; floral bracts strict, ovate, long-acuminate, 5 cm. long, 16 mm. wide, much exceeding the sepals, green tinged with purple, conspicuously hyaline-margined when dry; flowers 65 mm. long, barely exerted from the bracts; pedicels very short, obconic; sepals oblong, rounded, apiculate, 25-30 mm. long, over 4 mm. wide, glabrous; petals linear, obtuse, about 6 cm. long, pale-ochraceous, naked; ovary more than three-fourths superior; ovules long-caudate.

TYPE LOCALITY: Described from cultivation; origin not stated.

DISTRIBUTION: Native of Central America or Mexico.

26. *Pitcairnia imbricata* (Brongn.) Regel, Gartenflora 17: 135. 1868.

Neumannia imbricata Brongn. Ann. Sci. Nat. II. 15: 369. 1841.

Phlomostachys imbricata Beer, Bromel. 47. 1857.

Pitcairnia imbricata Brongn.; K. Koch, Ind. Sem. Hort. Berol. 1856: App. 2, as synonym. 1857.

Hepetis imbricata Mez, in DC. Monog. Phan. 9: 973. 1896.

Leaves 10-25 in a spreading rosette, distinctly petiolate, pale-green; sheaths large, triangular-ovate, entire, brown, at first covered below with a thick membrane of coalesced scales; petioles up to 3 dm. long, channeled, densely armed with retrorse spinose teeth up to 2.5 mm. long; blades narrowly lanceolate, acuminate, 5 dm. long, 45 mm. wide, sparsely furfuraceous-lepidote or soon glabrous, entire or with a few teeth at the extreme base; scape short, 7 mm. in diameter; scape-bracts erect, densely imbricate, narrowly ovate, acuminate, green; inflorescence

simple, subspicate, slenderly cylindric, acute, many-flowered, up to 4 dm. long, 25 mm. in diameter; rhachis sparsely lanate; floral bracts broadly ovate, acute, 4-ranked, erect, densely imbricate, 5-6 cm. long, much exceeding the sepals, nearly or quite glabrous; flowers subsessile; sepals narrowly oblong, rounded-apiculate, 22 mm. long, whitish-green, glabrous except for a few tomentose scales at the base and apex; petals linear, unequal, about 6 cm. long, naked, white, not recurved at anthesis; anthers 12 mm. long; ovary almost wholly superior; capsule 2 cm. long, acute; seeds long-caudate at both ends.

TYPE LOCALITY: "Mexico"; described from cultivation.

DISTRIBUTION: Vera Cruz.

ILLUSTRATION: *Gartenflora* 17: pl. 579.

27. *Pitcairnia Hemsleyana* Mez, in DC. Monog.

Phan. 9: 455, as to type only. 1896.

Pitcairnia ochroleuca Baker, Jour. Bot. 19: 306. 1881.

Hepetis Hemsleyana Mez, in DC. Monog. Phan. 9: 973. 1896.

Stemless, over 1 m. high; leaves dimorphic, the outer ones bladeless, acute, the inner subpetiolate, up to 8 dm. long; sheaths broadly ovate, dark; petioles broad, involute, laxly spinulose-serrate; blades linear-lanceolate, acuminate, 5 cm. wide, entire, channeled and glabrous above, finely appressed-pale-lepidote beneath; scape erect, stout, subglabrous; scape-bracts strict, imbricate, broadly ovate, acute; inflorescence simple, densely cylindric, 35 cm. long, 35 mm. in diameter; floral bracts strict, densely imbricate, 8-ranked, broadly ovate, acute, 55 mm. long, exceeding the sepals, nerved, finely appressed-pale-lepidote, becoming glabrous; flowers erect; pedicels slenderly obconic, 7 mm. long; sepals oblong, obtuse and apiculate, 33 mm. long; petals linear, broadly acute and apiculate, 8 cm. long, about equaling the stamens, pale, naked.

TYPE LOCALITY: Barranca Honda, Volcán de Fuego, Guatemala, altitude 1150 meters.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATION: *Hemsl. Biol. Centr. Am. Bot.* pl. 85.

28. *Pitcairnia densiflora* Brongn.; Lemaire, Hort.

Univ. 6: 228. 1845.

Pitcairnia aurantiaca Tenore, Ann. Sci. Nat. IV. 2: 378. 1854.

Philomastachys densiflora Beer, Bromel. 46. 1857.

Lamproconus aurantiacus E. Morren; Baker, Handb. Bromel. 114, as synonym. 1889.

Hepetis densiflora Mez, in DC. Monog. Phan. 9: 973. 1896.

Stemless, 4-8 dm. high; leaves 8-10, basal, arched-recurving, entire throughout, dimorphic, some reduced and squamiform, triangular-ovate or elliptic, abruptly acute, brown or pale, others petiolate, 6-14 dm. long, much exceeding the inflorescence; sheaths short, broadly triangular, covered outside with a membrane of white scales; petioles broad and indistinct, up to 15 cm. long; blades narrowly lanceolate, acuminate, 3-6 cm. wide, narrowly channeled down the middle, glabrous above at maturity; scape erect, stout; scape-bracts suberect, densely imbricate, subfoliaceous with triangular acuminate apices, thin, brown-lepidote; inflorescence simple, densely spiciform, cylindric or subcorymbose, broadly obtuse, 8-20 cm. long, 35 mm. in diameter; floral bracts erect, densely imbricate, 8-12-ranked, broadly ovate, acute, often apiculate, up to 5 cm. long, exceeding the sepals, membranaceous, nerved, glabrous, reddish-yellow; flowers erect, subsessile (Brongniart); sepals subtriangular, rounded-mucronate, 24 mm. long; petals linear, acute, unequal, 58-67 mm. long, slightly exceeding the stamens, yellow, bearing a large coarsely dentate scale well above the base; ovary more than three-fourths superior; ovules caudate.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Vera Cruz.

ILLUSTRATION: *Hortic. Univ.* 6: pl. opp. 228.

29. *Pitcairnia Wendlandi* Baker, Jour. Bot. 19: 306. 1881.

Puya sulphurea Hook. Bot. Mag. pl. 4696. 1853.

Neumannia sulphurea K. Koch, Ind. Sem. Hort. Berol. 1856: App. 2. 1857.

Philomastachys sulphurea Beer, Bromel. 46. 1857.

Pitcairnia sulfurea Mez, in DC. Monog. Phan. 9: 456. 1896. Not *P. sulphurea* Andr. 1802.
Hepetis sulfurea Mez, in DC. Monog. Phan. 9: 974. 1896.

Plant 10–15 dm. high; rhizome 15–20 cm. long, 25 mm. in diameter; leaves radical, petiolate, 6–10 dm. long, entire; sheaths triangular-ovate, brown; petioles 1 cm. wide, up to 3 dm. long, channeled; blades lanceolate, acuminate, 5–11 dm. long, 50–85 mm. wide, glabrous; scape erect, stout, tomentose-lepidote; scape-bracts erect, densely imbricate, large, elliptic, acute; inflorescence simple, densely spiciform, subacute, 2–5 dm. long, 3–6 cm. in diameter; floral bracts densely imbricate, about 6-ranked, broadly ovate with short, triangular, acuminate, erect to divergent, often green blade, 5 cm. long, much exceeding the sepals; flowers sessile; sepals lance-oblong, abruptly acute, up to 3 cm. long, glabrous; petals ligulate, 7 cm. long, about equaling the stamens, yellow, bearing a large bifid denticulate scale at the base; ovary almost wholly superior; ovules long-caudate.

TYPE LOCALITY: Described from cultivation.
 DISTRIBUTION: Guatemala (?) and Costa Rica.
 ILLUSTRATION: Bot. Mag. pl. 4696.

30. *Pitcairnia atrorubens* (Beer) Baker, Jour. Bot. 19: 307. 1881.

Phlomostachys atrorubens Beer, Bromel. 48. 1857.
Puya Warszewiczii H. Wendl.; Hook. Bot. Mag. pl. 5225. 1861.
Pitcairnia Lamarcheana E. Morren; Baker, Handb. Bromel. 111. 1889.
Pitcairnia Lindeni Baker, Handb. Bromel. 112. 1889.
Neumannia Lindeni E. Morren; Baker, Handb. Bromel. 112, as synonym. 1889.
Neumannia atrorubens K. Koch; Baker, Handb. Bromel. 112, as synonym. 1889.
Lamproconus Warszewiczii Lemaire; Baker, Handb. Bromel. 112, as synonym. 1889.
Pitcairnia atrorubens var. *Lamarcheana* Mez, in DC. Monog. Phan. 9: 457. 1896.
Hepetis atrorubens Mez, in DC. Monog. Phan. 9: 973. 1896.
Hepetis Lindeni Mez, in DC. Monog. Phan. 9: 974. 1896.

Plant 6–9 dm. high; leaves about 6, radical, the outer ones and sometimes some of the inner much reduced, squamiform, ovate, abruptly acute, brown, other leaves 6–9 dm. long, petiolate; sheaths triangular-ovate, brown-lepidote; petioles 2 dm. long, channeled, armed with small dark recurved-uncinate spines, finely tomentose-lepidote beneath; blades lanceolate, acuminate, 5 dm. long, 55 mm. wide, entire, glabrous; scape erect, stout, elongate; scape-bracts with a large ovate base and long acuminate blade, subglabrous, especially the upper ones brownish-purple; inflorescence simple, subspicate, obtuse, densely many-flowered, 3 dm. long, 5 cm. in diameter; rhachis finely tomentose-lepidote, wholly concealed; floral bracts broadly ovate with a narrowly triangular spreading blade, up to 7 cm. long, much exceeding the sepals, glabrous, deep-reddish-purple to bright-red; flowers sessile; sepals oblong, abruptly acute, short-mucronate, 25 mm. long, narrowly winged near the apex, minutely lanate; petals linear, broadly acute, exceeding the stamens, unequal, the largest 77 mm. long, pale-yellow, bearing a single large bidentate scale at the base; anthers 1 cm. long; ovary three-fourths superior; ovules long-caudate; capsule broadly ovoid, 13 mm. long.

TYPE LOCALITY: Described from cultivation.
 DISTRIBUTION: Mexico (?), Costa Rica, and Panama.
 ILLUSTRATION: Bot. Mag. pl. 5225.

31. *Pitcairnia petiolata* (Koch & Bouché) Baker, Jour. Bot. 19: 307. 1881.

Neumannia petiolata Koch & Bouché; K. Koch, Ind. Sem. Hort. Berol. 1856: App. 2. 1857.
Hepetis petiolata Mez, in DC. Monog. Phan. 9: 974. 1896.

Leaves with a definite petiole between sheath and blade; sheaths short, triangular; petioles elongate, channeled, armed with minute brown spreading teeth; blades lanceolate, 8–9 dm. long, 30–55 mm. wide, acuminate, entire, glabrous at maturity; scape well developed, densely appressed-tomentose; scape-bracts imbricate, entire, the lower ones green and elongate, the upper ones long-acuminate from a broadly ovate base, brownish-purple; inflorescence about equaling the leaves, subspicate, 2–4 dm. long, 4 cm. in diameter; floral bracts broadly ovate, triangular-acute, 55 mm. long, 22 mm. wide, exceeding the sepals, brownish-purple with a subhyaline margin when dry; flowers 45–60 mm. long, appearing sessile because of the very short

stout pedicels, glabrous; sepals 20–24 mm. long, 6 mm. wide, abruptly acuminate and terminating in a thin mucro; petals greenish-white to yellow, appendaged; anthers 9 mm. long; ovary almost wholly superior; ovules long-caudate.

TYPE LOCALITY: Guatemala.

DISTRIBUTION: Guatemala and British Honduras.

32. *Pitcairnia punicea* Scheidw. Bull. Acad. Brux. 9¹: 25. 1842.

Pitcairnia Jacksoni Hook. Bot. Mag. pl. 4540. 1850.

Pepinia punicea Brongn.; André, Ill. Hort. 17: 33. 1870.

Lamproconus Jacksoni Lemaire; Hemsl. Biol. Centr. Am. 3: 316. 1884.

Hepetis punicea Mez, in DC. Monog. Phan. 9: 974. 1896.

Plant slenderly caulescent, 4 dm. high; stem 15 cm. long, covered with the remains of old leaves, dividing at the base; leaves suberect, all alike, persistent, 25–30 cm. long; sheaths narrowly ovate, about 1 cm. broad, often dark-castaneous toward the base; blades linear, filiform-acuminate, 1 cm. wide, narrowed toward the base but not truly petiolate, sparsely and minutely spinose-serrate throughout, glabrous above, covered below with a thin pale membrane of coalesced scales; scape erect, much shorter than the leaves, 2–3 mm. in diameter, furfuraceous-lepidote; scape-bracts foliaceous, erect, much exceeding the internodes; inflorescence simple, laxly racemose, equaling or slightly exceeding the leaves, up to 2 dm. long, furfuraceous-lepidote; floral bracts lanceolate, acute or acuminate, the lowest exceeding the pedicels, the others much shorter; flowers suberect to spreading; pedicels slender, 15–30 mm. long; sepals oblong, asymmetric, acute, 15 mm. long, ecarinate, red; petals linear, obtuse, 5 cm. long, red, each bearing a single large bilobed scale at base; stamens about equaling the petals; ovary three-fourths or more superior, ovules obtuse; seeds 2 mm. long, the wing annular, thick, broadly truncate at the apex.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Tabasco, Chiapas, and Guatemala.

ILLUSTRATIONS: Bot. Mag. pl. 4540; Jard. Fleur. 2: pl. 127.

33. *Pitcairnia heterophylla* (Lindl.) Beer, Bromel. 68. 1857.

Puya heterophylla Lindl. Bot. Reg. 26: pl. 71. 1840.

Puya longifolia E. Morren, Ann. Soc. Agr. Bot. Gand 2: 483. 1846.

Pitcairnia Lindleyana Lemaire, Jard. Fleur. 2: under pl. 151. 1851.

Pitcairnia Morrenii Lemaire, Jard. Fleur. 3: pl. 291. 1852.

Pitcairnia longifolia Beer, Bromel. 67. 1857.

Pitcairnia Liebmanni K. Koch, Ind. Sem. Hort. Berol. 1857: App. 7. 1858.

Hepetis heterophylla Mez, in DC. Monog. Phan. 9: 973. 1896.

Flowering plant occasionally up to 2 dm. high but usually not over 1 dm.; leaves very numerous in a large bulb; sheaths suborbicular to ovate, deep-castaneous; blades dimorphic, the outer ones reduced to spinose-serrate rigid castaneous spines, the inner ones green and functional, linear, filiform-acuminate, up to 7 dm. long and 13 mm. wide, pale-flocculose-lepidote below, soon glabrous, deciduous along a straight transverse line slightly above the base before anthesis, entire above the line of cleavage, spinulose-serrate below; scape usually very short and concealed by the leaves; scape-bracts ovate, acuminate or the lower ones with a dark slenderly spinose apex, thin, white-flocculose; inflorescence simple, capitate or subspicate, 3–12-flowered; floral bracts like the upper scape-bracts, entire, shorter than the sepals; flowers erect; pedicels 3 mm. long, obconic; sepals narrowly subtriangular, acuminate, 3 cm. long, carinate, subulate, thin, white- or brown-flocculose; petals linear, up to 55 mm. long, red or sometimes white, bearing a sacciform retuse scale well above the base; ovary about half superior; ovules long-caudate; capsule slenderly ovoid, acute, much shorter than the sepals.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Southern Mexico to Panama; also Venezuela to Ecuador.

ILLUSTRATIONS: Bot. Reg. 26: pl. 71; Ann. Soc. Agr. Bot. Gand pl. 101; Lindl. & Paxt. Fl. Gard. pl. 86; Jard. Fleur. 3: pl. 291; Engler, Pflanzenreich 4²²: f. 58.

34. *Pitcairnia longibracteata* Bouché; Mez, in
DC. Monog. Phan. 9: 428. 1896.

Hepelis longibracteata Mez, in DC. Monog. Phan. 9: 974. 1896.

Plant imperfectly known; leaves probably all alike and persistent, 7 dm. long or more, exceeding the inflorescence; blades narrowed for a long distance above the base but not distinctly petiolate, 35 mm. wide, entire, coriaceous when dry, glabrous above, covered below with a dense pulverulent layer of buff scales; scape distinct, soon glabrous; scape-bracts foliaceous, elongate and exceeding the inflorescence, acuminate, green, densely and coarsely tomentose-lepidote especially below; inflorescence simple, subcorymbose, few-flowered; floral bracts like the scape-bracts, 6-8 cm. long, much exceeding the sepals, sparsely villous-lepidote below; pedicels slender, 1 cm. long, tomentulose with ferruginous scales; sepals acuminate, 25 mm. long, ecarinate, glabrous; ovary two-thirds superior.

TYPE LOCALITY: "Guatemala"; described from cultivation.
DISTRIBUTION: Known only from the type collection.

35. *Pitcairnia secundiflora* L. B. Smith, Contr.
Gray Herb. 114: 7. 1936.

Plant stemless, 2 dm. high; leaves few in a fasciculate rosette, all alike, persistent, 23 cm. long, distinctly petiolate, entire, sparsely tomentose-lepidote below; sheaths ovate, small, the outer ones dark-castaneous; petioles 3-4 cm. long; blades elliptic-oblong, broadly acute, apiculate, 2 cm. wide, chartaceous when dry; scape erect, very sparsely tomentose-lepidote, 2 mm. in diameter; scape-bracts shorter than the internodes, ovate, acute, membranaceous, sparsely appressed-lepidote; inflorescence simple, laxly racemose, secund-flowered, 5 cm. long, glabrous; floral bracts like the scape-bracts, secund with the flowers, exceeding the pedicels; flowers spreading; pedicels slender, 1 cm. long; sepals lanceolate, filiform-acuminate, uncinata, 2 cm. long, 4 mm. wide, prominently wing-carinate with the wings decurrent the whole length of the pedicels; petals linear, 35 mm. long, each bearing a single large oblong truncate serrate scale at the base; ovary subspheric, 7 mm. long, two-thirds superior; ovules caudate.

TYPE LOCALITY: Table land about Ocuilapa, Chiapas, altitude 1130-1260 meters.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATIONS: Contr. Gray Herb. 114: pl. 1, f. 1, 2.

36. *Pitcairnia Werckleana* Mez, Bull. Herb. Boiss.
II. 4: 622. 1904.

Leaves persistent, distinctly petiolate; sheaths triangular-ovate, thick, entire or minutely spinose-serrate toward the apex; petioles passing gradually into the blade, 17 cm. long, channeled, armed toward the base with stout darkish spreading spines up to 2.5 mm. long, upward with minute punctiform spines; blades elliptic, acuminate, pungent, 45 cm. long, 6 cm. wide, entire, pergamaeous, glabrous; scape unknown; inflorescence simple, densely racemose, secund-flowered, at least 21 cm. long; axis rather stout, arancous, subangled; floral bracts lanceolate, acuminate, 2 cm. long, 3 mm. wide, much exceeding the pedicels but shorter than the sepals, membranaceous, glabrous; flowers red (?); pedicels stout, 4 mm. long; sepals acute, 26 mm. long, ecarinate, recurved near the apex, slightly barbellate on the margins and the apex; petals ligulate, obtuse, bearing an obtuse slightly crenate scale; ovary four-fifths superior.

TYPE LOCALITY: Costa Rica.
DISTRIBUTION: Known only from the type collection.

37. *Pitcairnia oaxacana* L. B. Smith, Contr.
Gray Herb. 117: 25. 1937.

Plant up to 6 dm. high; base and outer leaves unknown, inner leaves nearly 7 dm. long, subpetiolate; sheath elliptic, small, pale; blades linear-lanceolate, acuminate, 3 cm. wide, thin, glabrous at maturity; scape erect, 3.5 mm. in diameter, sparsely white-floccose, soon glabrous;

scape-bracts elliptic, acuminate, all but the lowest remote; inflorescence simple, lax, rather few-flowered, 9–15 cm. long; floral bracts ovate, acuminate, distinctly shorter than the pedicels, membranaceous; flowers spreading, secund; pedicels slender, up to 9 mm. long, sparsely white-floccose; sepals narrowly oblong, acute, 24 mm. long, soon glabrous, red; petals lingulate, up to 58 mm. long, red, bearing a scale at the base; ovary half superior; ovules long-caudate.

TYPE LOCALITY: Cafetal Calvario, Oaxaca, altitude 600 meters.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATION: Contr. Gray Herb. 117: *pl. 2, f. 16, 17.*

38. *Pitcairnia cubensis* (Mez) L. B. Smith, Contr.
Gray Herb. 117: 24. 1937.

Pitcairnia latifolia var. *cubensis* Mez, in DC. Monog. Phan. 9: 396. 1896.

Hepetis latifolia var. *cubensis* Mez, in DC. Monog. Phan. 9: 974. 1896.

Stemless, 6–8 dm. high; leaves many in a dense fasciculate rosette, all alike, persistent, 8–14 dm. long; sheaths ovate, deep-castaneous; blades linear, filiform-acuminate, 1 cm. wide, slightly constricted, the larger ones entire except at the extreme base which is armed with antrorse spines up to 2 mm. long, glabrous above, covered beneath with a fine membrane of white coalesced scales; scape erect, slender, subglabrous; scape-bracts erect, the lower ones foliaceous and exceeding the internodes, the upper lanceolate, acuminate, much shorter than the internodes; inflorescence simple, laxly racemose, up to 22 cm. long; floral bracts lanceolate, acuminate, mostly shorter than the pedicels; flowers suberect to divergent at anthesis, sometimes becoming secund; pedicels slender, 4–10 mm. long; sepals lance-oblong, abruptly acute or obtuse and apiculate, 14–16 mm. long, ecarinate; petals linear, 4 cm. long, exceeding the stamens, bearing at the base a scale 8 mm. long; ovary half superior; ovules and seeds obliquely alate.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 2, f. 12, 13.*

39. *Pitcairnia spicata* (Lam.) Mez, in DC. Monog.
Phan. 9: 392. 1896.

Bromelia spicata Lam. Encyc. 1: 146. 1783.

Pitcairnia latifolia Redouté, Lil. *pl. 74.* 1804.

Pitcairnia bracteata α Ait. Hort. Kew. ed. 2. 2: 202. 1811.

Pitcairnia racemosa Woodf.; Schultes, in R. & S. Syst. Veg. 7: 1245, as synonym. 1830.

Pitcairnia fulgens Decaisne; A. Dietr. Allg. Gart. 19: 25. 1851.

Pitcairnia Gireoudiana A. Dietr. Allg. Gart. 21: 105. Ap 1853.

Pitcairnia bracteata var. *fulgens* Regel, Gartenflora 2: 163. 1853.

? *Billbergia bifrons* Lindl. Jour. Hort. Soc. Lond. 8: 54. Je 1853.

Pitcairnia bracteata var. *Gireoudiana* Beer, Bromel. 51. 1857.

Billbergia pyramidata Beer, Bromel. 123. 1857.

Pitcairnia commutata Regel, Gartenflora 16: 289. 1867.

Pitcairnia bracteata var. *commutata* Regel, Gartenflora 17: 8. 1868.

Hepetis spicata Mez, in DC. Monog. Phan. 9: 974. 1896.

Stemless, up to 8 dm. high; leaves all alike, persistent, many in a dense fasciculate rosette, 4–6 dm. long, entire or the sheaths of the outer ones spinose-serrate, only the outer ones at all contracted between sheath and blade; sheaths ovate, conspicuous, brown-lepidote; blades linear, acuminate, 20–35 mm. wide, glabrous above at maturity, pale-tomentulose-lepidote below; scape stout, straight, arachnoid-lepidote; scape-bracts erect, densely imbricate, broadly ovate, acute, green, lepidote, the upper ones 4–6 cm. long; inflorescence simple, densely racemose, several-many-flowered, cylindrical or ellipsoid, rarely subcorymbose, broadly obtuse, 6–21 cm. long, 4 cm. in diameter without the corollas, furfuraceous-lepidote; floral bracts broadly ovate, acute, green or rarely red, the upper ones about three-fourths as long as the sepals; flowers much decurved at anthesis; pedicels strict, about 8 mm. long; sepals lance-oblong, obtuse and slightly cucullate, 20–22 mm. long, 5.5 mm. wide, more or less carinate toward the apex, glabrous; petals linear, acute, up to 48 mm. long, exceeding the stamens, bearing a large ovate entire or dentate scale at the base; pistil barely exerted; ovary two-thirds superior; ovules caudate.

TYPE LOCALITY: Martinique.

DISTRIBUTION: Guadeloupe, Dominica, and Martinique.

ILLUSTRATIONS: Bot. Mag. pl. 2813; Redouté, Lil. pl. 73, 74; Gartenflora 2: pl. 54, f. 3-7; Gartenflora 16: pl. 557.

Pitcairnia spicata var. *sulphurea* (Andr.) Mez, in DC. Monog. Phan. 9: 393. 1896. *Pitcairnia sulphurea* Andr. Bot. Repos. 4: pl. 249. 1802. *Pitcairnia bracteata* var. *sulphurea* Ker, Bot. Mag. pl. 1416. 1811. *Hepetis spicata* var. *sulfurea* Mez, in DC. Monog. Phan. 9: 974. 1896. *Tillandsia vincentiensis* E. H. L. Krause, Beih. Bot. Centr. 32: 337. 1914. Petals yellow. TYPE LOCALITY: St. Vincent. DISTRIBUTION: St. Vincent and Dominica. ILLUSTRATION: Andr. Bot. Repos. pl. 249.

40. *Pitcairnia albucaefolia* Schrad. Blumenb. 24. 1827.

Pitcairnia affinis K. Koch, Ind. Sem. Hort. Berol. 1857: App. 5. 1858.

Pitcairnia angustifolia E. Morren; Baker, Handb. Bromel. 92, as synonym. 1889. Not *P. angustifolia* Ait. 1789.

Hepetis albucaefolia Mez, in DC. Monog. Phan. 9: 973. 1896.

Stemless, 6 dm. to probably well over 1 m. high; leaves 20-30 in a dense fasciculate rosette, all alike, persistent, 4-7 dm. long, not at all constricted between sheath and blade; sheaths triangular, conspicuous, brown, sometimes with a broad dark margin, covered with a membrane of scales; blades linear, filiform-acuminate, 15-25 mm. wide, glabrous above at maturity, densely white-pulverulent-lepidote beneath, entire or sparsely spinose-serrate near the base; scape erect, stout, pale-flocculose-lepidote; scape-bracts ovate, equaling or exceeding the internodes, entire, green, lepidote, the lower filiform-caudate, the upper acuminate, 3-7 cm. long; inflorescence densely racemose, many-flowered, 15-43 cm. long, cylindric, obtuse or acute, curved toward the apex, furfuraceous; floral bracts lanceolate, acuminate, up to 7 cm. long, from shorter than to exceeding the sepals, green; pedicels suberect, slender, 6-15 mm. long, white-arachnoid; sepals very narrowly triangular, acuminate, 2-4 cm. long, subglabrous; petals linear, acute, up to 55 mm. long, exceeding the stamens, bright-red, decurved with age, bearing a small deeply emarginate scale at the base; ovary half superior; ovules distinctly caudate.

TYPE LOCALITY: West Indies.

DISTRIBUTION: Martinique and St. Vincent.

ILLUSTRATIONS: Schrad. Blumenb. pl. 3; Gartenzeitung 3: f. 142.

41. *Pitcairnia Theae* Mez, in DC. Monog. Phan. 9: 376. 1896.

Hepetis Theae Mez, in DC. Monog. Phan. 9: 974. 1896.

Flowering plant over 5 dm. high; stem short, erect, not at all bulbous; leaves dimorphic or trimorphic, some of the outer ones reduced to mere sheaths, others with linear brown persistent sparsely serrate blades, the inner ones with well developed blades, not at all constricted between sheath and blade but serrate below the line of scission; blades green, deciduous, linear, acuminate, 5 dm. long, 17 mm. wide, entire, densely furfuraceous below; scape well developed, erect, appressed-cinereous-lepidote, becoming glabrous; scape-bracts strict, much exceeding the internodes, narrowly triangular, acuminate, sparsely lepidote, the upper ones 5 cm. long; inflorescence simple, racemose, subcylindric, a fruiting specimen 2 dm. long, 9 cm. in diameter, cinereous-furfuraceous; floral bracts triangular, acuminate, spreading or reflexed, exceeding the pedicels, entire, sparsely canescent; flowers more or less nodding in fruit; pedicels 15 mm. long, incanous; sepals triangular, acuminate, about 35 mm. long, slightly carinate at the base, cinereous-lepidote; petals appendaged; ovary almost superior; capsule slenderly ovoid, deeply trisulcate, long-beaked, about 24 mm. long; seeds long-caudate at both ends.

TYPE LOCALITY: Woods, near Boruca, Costa Rica.

DISTRIBUTION: Known only from the type locality.

42. *Pitcairnia carnea* Beer, Oesterr. Bot. Zeits. 8: 182. 1858.

Puya carnea Regel, Cat. Pl. Hort. Aksak. 117. 1860.

Hepetis carnea Mez, in DC. Monog. Phan. 9: 973. 1896.

Stemless; flowering plant 6 dm. high; leaves all alike, many, densely fasciculate, persistent, narrowed between sheath and blade but not actually petiolate; sheaths broadly triangular-ovate, entire, brown at the base; blades linear, filiform-acuminate, 6 dm. long, 13 mm. wide,

entire except for a few teeth just above the sheath, densely white-lepidote below, glabrous above at maturity; scape well developed, straight, lepidote, becoming glabrous; scape-bracts strict, narrowly lance-triangular, acuminate, pungent, lepidote, becoming glabrous, the upper ones equaling or slightly shorter than the internodes; inflorescence about equaling the leaves, racemose, cylindric, 2 dm. long, 7 cm. in diameter, white-floccose; floral bracts lanceolate, acuminate, equaling or exceeding the pedicels, the lower ones 18 mm. long; flowers erect, about 55 mm. long; pedicels slender, erect, 10-15 mm. long; sepals sublinear, filiform-acuminate, 34 mm. long, 4 mm. wide, often uncinata, ecarinate; petals 52 mm. long, red, strongly recurved after anthesis, each with a single large coarsely toothed scale at the base; stamens slightly longer than the petals; anthers 8 mm. long; ovary ovoid, three-fourths superior; ovules long-caudate.

TYPE LOCALITY: "Veragnu" [Veraguas, Panama]; described from cultivation.

DISTRIBUTION: Known only from the type collection.

43. *Pitcairnia Glymiana* K. Koch, Wochenschr.

Gärtn. 11: 89. 1868.

Hechtia Glymiana K. Koch, Wochenschr. Gärtn. 11: 90, as synonym. 1868.

Puya Glymiana K. Koch, Wochenschr. Gärtn. 11: 90, as synonym. 1868.

Pitcairnia firma Baker, Jour. Bot. 19: 268. 1881.

Pitcairnia Jacksoni K. Koch; Baker, Jour. Bot. 19: 268, as synonym. 1881.

Hepetis Glymiana Mez, in DC. Monog. Phan. 9: 973. 1896.

Up to 7 dm. high at least; leaves all alike, persistent, 4 dm. long; sheaths narrow, inconspicuous; blades not at all petiolate or narrowed at the base, linear, acuminate, pungent, 8 mm. wide, rigid, very closely lepidote beneath, subglabrous with age, armed with coarse, widely spaced, spreading or slightly antrorse, brown spines along all the margin; scape distinct, slender, glabrous with age; scape-bracts strict, narrowly triangular, long-acuminate, glabrous, the upper ones 15 mm. long and much shorter than the internodes; inflorescence simple, laxly racemose, exceeding the leaves, slightly more than 2 dm. long, 4 cm. in diameter, slender, interrupted toward the base, glabrous; floral bracts strict, lanceolate, acuminate, 5 mm. long, much shorter than the pedicels; flowers strict; pedicels slender, 8 mm. long; sepals triangular, abruptly acute, 19 mm. long, subulate-carinate; petals ligulate, apiculate, 42 mm. long, slightly exceeding the stamens, bearing a slightly crenulate scale at the base; ovary two-thirds superior; ovules with a very short thick appendage at the apex.

TYPE LOCALITY: Described from cultivation; origin wholly unknown.

DISTRIBUTION: Known only from the type collection. Possibly native of the West Indies, according to Mez.

44. *Pitcairnia Valerii* Standley, Jour. Wash. Acad. 17: 246. 1927.

Plant up to 2 m. high; rhizome short and stout; stem 10-13 cm. long, covered by the densely imbricate leaf-bases; leaves 10-15 dm. long, entire; sheaths triangular, 1 dm. long, densely and finely brown-appressed-lepidote; petioles 15-25 cm. long, 5 mm. wide; blades sub-linear, acuminate, 30-35 mm. wide, bearing 5 or 6 narrow grooves, finely nerved, glabrous; scape erect, short, slender, glabrous; the lower scape-bracts foliaceous, 5 dm. long, the upper 2 cm. long; inflorescence paniculate, laxly tripinnate, 7-18 dm. long, glabrous; primary bracts withered and fallen at anthesis; axes terete, smooth, red; branches up to 33 cm. long; racemes many-flowered; internodes 4-10 mm. long; floral bracts lanceolate, acuminate, less than half as long as the pedicels, greenish, scarious-margined; flowers spreading or nutant; pedicels slender, 5-7 mm. long; sepals narrowly triangular, acuminate, 9-12 mm. long, green, scarious-margined, ecarinate; petals linear, red, acute, 2 cm. long, bearing a small suborbicular scale at the base; stamens slightly shorter than the petals; pistil exerted; ovary four-fifths superior; seeds long-caudate at both ends.

TYPE LOCALITY: On steep bank at La Hondura, Province of San José, Costa Rica, altitude about 1,500 meters.

DISTRIBUTION: Costa Rica.

45. *Pitcairnia Fuertesii* Mez, Repert. Sp. Nov. 12: 415. 1913.

Pitcairnia tomentosa "Dietr."; Mez, in DC. Monog. Phan. 9: 389. 1896. Not *P. tomentosa* Dietr. 1820.

Stemless or with a very short stout caudex, 1 m. high; leaves numerous; sheaths elliptic, dark-castaneous, subglabrous; blades dimorphic, some reduced to rigid, dark-castaneous, coarsely retrorse-spinose spines, others green, linear, acuminate, 1 m. long, 1 cm. wide, narrowed at the base but not truly petiolate, coriaceous, laxly spinulose-serrate, glabrous above, covered beneath with a fine membrane of white coalesced scales; scape erect, 6 mm. in diameter, sparsely white-flocculose, soon glabrous; scape-bracts lanceolate, the lower ones with elongate filiform-acuminate blades, the upper ones shorter than the internodes; inflorescence simple or few-branched, 30-37 cm. long; axes sparsely furfuraceous; primary bracts lanceolate, acuminate, 1 cm. long; branches subdensely racemose, the lateral ones ascending with a long sterile base, up to 15 cm. long; floral bracts lanceolate, acuminate, membranaceous, longer or shorter than the pedicels; flowers erect or suberect; pedicels slender, less than 1 cm. long; sepals lance-oblong, abruptly acute, 17-25 mm. long, ecarinate, glabrous; petals linear, obtuse, up to 53 mm. long, exceeding the stamens, bright-red, bearing a crenulate scale slightly above the base; pistil equaling the petals; ovary more than half superior; ovules short-caudate.

TYPE LOCALITY: Barahona Province, Santo Domingo.

DISTRIBUTION: Santo Domingo.

46. *Pitcairnia Samuelssonii* L. B. Smith, Contr.

Gray Herb. 117: 28. 1937.

Pitcairnia xanthocalyx "Mart." Mez; Urban, Symb. Ant. 8: 87. 1920. Not *P. xanthocalyx* Mart. 1848.

Plant up to 15 dm. high; leaves many in a fasciculate rosette, dimorphic, some reduced to dark uncinete-serrate spines, others green and functional, 8 dm. long; sheaths suborbicular, 20-25 mm. long, dark-castaneous, covered at first with a membrane of whitish scales; blades linear, acuminate, slightly narrowed at the base, 8-18 mm. wide, glabrous above, covered beneath with a fine persistent membrane of whitish scales, serrate, teeth 1 mm. long or slightly more, uncinete, dense toward the base of the leaf, very lax elsewhere; scape erect, 7-10 mm. in diameter, very finely white-flocculose, soon glabrous; scape-bracts much shorter than the internodes, triangular-ovate, acuminate, white-flocculose; inflorescence simple or few-branched, lax, 3-6 dm. long; floral bracts ovate, acute, distinctly shorter than the pedicels, white-flocculose; flowers suberect at anthesis, later recurved; pedicels slender, 1 cm. long; sepals oblong, obtuse, 21 mm. long, ecarinate, white-flocculose; petals linear, obtuse, 5-7 cm. long, yellow or cream, bearing a small semiorbicular scale at the base; stamens barely exerted; ovary half superior; ovules bearing an oblique wing on the back and apex.

TYPE LOCALITY: In gulches, Central Plaine, Hinche, Savane Papaye, Haïti, altitude 250 meters.

DISTRIBUTION: Haïti.

ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 2, f. 24-26.

47. *Pitcairnia amblyosperma* L. B. Smith, Contr.

Gray Herb. 117: 23. 1937.

Plant 85 cm. high; base and outer leaves unknown, the inner leaves 1 m. long or more, scarcely petiolate; sheaths suborbicular, small, brown, prominently nerved, covered with a membrane of brown scales; blades linear, filiform-acuminate, 2 cm. wide, entire, glabrous above, covered beneath with a membrane of whitish scales; scape erect, 5 mm. in diameter, sparsely white-flocculose; scape-bracts erect, lanceolate, filiform-acuminate, the upper ones equaling or slightly shorter than the internodes; inflorescence simple, laxly polystichous-flowered, 32 cm. long, sparsely flocculose; floral bracts subtriangular, acuminate, equaling or slightly exceeding the pedicels, membranaceous; flowers spreading; pedicels slender, up to 2 cm. long; sepals oblong, acute, flat, 2 cm. long; petals imperfectly known, at least 4 cm. long, yellow when dry, bearing a large bidentate scale at the base; ovary half superior; ovules bearing a single oblique dorso-apical wing.

TYPE LOCALITY: Tlacuilotepec, Puebla.
 DISTRIBUTION: Known only from the type collection.
 ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 2, f. 4-7*.

48. *Pitcairnia xanthocalyx* Mart. Hort. Monac. Sem. 1848: 4.
 1848; *Linnaea* 24: 195. 1851.

Pitcairnia sulphurea "Andr." K. Koch, Ind. Sem. Hort. Berol. 1857: App. 5. 1858. Not *P. sulphurea* Andr. 1802.

Pitcairnia flavescens Baker, Bot. Mag. *pl. 6318*. 1877. Not *P. flavescens* K. Koch, 1858.

Stemless, up to 13 dm. high; leaves all alike, 1 m. long or more, entire or very sparsely and minutely spinose, scarcely petiolate; sheaths suborbicular, small, brown, prominently nerved, covered with a membrane of scale; blades linear or linear-lanceolate, filiform-acuminate, 2-3 cm. wide, glabrous above, covered beneath with a membrane of whitish scales; scape erect, up to 7 mm. in diameter, slightly floccose; scape-bracts erect, subfoliaceous, all exceeding the internodes; inflorescence simple, laxly polystichous-flowered, 3-6 dm. long, soon glabrous; floral bracts linear-lanceolate, the lower ones much exceeding the pedicels; pedicels slender, 15-20 mm. long; flowers spreading; sepals subtriangular, broadly acute or obtuse, 15-20 mm. long, orange, often floccose-lepidote at the apex; petals 45-50 mm. long, appendaged, pale-yellow; ovary half superior; ovules long-caudate.

TYPE LOCALITY: Mexico.
 DISTRIBUTION: Hidalgo.
 ILLUSTRATION: Bot. Mag. *pl. 6318*.

49. *Pitcairnia bromeliaefolia* L'Hér. Sert. Angl. 7. 1788.

Hepetis angustifolia Sw. Prodr. 56. 1788.

Hepetis bromeliaefolia Salisb. Prodr. 247. 1796.

Pitcairnia Redouteana Beer, Bromel. 57. 1857. Not *P. Redouteana* Schultes, 1830.

Stemless, 4-8 dm. high; leaves of the fertile rosettes all alike or those of the sterile shoots sometimes with spiniform blades, up to 9 dm. long; sheaths ovate or triangular, small, dark-castaneous; blades linear, acuminate, 10-15 mm. wide, channeled, closely spinose-serrate toward the base, sparsely elsewhere, glabrous above, covered with a fine white membrane of coalesced scales beneath; scape erect; scape-bracts exceeding the internodes, the lower foliaceous, the upper linear-lanceolate, acuminate, entire; inflorescence simple or few-branched; axes white-flocculose; primary bracts like the upper scape-bracts, many times shorter than the axillary branches; racemes laxly flowered, 2-4 dm. long; floral bracts narrowly triangular, filiform-acuminate, white-flocculose, the lower ones equaling or exceeding the pedicels, the upper much shorter; flowers spreading; pedicels slender, 20-25 mm. long; sepals narrowly triangular, acuminate, up to 23 mm. long, ecarinate; petals ligulate, acute, 40-55 mm. long, red, bearing at the base a truncate scale 7 mm. long; stamens included; ovary half superior.

TYPE LOCALITY: Jamaica.
 DISTRIBUTION: Jamaica; also St. Vincent and Martinique, according to Mez.
 ILLUSTRATIONS: L'Hér. Sert. Angl. *pl. 11*; Schneev. & Geuns, Ic. Pl. Rar. *pl. 11*; Bot. Mag. *pl. 824*.

50. *Pitcairnia platyphylla* Schrad. Blumenb. 26. 1827.

Pitcairnia bromeliaefolia "L'Hér."; Ait. Hort. Kew. 1: 401. 1789. Not *P. bromeliaefolia* L'Hér. 1789.

Pitcairnia latifolia Andr. Bot. Repos. *pl. 322*. 1803. Not *P. latifolia* Ait. 1789.

Hepetis platyphylla Mez, in DC. Monog. Phan. 9: 974. 1896.

Stemless, 4-7 dm. high; leaves many in a fasciculate rosette, all alike, persistent, 6-8 dm. long; sheaths small but distinct, broadly ovate, deep-castaneous, subglabrous; blades linear-lanceolate, filiform-acuminate, slightly narrowed and densely serrate with brown upwardly curved teeth up to 3 mm. long toward the base, entire or very sparsely and minutely spinulose elsewhere, 18-32 mm. wide, glabrous above, covered beneath with a fine white membrane of coalesced scales; scape erect, slender, red, especially toward the apex, very sparsely white-flocculose; scape-bracts narrowly triangular, filiform-acuminate, the uppermost shorter than

the internodes; inflorescence simple or few-branched, subglabrous; primary bracts linear-lanceolate, acuminate, many times shorter than the axillary branches; racemes 3 dm. long, laxly many-flowered; axes red; floral bracts lanceolate, acuminate, all much shorter than the pedicels; flowers spreading; pedicels 15-30 mm. long, slender; sepals linear-triangular, abruptly acute or obtuse, 24 mm. long, ecarinate, red or green; petals linear, acute, 5 cm. long, exceeding the stamens, red, bearing a large coarsely toothed scale at the base; ovary half superior; ovules with a broad rounded apical appendage.

TYPE LOCALITY: "Jamaica"; described from cultivation.

DISTRIBUTION: Jamaica.

ILLUSTRATIONS: Andr. Bot. Repos. *pl.* 322; Redouté, *Lil.* *pl.* 75; Bot. Reg. 12: *pl.* 1011.

51. *Pitcairnia angustifolia* Ait. Hort. Kew. 1: 401. 1789.

Pitcairnia furfuracea "Willd."; Jacq. f. *Eclog. Pl.* 1: 117. 1815. Not *P. furfuracea* Willd. 1809.

Pitcairnia ramosa Jacq. f. *Eclog. Pl.* 1: 154. 1816.

Pitcairnia tomentosa Dietr. *Lex. Nachtr.* 6: 305, as synonym. 1820.

Pitcairnia Redouteana Schultes, in R. & S. *Syst. Veg.* 7: 1243. 1830.

Pitcairnia alta "Hassk."; Mez, in DC. *Monog. Phan.* 9: 406. 1896.

Hepetis angustifolia "Sw."; Mez, in DC. *Monog. Phan.* 9: 973. 1896. Not *H. angustifolia* Sw. 1788.

Hepetis ramosa Mez, in DC. *Monog. Phan.* 9: 974. 1896.

Hepetis tomentosa Mez, in DC. *Monog. Phan.* 9: 974. 1896.

Stemless, 1-2 m. high; leaves 20-30 in a dense fasciculate rosette, all alike, persistent, often more than 1 m. long, scarcely or not at all contracted between sheath and blade; sheaths conspicuous, triangular-ovate, dark-castaneous at least toward the base, spinose-serrate toward the apex, covered dorsally with a membrane of fine coalesced scales; blades linear, subfiliform-acuminate, 1-2 cm. wide, armed throughout with spines up to 3 mm. long, glabrous above, covered beneath with a fine membrane of white or brown coalesced scales; scape erect, flocculose when young, often becoming glabrous; scape-bracts erect, the lower ones foliaceous and exceeding the internodes, the upper narrowly triangular, filiform-acuminate, often shorter than the internodes; inflorescence simple to much branched, white-flocculose when young, often becoming glabrous; primary bracts like the upper scape-bracts, many times shorter than the axillary branches; racemes suberect or ascending, elongate, laxly many-flowered; floral bracts ovate to linear-lanceolate, acute or acuminate, from shorter than to exceeding the pedicels; flowers erect or ascending at anthesis, sometimes secund on the branches; pedicels slender, 3-10 mm. long; sepals oblong or narrowly triangular, abruptly acute or obtuse, 18-24 mm. long, ecarinate but often swollen at the base; petals linear, acute, up to 55 mm. long, exceeding the stamens, red, bearing a large scale at the base; ovary about half superior; ovules with a truncate appendage.

TYPE LOCALITY: Island of Santa Cruz [Virgin Islands].

DISTRIBUTION: Porto Rico and Lesser Antilles.

ILLUSTRATIONS: Bot. Mag. *pl.* 1547; Jacq. *Eclog. pl.* 79; Redouté, *Lil.* *pl.* 76.

52. *Pitcairnia latifolia* Ait. Hort. Kew. 401. 1789.

Hepetis latifolia Raeschel; Schultes, in R. & S. *Syst. Veg.* 7: 1247, as synonym. 1830.

Billbergia latifolia Heynh. *Nom.* 2: 69, as synonym. 1846.

Pitcairnia furfuracea Beer, *Bromel.* 59. 1857.

Pitcairnia latifolia Jacq.; Beer, *Bromel.* 61. 1857.

Pitcairnia alta "Hassk." Baker, *Bot. Mag.* *pl.* 6606. 1882.

Hepetis pyramidata Rich.; Baker, *Handb. Bromel.* 92, as synonym. 1889.

Stemless, 1 m. high or more; leaves many in a dense fasciculate rosette, all alike, persistent, 8-10 dm. long, barely or not at all constricted above the sheath; sheaths elongate, brown, often dark, often spinulose toward the apex; blades linear-lanceolate, caudate-acuminate, over 3 cm. wide, often spinulose near apex, glabrous above, covered beneath with a fine white membrane of coalesced scales; scape erect, white flocculose, soon glabrous; scape-bracts strict, much exceeding the internodes, linear-lanceolate, acuminate; inflorescence simple or few-branched, 2-3 dm. long; primary bracts like the upper scape-bracts, many times shorter than the axillary branches; racemes laxly many-flowered; floral bracts linear-lanceolate, acuminate, exceeding the pedicels; flowers suberect at anthesis; pedicels slender, up to 12 mm. long; sepals narrowly

triangular, acuminate, 25 mm. long, ecarinate; petals linear, about 5 cm. long, exceeding the stamens, bearing a scale at the base, red.

TYPE LOCALITY: West Indies.

DISTRIBUTION: Porto Rico (Mez) and Lesser Antilles.

ILLUSTRATIONS: Bot. Mag. *pl.* 356, 6606.

53. *Pitcairnia gracilis* Mez, in DC. Monog. Phan. 9: 407. 1896.

Hepetis gracilis Mez, DC. Monog. Phan. 9: 973. 1896.

Leaves all alike, persistent, 5 dm. long or more, scarcely constricted above the sheath; blades linear, 26 mm. wide, armed toward the apex with minute antrorse green spines, glabrous above, densely flocculose-lepidote beneath; scape unknown; inflorescence very laxly and amply paniculate, glabrous; primary bracts very short; branches laxly racemose, 35 cm. long, the lateral ones ascending, nearly equaling the terminal; floral bracts lanceolate, acuminate, all distinctly shorter than the pedicels; flowers spreading at anthesis, soon deflexed; pedicels slender, 10–13 mm. long; sepals linear, acuminate, 25 mm. long, 3 mm. wide; petals narrowly linear, obtuse, up to 53 mm. long, exceeding the stamens, bearing a large scale at the base, red; ovary more than half inferior; ovules short-caudate.

TYPE LOCALITY: Guadeloupe.

DISTRIBUTION: Lesser Antilles.

54. *Pitcairnia Kalbreyeri* Baker, Jour. Bot. 19: 273. 1881.

Hepetis Kalbreyeri Mez, in DC. Monog. Phan. 9: 974. 1896.

Stemless, more than 2 m. high; leaves dimorphic, some much reduced with spiniform serrate blades, others elongate, their blades linear-lanceolate, acuminate, up to 7 cm. wide, entire, more or less furfuraceous beneath, narrowed at the base into a distinct, elongate, serrate petiole; scape erect, soon glabrous, its bracts lanceolate, acuminate, spinose-serrate, shorter than the internodes; inflorescence simple, elongate, laxly racemose, soon glabrous; floral bracts narrowly triangular, about equaling the pedicels; flowers spreading, slender; pedicels slender, 15 mm. long; sepals narrowly triangular, acuminate, 2 cm. long, ecarinate, striate; petals linear, up to 65 mm. long, red or pink, naked or with minute auricles near the base; ovary three-fourths superior.

TYPE LOCALITY: Mountains in Ocaña, Colombia, alt. 1350–1500 meters.

DISTRIBUTION: Panama; also in Colombia.

DOUBTFUL OR EXCLUDED SPECIES

PITCAIRNIA VALLISOLETANA Lex.; Llave & Lex. Nov. Veg. Descr. 1: 19. 1824. Described from Mexico.

4. *HECHTIA* Klotzsch, Allg. Gart. 3: 401. 1835.

Mostly coarse herbs with the habit of *Yucca* or *Agave*. Stem short or practically none. Leaves densely rosulate, usually recurving, acuminate, pungent, coarsely spinose-serrate in most species, lepidote throughout or only on the under side. Scape erect or ascending. Lower scape-bracts foliaceous, the upper usually vaginiform. Inflorescence paniculate, bi- or tripinnate. Branches from capitate to lax and very elongate. Flowers small, subsessile to distinctly pedicellate, dioecious but usually some remnant of the non-functional sex present. Sepals squamiform, free. Petals naked, usually free but sometimes joined to a ring of filaments by their centers. Stamens varying from exerted to included, the anthers usually ovate. Ovary glabrous or lepidote, varying from wholly superior to over three-fourths inferior. Capsule ovoid or ellipsoid, septicidal and loculicidal at the same time. Seeds numerous, oblong, narrowly winged or sometimes almost naked, often sculptured.

Type species, *Hechtia stenopetala* Klotzsch.

Floral bracts and sepals drying uniformly roseate with no hyaline margin.

Branches densely flowered; floral bracts equaling or exceeding the sepals; petals white.

Branches laxly flowered; floral bracts much shorter than the sepals; petals red.

1. *H. dichroantha*.

- Scape-bracts much exceeding the internodes, foliaceous.
 Scape-bracts much shorter than the internodes, vaginiform.
 Flowers subsessile.
 Flowers distinctly pedicellate.
- Floral bracts and sepals brown, stramineous or hyaline (roseate in *H. elliptica* and *H. scariosa* but with hyaline margins).
- Floral bracts flat, usually much shorter than the sepals, or if convex then shorter than the pedicels; flowers distinctly pedicellate in most species.
- Leaves densely serrulate with teeth not more than 0.5 mm. long; plant delicate, less than 1 m. high; inflorescence very lax.
- Sepals subtriangular, broadest at base; flowers 5 mm. long.
 Pedicels 3 mm. long, more than twice as long as the floral bracts.
 Pedicels less than 1 mm. long, equaling or shorter than the floral bracts.
- Sepals ovate, broadest at about one-third of their length; flowers 3 mm. long.
- Leaves laxly and coarsely serrate or where not known the plant coarse and over 1 m. high.
- Inflorescence densely cylindric; branches simple or 3-parted at base, not over 12 cm. long and usually much less.
 Branches densely flowered.
 Rhachis compressed, even or faintly sulcate; branches usually 3-parted from the base.
 Rhachis subterete with fine ridges decurrent from the flowers; branches simple, erect.
 Branches laxly flowered; pedicels slender, 3-8 mm. long.
- Inflorescence pyramidal or if subcylindric then lax with elongate branches.
- (Key to pistillate plants):
 Ovary almost wholly inferior.
 Racemes 10-15 cm. long; flowers reflexed.
 Racemes 3-7 cm. long.
- Ovary nearly or quite superior.
 Floral bracts equaling or shorter than the pedicels; racemes evenly flowered in most species.
 Pedicels not articulated with the rhachis.
 Pedicels slenderly cylindric, 4-8 mm. long; seeds slenderly long-caudate.
 Pedicels stoutly obconic, 3.5 mm. long; seeds with a thick blunt wing.
- Pedicels articulated with the rhachis.
 Carpels even except for a median ridge; pedicels strongly triquetrous.
 Carpels reticulate; pedicels sulcate, subterete.
- Floral bracts much exceeding the very short pedicels at anthesis; racemes interrupted and more or less moniliform; flowers strict.
 Rhachis slender, even or faintly angled.
 Rhachis stout, deeply sulcate.
- (Key to staminate plants):
 Pedicels 6-7 mm. long; primary bracts broadly ovate, apiculate.
 Pedicels not more than 3 mm. long.
- Sepals acute.
 Stamens included.
 Stamens exerted.
 Sepals much thickened toward base; pedicels stout; racemes interrupted.
 Sepals uniformly membranaceous; pedicels slender; racemes slightly or not at all interrupted.
- Sepals broadly obtuse, rarely apiculate.
 Petals 5 mm. long; inflorescence amply tripinnate; raceme laxly flowered.
 Petals 1.5-4 mm. long.
 Rhachis strongly compressed throughout.
 Stamens included; floral bracts equaling or shorter than the pedicels.
 Stamens exerted; floral bracts exceeding the pedicels.
 Rhachis compressed only at base.
 Rhachis slender, even or faintly angled.
 Stamens included.
 Stamens exerted.
 Rhachis stout, deeply sulcate.
- Floral bracts strongly convex, ample, always exceeding the pedicels and usually concealing much of the sepals.
 Flowers 8-10 mm. long; floral bracts stramineous or roseate with broad scarious margins.
2. *H. Desmetiana*.
 3. *H. rosea*.
 4. *H. Meziana*.
5. *H. Purpusii*.
 34. *H. Lundelliorum*.
 6. *H. lindmanioides*.
7. *H. podantha*.
 8. *H. subalata*.
 9. *H. pedicellata*.
10. *H. guatemalensis*.
 11. *H. epigyna*.
12. *H. montana*.
 13. *H. Roseana*.
14. *H. glabra*.
 15. *H. reticulata*.
16. *H. stenopetala*.
 17. *H. Galeottii*.
11. *H. epigyna*.
 12. *H. montana*.
 18. *H. suareolens*.
 19. *H. reflexa*.
10. *H. guatemalensis*.
 14. *H. glabra*.
 20. *H. Conzattiana*.
 21. *H. sphaeroblasta*.
 16. *H. stenopetala*.
 17. *H. Galeottii*.

- Sepals at least as broad as long.
 Sepals acute, 6 mm. long. 22. *H. texensis*.
 Sepals obtuse, 3.5 mm. long. 23. *H. mexicana*.
 Sepals much longer than broad.
 Sepals elliptic, obtuse; leaves splashed with bright-rose. 24. *H. elliptica*.
 Sepals acute; leaves green.
 Floral bracts and sepals roseate with broad scarious margins. 25. *H. scariosa*.
 Floral bracts pale-stramineous. 26. *H. zacatecae*.
 Flowers 5-7 mm. long.
 Sepals acute.
 Leaves densely lepidote on both sides. 27. *H. argentea*.
 Leaves glabrous above. 28. *H. capituligera*.
 Sepals obtuse.
 Spikes lax except at extreme apex, elongate. 29. *H. Schottii*.
 Spikes dense, abbreviated.
 Primary bracts broadly ovate or suborbicular, narrowed abruptly to a long-acuminate apex, serrulate, concealing much of the very short axillary branch; capsules glabrous. 30. *H. confusa*.
 Primary bracts lanceolate or narrowly triangular, inconspicuous.
 Sepals as broad as long with distinct lateral nerves. 31. *H. glomerata*.
 Sepals much longer than broad with very faint lateral nerves.
 Leaves all coarsely serrate. 32. *H. Ghiesbreghtii*.
 Leaves (only the inner known) finely serrulate. 33. *H. gamopetala*.

1. *Hechtia dichroantha* Donn. Smith, Bot. Gaz. 42: 299. 1906.

Flowering plant about 1 m. high; leaves densely rosulate, 2-4 dm. long; sheaths ample; blades linear-triangular, 4 cm. wide at the base, acuminate, glabrous above, covered below with a dense even layer of white appressed scales, armed with fine pale teeth 1-3 mm. long and 5-10 mm. apart; scape elongate, terete, glabrous; scape-bracts 7-9 cm. long, densely white-lepidote below, red, serrulate, with broadly ovate base and linear elongate contorted blade; inflorescence laxly bipinnate, 3-6 dm. long, glabrous except for the primary bracts, red; primary bracts ovate, acuminate, many times shorter than the axillary branches; racemes strobilate, many-flowered, 3-8 cm. long, sessile or the lower ones with a short much flattened naked base; floral bracts linear-lanceolate, acuminate, 6-8 mm. long, equaling or exceeding the sepals, membranaceous; pedicels 3 mm. long, stout; only the staminate flowers known; sepals ovate-lanceolate, acute, 5 mm. long, red; petals ovate-lanceolate, acute, 6 mm. long, white; stamens slightly shorter than the petals; remnant of the ovary almost wholly inferior.

TYPE LOCALITY: Near Santa Rosa, Baja Verapaz, Guatemala, altitude 1600 meters.

DISTRIBUTION: Baja Verapaz, Guatemala.

ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 1, f. 19, 20.

2. *Hechtia Desmetiana* (Baker) Mez, in DC.

Monog. Phan. 9: 551. 1896.

Dyckia Desmetiana Baker, Bot. Mag. pl. 7340. 1894.

Bromelia Desmetiana Baker, Bot. Mag. under pl. 7340, as synonym. 1894.

Leaves up to 4 dm. long, sparsely lepidote above, densely and coarsely lepidote below, armed with stout spines 7 mm. long; scape stout, glabrous; scape-bracts foliaceous, much exceeding the internodes; inflorescence laxly bipinnate, pyramidal, 65 cm. long, glabrous; primary bracts narrowly triangular, about equaling the long sterile bases of the branches; branches up to 15 cm. long, laxly many-flowered; floral bracts ovate-elliptic, apiculate, about equaling the pedicels; flowers 15 mm. long, suberect to spreading, only the pistillate phase known; pedicels 7 mm. long; sepals triangular-ovate, acute, 5 mm. long, roseate; petals narrowly elliptic with a carinate acuminate apex, rose, slightly coherent at base; ovary glabrous; style very short.

TYPE LOCALITY: Described from cultivation; origin unknown, but given as Brazil because the species was placed under *Dyckia*.

DISTRIBUTION: Unknown, but doubtless Mexico, where the closely related *H. Meziana* occurs.

ILLUSTRATIONS: Bot. Mag. pl. 7340.

3. *Hechtia rosea* E. Morren; Baker, Handb. Bromel. 140. 1889.

Hechtia Roeblii Baker, Handb. Bromel. 140. 1889.

Plant 12 dm. high; leaves 5 dm. long, densely lepidote on both sides; sheaths suborbicular, dark-brown; blades narrowly triangular, over 3 cm. wide, armed with coarse uncinuate teeth up to 7 mm. long and 6–12 mm. apart; scape elongate, 1 cm. in diameter, subglabrous, red; scape-bracts erect, broadly ovate, the lower ones with a long linear lamina exceeding the internodes, the upper ones merely acuminate, remote; inflorescence very laxly bipinnate, broadly pyramidal, 7 dm. long, many-flowered, subglabrous, red; primary bracts like the upper scape-bracts, 4 cm. long, usually shorter than the sterile base of the axillary branch; branches spreading, up to 3 dm. long, laxly flowered, somewhat interrupted; rachis slender, nearly straight; floral bracts broadly ovate, abruptly acuminate, 4 mm. long, much exceeded by the sepals; only the staminate flowers known, suberect to spreading, subsessile, about 1 cm. long; sepals broadly ovate, apiculate, 5 mm. long, glabrous; petals elliptic, obtuse, very short-connate, convex, rose; stamens barely exerted; remnant of the ovary one-third inferior, glabrous.

TYPE LOCALITY: "Mexico"; described from cultivation.

DISTRIBUTION: Known only from the type collection.

4. *Hechtia Meziana* L. B. Smith, Proc. Am. Acad. 70: 149. 1935.

Flowering plant known only from fragments, probably about 1 m. high; leaves up to 9 dm. long, very narrowly triangular, 3 cm. wide, completely covered with appressed ferruginous scales, coarsely serrate with teeth 6 mm. long, but the long-attenuate apex unarmed; scape elongate, slender, about 7 mm. in diameter, glabrous; scape-bracts small, extremely remote, ovate, acuminate, chartaceous, roseate; inflorescence very laxly bipinnate, 4–5 dm. long and 15–30 cm. in diameter, roseate, glabrous; primary bracts like the scape-bracts, about half as long as the sterile bases of the branches; branches slender, laxly flowered; floral bracts ovate, acute, equaling or exceeding the pedicels, membranaceous; only the pistillate flowers known; pedicels up to 3 mm. long; sepals broadly triangular-ovate, acute, 4 mm. long, chartaceous; petals ovate-lanceolate, acute, 8–10 mm. long, roseate; stamens included; ovary glabrous; style very short; capsule up to 2 cm. long; carpels 5 mm. in diameter, even, dark-brown, soon separating; seeds narrow, 5 mm. long exclusive of the long caudate appendage.

TYPE LOCALITY: Ravines near Monserrate, Chiapas.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Proc. Am. Acad. 70: *pl. 1, f. 2, 3.*

5. *Hechtia Purpusii* Brand. Univ. Calif. Publ. Bot. 7: 325. 1920.

Flowering plant less than 1 m. high, very graceful and delicate; leaves rosulate, spreading, arched, 2–3 dm. long; sheaths ample, subinflated; blades very narrowly triangular, 2 cm. wide, densely pale-lepidote on both sides, becoming glabrous above with age, striate, densely and finely serrulate with teeth 0.2–0.5 mm. long; scape erect, about 4 mm. in diameter, glabrous; scape-bracts with a broadly ovate base 5 mm. long and a filiform lepidote remotely toothed blade exceeding the internodes; inflorescence laxly and amply tripinnate, glabrous; primary bracts narrowly triangular, membranaceous, much shorter than the sterile base of the branches; branches up to 2 dm. long, very laxly flowered; floral bracts linear-lanceolate, membranaceous, less than half as long as the pedicels; flowers spreading, 5 mm. long; pedicels very slender, about 3 mm. long; sepals broadly triangular-ovate, obtuse, 1.5 mm. long, thin; petals elliptic, obtuse, 4 mm. long, white; stamens present in the pistillate flowers but obviously not functional; ovary ovoid, glabrous; stigmas sessile.

TYPE LOCALITY: On steep rocks, Barranca de Tenampa, Vera Cruz.

DISTRIBUTION: Vera Cruz.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 1, f. 21–23.*

6. *Hechtia lindmanioides* L. B. Smith, Contr.
Gray Herb. 117: 14. 1937.

Known only from parts of the pistillate plant, probably less than 1 m. high; leaves 3 dm. long; sheaths suborbicular, 3 cm. long, much thickened, glabrous; blades narrowly triangular, 2 cm. wide, caudate-acuminate, densely serrulate with teeth 0.5 mm. long, sparsely lepidote above, densely pale-appressed-lepidote beneath; scape unknown; inflorescence very laxly tripinnate, glabrous; primary bracts triangular, acuminate, up to 13 mm. long; branches very slender, up to 2 dm. long, their sterile bases 3–5 cm. long; racemes 3–10 cm. long, very laxly flowered; floral bracts linear-lanceolate, 2 mm. long, much shorter than the pedicels, hyaline; flowers spreading, 3 mm. long; pedicels very slender, 3–4 mm. long; sepals ovate, obtuse, 1.4 mm. long, 1-nerved, subhyaline; petals very broadly elliptic, obtuse, 2.3 mm. long, whitish when dry; ovary ovoid, 1.5 mm. long, superior, glabrous; style almost none.

TYPE LOCALITY: On dry stony slopes, Barranca de Consoquitla near El Fortin, Vera Cruz.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 1, f. 24–26.

7. *Hechtia podantha* Mez, in DC. Monog. Phan. 9: 549. 1896.

Hechtia Liebmannii Mez, Bot. Jahrb. 30: Beibl. 67: 6. 1901.

Hechtia tehuacana B. L. Robinson, Proc. Bost. Soc. Nat. Hist. 31: 265. 1904.

Plant stout, 1–2 m. high; leaves 4 dm. long; sheaths large, suborbicular; blades narrowly triangular, 2–4 cm. wide at the base, acuminate, rigid, finely striate and soon glabrous above, usually covered below with a dense even coat of white scales, armed with brown uncinate widely spaced teeth 4–6 mm. long; scape erect, terete, 1–2 cm. or more in diameter, soon glabrous except for tufts of fine tomentum at the base of the bracts; lower scape-bracts foliaceous, upper scape-bracts with a broadly ovate base and linear entire blade exceeding the internodes; inflorescence densely cylindric, tripinnate or rarely bipinnate, 6–8 dm. long, glabrous or very sparsely tomentose; primary bracts usually ample, broadly ovate, acuminate, sparsely serrulate, often nearly equaling the axillary branches; branches rarely simple, usually divided into three just above the base but without further subtending bracts, 3–12 cm. long, densely flowered; rhachis much flattened; floral bracts ovate to linear-lanceolate, shorter or longer than the pedicels, scarious; pedicels terete, 1–3 mm. long at anthesis, later becoming enlarged in the pistillate flowers; sepals 2–3 mm. long, ovate and obtuse or broadly acute in the staminate flowers; triangular and acute in the pistillate flowers; petals 3–5 mm. long, in the staminate flowers ovate or elliptic, obtuse, in the pistillate flowers triangular, acute; stamens included; ovary or its remnant glabrous, superior for all but a small fraction of its length; style not over 1 mm. long; capsule ovoid, acute, 8–14 mm. long; seeds with a narrow lateral or apical wing or almost wingless.

TYPE LOCALITY: Described from cultivation. "Patria absque dubio Mexico."

DISTRIBUTION: Hidalgo, Morelos, and Puebla.

ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 1, f. 27, 28.

8. *Hechtia subalata* L. B. Smith, Contr.
Gray Herb. 117: 15. 1937.

Known from parts of the pistillate plant only; leaf-blades narrowly triangular, at least 36 cm. long, 15 mm. wide, pungent, glabrous above, finely pale-lepidote between the nerves beneath, so strongly repand as to appear geniculate, the teeth themselves slender and not over 3 mm. long, yellow or brown; inflorescence cylindric, 36 cm. long, 6–7 cm. in diameter, quite glabrous in fruit; primary bracts narrowly triangular, acuminate, 25 mm. long, subchartaceous; branches simple, erect, not over 1 dm. long, densely flowered nearly to the base, 25 mm. in diameter in fruit; rhachis stout, subalate with fine ridges decurrent from the flowers; floral bracts very broadly ovate, obtuse, 4 mm. long, exceeding the pedicels, erose, even, thickened at the base, pale-brown; flowers erect or suberect; pedicels stout, triquetrous, sulcate, articulate with the rhachis, 2 mm. long; sepals broadly elliptic, obtuse, 3.5 mm. long, even, pale-brown

with a hyaline margin, erose; petals broadly triangular, acute, 4.5 mm. long, white; stigmas subsessile; capsule ovoid, acute, 11 mm. long; carpels even; seeds linear, long-caudate at apex.

TYPE LOCALITY: Sierra Madre, Durango.

DISTRIBUTION: Durango and Zacatecas.

ILLUSTRATION: Contr. Gray Herb. 117: *pl. 1, f. 29.*

9. *Hechtia pedicellata* S. Wats. Proc. Am. Acad. 26: 155. 1891.

Plant slender, 5–6 dm. high; leaves densely rosulate, up to 7 dm. long; sheaths large, suborbicular or reniform; blades linear-triangular, 35 mm. wide, densely pale-appressed-lepidote below, soon glabrous above, armed with uncinata teeth up to 2 mm. long and 1–2 cm. apart; scape short, ascending, 4–6 mm. in diameter, glabrous; scape-bracts lance-ovate, linear-laminate or acuminate, much exceeding the internodes, chartaceous; inflorescence densely cylindric, 4–5 dm. long, 5–15 cm. in diameter, bipinnate except for the barely divided lowest branches, glabrous; primary bracts lance-ovate, acuminate, the lower ones half as long as the axillary branches; racemes laxly few-flowered; floral bracts lance-oblong, minute, much shorter than the pedicels; flowers spreading; pedicels slender, the staminate up to 3 mm. long, the pistillate up to 8 mm. long; sepals broadly triangular, 1.5 mm. long; staminate petals oblong, obtuse, 3 mm. long, cucullate; pistillate petals broadly triangular, acute, 2 mm. long; stamens included; ovary wholly superior, glabrous; style 1 mm. long; capsule ovoid, acute, 1 cm. long; seeds linear or oblong, with a narrow wing on 3 sides.

TYPE LOCALITY: On ledges in the barranca near Guadalajara, Jalisco.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 1, f. 30, 31.*

10. *Hechtia guatemalensis* Mez, Repert. Nov. Sp. 3: 14. 1906.

Flowering plant slender, probably at least 2 m. high; leaves rosulate, 7–8 dm. long; sheaths suborbicular, slightly wider than the blade; blades linear-triangular, 3–6 cm. wide at the base, glabrous above, covered below with a dense even layer of white scales, the caudate apex entire, elsewhere armed with fine uncinata teeth 3–4 mm. long and 5–12 mm. apart; scape glabrous; scape-bracts unknown; inflorescence amply and densely tripinnate, 1 m. long, glabrous; primary bracts lance-triangular, not over 3 cm. long, entire or rarely the lowest ones serrulate toward apex; branches up to 3 dm. long; secondary bracts narrowly triangular, 5 mm. long, membranaceous; racemes 10–15 cm. long, laxly flowered; floral bracts lanceolate or triangular, acuminate, about equaling the pedicels, scarious; pedicels in the staminate plants slender, spreading, 2 mm. long, in the pistillate plants stout, reflexed, 1 mm. long; sepals elliptic in the staminate flowers, obtuse, 1.75 mm. long; petals elliptic in the staminate flowers, obtuse, 5 mm. long, white; stamens shorter than the petals; ovary or its rudiment almost wholly inferior, glabrous; capsule ellipsoid, 5–8 mm. long, glabrous, prominently and irregularly veined; seeds oblong, black-brown, minutely pitted, the wing reduced to two apical tubercles and a single narrow connecting band.

TYPE LOCALITY: San Bernardo, between Trapiche Grande and Las Canoras, Guatemala, Guatemala, altitude 600 meters.

DISTRIBUTION: Southeastern Guatemala and western Salvador.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 1, f. 32, 33.*

11. *Hechtia epigyna* Harms, Notizbl. Bot. Gart.

Berlin 12: 531. 1935.

Known only from fragments, probably 1 m. high or more; leaves 35–40 cm. long; blades linear-triangular, subfiliform-acuminate, 2–3 cm. wide at base, densely white-scurfy on both sides, becoming glabrous with age, densely serrulate toward the apex, the teeth stout, uncinata, pale, up to 3 mm. long and 12 mm. apart, coarsely lepidote in the axils; inflorescence laxly bipinnate or possibly tripinnate (! Harms), subcylindric, glabrous; axes slender; bracts subtending the racemes broadly ovate, apiculate, 7–15 mm. long, thin; racemes suberect or ascending, short-stipitate, dense or lax, 3–7 cm. long; floral bracts broadly elliptic, acute, 3–4 mm. long, mem-

branceous, white; flowers spreading or ascending; pedicels slender, terete, slightly enlarged toward apex, the staminate 6–7 mm. long, the pistillate about 3 mm. long; sepals subovate, obtuse, 2.5–3.5 mm. long, pale-brown, membranaceous; petals broadly elliptic, obtuse, cucullate, 5 mm. long, white; stamens equaling the petals; filaments free; ovary (or its minute rudiment) almost wholly inferior, trigonous, 5–10 mm. long; ovules numerous, fusiform, biacuminate.

TYPE LOCALITY: Jaumave, [Tamaulipas].

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 1, f. 34–37*.

12. *Hechtia montana* Brand. *Erythea* 7: 9. 1899.

Hechtia pedicellata "S. Wats." I. M. Johnston, Proc. Calif. Acad. IV. 12: 995. 1924.

Plant imperfectly known, probably about 1 m. high; leaves numerous in a dense rosette, 15–45 cm. long; sheaths large, broadly ovate to suborbicular, brown, glabrous or obscurely punctulate; blades linear-triangular, pungent, 2–3 cm. wide, cinereous-scurfy below, appressed-lepidote and soon glabrous and shiny above, armed with slender uncinete brown teeth up to 5 mm. long and 10–25 mm. apart; scape terete, 1 cm. in diameter, sparsely floccose-lepidote, soon glabrous; scape-bracts strict, the lower ones foliaceous, 10–15 cm. long, imbricate, the upper linear-lanceolate, pungent, remote; inflorescence laxly bipinnate, slenderly pyramidal, 3–5 dm. long, sparsely white-floccose, soon glabrous; primary bracts lance-ovate, acuminate, much shorter than the axillary branches, sparsely serrate or entire; racemes sessile or subsessile, ascending or spreading, laxly flowered especially in the pistillate plants, up to 16 cm. long; floral bracts linear-lanceolate, acuminate, equaling or exceeding the staminate pedicels, about half as long as the pistillate pedicels, flowers spreading; pedicels slender, the staminate 2–3 mm. long, the pistillate 4–8 mm. long; staminate sepals broadly ovate, acute, 2.5 mm. long, thin; pistillate sepals narrowly deltoid, acuminate, 3 mm. long, much thickened at base and bearing 3 prominent nerves; staminate petals broadly elliptic, obtuse, 4.5 mm. long, pale-yellow; pistillate petals deltoid, acuminate, 5 mm. long; stamens included; ovary slightly inferior; stigmas sessile; capsule ovoid, acute, 1 cm. long; seeds oblong or falcate with a narrow dorsal wing which is prolonged at apex into a narrow appendage nearly as long as the seed.

TYPE LOCALITY: Along the base of the mountains, San José del Cabo, [Baja California].

DISTRIBUTION: Southern Baja California, Sonora, and Sinaloa.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 1, f. 38–40*.

13. *Hechtia roseana* L. B. Smith, Contr. Gray Herb. 117: 17. 1937.

Known from parts of the pistillate plant only, probably 1 m. or more high; leaf 5 dm. long, finely pale-appressed-lepidote and prominently nerved on both sides; blades narrowly triangular, acuminate, pungent, 4 cm. wide, its spinose teeth 15–40 mm. apart, reddish-brown, uncinete, 4–6 mm. long; primary bracts triangular-ovate, filiform-acuminate, 25 mm. long, about equaling the sterile base of the raceme; branches simple, up to 14 cm. long, subdense, subsecond-flowered, glabrous; rhachis slender, terete, even; floral bracts triangular-ovate, acute, 2 mm. long, distinctly shorter than the pedicel and adnate to its base, carinate with mid-nerve much thickened; flowers suberect; pedicels stoutly obconic, 3.5 mm. long; sepals broadly triangular-ovate, acute, 3.5–4 mm. long, much thickened at the base, mid-nerve prominent; petals broadly triangular-ovate, acute, barely exceeding the sepals, white; ovary superior; capsule ovoid, acute, 12 mm. long; carpels dark-brown, sublustrous, very faintly wrinkled but not reticulate; seeds elliptic and 4 mm. long including the large thick circumferential wing.

TYPE LOCALITY: Near Tehuacan, Puebla.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 1, f. 41, 42*.

14. *Hechtia glabra* Brand. Univ. Calif. Publ.
Bot. 7: 325. 1920.

Plant large, probably 2 m. or more high; leaves 5-7 dm. long; blades linear-triangular, acuminate, pungent, 3 cm. wide, laxly spinose-serrate, repand, glabrous and shiny above, densely pale-appressed-lepidote below when young; inflorescence laxly bipinnate, subpyramidal, at least 7 dm. long and 2-3 dm. in diameter, glabrous; primary bracts narrowly ovate, acuminate, many times shorter than the axillary branches, chartaceous, soon deciduous; racemes ascending or spreading, short-stipitate, cylindric, densely many-flowered; rhachis strongly flattened throughout; floral bracts lance-oblong, acute, equaling or shorter than the pedicels, brown, membranaceous; flowers spreading; staminate pedicels obconic, 2 mm. long; pistillate pedicels 2 mm. long, 1.5 mm. in diameter, articulate at base, sharply triquetrous, often with intermediate ridges as well; staminate sepals broadly elliptic, obtuse, 1.5 mm. long, convex, ecarinate, cucullate; pistillate sepals broadly triangular, acute, 2.5 mm. long, carinate; staminate petals broadly elliptic, obtuse or emarginate, 3 mm. long, cucullate, pale-yellow; pistillate petals triangular, acuminate, 3 mm. long; stamens included; ovary very slightly inferior, more so in the remnant in the staminate flower; stigmas sessile; capsule oblong-ellipsoid, triquetrous, 7 mm. long; carpels even except for a median ridge; seeds slenderly ellipsoid with a single large triangular wing at the apex.

TYPE LOCALITY: Barranca de Panoaya, Vera Cruz.

DISTRIBUTION: Vera Cruz.

ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 1, f. 43-45.

15. *Hechtia reticulata* L. B. Smith, Contr.
Gray Herb. 117: 17. 1937.

Plant known only from very scant pistillate material but evidently large; leaves over 3 dm. long; blades linear-triangular, 3 cm. wide, armed with uncinat teeth 4 mm. long and 10-15 mm. apart; inflorescence bipinnate, large; racemes short-stipitate, cylindric, laxly many-flowered, up to 15 cm. long; floral bracts broadly deltoid, acuminate, equaling or shorter than the pedicels; flowers spreading; pedicels terete, slender, 4 mm. long, articulated with the rhachis, deeply sulcate; sepals deltoid, filiform-acuminate, thickened at the base, 4 mm. long but the point wearing away with age; petals narrowly deltoid, acuminate, 5 mm. long; ovary minutely inferior, the style short but distinct; capsule ovoid, acute, 1 cm. long, dark-brown, the carpels coarsely and irregularly reticulate; seeds 5 mm. long, linear with a narrow lateral wing which is expanded into a short broad appendage at the apex.

TYPE LOCALITY: Manzanillo, Colima.

DISTRIBUTION: Colima.

ILLUSTRATION: Contr. Gray Herb. 117: pl. 1, f. 46.

16. *Hechtia stenopetala* Klotzsch, Allg. Gart. 3: 402. 1835.

Hechtia Besseriana J. Verschaffelt, Cat. 18:- 1874.

Hechtia cordylinoides Baker, Bot. Mag. pl. 6554. 1881.

Hechtia Pringlei Rob. & Greenm. Am. Jour. Sci. III. 50: 167. 1895.

Plant 2 m. high; leaves numerous in a spreading rosette, up to 6 dm. long, coarsely and densely pale-appressed-lepidote below, soon glabrous and shiny above; sheaths large, suborbicular; blades linear-triangular, spine-tipped, 35 mm. wide, laxly serrate with dark uncinat spines up to 7 mm. long; scape erect, 1 cm. or more in diameter, soon glabrous; scape-bracts erect or spreading, lanceolate, linear-laminate or acuminate; inflorescence laxly bipinnate or tripinnate, slenderly pyramidal or subthyrsoid, 10-15 dm. long, sparsely pale-floccose at first, soon glabrous; primary bracts narrowly triangular, acuminate, 2-4 cm. long, thin; branches elongate, many-flowered, interrupted; rhachis slender, subterete, even or faintly angled; floral bracts subdeltoid, acute, entire or serrulate, exceeding the pedicel at anthesis but usually much shorter than the sepals, thin; flowers subverticillate, the staminate spreading, the pistillate strict; pedicels very short, the pistillate elongating beyond the floral bracts in fruit and becoming articulated at base; staminate sepals elliptic, broadly obtuse, sometimes apiculate, 1.5-2.5

mm. long, the pistillate deltoid, acute; petals free, 3–4 mm. long, the staminate elliptic, obtuse, the pistillate narrowly deltoid, acuminate; stamens exerted; ovary slightly inferior, glabrous, the stigmas sessile; capsule ovoid, acute, 5–6 mm. long, the carpels even; seed linear, completely encircled by a narrow wing.

TYPE LOCALITY: Vicinity of Mexico City.

DISTRIBUTION: Puebla and Oaxaca.

ILLUSTRATIONS: Bot. Mag. *pl.* 6554; Contr. Gray Herb. 117: *pl.* 1, *f.* 47–50.

17. *Hechtia Galeottii* Mez, Repert. Sp. Nov. 16: 71. 1919.

Plant large, probably over 2 m. high; leaves up to 4 dm. long; blades linear-triangular, acuminate, spine-tipped, 25 mm. wide, densely and finely pale-appressed-lepidote between the nerves below, soon glabrous and shiny above, armed with brown uncinatate teeth up to 4 mm. long and 3 cm. apart, entire toward the apex; inflorescence laxly tripinnate, elongate, subcylindric, 5 dm. in diameter, sparsely floccose-lepidote; primary bracts narrowly subtriangular, acuminate, 4 cm. long; spikes cylindrical, interrupted, up to 3 dm. long; rhachis stout, deeply sulcate; floral bracts broadly ovate-deltoid, acute, 1–2 mm. long, from longer than to shorter than the sepals, serrulate, thin; flowers strict, subsessile; staminate sepals broadly ovate, obtuse, 1.5 mm. long; pistillate sepals acute; staminate petals broadly elliptic, obtuse, 2.5 mm. long, dark-punctate; pistillate petals deltoid, acute; ovary glabrous, the stigmas sessile; capsule ovoid, acute, 3–4 mm. long, seed oblong, 2 mm. long, black, bearing small flattened appendages at both ends.

TYPE LOCALITY: Oaxaca.

DISTRIBUTION: Oaxaca.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl.* 1, *f.* 51, 52.

18. *Hechtia suaveolens* E. Morren; Mez, in DC. Monog. Phan. 9: 550. 1896.

Plant about 9 dm. high; leaves over 5 dm. long; sheath large, suborbicular; blades linear-triangular, 3 cm. wide, glabrous above, appressed-pale-lepidote below between the nerves, armed with dark uncinatate teeth 3 mm. long and 15 mm. apart; scape very short, stout, white-tomentulose; scape-bracts foliaceous, densely imbricate; inflorescence bipinnate, subcylindric, over 7 dm. long, 15 cm. in diameter, sparsely white-tomentulose; primary bracts ovate, acuminate, 3 cm. long; racemes ascending, subsessile, up to 15 cm. long, interrupted, many-flowered; rhachis slender, subterete; floral bracts lance-oblong, acute, membranaceous, exceeding the pedicel but much shorter than the sepals; flowers spreading, subverticillate; pedicels stout, 2 mm. long, terete; sepals elliptic, acute, 3 mm. long, much thickened basally; petals elliptic, acute, 4.5 mm. long, convex, white, very short-connate; stamens exerted; remnant of the ovary glabrous.

TYPE LOCALITY: Described from cultivation. "Patria absque dubia Mexico."

DISTRIBUTION: Known only from the type collection.

ILLUSTRATION: Contr. Gray Herb. 117: *pl.* 1, *f.* 53.

19. *Hechtia reflexa* L. B. Smith, Contr. Gray Herb. 117: 18. 1937.

Known from a fragment of the staminate plant only, 12 dm. high (! Langlassé); leaves 4 dm. long, coarsely uncinatate-serrate (! Langlassé); top of the scape terete, 5 mm. in diameter; scape-bracts linear-caudate from a small suborbicular base, 15 mm. long; inflorescence glabrous; primary bracts like the scape-bracts, equaling or slightly exceeding the sterile base of the branches; branches reflexed, up to 14 cm. long, very slender, simple or with a few short branches near the base, densely flowered, scarcely or not at all interrupted; floral bracts lance-elliptic, acute, barely shorter than the sepals, membranaceous; flowers spreading; pedicels slender, 0.5–0.7 mm. long; sepals triangular-ovate, acute, 1.5 mm. long, subhyaline, brownish with black spots, uniformly membranaceous; petals elliptic, obtuse, 2.5 mm. long, white; stamens exerted.

TYPE LOCALITY: Rocky slopes, San Salvador, Michoacán or Guerrero, altitude 650 meters.
 DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 1, f. 54, 55.*

20. *Hechtia Conzattiana* L. B. Smith, Contr.
 Gray Herb. 117: 19. 1937.

Known from parts of the staminate plant only, probably about 1 m. high; leaves up to 37 cm. long, even and sparsely pale-lepidote above, soon becoming glabrous, beneath closely and prominently nerved and persistently lepidote; sheaths ovate, 4 cm. long, brown; blades linear-triangular, acuminate, pungent, 13 mm. wide, laxly armed with uncinat spines up to 2 mm. long; scape terete, 5 mm. in diameter, at least 2 dm. long, glabrous; scape-bracts erect, linear from a triangular-ovate base, red with prominent hyaline margins, densely pale-lepidote, the upper ones small and remote; inflorescence lax, glabrous; primary bracts ovate, short-caudate or apiculate, not more than 13 mm. long; branches simple, spreading, 7-11 cm. long, subdensely flowered nearly to the base; rhachis flattened for its entire length, strongly sulcate; floral bracts elliptic, broadly acute or obtuse, 2-2.5 mm. long, exceeding the pedicels, brownish, membranaceous, erose; flowers spreading; pedicels subcylindric, 1.5 mm. long; sepals broadly elliptic, obtuse, 2 mm. long, pale-brown, blackish-punctate, uniformly membranaceous, entire or faintly erose; petals elliptic, obtuse, 4 mm. long, white; stamens exerted.

TYPE LOCALITY: Camino de Chiquihuitlán, Las Tres Aguas, Dist. Cuicatlan, Oaxaca, altitude 1300 meters.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATION: Contr. Gray Herb. 117: *pl. 1, f. 56.*

21. *Hechtia sphaeroblasta* B. L. Robinson, Proc. Am.
 Acad. 35: 323. 1900.

Large, only the staminate plant known; leaves 7 dm. long; blades linear-triangular, acuminate, pungent, 45 mm. wide, laxly serrate with slender uncinat stramineous spines 2 mm. long, glabrous above, densely gray-scurfy below; inflorescence at least 7 dm. long, tripinnate, glabrous; primary bracts ovate-oblong, acute, 1 cm. long or longer, entire, scarious with many fine dark veins; branches ascending, 1-3 dm. long, 5-9-branched near the middle; secondary bracts scarcely larger than the floral bracts; racemes ascending, 4-12 cm. long, laxly many-flowered, slightly interrupted; rhachis slender, angled but not sulcate; floral bracts broadly ovate, acute, 1-1.5 mm. long, exceeding the pedicels but distinctly shorter than the sepals, scarious; flowers solitary or subverticillate, spreading; pedicels very short but slender and distinct; sepals broadly ovate, obtuse, sometimes apiculate, 2 mm. long, brownish, scarious; petals suborbicular, obtuse, 3.5 mm. long, nearly or quite free, yellowish-white when dry; stamens included; remnant of the ovary glabrous.

TYPE LOCALITY: Tlapa, Guerrero, altitude 1,200 meters

DISTRIBUTION: Known only from the type collection.

ILLUSTRATION: Contr. Gray Herb. 117: *pl. 1, f. 57.*

22. *Hechtia texensis* S. Wats. Proc. Am. Acad. 20: 374. 1885.

Plant variable in habit, 2 m. high; leaves many in a dense rosette, up to 8 dm. long; sheaths large, subovate; blades linear-triangular, pungent, up to 4 cm. wide, densely appressed-cinereous-lepidote below, soon glabrous and shiny above, laxly serrate with uncinat spines up to 3 mm. long; scape erect, over 1 m. high, 2 cm. in diameter near base; scape-bracts erect, the lower subfoliaceous, densely imbricate, the upper remote, ovate, acuminate, brown when dry, subchartaceous; inflorescence laxly bipinnate or tripinnate, subthyrsoid, sparsely white-floccose when young; branches up to 2 dm. long, at least the larger ones laxly flowered toward the base; floral bracts very broadly ovate, acute, hyaline with several dark nerves, shorter than the sepals; flowers subsessile, erect or suberect, 8-10 mm. long; sepals broadly ovate, acute, up to 6 mm. long, white, membranaceous, with 5 dark nerves, the central one extending to the margin, the female ones somewhat thickened with age; petals elliptic, white, white-lepidote dorsally, the

female short-connate, the male connate for about one-third their length; stamens included; ovary densely white-tomentose-lepidote; stigmas sessile.

TYPE LOCALITY: Limestone bluffs in the Great Bend of the Rio Grande, western Texas.

DISTRIBUTION: Southern and western Texas.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 1, f. 58, 59.*

23. **Hechtia mexicana** L. B. Smith, Contr.
Gray Herb. 117: 19. 1937.

Only the pistillate plant known, about 2 m. high; leaves nearly 1 m. long; sheaths sub-orbicular, glabrous, shiny, castaneous; blades narrowly triangular, acuminate, pungent, glabrous and lustrous above, white-lepidote beneath, often repand, the teeth stout, straight or uncinat, up to 1 cm. long, brown, 2-4 cm. apart; scape about 15 mm. in diameter, glabrous with age; scape-bracts triangular, acuminate, subchartaceous, densely and minutely white-lepidote, the upper ones much shorter than the internodes; inflorescence large, laxly bipinnate, slenderly pyramidal; primary bracts like the scape-bracts, up to 15 mm. long; racemes spreading, sub-dense, often interrupted, up to 15 cm. long, the lower ones stipitate; floral bracts broadly ovate, acute, about half equaling the sepals, brown, hyaline-margined, nerved, densely pale-lepidote; flowers subsessile, spreading; sepals very broadly ovate, obtuse, mucronate, 3.5 mm. long, brown, nerved, lepidote; petals ovate, 6 mm. long, white; capsule ovoid, acute, 1 cm. long; carpels dark-castaneous, even, sublustrous, sparsely lepidote; seeds long-caudate.

TYPE LOCALITY: Sierra del Abra, Dept. Valles, San Luis Potosí, altitude 200-300 meters.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATION: Contr. Gray Herb. 117: *pl. 1, f. 60.*

24. **Hechtia elliptica** L. B. Smith, Contr.
Gray Herb. 117: 20. 1937.

Only the staminate plant known, up to 5 dm. high; leaves 27 cm. long; sheaths broadly ovate, 25 mm. long, flavous or castaneous, serrulate, glabrous; blades narrowly triangular, acuminate, pungent, 1-2 cm. wide, splashed with bright-rose, densely appressed-white-lepidote but soon becoming glabrous above, the teeth distant, 4 mm. long, straight or uncinat, dark-castaneous; scape slender, strongly compressed, soon glabrous; scape-bracts small, ovate, acute, thin, the upper remote; inflorescence laxly bipinnate, 2 dm. long, pale-lepidote; primary bracts like the scape-bracts, much shorter than the axillary spikes; spikes suberect, dense or subdense, 2-5 cm. long, 1 cm. in diameter; floral bracts suborbicular, apiculate, nearly equaling the sepals, very thin, rose with a broad hyaline margin, erose; flowers suberect, subsessile; sepals elliptic, obtuse, 5 mm. long, 3-nerved, broadly hyaline-margined; petals elliptic, obtuse, 8 mm. long, pale-lepidote outside, connate for 3 mm.; stamens included.

TYPE LOCALITY: Saltillo, Coahuila.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 1, f. 61, 62.*

25. **Hechtia scariosa** L. B. Smith, Contr.
Gray Herb. 117: 20. 1937.

Only the staminate plant known, probably 2 m. tall or more; leaves 35 cm. long; sheaths broadly ovate, 4 cm. long, denticulate toward apex, pale-brown, lustrous; blades narrowly triangular, 2 cm. wide, glabrous above, densely pale-appressed-lepidote beneath; scape slender, glabrous; upper scape-bracts ovate, acuminate, shorter than the internodes; inflorescence laxly pyramidal, 55 cm. long, minutely pale-lepidote; primary bracts like the scape-bracts, 25 mm. long; branches much divided, up to 16 cm. long, compressed near the base; racemes densely spiciform or lax near the base; floral bracts broadly ovate, acuminate, slightly shorter than the sepals, deep-rose with a broad scarious margin; flowers spreading; pedicels very short, obconic; sepals elliptic, acute, 6 mm. long, 1-5-nerved, deep-rose with a broad scarious margin; petals

elliptic, obtuse, 9 mm. long, connate for 3 mm.; stamens included, very unequal; remnant of the ovary more than half superior.

TYPE LOCALITY: Limestone ledges, hills near Jimulco, Coahuila.

DISTRIBUTION: Coahuila.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 1, f. 63, 64.*

26. *Hechtia zacatecae* L. B. Smith, Contr.
Gray Herb. 117: 21. 1937.

Known from fragments only; leaves up to 3 dm. long; sheaths broadly ovate, about 5 cm. long, only slightly broader than the blades, densely serrulate, stramineous, glabrous, even, lustrous; blades narrowly triangular, acuminate, pungent, 2 cm. wide, densely appressed-white-lepidote, soon glabrous above, the teeth uncinatate, 5-6 mm. long, flavous to dark-castaneous, distant; scape slender, soon glabrous; scape-bracts broadly ovate, apiculate, the upper ones small, remote; inflorescence laxly bipinnate or tripinnate, pale-subfloccose-lepidote; primary bracts like the scape-bracts; branches suberect, up to 17 cm. long; floral bracts broadly ovate, acuminate, about equaling the sepals, nerved, membranaceous, pale-stramineous, broadly hyaline-margined; staminate flowers subsessile; sepals ovate, acute, 5-6 mm. long, membranaceous; petals elliptic, obtuse, 8 mm. long, white, sparsely lepidote outside; stamens included; capsule ovoid, acute, 1 cm. long; carpels even.

TYPE LOCALITY: High ridges, Cedros, Zacatecas.

DISTRIBUTION: Zacatecas.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 1, f. 65, 66.*

27. *Hechtia argentea* Baker; Hemsl. Biol. Centr. Am.
Bot. 3: 317. 1884.

Hechtia argentea K. Koch, Wochenschr. Gärtn. 7: 176, nomen. 1864.

Stemless, up to 14 dm. high; leaves up to 100 in a dense spreading rosette, 3-6 dm. long, blades linear, acuminate, pungent, 18 mm. wide, densely cinereous-lepidote on both sides; laxly serrate with stout uncinatate pale-brown spines up to 7 mm. long, subrepand; scape ascending, 13 mm. in diameter at the base, soon glabrous; scape-bracts strict, broadly ovate, acuminate, the upper ones remote; inflorescence very laxly paniculate with simple or subsimple branches, 20-45 cm. long, sparsely white-tomentulose; primary bracts triangular-ovate, acuminate, about half as long as the axillary branches, dark-brown; spikes densely capitate, subglobose or short-cylindric, 2-5 cm. long; floral bracts broadly ovate, acuminate, nearly equaling the flowers, brown, scarious; flowers of only the pistillate plant known, subsessile; sepals subelliptic, acute, 4-5 mm. long, white-tomentulose; petals elliptic, broadly acute or obtuse, 7 mm. long, free, white; staminodes present; ovary ovoid, wholly superior, tomentose; stigmas sessile.

TYPE LOCALITY: "Mexico"; described from cultivation.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATION: Bot. Mag. *pl. 7460.*

28. *Hechtia capituligera* Mez, in DC. Monog. Phan. 9: 546. 1896.

Leaves barely over 3 dm. long; blades glabrous above, densely white-appressed-lepidote below, laxly serrate with spines up to 3 mm. long; scape soon glabrous; inflorescence laxly tripinnate, about 4 dm. long, many-flowered, sparsely tomentulose; branches scarcely over 1 dm. long, bearing about 6 small heads; floral bracts suborbicular, apiculate, shorter than the sepals, subglabrous; flowers subsessile, only the pistillate known, 6 mm. long; sepals broadly ovate, acute, 4 mm. long, ferruginous-tomentose; petals elliptic, acute, strongly convex, white, free; ovary densely tomentose-lepidote; stigmas sessile.

TYPE LOCALITY: Described from cultivation. "Patria absque dubio Mexico."

DISTRIBUTION: San Luis Potosí.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 1, f. 67, 68.*

29. *Hechtia Schottii* Baker; Hems. Biol. Centr. Am.

Bot. 3: 318. 1884.

Hechtia bracteata Mez, in DC. Monog. Phan. 9: 550. 1896.*Hechtia myriantha* Mez, Bot. Jahrb. 30: Beibl. 67: 6. 1901.*Hechtia macrophylla* Greenman, Field Mus. Publ. Bot. 2: 247. 1907.

Plant large, probably 2 m. or more high; leaves 5–10 dm. long; blades narrowly triangular, acuminate, pungent, 4 cm. wide, armed with stout uncinatate teeth up to 5 mm. long and 2–3 cm. apart, glabrous above, finely cinereous-lepidote below at least when young; scape stout, erect; inflorescence laxly 3–4-pinnate, pyramidal, up to 1 m. in diameter and doubtless somewhat longer, densely and finely buff-flocculose or white-flocculose throughout; axes slender, straight; primary bracts ovate, acuminate, not over 6 cm. long, membranaceous, dark-brown; racemes elongate, laxly flowered except at the extreme apex; floral bracts spreading, broadly ovate, acute, apiculate, 4–5 mm. long, about equaling the sepals, membranaceous, brown; flowers subspreading, 6–7 mm. long, subsessile; sepals broadly elliptic, obtuse, 4 mm. long in the pistillate flowers, slightly smaller in the staminate, brown with a broad pale margin; petals broadly elliptic, obtuse, slightly exceeding the sepals, short-connate; stamens barely included; ovary lepidote, a remnant present in the staminate flower, slightly inferior; capsule ovoid, acute, 9 mm. long; seeds slenderly fusiform, 6 mm. long, naked except for a small blunt wing at one end.

TYPE LOCALITY: Cerro de Maxeana, Yucatan.

DISTRIBUTION: Vera Cruz and Yucatan.

ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 1, f. 69, 70.

30. *Hechtia confusa* L. B. Smith, Contr. Gray

Herb. 117: 22. 1937.

About 8 dm. high; leaf-blades sublinear, acuminate, pungent, 25 cm. long, 6–7 mm. wide, stout, glabrous above, densely white-appressed-lepidote beneath; scape 7 mm. in diameter, terete, white-flocculose, soon glabrous; scape-bracts linear-caudate from a broadly ovate base, much exceeding the internodes but hardly obscuring the scape; inflorescence slenderly cylindrical, subax, about 5 cm. long, white-flocculose, soon glabrous; primary bracts very broadly ovate or suborbicular with an acuminate apex, 3 cm. long, usually exceeding the axillary branches and largely concealing them, thin, nerved, serrulate; branches simple, dense, subcapitate; floral bracts broadly ovate, obtuse or broadly acute, slightly shorter than the sepals, strongly convex, brown, even; pedicels short but distinct, stout, triquetrous; sepals ovate, obtuse, the staminate 3 mm., the pistillate 4 mm. long; petals broadly ovate, obtuse, barely exceeding the sepals, whitish; stamens included; capsules broadly ovoid, 8 mm. long, glabrous, even, dark-castaneous; seeds narrowly alate.

TYPE LOCALITY: Dry calcareous hills, La Cafiada near Tehuacan, Puebla.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 1, f. 71, 72.

31. *Hechtia glomerata* Zucc. Abh. Akad. Münch. 3: 240. 1840.*Dasylirion pitcairniaefolium* Karw. & Zucc.; Zucc. Allg. Gart. 6: 258. 1838. Not *Hechtia pitcairniaefolia* Verlot, 1868.

Plant about 1 m. high, only the pistillate known; leaves up to 4 dm. long; blades linear-triangular, glabrous above, densely appressed-cinereous-lepidote below, laxly serrate with stout uncinatate spines up to 6 mm. long; scape lateral, ascending, ferruginous-tomentose when young, soon glabrous; scape-bracts erect, ovate, acute; inflorescence bipinnate, lax, 4–5 dm. long, densely tomentose-lepidote; primary bracts like the scape-bracts, shorter than or equaling the axillary branches; branches dense sessile heads; floral bracts ovate, acuminate, up to 6 mm. long, shorter than the sepals; flowers appearing subsessile; sepals broadly triangular-ovate, obtuse or apiculate, 4.5 mm. long, prominently 3–5-nerved; petals oblong, obtuse, 5 mm. long, free, white; ovary densely tomentose; seeds broadly obovate with a wing across the large end and down one side.

TYPE LOCALITY: Described from cultivation.

DISTRIBUTION: Central Mexico.

ILLUSTRATIONS: Abh. Akad. Münch. 3: *pl.* 6; E. & P. Nat. Pfl. 24: *f.* 26; ed. 2. 15a: *f.* 43; Engler, Pflanzenreich 4²²: *f.* 79; Contr. Gray Herb. 117: *pl.* 1, *f.* 73, 74.

32. *Hechtia Ghiesbreghtii* Lemaire, Ill. Hort. 10: *pl.* 378. 1863.

Hechtia Morreniana Mez, in DC. Monog. Phan. 9: 547. 1896.

Stemless, up to 18 dm. high; leaves about 40 in a dense spreading rosette, 25 cm. long; sheaths suborbicular, 6 cm. wide; blades narrowly triangular, acuminate, pungent, 3 cm. wide, glabrous above, green, often reddish toward the apex, covered beneath with a close layer of fine white or pale-brown scales, laxly armed with coarse uncinat spines up to 5 mm. long, more or less repand; scape erect or ascending, relatively slender; scape-bracts elliptic, acuminate, the upper ones longer or shorter than the internodes; inflorescence laxly compound, 2-4 dm. long; primary bracts triangular-ovate, acuminate, much shorter than the axillary branches, dark-brown, thin, soon disintegrating; branches densely capitate to short-cylindric or the staminate plant sometimes bearing secondary branches up to 7 cm. long in the axils of the original ones; floral bracts broadly ovate, acute, mucronate, 4 mm. long, shorter than the sepals, yellow-brown, erose, membranaceous; flowers sessile; sepals elliptic-oblong, obtuse or apiculate, 4 mm. long, brown, erose; petals elliptic, obtuse, free, white, 5 mm. long; stamens included; ovary superior, densely tomentose-lepidote, its remnant in the staminate plant largely inferior; stigmas sessile.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Texas, Tamaulipas, and San Luis Potosí.

ILLUSTRATIONS: Ill. Hort. 10: *pl.* 378; Bot. Mag. *pl.* 5842.

33. *Hechtia gamopetala* Mez, DC. Monog. Phan. 9: 549. 1896.

Plant small, barely over 5 dm. high; leaves known only from the innermost ones, less than 4 cm. long, minutely spinulose, white-tomentulose-lepidote below; scape slender, subglabrous; inflorescence laxly tripinnate but rather few-flowered, 3 dm. long, interrupted, ferruginous-tomentulose, becoming glabrous; branches abbreviated, up to 3 cm. long, densely cylindric; floral bracts broadly ovate, acuminate, 5 mm. long, barely exceeded by the sepals; only the staminate flowers known, 5 mm. long; pedicels 1 mm. long; sepals squamiform-ovate, obtuse, 4 mm. long, tomentulose; petals elliptic, obtuse, convex, forming a tube with the filaments for about one-third of their length; ovary mostly aborted in the staminate flower, glabrous.

TYPE LOCALITY: "Mexico, prope El Banco."

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl.* 2, *f.* 1-3.

34. *Hechtia Lundelliorum* L. B. Smith, sp. nov.

Plant probably considerably more than 1 m. high; leaves more than 1 m. long, densely appressed-lepidote beneath, becoming glabrous above; sheaths elliptic-oblong, 1 dm. long; blades narrowly triangular, caudate-acuminate, 3 cm. wide at base, densely serrate with teeth not more than 0.5 mm. long; scape unknown; inflorescence amply and laxly tripinnate, 8 dm. long, glabrous at least in age; primary bracts poorly known, probably shorter than the sterile bases of the branches; ultimate branches filiform, elongate, straight; floral bracts lance-ovate, acute, equaling or exceeding the pedicels; only the pistillate flowers known, reflexed in fruit; pedicels stout, less than 1 mm. long; sepals deltoid, acute, 1.2 mm. long, much shorter than the petals; ovary three-fourths superior; capsule 5-7 mm. long, its upper half both loculicidal and septicidal; seeds few, subcylindric, 2 mm. long, not including the long caudate appendages at each end.

Versimiliter ultra 1 m. alta; foliis ultra 1 m. longis; laminis anguste triangularibus, caudato-acuminatis, 3 cm. latis, dentibus 0.5 mm. longis dense serrulatis; inflorescentia ample laxoque tripinnata, 8 dm. longa; ramis ultimis filiformibus, elongatis, rectis; bracteis florigeris pedicellis aequantibus vel superantibus; floribus femineis solum cognitis, maturitate reflexis; pedicellis validis, haud 1 mm. longis; sepalis deltoideis, acutis, 1.2 mm. longis, quam petala

bene brevioribus; ovario solum quarta parte infero; capsulis 5-7 mm. longis; seminibus paucis, 2 mm. longis, utroque polo caudatis.

Type collected on limestone cliffs and ledges, Tamazunchale, San Luis Potosí, altitude 225 meters, C. L. and Amelia A. Lundell 7265, in the herbarium of the University of Michigan.

DISTRIBUTION: Known only from the type locality.

Subfamily 2. TILLANDSIOIDEAE.

Herbs. Leaves always entire. Flowers perfect or in some species of *Catopsis* functionally or completely dioecious. Ovary wholly or partly superior. Seeds plumosely appendaged at base or apex or both.

Ovary wholly or almost wholly superior; seeds plumose-appendaged only at base or apex.

Appendage of the seed basal, straight at maturity.

Petals free.

Petals naked or rarely with vertical folds; inflorescence of one or more distichous-flowered spikes or rarely simple and polystichous.

Petals each bearing one or two scales on the inner surface.

Inflorescence of one or more distichous-flowered spikes or rarely simple and polystichous; floral bracts usually forming the conspicuous element of the inflorescence; branches usually elongate when present.

Inflorescence of several polystichous-flowered spikes, though the flowers sometimes turning secund or the spikes reduced to single flowers (but the two series of bracts indicating a compound inflorescence); primary bracts the conspicuous element of the inflorescence; branches not more than 13 cm. long.

Petals joined or closely agglutinated; inflorescence always of polystichous-flowered spikes.

Appendage of the seed apical, folded over at maturity; sepals strongly asymmetric in most species; inflorescence of polystichous-flowered spikes.

Ovary only half superior; seeds plumose-appendaged at both ends.

5. TILLANDSIA.

6. VRIESIA.

7. THECOPHYLLUM.

8. GUZMANIA.

9. CATOPSIS.

10. GLOMEROPITCAIRNIA.

ARTIFICIAL KEY TO THE SPECIES OF TILLANDSIOIDEAE FOR THE DETERMINATION OF FRUITING MATERIAL.

NOTE: The various species or groups of species are designated by number only.

Spikes with flowers distichous or secund, or else the inflorescence reduced to a single flower.

Sepals asymmetric, free, oblong or broadest near the apex, not over 10 mm. long.

Tillandsia 31-42.

Sepals symmetric or, if slightly asymmetric, ovate or lanceolate and broadest near the base.

Inflorescence simple and bearing but a single series of bracts, or reduced to a single flower, either terminal, axillary, or pseudo-axillary.

KEY I.

Inflorescence of 2 or more branches.

Flowers secund.

KEY II.

Flowers erect to spreading, but not secund.

Spikes lax; all or nearly all the floral bracts less than twice the internodes.

KEY III.

Spikes dense; floral bracts at least twice the internodes.

Sheaths of at least the lower primary bracts equaling or exceeding the axillary spikes.

KEY IV.

Sheaths of the primary bracts shorter than the axillary spikes.

KEY V.

Spikes with the flowers polystichous.

Ovary only half superior; seeds equally appendaged at both ends.

Glomeropitcairnia 1.

Ovary wholly or almost wholly superior; seed-appendages almost wholly at one end.

Plumose appendage of the seed apical, folded over at maturity; seeds strongly asymmetric in most species.

Catopsis 1-23.

Plumose appendage of the seed basal, straight at maturity; sepals usually symmetric.

Inflorescence simple and bearing but a single series of bracts.

KEY VI.

Inflorescence compound.

KEY VII.

KEY I.

- Plant caulescent; leaf-blades linear or triangular, very narrow.
 Leaves distichous. *Tillandsia 29-30.*
 Leaves polystichous.
 Inflorescence lax; floral bracts less than twice as long as the internodes. *Tillandsia 51.*
 Inflorescence dense; floral bracts imbricate.
 Sepals densely and persistently lepidote.
 Scape-bracts foliaceous; scape very short. *Tillandsia 90.*
 Scape-bracts, or at least the upper ones, thin and vaginiform. *Tillandsia 101.*
 Sepals glabrous; spike terete. *Tillandsia 102.*
- Plant stemless; leaf-blades either triangular or ligulate.
 Flowers secund.
 Floral bracts, or at least the basal ones, acuminate. *Vriesia 17-19.*
 Floral bracts acute or obtuse.
 Spike lax; nearly or quite all the floral bracts less than twice as long as the internodes. *Vriesia 20.*
 Spike dense; floral bracts more than twice as long as the internodes. *Vriesia 26-31.*
 Floral bracts becoming secund with the flowers. *Vriesia 26-31.*
 Floral bracts remaining erect.
 Floral bracts obtusely carinate toward apex. *Vriesia 24.*
 Floral bracts broadly convex, ecarinate.
 Leaves broadly acute or obtuse, apiculate; floral bracts nearly or quite straight, 3-4 times as long as the internodes. *Vriesia 9.*
 Leaves acuminate; floral bracts cucullate, slightly more than twice as long as the internodes. *Vriesia 25.*
- Flowers not secund.
 Floral bracts less than twice as long as the internodes.
 Leaf-blades linear, 1-2 mm. wide. *Tillandsia 49.*
 Leaf-blades 1 cm. or more broad.
 Flowers spreading or subspreading. *Tillandsia 48.*
 Flowers erect, appressed to the rhachis.
 Leaves covered with coarse cinereous spreading scales, 15-20 cm. long. *Tillandsia 43.*
 Leaves covered with minute pale appressed scales, usually much larger. *Tillandsia 45-7.*
- Floral bracts at least twice as long as the internodes.
 Leaf-blades ligulate, 2-7 cm. wide.
 Floral bracts carinate toward apex.
 Leaves with brown cross-bands; inflorescence subax, 18 mm. broad. *Vriesia 7.*
 Leaves concolorous.
 Floral bracts strongly incurved toward apex, rather thin.
 Scape-bracts distichous, carinate; floral bracts curved out at mid-keel. *Tillandsia 52.*
 Scape-bracts polystichous, ecarinate; floral bracts curved in at mid-keel. *Vriesia 6.*
 Floral bracts straight toward apex, firm. *Tillandsia 3.*
 Floral bracts broadly convex and ecarinate. *Vriesia 8-11.*
 Floral bracts appearing rugose, at least under a lens.
 Floral bracts even or longitudinally striate, not rugose.
 Flowers more or less spreading, separated.
 Leaf-blades and lower scape-bracts acute or acuminate. *Tillandsia 53.*
 Leaf-blades and scape-bracts broadly acute or obtuse, apiculate. *Vriesia 15-16.*
 Flowers erect or suberect, contiguous.
 Floral bracts inrolled about the sepals and exposing the rhachis or barely imbricate. *Vriesia 13-14.*
 Floral bracts densely imbricate. *Vriesia 1.*
 Floral bracts shorter than the sepals.
 Floral bracts equaling or exceeding the sepals.
 Inflorescences several and lateral in each rosette; floral bracts 15-25 mm. long. *Tillandsia 10.*
 Inflorescence single and terminal in each rosette; floral bracts 3-4 cm. long.
 Floral bracts 4 cm. long, castaneous, the lower ones acuminate. *Vriesia 12.*
 Floral bracts 3 cm. long, flesh-pink, obtuse. *Tillandsia 4.*
- Leaf-blades narrowly triangular or linear, acuminate.
 Leaf-sheaths inflated and forming a pseudobulb.
 Floral bracts shorter than the sepals. *Tillandsia 78.*
 Floral bracts equaling or exceeding the sepals.
 Floral bracts coriaceous, even or nerved only near the margin; leaves concolorous or purple-margined, appressed-lepidote. *Tillandsia 64.*
 Floral bracts rather thin.

- Scape-bracts vaginiform, the upper ones merely apiculate; leaf-blades straight or arched. *Tillandsia 14.*
 Scape-bracts foliaceous; leaf-blades usually coiled or contorted. *Tillandsia 81-86.*
- Leaf-sheaths nearly or quite flat, not forming a pseudobulb.
 Floral bracts coriaceous or subcoriaceous. *Tillandsia 59-60.*¹
 Leaf-blades linear-subulate to filiform; leaves closely fasciculate; leaf-sheaths triangular with abruptly auricled bases. *Tillandsia 28.*
 Leaf-blades definitely if narrowly triangular; leaf-sheaths usually ovate or elliptic without auricled bases. *Tillandsia 26.*
 Flowers spreading, separated. *Tillandsia 28.*
 Flowers erect or suberect, contiguous. *Tillandsia 26.*
 Leaf-sheaths longitudinally red-striped. *Tillandsia 26.*
 Leaf-sheaths concolorous. *Tillandsia 63.*
 Spikes linear-lanceolate, not more than 12 mm. wide; leaf-sheaths scarcely if at all darker than the blades. *Tillandsia 63.*
 Spikes lance-elliptic, ovate, or oblong, 12-70 mm. wide; leaf-sheaths much darker than the blades. *Tillandsia 61.*
 Floral bracts shorter than the sepals, densely cinereous-lepidote. *Tillandsia 61.*
 Floral bracts equaling or exceeding the sepals. *Tillandsia 2.*
 Leaf-sheaths bright-purple; upper scape-bracts merely apiculate. *Tillandsia 2.*
 Leaf-sheaths deep-castaneous. *Tillandsia 62.*
 Spikes terete. *Tillandsia 65-68.*
 Spikes more or less complanate. *Tillandsia 65-68.*
- Floral bracts subchartaceous to membranaceous. *Tillandsia 16.*
 Scales of the leaves linear, spreading; leaf-blades linear-subulate. *Tillandsia 16.*
 Scales of the leaves much broader. *Tillandsia 14.*
 Floral bracts not more than 16 mm. long; scape-bracts vaginiform, the upper ones merely apiculate. *Tillandsia 14.*
 Floral bracts 20-50 mm. long. *Tillandsia 95-97.*
 Rhachis exposed by the narrow floral bracts. *Tillandsia 95-97.*
 Rhachis concealed by the broad densely imbricate floral bracts. *Tillandsia 90.*
 Sepals lepidote; floral bracts densely lepidote; scape very short. *Tillandsia 90.*
 Sepals glabrous. *Tillandsia 66.*
 Floral bracts coriaceous toward the center, up to 5 cm. long. *Tillandsia 66.*
 Floral bracts uniformly thin, 25-40 mm. long. *Tillandsia 98-100.*

KEY II.

- Sepals 7-11 mm. long. *Thecophyllum 25.*
 Pedicels slender, 1-2 cm. long. *Thecophyllum 25.*
 Pedicels stout. *Thecophyllum 27.*
 Leaf-blades not cross-banded; pedicels 10 mm. long. *Thecophyllum 27.*
 Leaf-blades finely cross-banded near base; pedicels 4 mm. long. *Thecophyllum 32.*
- Sepals 15-35 mm. long; floral bracts much exceeding the short pedicels. *Vriesia 17.*
 Floral bracts acuminate. *Vriesia 17.*
 Floral bracts acute or obtuse. *Guzmania 30.*
 Flowers secund from a polystichous insertion; sepals thin. *Guzmania 30.*
 Flowers secund from a distichous insertion; sepals mostly coriaceous. *Guzmania 30.*
 Spikes lax; nearly or quite all the floral bracts less than twice the internodes. *Vriesia 3.*
 Floral bracts 3 cm. long, equaling the sepals. *Vriesia 21-22.*
 Floral bracts only about half as long as the sepals. *Vriesia 21-22.*
 Spikes dense; floral bracts distinctly more than twice the internodes. *Vriesia 26.*
 Inflorescence laxly compound from a few spikes. *Vriesia 26.*
 Inflorescence amply and densely compound. *Vriesia 2.*
 Spikes eprophyllate. *Vriesia 2.*
 Spikes prophyllate. *Vriesia 23.*

¹ *Tillandsia 56* and *58* will probably be keyed here when more material of them is discovered but no specimens with simple inflorescences are yet recorded.

KEY III.

- Leaf-blades filiform, 1 mm. wide; sepals 7-8 mm. long. *Tillandsia* 50.
 Leaf-blades 1-11 cm. wide.
 Leaf-blades ligulate; floral bracts coriaceous, broadly ovate, 3 cm. long. *Vriesia* 3.
 Leaf-blades narrowly triangular.
 Leaves 15-20 cm. long, covered with coarse cinereous spreading scales; inflorescence few-branched. *Tillandsia* 43.
 Leaves usually much larger, covered with minute pale appressed scales so far as known.
 Spikes distinctly flexuous or geniculate. *Tillandsia* 45-48.
 Spikes nearly or quite straight.
 Floral bracts obtuse. *Tillandsia* 44.
 Floral bracts acute. *Vriesia* 5.

KEY IV.

- Spikes with abbreviated axes, 2-3- or rarely up to 5-flowered; plants mostly less than 4 dm. high.
 Leaf-blades filiform to narrowly triangular. *Tillandsia* 110-117.
 Leaf-blades ligulate.
 Floral bracts shorter than the sepals. *Tillandsia* 20.
 Floral bracts much exceeding the sepals. *Tillandsia* 24.
 Spikes with elongate axes, 3-many-flowered; plants mostly 4 dm. or higher.
 Leaf-blades narrowly triangular; scape-bracts acuminate.
 Sepals equally subfree; primary bracts distichous, spreading, much exceeding the axillary spikes. *Tillandsia* 104.
 Sepals more or less connate posteriorly.
 Primary bracts submembranaceous. *Tillandsia* 105.
 Primary bracts firm.
 Floral bracts carinate.
 Spikes much compressed; floral bracts with flat sides. *Tillandsia* 106.
 Spikes slightly compressed; floral bracts with convex sides. *Tillandsia* 108.
 Floral bracts ecarinate.
 Floral bracts acute, even. *Tillandsia* 19.
 Floral bracts obtuse, deeply wrinkled when dry. *Tillandsia* 109.
 Leaf-blades ligulate or where not known the scape-bracts abruptly acute.
 Branches at the base of the inflorescence divided. *Tillandsia* 18.
 Branches all simple.
 Floral bracts shorter than the sepals, ecarinate. *Tillandsia* 21.
 Floral bracts equaling or exceeding the sepals, carinate.
 Primary bracts vaginiform, broadly elliptic. *Tillandsia* 22.
 Primary bracts with conspicuous triangular blades.
 Spikes linear to lanceolate; floral bracts prominently nerved. *Tillandsia* 23.
 Spikes elliptic or broadly lanceolate; floral bracts even or faintly nerved.
 Sepals equally subfree. *Tillandsia* 103.
 Sepals connate posteriorly. *Tillandsia* 107.

KEY V.

- Leaf-sheaths inflated and forming a pseudobulb, the inner ones closely enfolding the base of the scape or inflorescence.
 Floral bracts coriaceous, even or nerved only near the margin; leaves concolorous or purple-margined, appressed-lepidote. *Tillandsia* 64.
 Floral bracts rather thin.
 Scape-bracts vaginiform, the upper ones merely apiculate; leaf-blades straight or arched. *Tillandsia* 14.
 Scape-bracts foliaceous; leaf-blades usually coiled or contorted. *Tillandsia* 79-86.
 Leaf-sheaths nearly or quite flat, not forming a pseudobulb.
 Leaf-blades linear-subulate to filiform; leaves closely fasciculate; leaf-sheaths triangular with abruptly auricled bases. *Tillandsia* 55-60.
 Leaf-blades definitely if narrowly triangular or ligulate; leaf-sheaths usually ovate or elliptic without auricled bases.
 Leaf-blades ligulate.
 Sepals 24-45 mm. long.
 Inflorescence amply compound; primary bracts much larger than the floral bracts.
 Flowers divergent to spreading, separated. *Vriesia* 4.
 Flowers erect or suberect, contiguous.
 Sepals carinate. *Tillandsia* 1.
 Sepals ecarinate. *Tillandsia* 54.
 Inflorescence few-branched with the primary bracts scarcely if at all larger than the floral bracts.
 Floral bracts all sharply carinate. *Tillandsia* 3.
 Floral bracts broadly convex, all or all but the lowest ecarinate.

- Floral bracts erect, imbricate. *Tillandsia 5.*
 Floral bracts divergent, separated. *Tillandsia 53.*
- Sepals not more than 20 mm. long.
 Flowers divergent or spreading, separated.
 Sepals oblong, obtuse, 9 mm. long. *Tillandsia 6.*
 Sepals lanceolate, acute, 14 mm. long. *Tillandsia 27.*
- Flowers erect or suberect, contiguous.
 Branches of the inflorescence arching-recurved; floral bracts broadly ovate, thick. *Vriesia 2.*
 Branches of the inflorescence straight, divergent to spreading. *Tillandsia 7-9.*
- Leaf-blades narrowly triangular.
 Floral bracts coriaceous or subcoriaceous.
 Inflorescence digitate.
 Floral bracts shorter than the sepals. *Tillandsia 61.*
 Floral bracts equaling or exceeding the sepals. *Tillandsia 62.*
 Spikes terete.
 Spikes more or less complanate.
 Spikes linear-lanceolate, not more than 12 mm. wide; leaf-sheaths scarcely darker than the blades. *Tillandsia 63.*
 Spikes lance-elliptic, ovate, or oblong, 12-40 mm. wide; leaf-sheaths castaneous, much darker than the blades. *Tillandsia 65-68.*
- Inflorescence pinnate.
 Floral bracts shorter than the sepals.
 Inflorescence few-branched; floral bracts ecarinate. *Tillandsia 61.*
 Inflorescence amply compound; floral bracts carinate. *Tillandsia 69-70.*
 Floral bracts equaling or exceeding the sepals.
 Spikes terete; floral bracts 35 mm. long. *Tillandsia 71.*
 Spikes more or less complanate.
 Spikes not more than 12 mm. wide, linear or linear-lanceolate.
 Branches spreading; inflorescence very lax. *Tillandsia 72.*
 Branches erect or suberect.
 Lower branches digitately divided. *Tillandsia 73.*
 Lower branches simple. *Tillandsia 63.*
 Spikes 12-40 mm. wide, linear-lanceolate to ovate.
 Lower spikes less than twice as long as the sheaths of the primary bracts. *Tillandsia 74-75.*
 Lower spikes or branches several times as long as the sheaths of the primary bracts.
 Floral bracts densely and evenly impressed-lepidote. *Tillandsia 69.*
 Floral bracts glabrous or their scales scanty and not impressed.
 Inflorescence densely and narrowly cylindrical. *Tillandsia 76-77.*
 Inflorescence lax or sublux with divergent to spreading branches.
 Floral bracts 2-5 cm. long, densely imbricate; branches simple. *Tillandsia 66.*
 Floral bracts 15 mm. long, exposing the rhachis; lower branches divided. *Tillandsia 13.*
- Floral bracts subchartaceous to membranaceous.
 Floral bracts 10-17 mm. long.
 Leaf-sheaths small and inconspicuous; leaf-blades coarsely cinereous-lepidote; spikes 3 cm. long. *Tillandsia 17.*
 Leaf-sheaths large and conspicuous.
 Floral bracts ecarinate; lower primary bracts with elongate blades.
 Leaf-sheaths brown, much darker than the blades; floral bracts equaling or exceeding the sepals. *Tillandsia 12.*
 Leaf-sheaths green, scarcely darker than the blades; floral bracts shorter than the sepals. *Tillandsia 88.*
- Floral bracts carinate.
 Fertile part of the spike spreading and making an angle with the erect sterile base. *Tillandsia 15.*
 Fertile part of the spike not making an angle with the divergent base.
 Floral bracts lepidote; spikes 6-14-flowered with several sterile bracts at base. *Tillandsia 14.*
 Floral bracts glabrous; spikes 3-4-flowered with 1-2 sterile bracts at base. *Tillandsia 87.*
- Floral bracts 18-45 mm. long.
 Spikes not more than half fertile; scape very short. *Tillandsia 89.*
 Spikes more than half fertile.
 Rhachis concealed by the floral bracts.
 Floral bracts nearly or quite glabrous, coriaceous toward center. *Tillandsia 66.*

- Floral bracts densely cinereous-lepidote, uniformly subchartaceous or membranaceous. *Tillandsia 90-92.*
 Rhachis exposed by the floral bracts. *Tillandsia 93.*
 Floral bracts suborbicular, finely verrucose. *Tillandsia 94.*
 Floral bracts narrower, even or nerved but not verrucose. *Tillandsia 95.*
 Inflorescence thyrsoid; floral bracts 35-45 mm. long. *Tillandsia 96.*
 Inflorescence digitate or laxly pinnate; floral bracts 18-35 mm. long. *Tillandsia 11.*
 Leaf-sheaths castaneous, darker than the blades; floral bracts 25-35 mm. long. *Tillandsia 11.*
 Leaf-sheaths concolorous with the blades. *Tillandsia 96.*
 Spikes 1-2 cm. wide; plant 2-6 dm. high. *Tillandsia 11.*
 Spikes 12 mm. wide; plant 1 m. high. *Tillandsia 11.*

KEY VI.

- Flowers spreading or divergent; inflorescence lax. *Guzmania 6-7.*
 Flowers erect or suberect; inflorescence compact. *Guzmania 1-3.*
 Leaf-blades (or where not known, the scape-bracts) ligulate. *Guzmania 8-14.*
 Inflorescence cyathiform, the outer bracts much enlarged. *Vriesia 1.*
 Inflorescence not cyathiform, the outer bracts relatively inconspicuous; scape well developed. *Tillandsia 20.*
 Bracts equaling or exceeding the sepals. *Tillandsia 57.*
 Bracts, or at least the upper ones, shorter than the sepals. *Tillandsia 110.*
 Inflorescence fusiform; sepals 32 mm. long. *Tillandsia 113-114.*
 Inflorescence ovoid; sepals 12-15 mm. long. *Tillandsia 116-118.*
 Leaf-blades filiform-subulate to triangular, long-acuminate. *Guzmania 4-5.*
 Leaf-blades filiform-subulate. *Tillandsia 25.*
 Bracts coriaceous, nearly or quite even; leaf-scales suborbicular, subappressed. *Tillandsia 57.*
 Bracts membranaceous, nerved; leaf-scales linear, spreading. *Tillandsia 110.*
 Leaf-blades narrowly triangular. *Tillandsia 113-114.*
 Bracts of the inflorescence foliaceous. *Tillandsia 116-118.*
 Bracts of the inflorescence membranaceous, colored. *Guzmania 4-5.*
 Plants nearly or quite stemless. *Tillandsia 25.*
 Plants distinctly caulescent. *Guzmania 4-5.*
 Sepals obtuse, equally connate. *Tillandsia 25.*
 Sepals acute, much connate posteriorly, free anteriorly. *Tillandsia 25.*

KEY VII.

- Perfect flowers single in the axil of each primary bract, but the presence of floral bracts indicating a compound inflorescence. *Thecophyllum 1-3.*
 Perfect flowers 2 or more in the axils of at least the lower primary bracts. *Thecophyllum 4-19.*
 Branches of the inflorescence aborted, flowers fasciated in the axils of the primary bracts. *Thecophyllum 20-21.*
 Perfect flowers not more than 2 in the axil of each primary bract. *Thecophyllum 15-16.*
 Perfect flowers at least 3 in the axils of the lower primary bracts. *Thecophyllum 22.*
 Leaves cross-barred; floral bracts 6-9 mm. long. *Guzmania 23.*
 Leaves concolorous; floral bracts 30-40 mm. long. *Guzmania 17-19.*
 Sepals acute. *Guzmania 15-16.*
 Sepals obtuse. *Thecophyllum 28.*
 Floral bracts exceeding the sepals; branches 3-flowered. *Thecophyllum 22.*
 Floral bracts shorter than the sepals; branches many-flowered. *Guzmania 23.*
 Branches of the inflorescence well developed. *Guzmania 17-19.*
 Floral bracts equaling or exceeding the sepals. *Guzmania 15-16.*
 Spikes more or less elongate, not corymbose. *Thecophyllum 28.*
 Spikes densely corymbose. *Thecophyllum 28.*
 Sepals acute. *Guzmania 15-16.*
 Sepals obtuse, 2 cm. long. *Thecophyllum 28.*
 Floral bracts shorter than the sepals. *Thecophyllum 23.*
 Pedicels exceeding the floral bracts, 5-20 mm. long. *Thecophyllum 25-26.*
 Pedicels 5-6 mm. long. *Thecophyllum 23.*
 Pedicels 10-20 mm. long. *Thecophyllum 25-26.*
 Pedicels much shorter than the floral bracts. *Guzmania 20.*
 Spikes dense, usually short; floral bracts usually imbricate. *Guzmania 21-22.*
 Inflorescence lax, few-branched; scape-bracts lax. *Guzmania 20.*
 Inflorescence densely bipinnate; scape-bracts imbricate. *Guzmania 21-22.*
 Inflorescence digitate or subcorymbose, not over 75 mm. long; spikes all sessile. *Guzmania 21-22.*
 Inflorescence pyramidal to cylindric, 11-80 cm. long; at least the lower spikes stipitate. *Guzmania 16.*
 Floral bracts 40 mm. long; sepals linear, acute. *Guzmania 16.*
 Floral bracts much shorter; sepals broader, usually obtuse. *Guzmania 16.*

- Sepals nearly as broad as long. *Thecophyllum* 29.
 Sepals at least twice as long as broad.
 Leaves longitudinally dark-striped. *Guzmania* 25-26.
 Leaves concolorous.
 Lower branches 7-12-flowered. *Guzmania* 24.
 Lower branches 3-4-flowered.
 Pedicels up to 6 mm. long. *Thecophyllum* 24.
 Pedicels very short. *Thecophyllum* 30.
- Spikes lax, elongate.
 Sepals 8 mm. long; branches with only 2 perfect widely separated flowers. *Thecophyllum* 31.
 Sepals 12-32 mm. long.
 Sepals connate for 10 mm. *Guzmania* 27-28.
 Sepals not connate for more than 2 mm.
 Sepals 24-32 mm. long.
 Floral bracts lanceolate, acute, 25-35 mm. long. *Guzmania* 29.
 Floral bracts oblong or elliptic, obtuse, 16 mm. long. *Guzmania* 24.
 Sepals not more than 18 mm. long.
 Scape-bracts lax, at least the uppermost shorter than the internodes. *Guzmania* 7.
 Scape-bracts dense, all exceeding the internodes. *Guzmania* 30-32.

5. TILLANDSIA L. Sp. Pl. 286. 1753.

- Renalmia* L. Sp. Pl. 286. 1753.
Bonaparteia R. & P. Fl. Per. 3: 38. 1802.
Acanthospora Spreng. Anl. ed. 2. 2: 255. 1817.
Misandra Dietr. Lex. Nachtr. 5: 102. 1819. Not *Misandra* Commerson, 1789.
Dendropogon Raf. Neog. 3. 1825.
Bonaparteia Sweet, Hort. Brit. ed. 3. 706. 1839.
Strepsia Nutt.; Steud. Nom. Bot. ed. 2. 2: 645. 1841.
Allardtia A. Dietr. Allg. Gart. 20: 241. 1852.
Anoplophytum Beer, Flora 37: 346. 1854.
Diaphoranthema Beer, Flora 37: 349. 1854.
Phytarrhiza De Vis. Mem. Ist. Veneto 5: 340. 1855.
Platystachys Beer, Bromel. 18, 80. 1857.
Pityrophyllum Beer, Bromel. 17, 79. 1857.
Wallisia E. Morren, Belg. Hort. 20: 97. 1870.
Cipuroopsis Ule, Verh. Bot. Ver. Brand. 48: 148. 1907.

Caulесcent or acaulescent herbs of very variable habit. Leaves rosulate or fasciculate or distributed along a stem, polystichous or distichous, entire, ligulate or subtriangular. Scape usually distinct. Inflorescence various, usually of distichous spikes or sometimes reduced to a single polystichous spike by the reduction of the spikes to single flowers or rarely the whole inflorescence reduced to a single flower. Flowers perfect. Sepals usually symmetric, free, or equally or posteriorly joined. Petals free, naked or rarely with vertical folds. Stamens of various lengths relative to the petals and to the pistil. Ovary superior, glabrous. Ovules usually many and caudate. Capsule septicidal. Seeds erect, narrowly cylindrical or fusiform, the plumose appendage white, straight, basal.

Type species, *Tillandsia utriculata* L.

CONSPECTUS OF SUBGENERA.

- Stamens equaling or shorter than the petals.
 Sepals symmetric, or if slightly asymmetric, ovate or lanceolate, broadest near the base.
 Stamens exerted from the throat of the corolla; style slender, much longer than the ovary.
 Filaments straight; inflorescence usually of distichous-flowered spikes. Subgenus 1. ALLARDTIA.
 Filaments strongly transversely plicate near their apex; inflorescence of a single polystichous-flowered spike in the only North American species. Subgenus 2. ANOPLOPHYTUM.
 Stamens deeply included; style short and stout.
 Petal-blades broad, suborbicular, showy. Subgenus 3. PHYTARRHIZA.
 Petal-blades narrow, elliptic, inconspicuous; inflorescence of a single one-flowered spike. Subgenus 4. DIAPHORANTHEMA.
 Sepals asymmetric, free, oblong or broadest near the apex, not over 10 mm. long. Subgenus 5. PSEUDO-CATOPSIS.
 Stamens longer than the petals. Subgenus 6. PLATYSTACHYS.

Subgenus 1. ALLARDTIA.

Sheaths of the primary bracts all shorter than the axillary branches, or the inflorescence simple and distichous-flowered.

Sepals 24-45 mm. long.

Inflorescence amply compound; primary bracts very much larger than the floral bracts.

Inflorescence simple or few-branched; primary bracts scarcely if at all larger than the floral bracts.

Leaf-blades very narrowly triangular, caudate-acuminate.

Leaf-blades ligulate, acute.

Floral bracts all sharply carinate.

Floral bracts broadly convex, all or all but the lowest ecarinate.

Floral bracts nerved, dull, subcoriaceous.

Floral bracts even, lustrous, coriaceous.

Sepals not more than 20 mm. long.

Leaf-blades ligulate.

Inflorescence compound.

Flowers spreading; spikes lax.

Flowers suberect; spikes dense or subdense.

Sepals 15-20 mm. long; spikes lanceolate or elliptic, few-flowered; inflorescence usually much divided.

Sepals 9-13 mm. long; spikes linear-lanceolate.

Inflorescence narrowly subpyramidal or cylindrical; sepals 9-10 mm. long; lower branches usually divided.

Inflorescence broadly pyramidal; sepals 12-13 mm. long; lower branches usually simple.

Inflorescence simple; scapes numerous and axillary in each rosette.

Leaf-blades narrowly triangular or linear-subulate.

Inflorescence laxly pinnate, elongate, often tripinnate.

Lower and upper primary bracts all vaginiform, shorter than the short sterile bases of the usually simple branches; spikes linear, 15 cm. long.

Lower primary bracts with elongate foliaceous blades which generally exceed the usually divided branches; fertile part of the spike not more than 8 cm. long.

Blades of the leaves and primary bracts thin, even.

Blades of the leaves and primary bracts coriaceous, prominently veined and keeled.

Inflorescence short and compact, or simple.

Leaf-sheaths up to 8 cm. long, ample, often castaneous.

Petals denticulate; inflorescence simple or digitate.

Petals entire; inflorescence subpinnate.

Primary bracts erect, apiculate; fertile part of the spike spreading and making an angle with the erect sterile base.

Primary bracts spreading, acuminate; spikes straight, spreading.

Leaf-sheaths small and inconspicuous.

Leaf-scales filiform, spreading; inflorescence simple.

Leaf-scales suborbicular, slightly spreading; inflorescence digitate.

Sheaths of the primary bracts equaling or exceeding at least the lower axillary branches.

Branches at base of inflorescence divided.

Branches of the inflorescence all simple.

Leaf-blades narrowly triangular, acuminate; plant 65 cm. high.

Leaf-blades ligulate, acuminate to obtuse and apiculate, or if not known (*T. Covellii*), the plant less than 25 cm. high.

Floral bracts shorter than the sepals or the inflorescence simple and polystichous-flowered.

Floral bracts carinate; spikes 1-3-flowered.

Floral bracts ecarinate; spikes 3-5-flowered.

Floral bracts equaling or exceeding the sepals; inflorescence always compound.

Primary bracts vaginiform, broadly elliptic.

Primary bracts foliaceous.

Spikes 3-7-flowered; floral bracts 2 cm. long.

Spikes 1- or 2-flowered; floral bracts 3 cm. long.

1. *T. rubra*.

2. *T. lampropoda*.

3. *T. heterophylla*.

4. *T. glossophylla*.

5. *T. lucida*.

6. *T. singularis*.

7. *T. excelsa*.

8. *T. cyanea*.

9. *T. selleana*.

10. *T. complanata*.

11. *T. subimbricata*.

12. *T. gymnobotrya*.

13. *T. longifolia*.

14. *T. chontalensis*.

15. *T. didistichoides*.

12. *T. gymnobotrya*.

16. *T. ignesiae*.

17. *T. Mauryana*.

18. *T. Werckleana*.

19. *T. hotteana*.

20. *T. biflora*.

21. *T. Covellii*.

22. *T. compacta*.

23. *T. Leiboldiana*.

24. *T. cauliflora*.

Subgenus 2. ANOPLOPHYTUM.

One species in North America.

25. *T. pulchella*.

Subgenus 3. PHYTARRHIZA.

Flowers and their bracts suberect, densely imbricate; inflorescence simple.

Flowers and their bracts spreading, not at all imbricate.

Leaf-blades 45 mm. wide, ligulate, acute or obtuse and apiculate; inflorescence compound.

Leaf-blades 10-15 mm. wide, narrowly triangular, acuminate; inflorescence simple.

26. *T. anceps*.
27. *T. venusta*.
28. *T. monadelpha*.

Subgenus 4. DIAPHORANTHEMA.

Stem not more than 1 dm. long, wholly concealed by the imbricate leaf-sheaths; inflorescence terminal.

Stem elongate, often several meters long, exposed between alternating bunches of leaves; inflorescence pseudo-lateral, one-flowered.

29. *T. recurvata*.
30. *T. usneoides*.

Subgenus 5. PSEUDO-CATOPSIS.

Inflorescence simple or of a few closely aggregated spikes; floral bracts broad, membranaceous, much exceeding the sepals.

Inflorescence amply paniculate, or the floral bracts shorter than the sepals.

Floral bracts equaling or exceeding the sepals.

Floral bracts definitely exceeding the sepals.

Floral bracts at least toward base of spikes over 10 mm. long.

Branches arcuate-spreading; floral bracts subspreading, not at all imbricate.

Branches erect or ascending; floral bracts erect, densely imbricate.

Floral bracts less than 10 mm. long.

Spikes dense, strict; floral bracts largely concealing the rhachis with their very broad bases.

Spikes lax; floral bracts not at all concealing the rhachis.

Floral bracts merely equaling the sepals.

Inflorescence erect.

Inflorescence pendulous.

Floral bracts distinctly shorter than the sepals.

Primary bracts at least half as long as the axillary branches.

Sepals 5 mm. long; primary bracts usually equaling or exceeding the spikes; leaf-blades usually involute-subulate.

Sepals 6-9 mm. long; primary bracts usually about half as long as the spikes; leaf-blades usually flat.

Primary bracts much less than half as long as the axillary branches.

Spikes very lax; flowers spreading, much shorter than the internodes.

Spikes dense; flowers suberect, at least twice as long as the internodes.

Inflorescence pendulous.

Inflorescence erect.

31. *T. crispa*.
32. *T. Ghiesbreghtii*.
33. *T. ascendens*.
34. *T. Rothschildiana*.
35. *T. Fawcettii*.
36. *T. spiculosa*.
37. *T. Lescaillei*.
38. *T. adpressa*.
39. *T. caribaea*.
40. *T. aracostachya*.
41. *T. contorta*.
42. *T. guanacastensis*.

Subgenus 6. PLATYSTACHYS.

Sheaths of the primary bracts shorter than the axillary spikes or the inflorescence simple and distichous-flowered.

Floral bracts much less than twice as long as the internodes.

Plants stemless or with a very short stem bearing greatly reduced leaves; the fully developed leaves rosulate.

Leaf-blades 1-11 cm. wide; plants mostly large.

Flowers erect, appressed to the rhachis.

Leaves covered with coarse cinereous spreading scales,

15-20 cm. long; inflorescence simple or few-branched.

Leaves covered with minute pale appressed scales, up

to 10 dm. long.

Spikes nearly or quite straight, slender, sterile for

about half their length from base.

Spikes distinctly flexuous or geniculate.

Floral bracts even or at most faintly nerved near

margin; branches usually geniculate.

Floral bracts prominently nerved throughout;

branches merely flexuous in most cases.

Sepals 14-18 mm. long; rhachis slender.

Sepals 25-30 mm. long; rhachis stout.

Flowers spreading or subspreading.

Leaf-blades linear, 1-2 mm. wide; plants not over 3 dm. high.

43. *T. Karwinskyana*.
44. *T. Ekmanii*.
45. *T. dasylyriifolia*.
46. *T. utriculata*.
47. *T. Makoyana*.
48. *T. flexuosa*.

- Inflorescence simple, few-flowered; sepals 14 mm. long.
 Inflorescence compound, many-flowered; sepals 7-8 mm. long.
- Plants long-caulescent; leaves uniform and distributed along the stem.
- Floral bracts twice as long as the internodes; spikes dense or rarely lax by the spreading of the flowers.
- Leaf-blades ligulate.
 Floral bracts carinate; scapes several and axillary in each rosette; inflorescences simple.
- Floral bracts ecarinate; scape single and central.
 Floral bracts spreading at anthesis, not at all imbricate.
 Floral bracts imbricate.
- Leaf-blades narrowly triangular or linear.
 Floral bracts coriaceous or subcoriaceous; leaf-sheaths not inflated except in *T. Balbisiana*.
- Leaf-blades linear-subulate to filiform; leaves closely fasciculate; leaf-sheaths triangular with abruptly auricled bases.
- Spikes arching-recurved; floral bracts scarcely more than twice as long as the internodes, usually much nerved.
- Spikes straight, erect.
 Floral bracts glabrous.
 Floral bracts lepidote.
 Inflorescence densely polystichous-digitate with broad even bracts massed beneath it, equaling or exceeding the leaves.
- Inflorescence simple or compound, if dense the primary bracts narrow and not massed beneath it.
- Leaf-sheaths marked with alternating cinereous and ferruginous cross-bands.
- Leaf-sheaths concolorous.
 Leaf-sheaths 15-20 mm. wide; blades of the primary bracts generally exceeded by the axillary spikes.
 Leaf-sheaths smaller; blades of the primary bracts generally exceeding the axillary spikes.
- Leaf-blades definitely if narrowly triangular; leaf-sheaths usually ovate or elliptic without auricled bases.
- Inflorescence simple or digitate.
 Floral bracts distinctly shorter than the sepals, densely cinereous-lepidote.
- Floral bracts equaling or exceeding the sepals.
 Spikes terete.
 Spikes more or less complanate.
 Spikes linear-lanceolate, not more than 12 mm. wide; leaf-sheaths scarcely if at all darker than the blades.
 Leaf-sheaths flat.
 Leaf-sheaths inflated.
 Spikes lance-elliptic, ovate or oblong, 12-40 mm. wide; leaf-sheaths castaneous, much darker than the blades.
 Sepals alate; bracts subinvolute below the inflorescence.
 Sepals carinate but not alate; bracts not at all involucre.
 Sides of the spikes more or less convex; floral bracts ample.
 Sides of the spikes flat; floral bracts 9-18 mm. wide; primary bracts scarcely larger than the floral bracts.
 Plant not more than 2.5 dm. high.
 Plant 3-4 dm. high.
- Inflorescence pinnately compound.
 Floral bracts distinctly shorter than the sepals.
 Floral bracts appearing densely lepidote at least under a lens.
 Floral bracts ecarinate; inflorescence few-branched.
 Floral bracts carinate; inflorescence amply compound.
 Floral bracts nearly or quite glabrous.
 Floral bracts equaling or exceeding the sepals.
49. *T. argentea*.
 50. *T. filifolia*.
 51. *T. albida*.
 52. *T. multicaulis*.
 53. *T. grandis*.
 54. *T. thyrsgigera*.
 55. *T. festucoides*.
 56. *T. Ortgiesiana*.
 57. *T. juncea*.
 58. *T. bromoides*.
 59. *T. simulata*.
 60. *T. tenuifolia*.
 61. *T. exserta*.
 62. *T. Acostae*.
 63. *T. polystachya*.
 64. *T. Balbisiana*.
 65. *T. punctulata*.
 66. *T. fasciculata*.
 67. *T. melanocrater*.
 68. *T. tricolor*.
 69. *T. exserta*.
 70. *T. calothyrsus*.
 70. *T. lineatispica*.

- Spikes terete; floral bracts 35 mm. long.
 Spikes more or less complanate.
 Spikes not more than 12 mm. wide, linear or linear-lanceolate.
 Branches spreading; inflorescence very lax.
 Branches erect or suberect.
 Lower branches digitately divided.
 Lower branches simple.
 Leaf-sheaths flat.
 Leaf-sheaths inflated.
- Spikes 12-40 mm. wide, linear-lanceolate to ovate.
 Lower spikes less than twice as long as the sheaths of the primary bracts; floral bracts lepidote, at least toward the apex.
 Sheaths of the primary bracts broadly ovate.
 Sheaths of the primary bracts lance-elliptic.
 Lower spikes several times as long as the sheaths of the primary bracts.
 Floral bracts densely and evenly impressed-lepidote.
 Floral bracts glabrous or their scales scanty and not impressed.
 Inflorescence subaxillary; spikes strongly divergent.
 Inflorescence densely and narrowly cylindrical.
 Floral bracts with straight or slightly curved apices.
 Floral bracts cucullate.
- Floral bracts subchartaceous to membranaceous; leaf-sheaths inflated in many species.
 Leaf-sheaths inflated and forming a pseudobulb, the inner ones closely enfolding the base of the scape or inflorescence.
 Sepals exceeding the floral bracts.
 Sepals equaling or shorter than the floral bracts.
 Floral bracts densely cinereous-lepidote with coarse spreading or subspreading scales.
 Leaf-blades flat for most of their length, the outer ones spirally recurved.
 Leaf-blades involute-subulate throughout.
 Scape evident.
 Scape none.
- Floral bracts glabrous or appressed-lepidote.
 Leaf-sheaths variegated.
 Leaf-sheaths green, concolorous or with only a narrow marginal band of red or purple.
 Leaf-sheaths orbicular, distinct, making a sharp angle with the blades.
 Leaf-sheaths ovate or elliptic, merging into the blades.
 Floral bracts nearly or quite glabrous, larger than the primary bracts.
 Floral bracts densely lepidote.
 Pseudobulb elongate, one third to one half the total length of the plant.
 Pseudobulb relatively much smaller.
- Leaf-sheaths nearly flat and forming a crateriform rosette or distributed along a stem.
 Inflorescence compound or else the floral bracts lax and exposing the rhachis.
 Floral bracts 10-17 mm. long.
 Leaf-sheaths brown, much darker than the blades; floral bracts about equaling the sepals.
 Leaf-sheaths green, scarcely darker than the blades; floral bracts distinctly shorter than the sepals.
- Floral bracts 20-45 mm. long.
 Spikes not more than half fertile; inflorescence compound; scape very short.
 Spikes more than half fertile or else the inflorescence simple.
71. *T. Roland-Gosselini*.
 72. *T. Kirchoffiana*.
 73. *T. Rettigiana*.
 63. *T. polystachya*.
 64. *T. Balbistana*.
 74. *T. Bourgaei*.
 75. *T. mexicana*.
 69. *T. calothyrsus*.
 66. *T. fasciculata*.
 76. *T. Dugesii*.
 77. *T. Rodrigueziana*.
 78. *T. subulifera*.
 79. *T. streptophylla*.
 80. *T. Seleriana*.
 81. *T. pruinosa*.
 82. *T. Butzii*.
 83. *T. bulbosa*.
 84. *T. caput-Medusae*.
 85. *T. circinnata*.
 86. *T. Baileyi*.
 87. *T. canescens*.
 88. *T. chlorophylla*.
 89. *T. flabellata*.

- Rhachis concealed by the floral bracts at anthesis.
 Floral bracts nearly or quite glabrous, coriaceous toward the center.
 Floral bracts densely cinereous-lepidote, uniformly subchartaceous or membranaceous.
 Inflorescence barely compound; floral bracts ecarinate; scape very short.
 Inflorescence of 5-many spikes; floral bracts sharply carinate.
 Spikes broadly elliptic; floral bracts up to 35 mm. long.
 Spikes lance-oblong, 14 mm. wide; floral bracts 20-25 mm. long.
- Rhachis exposed at anthesis.
 Floral bracts suborbicular, finely verrucose.
 Floral bracts narrower, even or nerved, but not verrucose.
 Inflorescence thyrsoïd, 4 dm. long; floral bracts 35-45 mm. long.
 Inflorescence simple, digitate or laxly pinnate; floral bracts 20-35 mm. long.
 Leaf-sheaths dark-castaneous, large; inflorescence simple or digitate.
 Leaf-sheaths concolorous with the blades; inflorescence simple to pinnate.
 Leaves finely appressed-lepidote, their blades flat.
 Leaves coarsely spreading-lepidote, their blades involute.
- Inflorescence simple; floral bracts densely imbricate.
 Plants stemless or very short-caulescent.
 Leaf-blades linear-subulate to filiform.
 Leaf-blades much broader.
 Floral bracts uncinately incurved, fleshy in life, drying blackish and thin.
 Floral bracts nearly or quite straight toward apex.
 Leaf-sheaths dark-brown; floral bracts coriaceous toward center.
 Leaf-sheaths concolorous with the blades; floral bracts uniformly thin.
 Spike 1-2 dm. long; bracts and sepals glabrous.
 Spike 3-5 cm. long; bracts and sepals densely lepidote.
- Plants distinctly caulescent.
 Sepals densely and persistently lepidote; inflorescence strongly complanate.
 Sepals glabrous; inflorescence terete.
- Sheaths of at least the lower primary bracts equaling or exceeding the axillary spikes, these sometimes reduced to a single flower each, the inflorescence therefore appearing simple and polystichous-flowered.
- Spikes with elongate axes, 3-many-flowered; plants mostly 4 dm. or higher.
 Sepals equally subfree; primary bracts exceeding all the axillary spikes.
 Spikes subsessile; leaf-blades ligulate; inflorescence substrobilate.
 Spikes stipitate; leaf-blades narrowly triangular; inflorescence very lax.
- Sepals more or less connate posteriorly.
 Primary bracts submembranaceous.
 Primary bracts firm.
 Floral bracts with flat sides; spikes much compressed.
 Leaf-blades narrowly triangular.
 Leaf-blades ligulate.
- Floral bracts with convex sides; spikes slightly compressed.
 Floral bracts carinate, even or faintly nerved, densely lepidote.
- Floral bracts ecarinate, wrinkled as if much shrunken in drying, sparsely lepidote or glabrous.
- Spikes with abbreviated axes, 1-3- or rarely up to 5-flowered, plants mostly less than 4 dm. high.
66. *T. fasciculata*.
 90. *T. lepidosepala*.
 91. *T. Mexiae*.
 92. *T. vicentina*.
 93. *T. inflata*.
 94. *T. Parryi*.
 95. *T. incurva*.
 96. *T. Valenzuelana*.
 97. *T. pueblensis*.
 98. *T. chaetophylla*.
 99. *T. Kegeliana*.
 66. *T. fasciculata*.
 100. *T. achyrostachys*.
 90. *T. lepidosepala*.
 101. *T. Ehrenbergiana*.
 102. *T. Schiedeana*.
 103. *T. imperialis*.
 104. *T. Standleyi*.
 105. *T. foliosa*.
 106. *T. prodigiosa*.
 107. *T. Yunckeri*.
 108. *T. strobilifera*.
 109. *T. violacea*.

- Leaf-blades linear-subulate to filiform, elongate.
 Bracts coriaceous, nearly or quite even; leaf-scales suborbicular, subappressed. 57. *T. juncea*.
 Bracts membranaceous, nerved; leaf-scales linear, spreading. 110. *T. plumosa*.
 Leaf-blades narrowly triangular. 111. *T. Graebenerii*.
 Inflorescence lax.
 Inflorescence compact.
 Outer bracts of the inflorescence foliaceous.
 Leaf-sheaths inflated; inflorescence sessile. 112. *T. Diguetii*.
 Leaf-sheaths flat.
 Scape elongate, stout; leaves thick; floral bracts up to 35 mm. long. 113. *T. capitata*.
 Scape short to none, slender; leaves thin; floral bracts not over 20 mm. long. 114. *T. brachycaulos*.
 Outer bracts of the inflorescence brightly colored or membranaceous, or both.
 Bracts and sepals coriaceous. 115. *T. macrochlamys*.
 Bracts and sepals membranaceous.
 Inflorescence sessile in the center of the rosette; leaves rarely over 6 cm. long. 116. *T. erubescens*.
 Inflorescence scapose; leaves 10–20 cm. long.
 Petals green; bracts acute. 117. *T. Benthamiana*.
 Petals violet; bracts obtuse or apiculate. 118. *T. Andrieuxii*.

1. Subgenus *Allardtia* (A. Dietr.) Baker, Jour. Bot. 26: 40. 1888. *Allardtia* A. Dietr. Allg. Gart. 20: 241. 1852. *Tillandsia* § *Allardtia* E. Morren, Belg. Hort. 27: 272. 1877. *Tillandsia* subgenus *Pseudalcantarea* Mez, in Engler, Pflanzenreich 4³²: 437, 455. 1935. (as to first species).

1. *Tillandsia rubra* R. & P. Fl. Per. 3: 40. 1802.

- Tillandsia paniculata* Schlecht. & Cham. Linnæa 6: 54. 1831. Not *T. paniculata* L. 1762.
Tillandsia Deppeana Steud. Nom. Bot. ed. 2: 688. 1841.
Vriesea rubra Beer, Bromel. 98. 1857.
Tillandsia Fendleri Griseb. Nachr. Ges. Wiss. Gött. 1864: 17. 1865.
Tillandsia excelsa var. *latifolia* Griseb. Nachr. Ges. Wiss. Gött. 1864: 17. 1865.
Tillandsia incurvata Wright; Sauv. Anal. Acad. Ci. Habana 8: 54, excl. syn. 1871. As to material cited.
Tillandsia Kalbreyeri Baker, Jour. Bot. 26: 45. 1888.
Phylarhiza rubra E. Morren; Baker, Handb. Bromel. 206, as synonym. 1889.
Tillandsia leiochlamys Baker, Handb. Bromel. 184. 1889.
Tillandsia paniculata var. *Fendleri* Mez, in DC. Monog. Phan. 9: 703. 1896.
Tillandsia paniculata var. *costaricensis* Mez, in DC. Monog. Phan. 9: 703. 1896.
Tillandsia clavigera Mez, in DC. Monog. Phan. 9: 783. 1896.
Tillandsia Bangii Baker, Mem. Torrey Club 6: 124. 1896.
Tillandsia macrodactylon Mez, Repert. Nov. Sp. 3: 39. 1906.
Tillandsia baliophylla Harms, Notizbl. Bot. Gart. Berlin 12: 538. 1935.

Stemless, 1–2 m. high; leaves many in a dense crateriform rosette, 6–10 dm. long; sheaths subelliptic, inconspicuous, 1–3 dm. long, very densely brown-punctulate-lepidote; blades ligulate, triangular-acuminate, up to 8 cm. wide, flat, nearly or quite glabrous; scape erect, stout; scape-bracts erect, densely imbricate, foliaceous, very inconspicuously punctulate-lepidote; inflorescence lax, ample, pinnately compound with simple or divided branches; primary bracts like the upper scape-bracts, much shorter than the axillary branches but much larger than the floral bracts; spikes lanceolate, acute, complanate, densely 6–28-flowered, 1–3 dm. long, 5 cm. wide, often spreading or recurved, more or less stipitate with reduced sterile bracts at the base; floral bracts narrowly obovate, keeled toward the apex, glabrous, even, coriaceous and rigid at least after anthesis, about equaling the sepals; flowers erect, short-stipitate; sepals oblong-lanceolate, acute, 25–45 mm. long, carinate, equally subfree; petals slightly exceeding the stamens.

TYPE LOCALITY: Peru.

DISTRIBUTION: Mexico and Central America; West Indies; also from Venezuela to Peru and Bolivia.

ILLUSTRATION: R. & P. Fl. Per. pl. 266.

2. *Tillandsia lampropoda* L. B. Smith; Yuncker, Field Mus. Publ. Bot. 17: 320. 1938.

Stemless, up to 43 cm. high; leaves many, substrict, forming a slenderly cyathiform rosette, about equaling the inflorescence; sheaths oblong-elliptic, 1 dm. long, densely and

obscurely punctulate-lepidote, bright-purple; blades very narrowly triangular, caudate-acuminate, 15-20 mm. wide at the base, very densely appressed-cinereous-lepidote; scape erect, 6 mm. in diameter, glabrous; scape-bracts erect, imbricate, broadly ovate, apiculate or the lowest narrowly caudate-laminate, very obscurely punctulate, even, shining, red when living; inflorescence simple, elliptic, acute, strongly complanate, 15 cm. long, 7 cm. wide; floral bracts distichous, densely imbricate, 8 times as long as the internodes, broadly ovate, acute, 5 cm. long, 4 cm. wide, strongly carinate, coriaceous, even, shining, very obscurely punctulate, cinereous-lepidote toward apex, yellow toward the apex, shading into red toward the base, narrowly dark-margined; flowers imperfectly known, subsessile; sepals narrowly lanceolate, acute, 32 mm. long, carinate, coriaceous, nerved, glabrous, free; petals about 5 cm. long; style elongate.

TYPE LOCALITY: On tree near El Achote, above the plains of Siguatepeque, Comayagua, Honduras, altitude 1350 meters.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Field Mus. Publ. Bot. 17: *pl. 9*.

3. *Tillandsia heterophylla* E. Morren, Belg. Hort. 23: 138. 1873.

Tillandsia virginalis E. Morren, Belg. Hort. 30: 238. 1880.

Plant stemless, 5-8 dm. high; leaves many in a dense infundibuliform rosette, 4 dm. long, pale-green, farinaceous below when living; sheaths broadly elliptic, 15 cm. long, very finely brown-punctulate; blades ligulate, acute, 4-5 cm. wide, obscurely punctulate below, glabrous and shiny above; scape erect, relatively slender; scape-bracts erect, densely imbricate, elliptic, acute or the lowest foliaceous-laminate; inflorescence simple or pinnately few-branched; primary bracts like the upper scape-bracts, scarcely larger than the floral bracts; spikes erect, oblong-lanceolate in outline, acute, 16-20 cm. long, 6 cm. wide, complanate; floral bracts erect, densely imbricate, broadly elliptic, acute, 5 cm. long, 3 cm. wide, much exceeding the sepals, 3-4 times as long as the internodes, sharply carinate, coriaceous, even, glabrous or with a slight bloom when living; flowers subsessile; sepals narrowly elliptic, acute, 4 cm. long, 14 mm. wide, prominently nerved, glabrous outside, punctulate-lepidote inside, the posterior ones sharply carinate, very short-connate; petals 9 cm. long, white, flaccid after anthesis, the claw oblong, the blade elliptic, obtuse; stamens shorter than the petals; anthers linear, 12 mm. long, obtuse, attached just above the base; style elongate; capsule slenderly cylindric, acute, 4 cm. long; seeds with a short apical appendage.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Vera Cruz.

4. *Tillandsia glossophylla* L. B. Smith; Yuncker, Field Mus. Publ. Bot. 17: 319. 1938.

Stemless, 4 dm. high; leaves in a dense cyathiform rosette, 2 dm. long, very minutely and obscurely brown-lepidote; sheaths elliptic, ample, 1 dm. long; blades ligulate, acute, 25 mm. wide, flat, green or tinged with purple; scape erect, 5 mm. in diameter; scape-bracts erect, densely imbricate, broadly ovate, apiculate or the lowest acuminate, glabrous, nerved; inflorescence simple, linear-lanceolate, acute, 18 cm. long, 25 mm. wide, complanate; floral bracts erect, densely imbricate, broadly elliptic, obtuse, 3 cm. long, about equaling the sepals, ecarinate, flesh-pink, dull, glabrous, nerved, subcoriaceous; flowers subsessile; sepals narrowly elliptic, obtuse, 27 mm. long, subchartaceous, strongly nerved, glabrous, free; petals linear, the blades narrowly elliptic, 1 cm. long; stamens included; style elongate; capsules barely exceeding the sepals.

TYPE LOCALITY: Ravine near El Achote, above the plains of Siguatepeque, Comayagua, Honduras, altitude 1350 meters.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATION: Field Mus. Publ. Bot. 17: *pl. 8*.

5. *Tillandsia lucida* E. Morren; Baker, Handb. Bromel. 207. 1889.

Plant stemless, 6 dm. to over 1 m. high; leaves 20-30 in a dense subspreading rosette, 1-4 dm. long, punctulate-lepidote throughout; sheaths ovate or elliptic, 12 cm. long, densely

lepidote, dark-violet or brownish-violet inside, pale-green outside, matching the blades; blades ligulate, acute, 3 cm. wide, sparsely lepidote, dark-green above, chartaceous when dry; scape erect or ascending, stout; scape-bracts densely imbricate, subfoliaceous with spreading or recurved blades, violet-tinted, subcoriaceous, glabrous, lustrous; inflorescence compound, densely digitate or subpinnate, subfusiform, up to 3 dm. long, of 5–12 spikes, glabrous; primary bracts suberect, broadly ovate, acute, much shorter than the axillary branches; spikes substrict, sessile, oblong in outline, acute, slightly curved, 1 dm. long, 18 mm. wide, complanate, densely 8–14-flowered; floral bracts erect, densely imbricate, broadly elliptic, obtuse, 35 mm. long, exceeding the sepals, subinflated, only the lowest ones at all carinate, coriaceous, lustrous, even or somewhat striate, reddish-green, drying to pale-stramineous; flowers erect; pedicels stout, 2 mm. long; sepals narrowly elliptic, obtuse, 24 mm. long, 8 mm. wide, membranaceous or chartaceous, prominently nerved, subfree; petals 6 cm. long, tubular-erect, pale-blue-violet; stamens included.

TYPE LOCALITY: "Mexico and Guatemala"; described from cultivation.
DISTRIBUTION: Known only from the type collection.

6. *Tillandsia singularis* Mez & Wercklé; Mez, Bull. Herb. Boiss.
II. 5: 103. 1905.

Plant stemless, about 3 dm. high; leaves densely rosulate, subfasciculate, 15–25 cm. long, very minutely and obscurely punctulate-lepidote; sheaths elliptic, conspicuous, dark-castaneous with a broad pale margin; blades ligulate, broadly rounded and apiculate, 20–25 mm. wide at base, green; scape slender, erect, from shorter than to about equaling the leaves; scape-bracts imbricate and wholly concealing the scape, elliptic-lanceolate, obtuse and apiculate, thin, prominently nerved, glabrous, bright-red; inflorescence slenderly pyramidal, laxly bipinnate, 15 cm. long, glabrous, bright-red; axis slender; primary bracts like the scape-bracts, only about half as long as the axillary branches; spikes suberect to spreading, short-stipitate with no sterile bracts at base, 4 cm. long, laxly 6–8-flowered; rhachis slender, slightly geniculate, angled, sulcate; floral bracts spreading, elliptic, obtuse, much shorter than the sepals, more than twice as long as the internodes but not at all concealing the rhachis, ecarinate, membranaceous, prominently nerved; flowers spreading, short-pedicellate; sepals oblong, obtuse, prominently nerved, subfree, about 9 mm. long; petals ligulate, 11 mm. long; stamens and pistil included; capsule cylindrical, barely exceeding the sepals.

TYPE LOCALITY: Costa Rica.
DISTRIBUTION: Costa Rica.

7. *Tillandsia excelsa* Griseb. Fl. Brit. W. Ind. 597. 1864.

Tillandsia costaricana Mez & Wercklé; Mez, Bull. Herb. Boiss. II. 3: 143. 1903.
Tillandsia costarricensis Mez & Wercklé; Wercklé, Subr. Fit. Costarric. 33, hyponym. 1909.

Plant stemless, often over 1 m. high; leaves densely rosulate, 45 cm. long, obscurely punctulate-lepidote, light-green, sometimes suffused or marked with red or purple; sheaths conspicuous, suborbicular; blades ligulate, acute, up to 6 cm. wide; scape erect, glabrous; scape-bracts foliaceous, densely imbricate and concealing the scape, spreading toward apex; inflorescence barely or amply tripinnate, pyramidal, red when living, glabrous throughout; primary bracts large and foliaceous, the lower ones exceeding the axillary branches; secondary bracts narrowly lanceolate, slightly shorter than the axillary spikes; spikes lanceolate or elliptic, acute, dense, up to 8-flowered but usually much less; floral bracts suberect, 2 to 3 times as long as the internodes but so narrow as to expose the rhachis, narrowly elliptic, acute, exceeding the sepals, convex, ecarinate, coriaceous, even to distinctly nerved; flowers subsessile, 25–30 mm. long; sepals linear-lanceolate, acute, 15–20 mm. long, coriaceous, even or nerved, subfree; petals violet; stamens and pistil included; capsule cylindrical, short-beaked, 3 cm. long.

TYPE LOCALITY: Jamaica.
DISTRIBUTION: Central America; Cuba and Jamaica.

8. *Tillandsia cyanea* (A. Dietr.) E. Morren,
Belg. Hort. 29: 297. 1879.

Allardia cyanea A. Dietr. Allg. Gart. 20: 241. 1852.

Platystachys cyanea Koch & Sello; K. Koch, Ind. Sem. Hort. Berol. 1854: App. 11. 1855.

Tillandsia columnaris E. Morren; Baker, Handb. Bromel. 208, as synonym. 1889.

Stemless, up to 8 dm. high; leaves many in a dense crateriform rosette, 4 dm. long; sheaths conspicuous, elliptic or ovate, 8 cm. broad, densely brown-punctulate-lepidote; blades ligulate, acuminate, flat, 3-4 cm. wide, thin when dry, subglabrous, glaucous-green; scape erect, stout, equaling or exceeding the leaves, glabrous; scape-bracts densely imbricate, foliaceous with divergent to spreading blades; inflorescence ample, pinnately compound with most of the branches divided, narrowly subpyramidal or cylindrical, up to 8 dm. long; axes glabrous, often flexuous toward apex; primary bracts lanceolate to broadly ovate with acuminate green blades, red, the lower ones about equaling the axillary branches, the upper ones much shorter; branches about 2 cm. apart, divergent to spreading, up to 15 cm. long; spikes narrowly lanceolate, acute, subdense, 6-26-flowered, complanate, up to 85 mm. long, 10 mm. wide; floral bracts erect, imbricate, elliptic-ovate, obtuse and apiculate, 10-14 mm. long, slightly exceeding the sepals, two and a half times as long as the internodes, slightly if at all carinate, subcoriaceous, prominently nerved, glabrous; flowers erect, short-stipitate; sepals ovate-lanceolate, obtusish, 9-10 mm. long, thin, nerved, glabrous, the posterior ones short-connate; petals linear, obtuse, 15-18 mm. long, exceeding the stamens and pistil, blue; capsule cylindrical, acute, 20-25 mm. long.

TYPE LOCALITY: Guatemala.

DISTRIBUTION: Guatemala, Honduras, Salvador, and Costa Rica.

9. *Tillandsia selleana* Harms, Notizbl. Bot. Gart.
Berlin 10: 799. 1929.

Stemless, 2-5 dm. high; leaves in a dense crateriform rosette, 15-22 cm. long; sheaths broadly elliptic, distinct, 6-8 cm. long, very finely brown-punctulate-lepidote, often purple toward apex; blades ligulate, acuminate, flat, 2-3 cm. wide, glabrous above, very inconspicuously punctulate-lepidote below; scape erect, slender, very short, glabrous; scape-bracts erect, densely imbricate, lanceolate, acuminate; inflorescence broadly pyramidal, laxly compound with simple branches or the lower ones rarely somewhat divided, exceeding the leaves, 12-35 cm. long; axis nearly straight, glabrous; lower primary bracts like the scape-bracts, their blades exceeding the axillary spikes, the upper primary bracts ovate and much shorter than the spikes; spikes sessile, divergent to spreading, linear-lanceolate, acute, densely 4-6-flowered with several sterile bracts at base, up to 8 cm. long, 1 cm. wide, complanate; rhachis slightly flexuous, glabrous; floral bracts erect, imbricate, broadly lanceolate or lance-ovate, acute or apiculate, 15-20 mm. long, exceeding the sepals, two and a half times as long as the internodes, ecarinate, subchartaceous, prominently nerved, glabrous; flowers subsessile; sepals oblong, broadly acute or obtuse, 12-13 mm. long, free; capsule cylindrical, short-beaked, 20-25 mm. long.

TYPE LOCALITY: Massif de la Selle, Nouvelle Touraine, in forest, near road to Morne la Visite, Haiti, altitude 1700 meters.

DISTRIBUTION: Haiti.

10. *Tillandsia complanata* Benth. Bot. Voy. Sulph. 173. 1846.

Tillandsia axillaris Griseb. Fl. Brit. W. Ind. 597. 1864.

Plant stemless; leaves many in a dense rosette, 3-4 dm. long or rarely more, mostly exceeding the inflorescences, spotted, streaked, or suffused with dark-purple especially toward the base; sheaths elliptic or narrowly ovate, 10-16 cm. long, densely and minutely brown-appressed-lepidote; blades ligulate, abruptly acute or subobtuse, apiculate, 3-5 cm. wide, obscurely punctulate-lepidote, soon glabrous above; scapes many from the axils of the leaves, ascending, 1-2 mm. in diameter above the flattened base, glabrous; scape-bracts numerous, erect, usually imbricate, narrowly lanceolate, acute or acuminate, subchartaceous, glabrous or subglabrous; inflorescence simple, lanceolate or linear in outline, acute, densely 4-24 flowered, up to 8 cm.

long, 15–20 mm. wide, usually complanate, glabrous; floral bracts erect, imbricate, elliptic, obtuse, 15–25 mm. long, exceeding the sepals, coriaceous or subcoriaceous, even or prominently nerved, ecarinate, often rose or purple; flowers sessile; sepals lanceolate, acute, 10–15 mm. long, subcoriaceous, the posterior ones carinate and usually much connate; petals ligulate, about 2 cm. long, rose, purple, or blue, the blade suberect, obtuse; stamens and pistil slightly shorter than the petals; capsule slenderly cylindric, acute, 4 cm. long.

TYPE LOCALITY: Ecuador.

DISTRIBUTION: Costa Rica; West Indies; also from British Guiana to Peru and Bolivia.

11. *Tillandsia subimbricata* Baker, Jour. Bot. 25: 304. 1887.

Tillandsia orthorhachis Mez & Baker; Mez, Bull. Torrey Club 30: 435. 1903.

Stemless, 1 m. high; leaves numerous in a utriculate rosette, up to 8 dm. long, densely punctulate-lepidote; sheaths ovate, large, not inflated; blades recurving, narrowly triangular, subulate-acuminate, 4 cm. wide; scape erect, 1 cm. in diameter; scape-bracts imbricate, the lower ones foliaceous with long reflexed laminae, the upper ovate and usually apiculate or with short filiform erect laminae; inflorescence laxly compound, its branches simple or rarely the lowest divided, curved-ascending; primary bracts like the upper scape-bracts, much shorter than the axillary branches; spikes linear, complanate, up to 20-flowered with several sterile bracts at base, 15 cm. long, 12 mm. wide; rhachis nearly straight, slender, angled, sulcate when dry, glabrous; floral bracts erect, two to three times as long as the internodes or sometimes less, exposing the rhachis, narrowly ovate, obtuse or apiculate, inrolled at apex, 18–20 mm. long, exceeding the sepals, subchartaceous, glabrous, strongly nerved; flowers subsessile; sepals narrowly elliptic, obtuse, 11–13 mm. long, glabrous, strongly nerved, equally subfree; petals 25 mm. long, blue or lilac; stamens included, equaling the pistil; capsule slenderly cylindric, 3–4 cm. long.

TYPE LOCALITY: Trinidad.

DISTRIBUTION: Yucatan, Nicaragua, and Panama; Cuba and Jamaica; also in Trinidad and Colombia.

ILLUSTRATION: Contr. Gray Herb. 89: pl. 4, f. 1.

12. *Tillandsia gymnotrya* Baker, Jour. Bot. 25: 243. 1887.

Tillandsia tridactylites E. Morren; Baker, Handb. Bromel. 181, as synonym. 1889.

Tillandsia Liebmanniana E. Morren; Baker, Handb. Bromel. 183, hyponym. 1889.

Tillandsia Purpusii Mez, Repert. Sp. Nov. 14: 251. 1916.

Stemless, 2–7 dm. high; leaves many in a crateriform rosette, 15–50 cm. long, chartaceous when dry; sheaths elliptic, 6–12 cm. long, brown, densely and finely brown-appressed-lepidote; blades narrowly triangular, subfiliform-acuminate, 15–25 mm. wide, flat, thin, even, densely and finely pale-appressed-lepidote, especially below; scape erect, up to 8 mm. in diameter, equaling or slightly shorter than the leaves; scape-bracts erect, densely imbricate, foliaceous; inflorescence laxly compound with the lower branches simple or bearing 2–5 spikes, subpyramidal, up to 3 dm. long and 2 dm. in diameter; axes red, glabrous; primary bracts lance-ovate, their sheaths much shorter than the spreading axillary branches, but the lower ones with long foliaceous blades which usually exceed the branches; secondary bracts no larger than the floral bracts; spikes divergent, short-stipitate, lanceolate or linear-lanceolate, rather laxly 5–8-flowered with several sterile bracts at base, complanate, up to 7 cm. long and 15 mm. wide; rhachis slender, flexuous; floral bracts divergent, scarcely or not at all imbricate and completely exposing the rhachis, elliptic, obtuse when expanded, up to 16 mm. long, equaling or exceeding the sepals, 3 times as long as the internodes, ecarinate, chartaceous, prominently nerved, glabrous or sparsely lepidote toward apex; flowers short-pedicellate; sepals elliptic, obtuse, 11–13 mm. long, coriaceous, glabrous, free; petals with linear claw and elliptic obtuse blade, 18 mm. long; stamens and pistil included.

TYPE LOCALITY: Orizaba.

DISTRIBUTION: Central Mexico.

13. *Tillandsia longifolia* Baker, Handb. Bromel. 185. 1889.

Tillandsia elongata "H.B.K." Griseb. Nachr. Ges. Wiss. Gött. 1864: 17. 1865. Not *T. elongata* H. B. K. 1816.

Flowering plant up to 2 m. high; leaves rosulate, 8-13 dm. long, densely and minutely appressed-lepidote throughout; sheaths elliptic, 15 cm. long; blades linear-triangular, acuminate to an abruptly acute apex, 3-4 cm. wide at the base, flat, coriaceous, prominently veined and keeled; scape erect, over 1 cm. in diameter; scape-bracts erect, foliaceous, densely imbricate; inflorescence amply and laxly tripinnate, pyramidal, 6 dm. long, 3 dm. in diameter; axes glabrous; primary bracts like the scape-bracts but the uppermost bladeless, their sheaths much shorter than the axillary branches; branches suberect to spreading, often bearing sterile bracts near the base; spikes 4-12-flowered, oblong to linear-oblong, acute, complanate, 13-15 mm. wide at anthesis, the fertile part 5-8 cm. long; rachis angled, flexuous, glabrous; floral bracts suberect, two to three times as long as the internodes but exposing most of the rachis at anthesis, ovate, broadly acute or obtuse, 15 mm. long, exceeding the sepals, convex, ecarinate, subcoriaceous, prominently nerved, glabrous or sparsely lepidote toward the apex, red-purple; flowers erect, short-stipitate; sepals ovate-oblong, obtuse, 10-12 mm. long, subcoriaceous, glabrous, subfree; petals ligulate, obtuse, 17 mm. long, violet; stamens and pistil included; capsule slenderly cylindrical, beaked, 32 mm. long.

TYPE LOCALITY: Venezuela.

DISTRIBUTION: Costa Rica; also in Venezuela.

14. *Tillandsia chontalensis* Baker, Jour. Bot. 25: 237. 1887.

Tillandsia spuria Mez & Wercklé; Mez, Repert. Sp. 16: 74. 1919.

Plant stemless, less than 2 dm. high; leaves densely rosulate, 12-14 cm. long, densely appressed-lepidote throughout; sheaths suborbicular, 25 mm. wide, castaneous-lepidote, often forming a pseudobulb; blades erect, linear-triangular, 10-12 mm. broad at the base, acuminate, involute, rigid when dry, cinereous-lepidote; scape erect or ascending, distinctly shorter than the leaves; scape-bracts densely imbricate, making the scape appear 5 mm. thick, broadly ovate, caudate, roseate, densely appressed-lepidote; inflorescence simple or digitate with 2-4 spikes; primary bracts like the scape-bracts, inconspicuous; spikes linear-lanceolate in outline with an attenuate base of several sterile bracts, acute, complanate, 4-8 cm. long, 10-12 mm. wide, densely 6-14-flowered; floral bracts suberect, three to four times as long as the internodes but partially exposing the rachis, triangular-ovate, up to 16 mm. long and 9 mm. wide, equaling or exceeding the sepals, carinate, submembranaceous, prominently nerved, appressed-lepidote, roseate toward the apex; flowers subsessile; sepals lanceolate, acute, 10-12 mm. long, subfree, chartaceous, glabrous; petals oblong, subtruncate, 12-18 mm. long, denticulate, pale-green, bearing 2 longitudinal folds with free scale-like apices; stamens and pistil shorter than the petals; capsule barely exerted from the bracts.

TYPE LOCALITY: Chontales, Nicaragua.

DISTRIBUTION: Nicaragua and Costa Rica.

ILLUSTRATIONS: Contr. Gray Herb. 89: pl. 3, f. 5-7.

15. *Tillandsia didistichoides* Mez, in DC. Monog.

Phan. 9: 778. 1896.

Stemless, 2-4 dm. high; leaves many in a dense globular rosette, 15-35 cm. long, densely and finely appressed-lepidote; sheaths broadly ovate to suborbicular, not strongly inflated nor closely investing the base of the scape, 4-8 cm. long, dark-castaneous; blades linear-triangular, acuminate, 1-2 cm. wide at the base, involute-subulate, cinereous-lepidote; scape usually decurved, slender; scape-bracts erect, imbricate, broadly ovate, at least the lower ones with elongate linear blades, inflated and loosely enfolding the scape, chartaceous, prominently nerved, appressed-lepidote, bright-red, drying to brown; inflorescence subpinnately compound with simple branches, 10-23 cm. long; primary bracts like the scape-bracts but usually bladeless and merely apiculate, erect, imbricate and wholly concealing the slender axis and the lower part of the sterile bases of the axillary spikes; spikes with the lower part of the sterile base erect

and closely appressed to the axis of the inflorescence, then sharply bent outward and spreading, the sterile base narrower than the fertile part and covered with reduced imbricate bracts, the fertile part lanceolate or linear-lanceolate, acute, complanate, 4–5 cm. long, 10–15 mm. wide, 8–12-flowered; rhachis straight, slender, angled, glabrous; floral bracts erect, imbricate, elliptic, acute, 15 mm. long, exceeding the sepals, three times as long as the internodes and concealing the rhachis, chartaceous, prominently nerved, obscurely lepidote, bright-red; flowers erect; sepals elliptic, acute, 10–12 mm. long, prominently nerved, glabrous, free; petals oblong, acute, 2 cm. long, entire, naked, lilac; stamens included, filaments straight; capsule slenderly cylindrical, acute, 15 mm. long.

TYPE LOCALITY: Trinidad.

DISTRIBUTION: Eastern Cuba and Haiti; Guadeloupe; also in Trinidad and Venezuela.

ILLUSTRATIONS: Contr. Gray Herb. 102: *pl. 2, f. 1–3.*

16. *Tillandsia ignesiae* Mez, Bull. Herb. Boiss. II. 3: 143. 1903.

Stemless, 10–17 cm. high; leaves many in a very dense subbulbous rosette, about equaling the inflorescence, densely and finely tomentose-lepidote throughout with spreading or reflexed cinereous scales; sheaths suborbicular, 8–10 mm. wide; blades linear-subulate, filiform-acuminate, about 1 mm. thick, the outer ones reflexed; scape erect or ascending, very slender; scape-bracts erect, densely imbricate, elliptic with long filiform blades, membranaceous, densely lepidote; inflorescence simple, lanceolate or linear-lanceolate in outline, acute, 25–55 mm. long, 12 mm. wide, strongly complanate, dense; floral bracts erect or slightly spreading toward the apex, triangular-ovate, acuminate, up to 19 mm. long, much exceeding the sepals, four times as long as the internodes, sharply carinate, membranaceous at anthesis, somewhat indurated in fruit, prominently many-nerved, densely lepidote; flowers sessile; sepals lanceolate, acute, 12 mm. long, carinate, membranaceous, subtomentose-lepidote especially along the keel, nerved, connate posteriorly for about 1 mm.; petals ligulate, obtuse, 18 mm. long, greenish-yellow when dry; stamens and pistil included; capsule cylindrical, stout, short-beaked, 20–25 mm. long.

TYPE LOCALITY: "Mexico, Monte Santa Ignés."

DISTRIBUTION: State of Mexico; Michoacán or Guerrero.

17. *Tillandsia Mauryana* L. B. Smith, Contr. Gray Herb. 117: 31. 1937.

Plants aggregated in dense masses, stemless, 10–12 cm. high; leaves very numerous in a dense rosette, recurving, 7–8 cm. long, densely and coarsely spreading-lepidote; sheaths inconspicuous, small, ferruginous-lepidote; blades narrowly triangular, acuminate, subpungent, flat, 7 mm. wide, keeled beneath, cinereous-lepidote; scape very short; scape-bracts foliaceous, densely imbricate, recurving; inflorescence densely digitate from 3–5 spikes; primary bracts lanceolate, acuminate, shorter than the axillary spikes, densely lepidote; spikes suberect, lanceolate, acute, 3 cm. long, 1 cm. wide, complanate, densely 6-flowered; floral bracts ovate, acute, 13 mm. long, equaling or exceeding the sepals, sharply carinate, chartaceous, covered with coarse cinereous subspreading scales; flowers subsessile; sepals lanceolate, acute, 12 mm. long, chartaceous, coarsely cinereous-lepidote, the posterior ones connate for 1 mm.; petals linear, obtuse, 14 mm. long, yellow-green when dry; stamens and pistil included.

TYPE LOCALITY: Cañada de Meztitlan, Hidalgo, altitude 1300–1500 meters.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 2, f. 32, 33.*

18. *Tillandsia Werckleana* Mez, Bull. Herb. Boiss. II. 3: 144. 1903.

Stemless, up to 6 dm. high; leaves about 15 in a dense subtriculate rosette, 2 dm. long; sheaths broadly ovate, very large, densely and minutely brown-punctulate, margins and apex dark-violet; blades ligulate, abruptly acute and apiculate, 18 mm. wide, minutely violet-spotted, subglabrous, chartaceous when dry; scape erect, stout, exceeding the leaves; scape-bracts erect, short, densely imbricate, foliaceous; inflorescence many-flowered, amply paniculate with the

lower branches divided, slenderly thyrsoid, 3 dm. long, 5 cm. in diameter; axes angled, glabrous; lower primary bracts like the scape-bracts, ample, equaling or exceeding the axillary branches; spikes subdense, rarely more than 6-flowered, elliptic in outline, abruptly acute, 4 cm. long, 22 mm. wide; rhachis nearly straight; floral bracts erect, laxly imbricate, hardly concealing the rhachis at anthesis, subobtusate, 20-25 mm. long, coriaceous, glabrous, carinate and prominently nerved toward the apex; flowers suberect, short-pedicellate; sepals oblong, obtuse, 18 mm. long, submembranaceous, sparsely punctulate-lepidote, the posterior ones short-connate and slightly carinate; petals only slightly longer than the sepals; capsule stout, short-beaked, 16 mm. long.

TYPE LOCALITY: Near Cartago, Costa Rica, altitude 1200-1600 meters.

DISTRIBUTION: Known only from the type collection.

NOTE: Further collections may show that this is only a reduced form of *Tillandsia excelsa* Griseb.

19. *Tillandsia hotteana* Urban, Ark. Bot. 17⁷: 16. 1921.

Plant stemless, up to 65 cm. high; leaves many in a dense infundibuliform rosette, 35 cm. long; sheaths broadly elliptic, nearly as long as the blades, densely brown-punctulate, the upper half deep-purple, the lower pale-ferruginous; blades narrowly triangular, acuminate with the extreme apex subulate-involute, 4 cm. wide, pale-green with large irregular purple spots, obscurely punctulate below, subglabrous above; scape erect, stout; scape-bracts erect, foliaceous, densely imbricate; inflorescence compound, very densely cylindric or subfusiform, 2-3 dm. long, 3-5 cm. in diameter; primary bracts erect, densely imbricate, suborbicular, 5 cm. long exclusive of the blades and exceeding the axillary spikes, subinflated, even or faintly striate, pale-reddish-violet, the lower ones with strict foliaceous blades up to 8 cm. long, the upper merely apiculate; spikes sessile, broadly ovate, complanate, densely 2-6-flowered; floral bracts broadly elliptic, acute, up to 3 cm. long, equaling the sepals, ecarinate, subcoriaceous, even, glabrous outside, finely punctulate-lepidote inside; flowers erect; pedicels 2-3 mm. long; sepals linear-lanceolate, acute, coriaceous, even, glabrous outside, connate posteriorly; petals linear-lanceolate, obtuse, 4 cm. long, 7 mm. wide; stamens included.

TYPE LOCALITY: "Morne de la Hotte in montibus Ma Blanche ad arbores regionis Pinorum cr. 1,500 m. alt."

DISTRIBUTION: Eastern Cuba and Haiti.

20. *Tillandsia biflora* R. & P. Fl. Per. 3: 41. 1802.

Diaphoranthema biflora Beer, Bromel. 156. 1857.

Anoplophytum violaceum Beer, Bromel. 266, nomen nudum. 1857.

Tillandsia tetrantha "R. & P." Griseb. Nachr. Ges. Wiss. Gott. 1864: 18. 1865. Not *T. tetrantha* R. & P. 1802.

Tillandsia Grisebachiana Baker, Jour. Bot. 26: 143. 1888.

Stemless, up to 3 dm. high; leaves utriculate-rosulate, 2 dm. long, obscurely punctulate-lepidote, often purple-mottled; sheaths ovate, large; blades ligulate, 2 cm. wide, acute; scape slender, usually curved, its bracts foliaceous, densely imbricate; inflorescence densely bipinnate or rarely reduced to a single polystichous spike, ovoid, glabrous or obscurely punctulate-lepidote; primary bracts broadly ovate, thin, inflated, exceeding the lower and middle spikes, the lower acuminate, the upper apiculate; spikes laxly 1-3-flowered, short-stipitate; floral bracts broadly ovate, obtuse or rarely broadly acute, much shorter than the sepals, carinate, strongly nerved, membranaceous; flowers suberect, 2 cm. long; sepals oblong, obtuse or rarely broadly acute, 12-15 mm. long, subfree, carinate, nerved; petals ligulate, lavender; stamens and pistil included.

TYPE LOCALITY: Mufia, Peru.

DISTRIBUTION: Costa Rica; also from Venezuela to Peru and Bolivia.

ILLUSTRATION: R. & P. Fl. Per. pl. 268, f. b.

21. *Tillandsia Cowellii* Mez & Britton; Mez, Bull. Herb. Boiss.

II. 3: 225. 1903.

Probably stemless, less than 25 cm. high; leaves not known; scape erect, stout, nearly or quite glabrous; scape-bracts densely imbricate, broadly elliptic, abruptly acute, subinflated, not at all laminate, densely and finely appressed-lepidote below; inflorescence depauperately

compound with simple branches, pinnate, compact, slenderly subcylindric, obtuse, 12 cm. long, 25 mm. in diameter; primary bracts exceeding the lower axillary spikes, shorter than the upper ones; spikes sessile, densely 3-5-flowered, narrowly elliptic, complanate, 3 cm. long, 1 cm. wide; floral bracts ovate-elliptic, subobtusate, shorter than the sepals, ecarinate, prominently nerved, inconspicuously punctulate-lepidote; flowers erect, subsessile; sepals subtriangular, up to 16 mm. long, equally short-connate; capsule short-beaked, about equaling the sepals.

TYPE LOCALITY: Mount Misery, St. Kitt's.

DISTRIBUTION: Known only from the type collection.

22. *Tillandsia compacta* Griseb. Nachr. Ges. Wiss.

Gött. 1864: 18. 1865.

Stemless, 3-5 dm. high; leaves about 20 in a narrowly crateriform rosette, up to 4 dm. long; sheaths broadly ovate, 1 dm. long, pale-brown or purple, brown-punctulate-lepidote; blades ligulate, rounded-apiculate, 3-4 cm. wide, flat; scape curved, 4 mm. in diameter; scape-bracts erect, imbricate and wholly concealing the scape, broadly elliptic, acute, punctulate-lepidote, red toward the apex; inflorescence nodding, pinnately compound with simple branches, dense at least toward the apex, ovoid to subcylindric, 6-18 cm. long; axis angled, glabrous; primary bracts broadly elliptic, acute, equaling or exceeding the lower spikes, even, subglabrous; spikes sessile, erect to divergent, ovate or lanceolate, densely 5-10-flowered, complanate, 3-5 cm. long, 2 cm. wide; floral bracts erect, imbricate, broadly ovate, acute, carinate, 18-23 mm. long, exceeding the sepals, three to five times as long as the internodes, even or somewhat nerved, coriaceous, glabrous; flowers subsessile; sepals lanceolate, acute, 14-16 mm. long, coriaceous, even, glabrous, the posterior ones connate for three-fourths of their length; petals 2 cm. long; capsule prismatic, acute, 3 cm. long.

TYPE LOCALITY: Venezuela.

DISTRIBUTION: Eastern Cuba and Haïti; also in Venezuela.

23. *Tillandsia Leiboldiana* Schlecht. Linnaea 18: 414. 1844.

Tillandsia xiphophylla Baker, Jour. Bot. 26: 143. 1888.

Tillandsia phyllostachya Baker, Jour. Bot. 26: 143. 1888.

Tillandsia Aschersomiana Wittm. Bot. Jahrb. 11: 68. 1889.

Tillandsia rhodochlamys Baker, Handb. Bromel. 203. 1889.

Tillandsia sparsiflora Baker, Jour. Bot. 28: 306. 1890.

Tillandsia coccinea Sessé & Moc. Fl. Mex. ed. 2. 81. 1894.

Tillandsia lilacina Mez, in DC. Monog. Phan. 9: 806. 1896.

? *Vriesia Siebertiana* Sander; Bois, Jour. Soc. Hort. Fr. III. 21: 665. 1899.

Stemless, 2-6 dm. high; leaves many in a crateriform rosette, 1-3 dm. long; sheaths ovate, 6-8 cm. long, flat, brown-punctulate-lepidote; blades ligulate, acute, flat, up to 25 mm. wide, very obscurely pale-lepidote, often spotted or tinged with purple; scape erect or rarely curved, slender, glabrous; scape-bracts erect, densely imbricate, large, foliaceous but the upper ones with bright-red bases; inflorescence compound with simple branches, laxly pyramidal or subcylindric, 1-3 dm. long; axis slender, glabrous; primary bracts like the upper scape-bracts, all but the uppermost much exceeding and closely enfolding the axillary spikes, obscurely lepidote toward the apex, the upper ones wholly bright-red; spikes sessile, divergent to spreading, linear to lanceolate, acute, complanate, densely 3-7-flowered, 3-6 cm. long; rhachis straight, slender, angled, glabrous; floral bracts erect, imbricate, narrowly ovate, acute, 2 cm. long, exceeding the sepals, 4 times as long as the internodes and usually concealing the rhachis, subcoriaceous to chartaceous, prominently nerved, carinate and often dark-purple toward the apex, glabrous outside, punctulate inside; flowers subsessile; sepals lance-oblong, up to 16 mm. long, thin, glabrous; petals linear, up to 3 cm. long, violet; stamens included; capsules slenderly cylindrical, acute, about equaling the floral bracts.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Vera Cruz, British Honduras, Guatemala, Honduras, Nicaragua, and Costa Rica.

ILLUSTRATIONS: Rev. Hort. 66: pl. opp. 378; Engler, Pflanzenreich 4²²: f. 104.

24. *Tillandsia cauliflora* Mez & Wercklé; Mez, Bull. Herb. Boiss.
II. 5: 100. 1905.

Stemless, about 3 dm. high; leaves about 10 in a dense utriculate rosette, 2 dm. long, erect or suberect, bright-red when living; sheaths elliptic, large and conspicuous, densely and minutely punctulate-lepidote; blades ligulate, acuminate with a reflexed tip, 2 cm. wide, subglabrous, chartaceous when dry; scape erect, very short; scape-bracts strict, densely imbricate, foliaceous, red; inflorescence few-flowered, paniculate, cylindrical, 13 cm. long; primary bracts foliaceous but somewhat narrower, much exceeding the axillary spikes; spikes densely 1-2-flowered, lanceolate in outline, acute at both ends, 4 cm. long, 1 cm. wide, complanate, bearing a sterile bract at base; floral bracts imbricate and concealing the axis, subtriangular, acuminate, 3 cm. long, much exceeding the sepals, sharply carinate, slightly incurved toward the apex, even, glabrous, pergamaceous; flowers subsessile, erect, 57 mm. long; sepals lanceolate, acute, 22 mm. long, glabrous, even, equally subfree, the posterior ones carinate; petals obtuse, exceeding the stamens.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type collection.

2. Subgenus *Anoplophytum* (Beer) Baker, Jour. Bot. 25: 212. 1887. *Anoplophytum* Beer, Flora 37: 346. 1854. *Tillandsia* § *Anoplophytum* Griseb. Fl. Brit. W. Ind. 597. 1864.

25. *Tillandsia pulchella* Hook. Exot. Fl. pl. 154 (on plate). 1825;
Sieb. & Vriese, Ann. Hort. Bot. Fl. Jard. 3: 49. 1859.

Tillandsia subulata Vell. Fl. Flum. 133. 1825.

Tillandsia pityphylla Mart.; Schultes, in R. & S. Syst. Veg. 7: 1208. 1830.

Tillandsia rosea Lindl. Bot. Reg. 16: pl. 1357. 1830.

Anoplophytum pulchellum Beer, Bromel. 41. 1857.

Diaphoranthema subulata Beer, Bromel. 155. 1857.

Tillandsia recurvifolia Hook. Bot. Mag. pl. 5246. 1861.

Anoplophytum amoenum E. Morren, Belg. Hort. 33: 265. 1883.

Tillandsia pulchella var. *surinamensis* Mez, in Mart. Fl. Bras. 3^a: 603. 1894.

Tillandsia surinamensis Miq.; Mez, in Mart. Fl. Bras. 3^a: 603, as synonym. 1894.

Tillandsia pseudostricta Chodat & Vischer, Bull. Soc. Bot. Genève II. 8: 263. 1917.

Plant more or less caulescent with stem up to 25 cm. long, often branching and associated in great mats, rather variable; leaves densely polystichous along the stem, 5-10 cm. long, densely and minutely appressed-lepidote throughout; sheaths small and inconspicuous, barely distinct from the blades; blades narrowly triangular, subulate-acuminate, channeled above, 2-7 mm. wide; scape erect or ascending, slender, short, largely concealed by the leaves; scape-bracts erect, imbricate, elliptic, caudate, membranaceous, rose; inflorescence about equaling the leaves, simple, polystichous-flowered, ovoid, densely 4-10-flowered; floral bracts like the scape-bracts but suborbicular and less caudate, much exceeding the sepals, punctulate-lepidote, prominently nerved; flowers erect; sepals lanceolate, acute, glabrous, 10 mm. long, membranaceous, much connate posteriorly; petals blue, white, or rose, 20 mm. long, the claw linear, the blade oblong, broadly obtuse; stamens shorter than the petals, emerging from the throat of the corolla, shorter than the style, filaments transversely plicate; capsule cylindrical, 15 mm. long.

TYPE LOCALITY: "Trinidad"; described from cultivation.

DISTRIBUTION: Cuba, Jamaica, and Haiti, and southward through Venezuela, Guiana, and eastern Brazil to Bolivia and northern Argentina.

ILLUSTRATIONS: Hook. Exot. Fl. pl. 154; Ann. Hort. Bot. Fl. Jard. 3: pl. opp. 49; Bot. Mag. pl. 5229, 5246; Bot. Reg. 16: pl. 1357; Belg. Hort. 33: pl. 17.

3. Subgenus *Phytarrhiza* (De Vis.) Baker, Jour. Bot. 25: 212, 214. 1887. ("*Phytarrhiza*".) *Phytarrhiza* De Vis. Mem. Ist. Veneto. 5: 340. 1855. *Tillandsia* § *Wallisia* Regel, Gartenflora 18: 193. 1869. *Tillandsia* § *Phytarrhiza* K. Koch, Ind. Sem. Hort. Berol. 1873: App. 4: 1. 1874. *Tillandsia* § *Wallisia* Baker, Jour. Bot. 25: 212. 1887.

26. *Tillandsia anceps* Lodd. Bot. Cab. pl. 771. 1823.

Platylachys anceps Beer, Bromel. 80. 1857.

Vriesea anceps Lemaire, Ill. Hort. 6: Misc. 15. 1859.

Tillandsia xiphostachys Griseb. Nachr. Ges. Wiss. Gött. 1864: 14, in part. 1865.
Phytarrhiza anceps E. Morren, Belg. Hort. 29: 368. 1879.
Vriesea Schlechtendahlia Wittm. Bot. Jahrb. 11: 69, excl. syn. 1889.
Vriesea Schlechtendahlia var. *alba* Wittm. Bot. Jahrb. 11: 69. 1889.
Tillandsia lineatifolia Mez, in DC. Monog. Phan. 9: 686. 1896.

Plant stemless; leaves numerous, densely rosulate, 15–40 cm. long, equaling or exceeding the inflorescence, very densely and minutely pale-appressed-lepidote throughout, green; sheaths triangular-ovate, longitudinally red-striate; blades recurving, narrowly triangular, acuminate 7–12 mm. wide at the base; scape erect, stout, very short and largely hidden by the leaves; scape-bracts erect, densely imbricate, ovate, acute or the lowest with a stiff erect linear blade, much smaller than the floral bracts, coriaceous, even, glabrous; inflorescence simple, elliptic in outline, strongly complanate, 10–15 cm. long, 55 mm. wide, densely 10–20-flowered, glabrous; floral bracts suberect, densely imbricate, triangular-acute, up to 4 cm. long, much exceeding the sepals, strongly carinate, coriaceous, even, somewhat shiny, green or pale-rose with greenish margins; flowers short-pedicellate; sepals narrowly lanceolate, acute, 3 cm. long, coriaceous, even, equally subfree, carinate; petals more than twice as long as the sepals, the claw linear, white, the blade spreading, lance-elliptic, acute, blue or rarely white; stamens deeply included, exceeding the style; capsule slenderly cylindric, shorter than the sepals.

TYPE LOCALITY: "Trinidad"; described from cultivation.

DISTRIBUTION: Honduras, Costa Rica, and Panama; also in Trinidad, British Guiana, Venezuela, and Colombia.

ILLUSTRATIONS: Bot. Cab. *pl.* 771; Belg. Hort. 29: *pl.* 20/21.

27. *Tillandsia venusta* Mez & Wercklé; Mez, Bull. Herb. Boiss.
 II. 5: 108. 1905.

Plant stemless, up to 45 cm. high; leaves numerous in a utricular rosette, 15–30 cm. long, purple-spotted; sheaths ovate-elliptic, densely pale-punctulate-lepidote; blades ligulate, obtuse or broadly acute, apiculate, 45 mm. wide, subglabrous, purple at apex, coriaceous when dry; scape erect, slender, about equaling the leaves; scape-bracts broadly lanceolate, acute, membranaceous, equaling the internodes or the highest somewhat shorter; inflorescence laxly bipinnate, composed of a terminal and 2 lateral spikes, 13 cm. long, glabrous; primary bracts like the scape-bracts, barely reaching the lowest flowers of the axillary spikes; spikes subspreading, with long sterile naked bases; rhachis straight, angled; floral bracts elliptic, acute, distinctly shorter than the sepals, two to four times as long as the internodes, ecarinate, prominently nerved, membranaceous; flowers dense, but subspreading so that the rhachis is completely exposed, sessile, faintly sweet-scented; sepals lanceolate, acute, 14 mm. long, three to five times as long as the internodes, ecarinate, coriaceous, yellow-brown or olivaceous with a dark-brown margin, free; petals 25 mm. long, white, the claw linear, 4 mm. wide, the blade spreading at anthesis, triangular-ovate, broadly acute, 12 mm. long, 10 mm. wide; stamens free, equal, 7 mm. long, deeply included; pistil 6 mm. long; ovary ovoid, as long as the style.

TYPE LOCALITY: Near Turrialba, Costa Rica, altitude 600 meters.

DISTRIBUTION: Known only from the type locality.

28. *Tillandsia monadelpha* (E. Morren) Baker, Jour.
 Bot. 25: 281. 1887.

Phytarrhiza monadelpha E. Morren, Belg. Hort. 32: 168. 1882.

Tillandsia graminifolia Baker, Jour. Bot. 25: 281. 1887.

Tillandsia monobotrya Mez, Repert. Sp. Nov. 16: 77. 1919.

Tillandsia digitata "Mez" Standley, Smithsonian Misc. Coll. 78³: 12. 1927. Not *T. digitata* Mez, 1896.

Stemless, flowering plant 35 cm. high; leaves densely rosulate, 2 dm. long, obscurely punctulate-lepidote; sheaths ovate; blades very narrowly triangular, 10–15 mm. wide; scape erect, slender, glabrous; scape-bracts elliptic-lanceolate, imbricate, lepidote at the apex; inflorescence simple, distichous, linear-oblong in outline, much compressed, about 22-flowered, appearing lax by the spreading of the flowers, 13 cm. long; rhachis straight, angled, thickened at the base of each flower; floral bracts ovate, acute, spreading, 17 mm. long, equaling the sepals, coriaceous

or subcoriaceous, carinate, striate, sparsely lepidote, soon glabrous; flowers sessile, spreading, 30 mm. long; sepals equally short-connate, glabrous, lance-elliptic, carinate; petals white, the blade ovate, reflexed; stamens deeply included, exceeding the style, filaments connate; capsule slenderly cylindric, 4-7 cm. long.

TYPE LOCALITY: South America; described from cultivation.

DISTRIBUTION: British Honduras and Guatemala to Panama; also from Colombia and Ecuador to Guiana and Trinidad.

ILLUSTRATIONS: Belg. Hort. 32: pl. 7.

4. Subgenus *Diaphoranthema* (Beer) Baker, Jour. Bot. 16: 236. 1878. *Tillandsia* § *Strepsia* Nutt. Gen. 1: 208. 1818. *Dendropogon* Raf. Neog. 3. 1825. *Strepsia* Nutt.; Steud. Nom. Bot. ed. 2. 2: 645. 1841. *Diaphoranthema* Beer, Flora 37: 349. 1854. *Tillandsia* § *Diaphoranthema* K. Koch, Ind. Sem. Hort. Berol. 1873: App. 4: 1. 1874. *Tillandsia* subgenus *Strepsia* Baker, Jour. Bot. 25: 212. 1887.

29. *Tillandsia recurvata* L. Sp. Pl. ed. 2. 410. 1762.

Renealmia recurvata L. Sp. Pl. 287. 1753.

Tillandsia uniflora H. B. K. Nov. Gen. & Sp. 1: 290. 1816.

Diaphoranthema uniflora Beer, Bromel. 154. 1857.

Diaphoranthema recurvata Beer, Bromel. 156. 1857.

Tillandsia monostachys Gillies; Baker, Jour. Bot. 16: 239, as synonym. 1878.

Plant somewhat variable, 4-23 cm. long when in flower; stems densely massed, simple or few-branched, 1-10 cm. long, typically much shorter than the leaves but occasionally about equaling them; roots present; leaves distichous-ranked, 3-17 cm. long, densely pruinose-lepidote with cinereous or ferruginous scales; sheaths elliptic-ovate, thin, many-nerved with a broad hyaline nerveless margin, the extreme base glabrous, elsewhere densely lepidote and with a ciliate margin of elongate scales, imbricate and completely concealing the stem; blades typically recurved, sometimes only spreading or even erect, linear, terete, 0.5-2 mm. in diameter, rather soft with a weak point; scape terminal, always prominent, up to 13 cm. long, about 0.5 mm. in diameter; scape-bracts linear-lanceolate, lepidote, 1 or very rarely 2 immediately below the inflorescence, sometimes one next the inflorescence and one remote; inflorescence typically 1-2-flowered or rarely up to 5-flowered, dense; floral bracts like the scape-bracts but smaller, typically equaling or longer than the sepals but often distinctly shorter, several-nerved, densely lepidote; flowers erect, subsessile; sepals lanceolate, usually acute, 4-9 mm. long, thin, with 3 or more prominent nerves, typically glabrous but towards the southern limits of the species somewhat lepidote in an increasing proportion of specimens; petals narrow, pale-violet or white; stamens deeply included, exceeding the pistil; capsule slenderly cylindric, abruptly short-beaked, up to 3 cm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Arizona, Texas, and Florida, and southward to northern Argentina and Chile.

ILLUSTRATION: R. & P. Fl. Per. pl. 271, f. a; Shattuck, Bahama Isl. pl. 40; Sci. Surv. Porto Rico 7: pl. 49.

30. *Tillandsia usneoides* L. Sp. Pl. ed. 2. 411. 1762.

Renealmia usneoides L. Sp. Pl. 287. 1753.

Tillandsia trichooides H. B. K. Nov. Gen. & Sp. 1: 290. 1816.

Dendropogon usneoides Raf. Fl. Tell. 4: 25. 1838.

Strepsia usneoides Steud. Nom. Bot. ed. 2. 2: 645. 1841.

Tillandsia crinita Willd.; Beer, Bromel. 152. 1857.

Plant growing pendent from trees in branching strands up to 8 m. long; roots absent; stem sympodial, less than 1 mm. in diameter, the internodes 3-6 cm. long with only the extreme base covered by the leaf-sheath, strongly curved; pseudo-axillary branches, actually a continuation of the main axis, very short and concealed by the basal leaf-sheath, bearing 2-3 leaves; leaves distichous-ranked, 25-50 mm. long, densely cinereous-lepidote or ferruginous lepidote; sheaths elliptic, involute, up to 8 mm. long; blades filiform, less than 1 mm. in diameter; scape practically none; inflorescence reduced to a single pseudo-terminal flower; floral bract ovate, apiculate or caudate, densely lepidote, shorter than the sepals; flower subsessile; sepals narrowly ovate, acute, up to 7 mm. long, thin, strongly nerved, glabrous, equally short-connate; petals narrow,

acute or obtuse, 9–11 mm. long, pale-green or blue; stamens deeply included, exceeding the pistil; capsule up to 25 mm. long, cylindric, abruptly short-beaked.

TYPE LOCALITY: Virginia, Jamaica.

DISTRIBUTION: Virginia to Texas along the coast, and southward to central Argentina and Chile.

ILLUSTRATIONS: Belg. Hort. 27: *pl.* 17; Bot. Mag. *pl.* 6309; E. & P. Nat. Pfl. 24: *f.* 27; Britt. & Brown, Ill. Fl. *f.* 904; ed. 2. *f.* 1146; Engler, Pflanzenreich 432: *f.* 109.

5. Subgenus *Pseudo-Catopsis* Baker, Handb. Bromel. 157, 192. 1889. *Tillandsia* § *Pseudo-Catopsis* André, Bromel. Andr. 62, 66. 1889.

31. *Tillandsia crispa* (Baker) Mez, in DC. Monog. Phan. 9: 739. 1896.

Guzmania crispa Baker, Jour. Bot. 25: 173. 1887.

Tillandsia undulifolia Mez, in DC. Monog. Phan. 9: 740. 1896.

Tillandsia plicatifolia Ule, Verh. Bot. Ver. Brand. 48: 144. 1907.

Stemless, 1–3 dm. high; leaves many, densely rosulate, finely appressed-lepidote throughout; sheaths large, brown-lepidote; blades very narrowly triangular, undulate-cripsed; scape erect or slightly curved, slender; scape-bracts elliptic, somewhat inflated, apiculate to finely caudate, appressed-lepidote; inflorescence of one spike or of several digitately arranged spikes; spikes oblong, densely 6–36-flowered, 3–8 cm. long, 1.5–2.5 cm. wide; rhachis pruinose, brown-lepidote; floral bracts 9–15 mm. long, distinctly exceeding the sepals, suborbicular, inflated-convex, membranaceous, lepidote; flowers erect or suberect, sessile; sepals 5–8 mm. long, broadly elliptic, asymmetric, ecarinate, coriaceous, sparingly lepidote or glabrous, even; petals exceeding the sepals, coherent; stamens and pistil included.

TYPE LOCALITY: Ocaña, Norte de Santander, Colombia.

DISTRIBUTION: Panama; also in Colombia, Ecuador and Peru.

32. *Tillandsia Ghiesbreghtii* Baker, Handb. Bromel. 206. 1889.

Stemless, 1 m. or more high; leaves densely rosulate, 3–5 dm. long, covered with very minute appressed dark-centered scales but appearing glabrous to the naked eye, chartaceous in the dried specimens; sheaths ovate, 5–6 cm. broad, densely punctulate-lepidote, brown; blades 3–4 cm. wide, ligulate, acute; scape erect, glabrous; scape-bracts ovate-elliptic, acute, appressed, exceeding the internodes; inflorescence 3 to over 5 dm. long, 2 dm. wide, lax, distichous, bipinnate except for the lowest branches which are sometimes divided; primary bracts like the scape-bracts, up to 35 mm. long; spikes arcuate-spreading, laxly 18-flowered, 15 cm. long or less, 1.5–2 cm. wide, usually bearing 1–4 sterile bracts at base; rhachis glabrous, sharply 4-angled, excavated next the flowers; floral bracts subspreading, not at all imbricate nor concealing the rhachis at maturity, 12 mm. long, much exceeding the sepals and the internodes, ovate-elliptic, obtuse, ecarinate, even or very faintly nerved, glabrous, coriaceous; flowers subsessile; sepals 7–8 mm. long, elliptic, asymmetric, coriaceous, glabrous, very faintly nerved if at all; petals 2 mm. longer than the sepals, white or yellowish, abruptly spreading toward the apex, much exceeding the stamens; anthers deltoid-cordate, bifid at apex, 1 mm. long; style short.

TYPE LOCALITY: "Oaxaca".

DISTRIBUTION: Vera Cruz.

33. *Tillandsia adscendens* L. B. Smith, sp. nov.

Tillandsia Ghiesbreghtii "Baker" L. B. Smith, Contr. Gray Herb. 89: 24, in part. 1930. Not *T. Ghiesbreghtii* Baker. 1889.

Stemless, 6 to over 10 dm. high; leaves rosulate, over 3 dm. long, punctulate-lepidote; sheaths broadly elliptic, 1 dm. long, deep-castaneous; blades ligulate, acute, nearly 4 cm. wide at base; scape erect, stout; scape-bracts erect, densely imbricate, ovate, acute, even, obscurely punctulate-lepidote; inflorescence dense, 4–6 dm. long, very narrow, complanate; primary bracts like the scape-bracts, suberect, 3–7 cm. long, mostly much shorter than the axillary branches; branches distichous, erect or strongly ascending, simple or the lowest slightly divided;

spikes linear, complanate, 5–10 cm. long, densely 10–16-flowered; floral bracts erect, densely imbricate, very broadly ovate, broadly acute or obtuse, 13–21 mm. long, much exceeding the sepals, ecarinate, even, coriaceous, glabrous; flowers sessile; sepals asymmetric, broadly obovate, truncate, 8 mm. long, even, coriaceous, sparsely pale-lepidote or glabrous; petals shorter than the sepals, yellow; stamens and pistil included.

Acaulis; foliis ultra 3 dm. longis, punctulato-lepidotis; laminis ligulatis, acutis, fere 4 cm. latis; scapo erecto; scapi vaginis imbricatis; inflorescentia angustissima, 4–6 dm. longa; bracteis primariis quam spicas axillares plerumque bene brevioribus; ramis erectis vel arcte adscendentibus, simplicibus vel infimis paupere divisis; spicis 5–10 cm. longis; bracteis florigeris dense imbricatis, latissime ovatis, 13–21 mm. longis, sepala multo superantibus, ecarinatis, glabris, coriaceis; sepalis asymmetricis, 8 mm. longis; petalis quam sepala brevioribus; staminibus styloque inclusis.

Type, *Botteri* 1005, from Orizaba, Vera Cruz, in the Gray Herbarium.

DISTRIBUTION: Vera Cruz and Costa Rica.

NOTE: The Costa Rican record is based on *Standley & Valerio* 46302, from Quebrada Serena, southeast of Tilaran, province of Guanacaste, altitude about 700 meters, in the United States National Herbarium.

34. *Tillandsia Rothschuhiana* Mez, in DC. Monog. Phan. 9: 645.

1896 ("Rothschuchiana"); Bot. Jahrb. 30: Beibl. 67: 8. 1901.

Tillandsia spiculosa var. *Rothschuhiana* L. B. Smith, Contr. Gray Herb. 89: 14. 1930.

Stemless, 45–55 cm. high; leaves densely rosulate, suberect, 16–25 cm. long, densely and minutely appressed-lepidote, especially beneath; sheaths large, ovate or elliptic, castaneous; blades ligulate, acute, 15–20 mm. wide, flat, cinereous; scape erect, glabrous, exceeding the leaves; scape-bracts erect, imbricate, elliptic, acute, densely and finely pale-lepidote; inflorescence densely bipinnate, 14–15 cm. long, narrow; primary bracts strict, ovate, acute, 25 mm. long, much shorter than the axillary spikes; spikes distichous or slightly secund, linear-lanceolate, 45–50 mm. long, complanate, 10-flowered; floral bracts erect, densely imbricate, very broadly ovate, obtuse, 8–9 mm. long, slightly but constantly exceeding the sepals, 10–11 mm. wide, ecarinate, even, glabrous, coriaceous; flowers sessile; sepals asymmetric, obovate, truncate, 6–7 mm. long, coriaceous, even, glabrous; capsule cylindric, short-beaked, 12–14 mm. long.

TYPE LOCALITY: Nicaragua.

DISTRIBUTION: British Honduras and Nicaragua.

35. *Tillandsia Fawcettii* Mez, in DC. Monog. Phan. 9: 752. 1896.

Plant stemless, 1 m. or more high; leaves densely rosulate, coriaceous-chartaceous, densely appressed-pale-lepidote; sheaths unknown; blades oblong, nearly 4 cm. wide, rounded-apiculate; scape erect, stout, nearly glabrous; scape-bracts ovate, cinereous-lepidote, the lower ones acuminate, imbricate, the upper ones acute, equaling the internodes; inflorescence imperfectly known, laxly tripinnate, not ferruginous-lepidote; axis strongly geniculate, glabrous; branches remote, suberect, 11 cm. long; primary bracts reflexed, equaling the scape-bracts, much shorter than the axillary branches; spikes long-stipitate, very laxly 10-flowered, scarcely more than 8 cm. long; rhachis undulate, not winged; floral bracts not at all imbricate or concealing the rhachis, about 7 mm. long, distinctly exceeding the sepals, elliptic, obtuse, more or less incurved at the apex, coriaceous, even, lepidote; flowers erect, subsessile; sepals 5 mm. long, rigid, scanty lepidote.

TYPE LOCALITY: Blue Mountains, Jamaica.

DISTRIBUTION: Cuba, Jamaica, and Haiti (Mez).

36. *Tillandsia spiculosa* Griseb. Nachr. Ges. Wiss.

Gött. 1864: 17. 1865.

Tillandsia micrantha Baker; Rusby, Bull. Torrey Club 29: 698. 1902. Not *Tillandsia micrantha* Baker, 1887.

Plant stemless, up to 8 dm. high; leaves rosulate, 3–4 dm. long, obscurely punctulate-lepidote throughout, often irregularly purple-spotted; sheaths relatively large, broadly ovate,

dark-brown; blades ligulate, rounded-apiculate or acute, 2-4 cm. wide; scape erect, glabrous, often much exceeding the leaves; scape-bracts narrowly elliptic, rounded-apiculate or short-caudate, about equaling the internodes or the upper ones slightly shorter, punctulate-lepidote; inflorescence tripinnate or if bipinnate the branches not over 7 cm. long, lax; axes soon glabrous; primary bracts narrowly ovate, apiculate, much shorter than the axillary branches; spikes linear in outline, often curved, densely 24-flowered, up to 9 cm. long, 6-9 mm. wide, spreading, usually long-stipitate with sterile bracts at the base; floral bracts broadly ovate, 6-9 or rarely 5 mm. long, equaling or slightly exceeding the sepals, convex, ecarinate, coriaceous, even or faintly fernerved, scantily lepidote or glabrous; flowers sessile or subsessile, spreading, crowded and touching at maturity; sepals broadly elliptic, even, glabrous, asymmetric; petals orange or yellow, acute; stamens included, the anthers deltoid; ovary globose, the style short; capsule slenderly cylindrical, 22 mm. long.

TYPE LOCALITY: Colonia Tovar, Aragua, Venezuela.

DISTRIBUTION: Costa Rica; also in Venezuela, Colombia, and Bolivia.

NOTE: The typical variety, with the sterile bases of the branches longer than the primary bracts, is not yet known from North America, where the species is represented only by the following:

Tillandsia spiculosa var. *palmana* (Mez) L. B. Smith, Contr. Gray Herb. 89: 14. 1930. *Tillandsia palmana* Mez, Bot. Jahrb. 30: Beibl. 67: 9. 1901. Sterile bases of the branches shorter than the primary bracts; leaves rounded-apiculate. TYPE LOCALITY: La Palma, Costa Rica. DISTRIBUTION: Costa Rica.

37. *Tillandsia Lescaillei* C. Wright; Sauv. Anal. Acad. Ci.
Habana 8: 53. 1871.

Stemless, 6-11 dm. in length; leaves forming a basal rosette 6-10 cm. thick, all erect, 25-30 cm. long; sheaths broad, elliptic, chestnut-brown, passing almost imperceptibly into the blades; blades evenly green, subulate, 3-4 cm. wide; scape much surpassing the leaves, decurved; scape-bracts membranaceous, densely and finely pale-lepidote, apiculate, much shorter than the internodes and not wholly enfolding the scape; inflorescence pendulous at maturity, open, bipinnate and distichous, 25-55 cm. long, 10-20 cm. wide; primary bracts not over 25 mm. long, narrow, apiculate; spikes linear in outline, 5-12 cm. long, about 10 mm. wide, with flowers closely erect and barely or not quite imbricate, often long-stipitate and bearing several sterile bracts at the base; rhachis somewhat flexuous; floral bracts 7-8 mm. long, about equaling the sepals, usually quite nerveless, soon glabrous, ecarinate; sepals asymmetric, obtuse; capsule cylindrical, 18-23 mm. long.

TYPE LOCALITY: Monteverde, Oriente, Cuba.

DISTRIBUTION: Cuba and Hispaniola.

38. *Tillandsia adpressa* André, Enum. Bromél. 6. 13 D 1888;
Rev. Hort. 60: 566. 16 D 1888.

Catopsis Schumanniana Wittm. Bot. Jahrb. 11: 70. 1889.

Tillandsia Schumanniana Mez, in DC. Monog. Phan. 9: 740. 1896.

Plant extremely variable in habit, stemless, 2-5 dm. high; leaves many, rosulate, usually forming an ovoid pseudobulb, 15-30 cm. long, densely punctulate-lepidote throughout; sheaths broadly elliptic-ovate, dark-brown with a narrow hyaline margin, brown-lepidote; blades not over 20 mm. wide at the base, usually much less, narrowly triangular, involute-subulate at least near the apex, erect or recurved, pale-lepidote; scape erect or nearly so, ferruginous- or pale-lepidote with minute spreading scales; scape-bracts narrowly ovate-oblong, long-caudate, usually equaling or exceeding the internodes irrespective of the caudate tips, densely appressed-lepidote; inflorescence narrow, bipinnate, of 4-12 spikes, erect or arching-pendulous; axis straight to very strongly geniculate, spreading-lepidote, becoming glabrous; primary bracts narrowly ovate-oblong, attenuate to definitely caudate, densely appressed-lepidote, usually equaling or exceeding the spikes, always attaining several of the lower flowers of the spikes; spikes distichous, normally 8-12-flowered; floral bracts distinctly shorter than the sepals at maturity, ovate, acute, densely tomentose-lepidote; flowers sessile, spreading, the terminal ones often abortive; sepals scarcely more than 5 mm. long, strongly asymmetric, obovate,

usually distinctly keeled, densely spreading-lepidote; capsule cylindric, apiculate, 20–25 mm. long.

TYPE LOCALITY: Pichincha, Ecuador.

DISTRIBUTION: Costa Rica; also in Colombia and Ecuador.

ILLUSTRATION: André, *Bromel. Andr. pl. 23, f. b.*

NOTE: The typical variety is not yet known in North America, where the species is represented by the two following:

Tillandsia adpressa var. *orthiantha* (Standley) L. B. Smith, *Contr. Gray Herb.* 89: 9. 1930.
Tillandsia orthiantha Standley, *Jour. Wash. Acad.* 17: 248. 1927. Inflorescence compact, the spikes erect and appressed to the rachis at maturity. TYPE LOCALITY: Laguna de la Chonta, northeast of Santa Maria de Dota, San José, Costa Rica. DISTRIBUTION: Costa Rica.

Tillandsia adpressa var. *Tonduziana* (Mez) L. B. Smith, *Contr. Gray Herb.* 89: 8. 1930.
Tillandsia Tonduziana Mez, *Bot. Jahrb.* 30: Beibl. 67: 9. 1901. Inflorescence open, elongate, the spikes spreading or reflexed at maturity. TYPE LOCALITY: La Palma, Costa Rica. DISTRIBUTION: Costa Rica.

39. *Tillandsia caribaea* L. B. Smith, *Proc. Am. Acad.* 70: 155. 1935.

Tillandsia parviflora "R. & P." Griseb. *Nachr. Ges. Wiss. Gött.* 1864: 16. 1865. Not *T. parviflora* R. & P. 1802.

Catopsis Fendleri Baker, *Jour. Bot.* 25: 175. 1887.

Tillandsia Fendleri Mez, in DC. *Monog. Phan.* 9: 741. 1896. Not *T. Fendleri* Griseb. 1865.

Tillandsia pauciflora (error for *parviflora*) Griseb.; Mez, in DC. *Monog. Phan.* 9: 741, as synonym. 1896.

Tillandsia ferruginascens Mez, in Engler, *Pflanzenreich* 4³²: 500. 1935.

Stemless, the flowering plant 5 dm. high; leaves 10–12 in a dense rosette, 15–20 cm. long, densely punctulate throughout with minute appressed scales; sheaths ovate, dark-brown, brown-lepidote; blades narrowly triangular, not over 20 mm. wide at the base, gray-green, pale-lepidote; scape erect or curved, spreading-ferruginous-lepidote, becoming glabrous; scape-bracts oblong-elliptic, caudate, densely pale-lepidote, about equaling the internodes; inflorescence bipinnate, erect or pendulous, lax, 20–30 cm. long, 6–10 cm. in diameter, much exceeding the leaves; axis distinctly geniculate, angled, tomentosely ferruginous-lepidote, becoming glabrous; primary bracts lanceolate-acute, densely pale-lepidote, about half as long as the spikes; spikes spreading or reflexed, very laxly 3–12-flowered, distinctly stipitate; rachis slightly flexuous, densely ferruginous-lepidote; floral bracts shorter than the sepals, broadly ovate, apiculate, bluntly keeled, striate, densely ferruginous-lepidote; flowers spreading, sessile, 6–9 mm. long, the apical ones often poorly developed; sepals subfree, asymmetric, slightly longer than the petals, densely lepidote; petals much exceeding the stamens, the blade minute; anthers lanceolate, acute, 1.5 mm. long; ovary globose, abruptly contracted into the thick style; stigma even with the middle of the anthers; capsule cylindric, abruptly short-beaked, 25 mm. long; seeds many, 2.5 mm. long, the coma white, 15 mm. long.

TYPE LOCALITY: Colonia Továr, Aragua, Venezuela, altitude 2300 meters.

DISTRIBUTION: Cuba and Haiti; also in Venezuela.

40. *Tillandsia araeostachya* Harms, *Notizbl. Bot. Gart.*

Berlin 10: 797. 1929.

Flowering plant 3–5 dm. or higher; leaves densely rosulate, about 2 dm. long, densely and minutely lepidote; sheaths broad; blades linear, acuminate, somewhat recurved; scape erect, slender; scape-bracts lanceolate, acuminate, subglabrous, the lower ones exceeding the internodes, the upper equaling them or slightly shorter; inflorescence ample, very laxly bipinnate or tripinnate; primary bracts lanceolate, acute, 5–15 mm. long, shorter than the sterile base of the branch; spikes elongate, slender, pedunculate, remotely 8–15-flowered, 5–12 cm. long, or more if divided; rachis very slender, nearly straight or slightly flexuous; floral bracts ovate, navicular, 2–3 mm. long, distinctly shorter than the sepals, obtuse; flowers sessile, obliquely or fully spreading; sepals 4–5 mm. long, asymmetric, sparsely appressed-lepidote; capsule 18–20 mm. long.

TYPE LOCALITY: Sierra Maestra, Alto de Iberia, Oriente, Cuba.

DISTRIBUTION: Eastern Cuba and Haiti.

41. *Tillandsia contorta* Mez & Pittier; Mez, Bull. Herb. Boiss.
II. 3: 224. 1903.

Stemless, 17 cm. high; leaves densely rosulate, forming a pseudobulb 6 cm. in diameter, convolute, subfistulose, very minutely appressed-lepidote (especially the younger leaves); sheaths broadly ovate-elliptic, brown-lepidote, not at all violet-colored; blades 6 mm. wide, very narrowly triangular, more or less undulate-cripsed, not at all spotted, canescent-lepidote; scape slender, decurved; scape-bracts tubular, shorter than the internodes; inflorescence pendulous, about equaling the leaves, 9 cm. long, 7 cm. wide, densely bipinnate; axis slender, at length glabrous; primary bracts very small, not attaining the lowest flowers of the spikes; spikes densely 14-flowered, the lower ones long-stipitate, suberect to spreading, 50 mm. long; floral bracts suberect, ovate, obtuse, much shorter than the sepals, rigid, nearly glabrous, distinctly convex; flowers suberect, sessile, scarcely more than 5 mm. long, 2.5 mm. apart; sepals free, asymmetric, broadly rounded, brown; capsule cylindric, 8 mm. long.

TYPE LOCALITY: Near Tuis, Costa Rica.

DISTRIBUTION: Known only from the type collection.

42. *Tillandsia guanacastensis* Standley, Jour. Wash.
Acad. 17: 247. 1927.

Stemless, 15–20 cm. high; leaves about 25, densely rosulate, 10–20 cm. long, densely lepidote throughout with gray appressed scales; sheaths 2–3 cm. wide, broadly ovate with a narrow hyaline margin; blades 10 mm. wide at the base, narrowly triangular, subulate-involute, erect or recurved; scape erect, 7–9 cm. long, almost completely concealed by the leaves, sparsely pale-lepidote; scape-bracts small, about equaling the internodes, ovate-elliptic, apiculate, pale-lepidote; inflorescence digitate or pinnate, of 2–9 spikes, equaling or slightly exceeding the leaves; primary bracts like the scape-bracts, extending no higher than the lowest flower of the spike; spikes densely 12–22-flowered, straight, nearly erect, 3–6 cm. long, about 1 cm. wide; floral bracts 4 mm. long, distinctly shorter than the sepals, convex, not at all carinate, ovate-obtuse, green, sparsely pale-lepidote, even, thin; flowers sessile, nearly erect; sepals 5–6 mm. long, asymmetric, obovate, keeled toward the base, rounded and emarginate at the apex, very sparsely and obscurely lepidote, even; petals 6 mm. long, yellowish-white; stamens and pistil included; capsule slenderly cylindric, abruptly short-beaked, 18–20 mm. long, 2.5 mm. in diameter; seeds pale-brown, fusiform, 2 mm. long, the coma white.

TYPE LOCALITY: La Tejona, north of Tilarán, province of Guanacaste, Costa Rica, altitude 600 to 700 meters.

DISTRIBUTION: Costa Rica.

6. Subgenus *Platystachys* (Beer) Baker, Jour. Bot. 25: 212, 236. 1887. *Pityrophyllum* Beer, Bromel. 17, 79. 1857. *Platystachys* Beer, Bromel. 18, 80. 1857. *Tillandsia* § *Pityrophyllum* K. Koch, Ind. Sem. Hort. Berol. 1873: App. 4: 1. 1874. *Tillandsia* § *Platystachys* ("Platystachya") Benth. & Hook. Gen. Pl. 3: 670. 1883. *Tillandsia* subgenus *Pityrophyllum* Baker, Jour. Bot. 26: 39. 1888. *Tillandsia* subgenus *Pseudalcantarea* Mez, in Engler, Pflanzenreich 43²: 437, 455, in part. 1935.

43. *Tillandsia Karwinskyana* Schultes, in R. & S. Syst.
Veg. 7: 1209. 1830.

Tillandsia Pringlei S. Wats. Proc. Am. Acad. 26: 155. 1891.

Plant stemless, 4–6 dm. high; leaves in a dense fasciculate rosette, 15–20 cm. long, densely and persistently lepidote throughout with coarse spreading scales; sheaths ovate or triangular, small, sometimes castaneous; blades linear-triangular, acuminate, 1 cm. wide at base, cinereous-lepidote; scape erect, 2–3 mm. in diameter, equaling or exceeding the leaves, glabrous; scape-bracts erect, involute, appressed-cinereous-lepidote, the lower foliaceous, densely imbricate, the upper elliptic, acute or apiculate, submembranaceous, bright-red, barely exceeding the internodes; inflorescence simple or few-branched; primary bracts like the upper scape-bracts, not

attaining the lowest flower of the axillary spikes; spikes suberect, linear in outline, laxly 4-8-flowered, 10-15 cm. long, long-stipitate with a single sterile bract at base; rhachis flexuous, angled, sulcate, glabrous; floral bracts erect, ovate, acute, 15-20 mm. long, much shorter than the sepals, glabrous, prominently nerved, submembranaceous with a thinner often blackish margin; flowers strict, appressed to the rhachis; pedicels very short and stout; sepals elliptic, obtuse, 23 mm. long, glabrous, prominently nerved, submembranaceous, short-connate; petals tubular-erect, linear, 3 cm. long, greenish-yellow; stamens exserted, the filaments undulate when dry.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Nuevo León and San Luis Potosí.

44. *Tillandsia Ekmanii* Harms, Notizbl. Bot. Gart.

Berlin 11: 59. 1930.

Tillandsia magna Ekman & Harms; Ekman, Ark. Bot. 23A^o: 16. 1930. Not *T. magna* Baker, 1889.

Plant very large; leaves 5-6 dm. long, very densely and minutely appressed-lepidote; sheaths very broadly ovate, 13-16 cm. long; blades acuminate, subpungent, 9-11 cm. wide; inflorescence amply paniculate, 3 m. long, 2-3-pinnate or possibly even 4-pinnate; lower primary bracts broadly vaginiform with a cuspidate-acuminate apex, the upper ovate-oblong or broadly lanceolate, obtuse, 25-30 mm. long; spikes 4-5 dm. long, laxly flowered, with 3 or 4 sterile bracts at base; rhachis comparatively slender, nearly straight or slightly flexuous, subglabrous; floral bracts ovate-elliptic to narrowly elliptic, obtuse, 25 mm. long or longer, subcoriaceous, minutely lepidote or subglabrous; flowers erect and appressed to the rhachis; pedicels very short and stout; sepals narrowly lance-oblong, appearing acute but obtuse when expanded, 25-27 mm. long; petals narrow, 5-6 cm. long, pale-green with whitish midrib; stamens long-exserted; capsule slender, 5-6 cm. long; seeds slenderly fusiform, 2-2.5 mm. long, with a coma 30-35 mm. long and an apical appendage 5-10 mm. long.

TYPE LOCALITY: Montagnes du Trou d'Eau, Morne à Cabrits, Bois d'Orme, Haïti, altitude 500 meters.

DISTRIBUTION: Haïti.

45. *Tillandsia dasyliroifolia* Baker, Jour. Bot. 25: 304. 1887.

Tillandsia drepanoclada Baker, Handb. Bromel. 188. 1889.
Tillandsia geniculata E. Morren; Baker, Handb. Bromel. 190. 1889.
Tillandsia pulrinata E. Morren; Baker, Handb. Bromel. 190. 1889.

Plant stemless, 5-15 dm. high; leaves many in a dense rosette, up to 7 dm. long, densely and finely appressed-lepidote throughout; sheaths large, elliptic, dark-castaneous; blades linear-triangular, up to 6 cm. wide at base; scape erect, stout, generally exceeding the leaves; scape-bracts erect, ovate or lanceolate, acute, at least the lower ones imbricate and linear-laminate; inflorescence central, laxly bipinnate, usually ample, subpyramidal; primary bracts ovate, acute or obtuse, shorter than the sterile base of the axillary branch; spikes suberect or curved-ascending, up to 45 cm. long, laxly flowered with several sterile bracts at base; rhachis strongly flexuous or geniculate so that the flowers are nearly or quite at right angles to each other, usually stout, sulcate, flattened next the flowers, glabrous; floral bracts very broadly ovate, the lower half consequently enfolding part of the rhachis at anthesis, obtuse, 16-25 mm. long, shorter than the sepals, about equalling the internodes or sometimes slightly longer, coriaceous, glabrous outside, dark-punctulate-lepidote inside, even except near the margin, cecarinate; flowers suberect, erect and appressed to the rhachis; sepals narrowly elliptic or obovate, obtuse, up to 25 mm. long, coriaceous, even, glabrous outside, dark-punctulate-lepidote inside, short-connate; petals tubular-erect, ligulate, obtuse, 3-4 cm. long, white or greenish; stamens and pistil long-exserted; capsule slenderly cylindrical, acute, 4-5 cm. long.

TYPE LOCALITY: Holbox Island, Bay of Honduras, Honduras.

DISTRIBUTION: San Luis Potosí and Jalisco to Salvador and Honduras.

46. *Tillandsia utriculata* L. Sp. Pl. 286. 1753.

- Tillandsia lingulata* Bartr. Trav. 61. 1791. Not *T. lingulata* L. 1753.
Tillandsia polystachya Muhl. Cat. 34, hyponym. 1813. Not *T. polystachya* L. 1762.
Tillandsia Bartrami Nutt. Am. Jour. Sci. 5: 292. 1822.
Tillandsia flexuosa γ *pallida* Lindl. Bot. Reg. 9: pl. 749. 1823.
Tillandsia ramosa Sweet, Hort. Brit. 425. 1826.
Tillandsia Nuttalliana Schultes, in R. & S. Syst. Veg. 7: 1220. 1830.
Anoplophytum flexuosum var. *pallidum* Beer, Bromel. 43. 1857.
Vriesea ramosa Beer, Bromel. 265. 1857.
Platystachys utriculata Beer, Bromel. 266. 1857.
Vriesea utriculata Regel, Ind. Sem. Hort. Petrop. 1869: 34. 1870.
Platystachys Ehrenbergii K. Koch, Ind. Sem. Hort. Berol. 1873: App. 4: 5. 1874.
Allardtia Potockii Ant. Oesterr. Bot. Zeits. 28: 56. 1878.
Tillandsia brevibracteata Baker, Jour. Bot. 25: 346. 1887.
Tillandsia Sintenisii Baker, Jour. Bot. 26: 12. 1888.

Plant stemless, 0.5–2 m. high; leaves many in a dense utriculate rosette, 4–10 dm. long, densely and finely pale-appressed-lepidote throughout; sheaths subovate, large; blades linear-triangular, long-acuminate, 2–7 cm. wide at the base, the outer ones usually recurving; scape erect, equaling or often exceeding the leaves, stout or slender, glabrous; scape-bracts erect, tubular-involute, barely imbricate or the uppermost sometimes remote, ovate, the lower ones linear-laminate, the upper acute; inflorescence central, amply bi- or tripinnate or rarely simple, lax, glabrous; primary bracts like the upper scape-bracts, not more than 4 cm. long, much shorter than the sterile base of the axillary branch, often dark-violet; branches curved-ascending; spiciform racemes up to 35 cm. long with an elongate sterile base bearing several bracts, laxly flowered; rhachis slender, undulate, sulcate, strongly flattened next the flowers; floral bracts erect, enfolding the base of the flower but very little of the rhachis, ovate, obtuse or acutish, much exceeding by the sepals, equaling or shorter than the internodes, closely and prominently nerved throughout, subcoriaceous and green with a broad, membranaceous, often dark-purple margin, ecarinate; flowers erect, appressed to the rhachis; pedicels stout, up to 5 mm. long; sepals narrowly elliptic or obovate, obtuse, 14–18 mm. long, subcoriaceous with a membranaceous margin, prominently nerved; petals tubular-erect, linear, acute, 3–4 cm. long, white; stamens and pistil exerted; capsule slenderly cylindrical, acute, 4 cm. long; seed with a long apical appendage.

TYPE LOCALITY: "Habitat in Americae meridionalis arboribus."

DISTRIBUTION: Georgia (Bartram) and Florida; West Indies; Tamaulipas and British Honduras; also in Venezuela.

ILLUSTRATIONS: Bot. Reg. 9: pl. 749; Oesterr. Bot. Zeits. 28: pl. opp. 57.

47. *Tillandsia Makoyana* Baker, Handb. Bromel. 189. 1889.

Tillandsia cucaensis Wittm. Bot. Jahrb. 14: Beibl. 32: 7. 1891.

Plant stemless, 5–10 dm. high; leaves many in a dense rosette, up to 65 cm. long, densely and finely appressed-cinereous-lepidote throughout; sheaths elliptic-ovate, 12 cm. long, castaneous; blades linear-triangular, caudate-acuminate, 3–5 cm. wide; scape erect, stout, from slightly shorter than to exceeding the leaves; scape-bracts erect, the lower ones lanceolate, linear-laminate, imbricate, the upper ones ovate-lanceolate, acute, sometimes remote; inflorescence simple to amply bipinnate, up to 4 dm. long; primary bracts like the upper scape-bracts, scarcely larger than the floral bracts, enfolding the lower half of the sterile base of the axillary branch; spiciform racemes up to 24 cm. long, laxly flowered; rhachis strongly undulate, stout, flattened next the flowers, glabrous; floral bracts broadly ovate, obtuse, shorter than the sepals, about equaling the internodes, coriaceous with a hyaline margin, prominently nerved, ecarinate; flowers erect and closely appressed to the rhachis; pedicels up to 5 mm. long; sepals narrowly elliptic or obovate, obtuse, 25–30 mm. long, very short-connate, coriaceous, even except near the margin, glabrous outside, brown-punctulate-lepidote inside; petals tubular-erect, 5 cm. long, violet or green; stamens and pistil exerted; capsule slenderly cylindrical, acute, 6–8 cm. long.

TYPE LOCALITY: "Mexico"; described from cultivation.

DISTRIBUTION: Mexico (?), Guatemala, Honduras, and Costa Rica.

48. *Tillandsia flexuosa* Sw. Prodr. 56. 1788.

Tillandsia tenuifolia "L." Jacq. Sel. Stirp. Am. 92. 1763. Not *T. tenuifolia* L. 1762.
Tillandsia flexuosa β *fasciata* Lindl. Bot. Reg. 9: under pl. 749. 1823.
Tillandsia aloifolia Hook. Exot. Fl. pl. 205. 1826.
Tillandsia patens Willd.; Schultes, in R. & S. Syst. Veg. 7: 1229. 1830.
Vriesea aloifolia Beer, Bromel. 95. 1857.
Vriesea tenuifolia Beer, Bromel. 96, in part. 1857.
Platystachys patens K. Koch, Ind. Sem. Hort. Berol. 1873: App. 4: 5. 1874.
Tillandsia flexuosa var. *vivipara* André, Bromel. Andr. 82. 1889.

Plant stemless, 2-15 dm. high; leaves 10-20 in a dense often subbulbous rosette, 2-5 dm. long, densely pale-appressed-lepidote, usually marked with broad white transverse stripes, the outer bladeless, squamiform; sheaths ovate, very large but passing into the blade without clear distinction; blades narrowly triangular, about 25 mm. wide, acuminate, then abruptly and pungently acute, stiff, curved; scape erect, slender, glabrous; scape-bracts erect, tubular-involute, elliptic, acute or obtuse, appressed-lepidote, at least the upper ones shorter than the internodes; inflorescence simple or very laxly bipinnate; primary bracts like the upper scape-bracts, much shorter than the sterile bases of the axillary branches; branches ascending, up to 4 dm. long, very laxly flowered; rhachis slender, flexuous, sharply angled, glabrous; floral bracts spreading with the flowers, elliptic, broadly acute, 2-3 cm. long, equaling or shorter than the sepals, about equaling the internodes, ecarinate, chartaceous, prominently nerved, densely or sparsely appressed-lepidote; pedicels up to 7 mm. long; sepals narrowly elliptic, obtuse, 2-3 cm. long, 7 mm. wide, free, subchartaceous, prominently nerved, sparsely lepidote or glabrous; petals tubular-erect, linear, acute, up to 4 cm. long, white or rose or purple; stamens exserted; capsule slenderly cylindric, acuminate, up to 7 cm. long.

TYPE LOCALITY: Cartagena, Colombia.

DISTRIBUTION: Southern Florida and West Indies; Panama; also in Guiana, Venezuela, and Colombia.

ILLUSTRATIONS: Jacq. Sel. Stirp. Am. pl. 63; Jacq. Sel. Stirp. Pict. pl. 93; Hook. Exot. Fl. pl. 205.

49. *Tillandsia argentea* Griseb. Cat. Pl. Cub. 254. 1866.

Plant 25 cm. high; stem curved, very short but often branched; leaves many in a dense rosette, spreading, 6-9 cm. long, densely white- or ferruginous-lepidote with appressed to slightly spreading scales; sheaths subtriangular, small, scarcely distinct from the blade; blades linear-subulate, filiform-acuminate, rigid, 2 mm. wide at base; scape erect or ascending, exceeding the leaves, 1 mm. in diameter, glabrous; scape-bracts erect, partially clasping the scape, exceeding the internodes or the uppermost sometimes slightly shorter, ovate, abruptly acute or caudate, 8 mm. long without the caudate apex, chartaceous, prominently nerved, at least the lowest densely appressed-lepidote; inflorescence simple, 7 cm. long, laxly up to 6-flowered with the rudiment of seventh at the apex; rhachis geniculate, slender, angled, glabrous; floral bracts subspreading, equaling or shorter than the internodes, broadly elliptic, acute or apiculate, 11 mm. long, much shorter than the sepals, membranaceous, densely appressed-lepidote; flowers subspreading; pedicels distinct, stout, 2-5 mm. long; sepals elliptic, obtuse, 14 mm. long, 5 mm. wide, submembranaceous, prominently nerved, appressed-lepidote, becoming glabrous with age, free; petals ligulate, obtuse, 3 cm. long, bright-red; stamens exserted, shorter than the pistil; capsule 4-5 cm. long, slender, acute.

TYPE LOCALITY: Near Monteverde, eastern Cuba.

DISTRIBUTION: Sinaloa and Oaxaca; Cuba and Jamaica.

50. *Tillandsia filifolia* Schlecht & Cham. Linnæa 6: 53. 1831.

Platystachys filifolia Beer, Bromel. 264. 1857.
Tillandsia staticeflora E. Morren, Belg. Hort. 21: 177. 1871.

Plant usually stemless, 25-30 cm. high; leaves many in a dense rosette, 15-30 cm. long, spreading in all directions, cinereous-lepidote with appressed or slightly spreading scales; sheaths triangular, conspicuous, dark-brown, glabrous with age; blades filiform, 1 mm. wide at base, channeled above, green; scape erect, 1 mm. in diameter, glabrous, brownish-green; scape-

bracts ovate or elliptic, 8 mm. long, all but the uppermost filiform-caudate, barely exceeding the internodes, membranaceous, prominently nerved, appressed-lepidote; inflorescence laxly bipinnate, broadly pyramidal, 15 cm. long; primary bracts like the upper scape-bracts but nearly or quite glabrous, barely reaching the lowest flower of the axillary branch; spikes suberect to spreading, laxly 10-16-flowered with an aborted flower at the apex, up to 1 dm. long; rhachis very slender, flexuous, glabrous; floral bracts spreading at an angle of 45°, equaling or slightly longer than the internodes, elliptic, obtuse or broadly acute, 7-8 mm. long, equaling or slightly shorter than the sepals, membranaceous, prominently nerved; flowers subsessile; sepals narrowly elliptic, obtuse, 7-8 mm. long, submembranaceous, prominently nerved, glabrous outside, lepidote inside, equally short-connate; petals ligulate, 10 mm. long, pale-lilac, the blade spreading; stamens barely longer than the petals and pistil; capsule slenderly cylindrical, 25 mm. long.

TYPE LOCALITY: "Hacienda de la Laguna" [Vera Cruz].

DISTRIBUTION: Puebla, Vera Cruz, Tabasco, Oaxaca, Guatemala, Honduras, and Costa Rica.

ILLUSTRATION: Belg. Hort. 21: pl. 12.

51. *Tillandsia albida* Mez & Purpus; Mez, Repert. Sp.

Nov. 14: 248. 1916.

Strongly caulescent, the flowering plant up to 4 dm. high; stem elongate, much branched; leaves densely polystichous-ranked, 12 cm. long, densely pale-cinereous-lepidote; sheaths merging imperceptibly into the blades; blades suberect to squarrose, narrowly triangular, long-acuminate, channeled above but not convolute; scape terminal, erect, short but exceeding the leaves; scape-bracts densely imbricate, bright-red, white-lepidote; inflorescence 13 cm. long, 3 cm. wide, laxly 6-flowered; rhachis undulate, angled, glabrous, bright-red; floral bracts erect, not at all imbricate nor concealing the rhachis, elliptic, obtuse, up to 21 mm. long, coriaceous, nearly or quite even with a hyaline margin, ecarinate, especially the lower ones appressed-lepidote; flowers erect, with short stout pedicels, 37 mm. long without the genitalia; sepals obtuse, 20 mm. long, coriaceous, glabrous, even, pale-green; petals greenish-white, obtuse, tubular-erect; stamens and pistil 5 mm. longer than the petals.

TYPE LOCALITY: Vicinity of Ixmiquilpan, Hidalgo, Mexico; described from cultivated material.

DISTRIBUTION: Known only from the type locality.

52. *Tillandsia multicaulis* Steud. Nom. Bot. ed. 2. 2: 688. 1841.

Tillandsia caespitosa Schlecht. & Cham. Linnaea 6: 54. 1831. Not *T. caespitosa* LeConte, 1828.

Tillandsia Schlechtendalii Baker, Jour. Bot. 26: 49. 1888.

Vriesea caespitosa E. Morren; Baker, Jour. Bot. 26: 49, as synonym. 1888.

Vriesea Schlechtendalii Wittm. Bot. Jahrb. 14: Beibl. 32: 8. 1891.

Plant stemless; leaves many in a dense rosette, 3-4 dm. long, exceeding the inflorescences, densely but obscurely brown-punctulate-lepidote throughout; sheaths elliptic, 12 cm. long, purple or castaneous on the inside; blades ligulate, acute and apiculate, 25-35 mm. wide; scapes several from the axils of the leaves, erect, 5 mm. in diameter, glabrous; scape-bracts erect, imbricate, broadly elliptic, acute, incurved at the apex, carinate, 2-4 cm. long with the smallest below, glabrous, even, subcoriaceous, bright-red; inflorescences simple, lanceolate in outline, acute, strongly complanate, very densely 9-12-flowered, 14 cm. long, 4-6 cm. wide, glabrous; floral bracts like the scape-bracts, densely imbricate, 5 cm. long, 4 cm. wide, much exceeding the sepals, very sharply carinate; flowers subsessile; sepals narrowly elliptic, obtuse, up to 36 mm. long and 10 mm. wide, submembranaceous, glabrous outside, finely punctulate-lepidote inside, free; petals ligulate, acute, 7 cm. long, erect, blue; stamens slightly exerted, the filaments free, the anthers 10 mm. long; pistil exceeding the stamens; ovary slenderly conic.

TYPE LOCALITY: Jalapa [Vera Cruz].

DISTRIBUTION: Vera Cruz, British Honduras, Honduras, Costa Rica, and western Panama.

NOTE: In its habit and in its sepals with indument on the inside only this species seems much more like a *Vriesea* than a *Tillandsia*, but as yet no trace of scales has been found on the petals.

53. *Tillandsia grandis* Schlecht. Linnaea 18: 424. 1844.

Platystachys viridiflora Beer, Bromel. 81. 1857.

? *Vriesea Billbergiae* Lemaire, Ill. Hort. 16: Misc. 91. 1869.

Tillandsia macropetala Wawra, Wiener Ill. Gart. 12: 241. 1887.

? *Tillandsia Billbergiae* Baker, Jour. Bot. 26: 48. 1888.

Tillandsia viridiflora Baker, Jour. Bot. 26: 81. 1888.

Tillandsia orizabensis Baker, Jour. Bot. 26: 105. 1888.

Tillandsia longiflora Sessé & Moc. Fl. Mex. ed. 2. 81. 1894.

Tillandsia virginalis "E. Morren" Wittm. Gartenflora 44: 398. 1895. Not *T. virginalis* E. Morren. 1880.

Plant stemless, 5–20 dm. high; leaves numerous in a dense utriculate rosette, suberect or curved-spreading, 35–55 cm. long, glaucous below at least when living; sheaths ovate, large and distinct, brown-punctulate; blades ligulate, acute or acuminate, 3–7 cm. wide, glabrous above, obscurely punctulate below, often purplish; scape erect, stout, exceeding the leaves; scape-bracts densely imbricate, the lower ones foliaceous with divergent blades, the upper elliptic, broadly acute or obtuse; inflorescence simple or pinnately compound from a few racemes, pale-green, glaucous when living; primary bracts like the upper scape-bracts, scarcely larger than the floral bracts; racemes spreading or curved-ascending, long-stipitate with several sterile bracts at the base, oblong in outline, up to 3 dm. long, 6–7 cm. wide at anthesis; rhachis nearly straight, stout, angled or slightly winged, nerved with lines decurrent from the bracts, glabrous; floral bracts spreading at anthesis and not at all imbricate nor concealing the rhachis, enfolding the base of the calyx, broadly ovate or elliptic, broadly acute or obtuse, 3–5 cm. long, slightly or much shorter than the sepals at anthesis, two to three times as long as the internodes, subinflated, ecarinate, coriaceous, even, glabrous; flowers divergent at anthesis; pedicels stout, up to 1 cm. long; sepals elliptic, obtuse, 30–45 mm. long, ecarinate, coriaceous, prominently nerved, glabrous outside, brown-punctulate inside, equally subfree; petals erect at anthesis, then flaccid, narrow, obtuse, 8–12 cm. long, green or greenish-white; stamens exerted, the anthers versatile, 13 mm. long; capsule subcylindric, acuminate, 5–7 cm. long; seed with a very short apical appendage.

TYPE LOCALITY: "Hacienda de la Laguna" [Vera Cruz].

DISTRIBUTION: San Luis Potosí, Vera Cruz, Puebla, and British Honduras.

ILLUSTRATIONS: Wiener Ill. Gart. 12: 243. 1887; Gartenflora 44: 399. f. 87; 400. f. 88; Rev. Hort. 69: f. 116; Engler, Pflanzenreich 4²: f. 94.

54. *Tillandsia thyrsgera* E. Morren; Baker, Handb.

Bromel. 185. 1889.

Tillandsia Uhdei Mez, in DC. Monog. Phan. 9: 706. 1896.

Plant stemless, 2 m. high; leaves densely rosulate, 7 dm. long; sheaths 17 cm. long, 12 cm. wide, brown, densely appressed-lepidote; blades arching, ligulate, long-acuminate, 55 mm. wide at base, involute toward apex, glabrous above, densely appressed-lepidote below; scape erect, shorter than the leaves, very stout; scape-bracts densely imbricate, foliaceous; inflorescence over 1 m. long, amply thyrsoïd; primary bracts like the scape-bracts, much shorter than the axillary spikes; spikes strict, stipitate with several sterile bracts at base, linear in outline, acute, 20–35 cm. long, 25–30 mm. wide, complanate; rhachis nearly or quite straight, angled, glabrous; floral bracts erect, imbricate, ovate-oblong, acute, 45–55 mm. long, 2 cm. wide, exceeding the sepals, 2.5–4 times as long as the internodes, ecarinate, coriaceous, even or slightly nerved toward apex, red, glabrous outside, brown-punctulate inside; flowers short-stipitate; sepals ovate, acute, 35 mm. long, 14 mm. wide, ecarinate, coriaceous, even, glabrous; petals tubular-erect, narrow, 6 cm. long, violet; stamens and pistil exerted.

TYPE LOCALITY: "Mexico, locis ignotis."

DISTRIBUTION: State of Mexico.

55. *Tillandsia festucoides* Brongn.; Mez, in DC. Monog.

Phan. 9: 678. 1896.

Tillandsia caricifolia E. Morren; Mez, in DC. Monog. Phan. 9: 672. 1896.

Plant stemless, 20–55 cm. high; leaves many in a dense fasciculate rosette, often exceeding the inflorescence, densely and minutely appressed-lepidote throughout; sheaths narrowly subtriangular, conspicuous, castaneous or ferruginous; blades linear-subulate to filiform, less than 1 mm. in diameter for more than half their length, green; scape erect or ascending, usually

slender; scape-bracts erect, densely imbricate, the lower foliaceous, the upper subelliptic, filiform-laminate, chartaceous, often bright-red; inflorescence bipinnate, densely digitate, subellipsoid or broadly pyramidal after anthesis, up to 17 cm. long; primary bracts like the upper scape-bracts but the higher ones not laminate, at least their sheaths much shorter than the axillary branches; spiciform racemes arching-recurved especially after anthesis, linear in outline, 3-9 cm. long, complanate; rhachis slender, often strongly flexuous; floral bracts erect, barely imbricate, lance-ovate, acute, 17-22 mm. long, exceeding the sepals, slightly more than twice as long as the internodes, carinate and often incurved toward apex, subcoriaceous, prominently nerved in most specimens, pale-appressed-lepidote to glabrous, green or red; flowers subsessile; sepals lanceolate, acute or obtuse, up to 17 mm. long, coriaceous, glabrous or sparsely lepidote, connate posteriorly for 6-8 mm.; petals tubular-erect, linear, 25-30 mm. long; stamens and pistil exerted; capsule slenderly cylindrical, acute, 25-30 mm. long.

TYPE LOCALITY: First known from cultivated material of uncertain origin.

DISTRIBUTION: Florida (Mez!); Cuba, Jamaica, Santo Domingo, and Porto Rico; Tamaulipas, Vera Cruz, Tabasco, British Honduras, Guatemala, Honduras, and Costa Rica.

56. *Tillandsia Ortgiesiana* E. Morren; Mez, in DC. Monog.
Phan. 9: 678. 1896.

Plant stemless, over 3 dm. high; leaves many in a dense fasciculate rosette, up to 27 cm. long, densely pruinose-lepidote throughout; sheaths narrowly subtriangular, passing insensibly into the blades, ferruginous; blades subulate, stout, 6 mm. wide in the middle, complicate, angled, rigid, pungent; scape erect, stout; scape-bracts erect, densely imbricate, elliptic, acute, linear-laminate, coriaceous, lepidote, bright-red; inflorescence digitate from 2-3 spikes; primary bracts ovate, acute, less than half as long as the axillary spikes; spikes sessile, narrowly elliptic in outline, up to 5 cm. long, 14 mm. wide, densely 8-flowered, complanate; floral bracts erect, densely imbricate, ovate, acute, 20-25 mm. long, 12 mm. wide, equaling the sepals, somewhat carinate toward apex, coriaceous, even, glabrous; flowers short-pedicellate; sepals lanceolate, acute, 21 mm. long, 5.5 mm. wide, coriaceous, even, glabrous, much connate posteriorly; petals tubular-erect, linear, 4 cm. long, violet; stamens and pistil exerted.

TYPE LOCALITY: "Mexico, loco ignoto"; described from cultivation.

DISTRIBUTION: Known only from the type collection.

57. *Tillandsia juncea* (R. & P.) Poir. in Lam. Encyc.
Suppl. 5: 309. 1817.

Bonapartea juncea R. & P. Fl. Per. 3: 38. 1802.

Misandra juncea Dietr. Lex. Nachtr. 5: 103. 1819.

Acanthospora juncea Spreng. Syst. 2: 25. 1825.

? *Tillandsia pinifolia* LeConte, Ann. Lyc. N. Y. 2: 131. 1826.

Tillandsia quadrangularis Mart. & Gal. Bull. Acad. Brux. 10: 119. 1843.

Tillandsia pulchra "Hook." Seem. Bot. Voy. Herald 216. 1854. Not *T. pulchra* Hook. 1825.

Platystachys juncea Beer, Bromel. 86. 1857.

Tillandsia juncifolia Regel, Gartenflora 23: 321. 1874.

Tillandsia setacea "Sw." Baker, Jour. Bot. 25: 241. 1887. Not *T. setacea* Sw. 1797.

Plant stemless, often propagating by scaly branching rhizomes, 2-4 dm. high; leaves numerous in a dense fasciculate rosette, usually about equaling the inflorescence or shorter, densely and minutely subappressed-lepidote throughout; sheaths triangular-ovate, conspicuous, ferruginous; blades linear-subulate, filiform-acuminate; scape erect or ascending, stout; scape-bracts erect, involute, densely imbricate, lance-elliptic, acuminate, filiform-laminate, sub-chartaceous, densely pale-appressed-lepidote; inflorescence very densely digitate from a few spikes or sometimes reduced to a single densely polystichous-flowered spike, ovoid, rarely more than 7 cm. long; primary bracts like the upper scape-bracts, subinvolucrate below the inflorescence, their sheaths slightly shorter than the lower axillary spikes, their blades mostly exceeding them; spikes sessile, elliptic or lanceolate in outline, acute, up to 4 cm. long, stout, slightly complanate; floral bracts densely imbricate, broadly ovate, broadly acute or obtuse, exceeding the sepals, carinate in the distichous-flowered spikes, coriaceous or subcoriaceous, nearly or quite even, densely lepidote, often red; flowers subsessile; sepals lanceolate, acute, 15-20 mm.

long, coriaceous, even, glabrous or sparsely lepidote, much connate posteriorly; petals tubular-erect, ligulate, acute, up to 4 cm. long, violet; stamens and pistil exerted; capsule slenderly cylindrical, acute, 25–35 mm. long.

TYPE LOCALITY: Muña, Peru.

DISTRIBUTION: Florida (according to Mez); Cuba, Jamaica, and Hispaniola; Vera Cruz and Oaxaca, and southward to Panama; also from Trinidad and Colombia southward to Peru and Bolivia.

ILLUSTRATIONS: R. & P. Fl. Per. *pl.* 262; *Gartenflora* 23: *pl.* 811; *Refug. Bot.* *pl.* 288.

58. *Tillandsia bromoides* Mez, *Repert. Sp. Nov.* 12: 419. 1913.

Plant stemless, 26 cm. high; leaves many in a dense fasciculate rosette, 18 cm. long, densely appressed-lepidote throughout; sheaths narrowly subtriangular, marked with alternating cinereous and ferruginous cross-bands; blades subulate, 1.5 mm. in diameter, rigid, gray-green; scape strict, slender, about equaling the leaves; scape-bracts involute, densely imbricate, elliptic, acute, foliaceous-laminate; inflorescence exceeding the leaves, scantily bipinnate, the type consisting of merely a large terminal spike and a single smaller lateral one; spikes erect, narrowly lanceolate in outline, acute, 35–70 mm. long, 5 mm. wide, densely 10-flowered, complanate, the terminal one long-stipitate, the lateral one shorter than the primary bract; floral bracts erect, densely imbricate, acute, up to 17 mm. long, much exceeding the sepals, prominently nerved, lepidote and slightly carinate toward apex; flowers sessile; sepals acute, about 12 mm. long, chartaceous, even, glabrous, connate posteriorly for 5–6 mm.; petals tubular-erect, more than twice as long as the sepals; stamens and pistil exerted. (Description compiled.)

TYPE LOCALITY: Barahona Province, Santo Domingo.

DISTRIBUTION: Known only from the type collection.

NOTE: The species is doubtfully distinct from *T. tenuifolia* L.

59. *Tillandsia simulata* Small, *Man. SE. Fl.* 270. 1933.

Plant stemless, 2–4 dm. high; leaves many in a dense subfasciculate rosette, equaling or slightly exceeding the inflorescence, densely and finely appressed-lepidote throughout; sheaths subtriangular, 15–20 mm. wide, conspicuous, pale-ferruginous; blades suberect to spreading, linear-triangular, filiform-acuminate, involute; scape erect, slender; scape-bracts erect, involute, densely imbricate, elliptic, acuminate, filiform-laminate, chartaceous, densely lepidote, red; inflorescence digitate from a few spikes; primary bracts resembling the upper scape-bracts, usually much shorter than the axillary spikes; spikes erect, linear in outline, acute, 3–9 cm. long, 1 cm. wide, complanate, densely flowered; floral bracts erect, imbricate, ovate, broadly acute, up to 16 mm. long, equaling the sepals, three times as long as the internodes, carinate only at extreme apex, subcoriaceous, even or slightly nerved, densely pale-appressed-lepidote; flowers sessile; sepals elliptic-oblong, obtuse, coriaceous, even, lepidote, connate posteriorly; petals tubular-erect, ligulate, 30–45 mm. long, violet; stamens and pistil exerted; capsule slenderly cylindrical, acute, 3 cm. long.

TYPE LOCALITY: Peninsular Florida.

DISTRIBUTION: Florida.

60. *Tillandsia tenuifolia* L. *Sp. Pl. ed. 2.* 410. 1762.

Renealmia recurvata β. L. *Sp. Pl.* 287. 1753.

Tillandsia setacea Sw. *Fl. Ind. Occ.* 593. 1797.

Tillandsia Bartramii Ell. *Bot. S. C. & Ga.* 1: 379. 1817.

Tillandsia caespitosa LeConte, *Ann. Lyc. N. Y.* 2: 131. 1826.

Platystachys setacea Beer, *Bromel.* 80. 1857.

Vriesea tenuifolia Beer, *Bromel.* 96, excl. descr. 1857.

Diaphoranthema versicolor Beer, *Bromel.* 155. 1857.

Renealmia monostachya L.; ex Baker, *Handb. Bromel.* 175, as synonym. 1889.

Tillandsia remota Wittm. *Bot. Jahrb.* 14: Beibl. 32: 6. 1891.

Vriesea setacea Hook.; Mez, in DC. *Monog. Phan.* 9: 688. 1896.

Tillandsia myriophylla Small, *Man. SE. Fl.* 270. 1933.

Plant stemless; leaves many in a densely fasciculate rosette, 2–5 dm. long, usually much exceeding the inflorescence, densely and finely appressed-lepidote throughout; sheaths triangu-

lar-ovate, conspicuous, about 2 cm. long and 8 mm. wide, ferruginous, often keeled; blades setiform, usually less than 1 mm. in diameter for most of their length; scape erect or ascending, very slender, sparsely lepidote; scape-bracts erect, closely involute, densely imbricate, lanceolate, acute, filiform-laminate, chartaceous, densely pale-appressed-lepidote; inflorescence bipinnate or frequently simple and distichous-flowered, slenderly ellipsoid, lax at least below, up to 12 cm. long but usually much less; axes slender, lepidote; primary bracts like the upper scape-bracts, suberect, the sheath shorter than the axillary spike but the blade usually much exceeding it; spikes sessile, turned edgewise to the axis of the inflorescence as in *Lolium*, linear-lanceolate in outline, acute, 2-5 cm. long, only 5-7 mm. wide at anthesis, complanate; floral bracts erect, densely imbricate, broadly ovate, acute, 8-14 mm. long or rarely up to 19 mm., exceeding the sepals, subcoriaceous, even or nerved, densely pale-appressed-lepidote at least when young, scarcely or not at all carinate; flowers sessile; sepals elliptic-oblong, acute, 7-12 mm. long, glabrous, connate posteriorly; petals tubular-erect, linear, 2 cm. long, violet; stamens and pistil exerted; capsule slenderly cylindrical, 25 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: South Carolina to Florida and Greater Antilles; Mexico to Salvador; also in Venezuela and northern Brazil.

ILLUSTRATIONS: Sloane, *Hist. Jam. pl. 122, f. 1*; Belg. *Hortic. 26: pl. 14*.

61. *Tillandsia exserta* Fernald, Bot. Gaz. 20: 537. 1895.

Tillandsia cinerea Mez, in DC. *Monog. Phan.* 9: 679. 1896.

Plant stemless, 2-7 dm. high; leaves many in a dense rosette, up to 3 dm. long, densely lepidote throughout with coarse, pale-cinereous, subspreading scales; sheaths ovate, conspicuous; blades coiled-recurving, very narrowly triangular, long-acuminate, involute, 3-4 mm. in diameter at the base; scape erect, 3 mm. in diameter, glabrous; scape-bracts erect, involute, imbricate, the lower foliaceous, the upper elliptic, acute or apiculate, densely appressed-lepidote; inflorescence simple or subdigitately compound, up to 18 cm. long; primary bracts like the upper scape-bracts, much shorter than the axillary branches; axes slender, glabrous; spikes erect or slightly divergent, linear-lanceolate in outline, acute, 5-14 cm. long, 8-15 mm. wide, sessile with a few sterile bracts at the base or the terminal spike sometimes stipitate, complanate, densely about 12-flowered; rhachis angled, straight; floral bracts erect, densely imbricate, broadly ovate, acute, 2 cm. long, distinctly shorter than the sepals at anthesis, over three times as long as the internodes, straight, ecarinate, subcoriaceous, usually even except near the apex, densely appressed-lepidote, often red; flowers sessile, erect; sepals linear-lanceolate, acute, up to 26 mm. long, carinate, coriaceous, even, connate posteriorly for about half their length; petals tubular-erect, linear, acute, 35 mm. long, violet; stamens and pistil exerted; capsule slenderly cylindrical, acute, 3 cm. long.

TYPE LOCALITY: Near Mazatlan, Sinaloa.

DISTRIBUTION: Sonora and Sinaloa.

ILLUSTRATIONS: Contr. Gray Herb. 98: *pl. 4, f. 10, 11*.

62. *Tillandsia Acostae* Mez & Tonduz; Mez, *Repert. Sp.* Nov. 14: 252. 1916.

Plant stemless, 20-25 cm. high; leaves many in a dense subspreading rosette, about equaling the inflorescence, rigid, very densely and minutely appressed-lepidote throughout; sheaths elliptic-oblong, 3-4 cm. long, dark-castaneous; blades linear-triangular, acuminate, 10-15 mm. wide at the base, involute-subulate toward the apex, pungent; scape erect, short and much obscured by the leaves, stout; scape-bracts erect, involute, densely imbricate, foliaceous, subinflated; inflorescence simple or digitate from 2 subequal sessile spikes; primary bracts like the upper scape-bracts but not laminate, scarcely longer than the floral bracts; spikes linear in outline, acuminate, terete, 7-14 cm. long, 2 cm. in diameter; floral bracts erect, very densely imbricate, suborbicular, apiculate, 2 cm. long, exceeding the sepals, inflated, carinate toward apex, coriaceous, even, glabrous; flowers sessile; sepals lanceolate, acute, 14 mm. long, coria-

ceous, even, glabrous, much connate posteriorly; petals tubular-erect, 35 mm. long; stamens exerted for 10 mm.

TYPE LOCALITY: Near San Ramon, Costa Rica, altitude 1200-1400 meters.

DISTRIBUTION: Costa Rica.

63. *Tillandsia polystachya* L. Sp. Pl. ed. 2. 410. 1762.

Renealmia polystachya L. Sp. Pl. 286. 1753.

Tillandsia angustifolia Sw. Prodr. 57. 1788.

Tillandsia Kunthiana "Gaud." Hemsl. Biol. Centr. Am. Bot. 3: 321. 1884. Not *T. Kunthiana* Gaud. 1846.

Tillandsia parvispica Baker, Jour. Bot. 25: 244. 1887.

Tillandsia Schlumbergeri E. Morren; André, Rev. Hort. 66: 378, as synonym. 1894.

? *Tillandsia acroleuca* Mez & Purpus; Mez, Repert. Sp. Nov. 16: 72. 1919.

Plant stemless, 20-65 cm. high; leaves many in a dense subspreading rosette, usually much exceeded by the inflorescence and arched-recurving, very densely and finely pale-appressed-lepidote throughout, often with a narrow purple margin; sheaths broadly ovate or elliptic-oblong, large and conspicuous, pale-ferruginous toward the base, not at all inflated; blades narrowly triangular, filiform-acuminate, 10-25 mm. wide at the base, usually flat for most of its length; scape erect or ascending, slender; scape-bracts foliaceous with erect densely imbricate sheaths and elongate spreading or recurved laminae, green, red, or purple; inflorescence pinnately or subdigitately compound or very rarely simple, usually subcylindric or slenderly fusiform, dense, up to 3 dm. long; primary bracts elliptic, acute, much shorter than the axillary spikes, the lower ones short-laminate; spikes erect, sessile, linear in outline, acute, 3-10 cm. long, 1 cm. wide at anthesis, complanate, dense or subdense; floral bracts erect, barely to densely imbricate, broadly ovate, broadly acute or obtuse, mucronulate, 15-20 mm. long, about equaling the sepals, from barely more than twice to four times as long as the internodes, coriaceous, even or slightly nerved toward the apex, glabrous or obscurely lepidote especially toward the apex, slightly carinate at the extreme apex; flowers subsessile; sepals elliptic, abruptly acute or obtuse, coriaceous, even, glabrous, posteriorly short-connate; petals tubular-erect, ligulate, 3 cm. long, violet; stamens and pistil exerted; capsule slenderly cylindric, acute, 3-4 cm. long.

TYPE LOCALITY: "*Habitat in America calidiora.*"

DISTRIBUTION: Sinaloa and San Luis Potosí to Honduras and Nicaragua; Cuba and Jamaica to Martinique; also in Colombia, Bolivia, and Brazil.

NOTE: The species has been reported from Florida, but on a very doubtful basis.

64. *Tillandsia Balbisiana* Schultes, in R. & S. Syst.

Veg. 7: 1212. 1830.

Tillandsia tenuifolia Bertero; Schultes, in R. & S. Syst. Veg. 7: 1212, as synonym. 1830. Not *T. tenuifolia* L. 1762.

Platystachys digitata Beer, Bromel. 84. 1857.

Tillandsia Urbaniana Wittm. Bot. Jahrb. 11: 65. 1889.

Tillandsia cubensis Gand. Bull. Soc. Bot. Fr. 66: 290. 1920.

Plant stemless, 13-65 cm. high; leaves many in a dense bulbous rosette, often exceeding the inflorescence if extended but typically recurved, densely and minutely pale-appressed-lepidote throughout, often purple-margined; sheaths ovate, large, inflated, forming an ovoid or ellipsoid pseudobulb up to 12 cm. long, pale-ferruginous toward the base; blades abruptly spreading or recurved from the apices of the sheaths, linear-triangular, filiform-acuminate, 1 cm. wide at the base, usually involute for their entire length; scape erect or ascending, slender, subglabrous; scape-bracts erect, imbricate, elliptic with long, linear, spreading or reflexed blades, inflated; inflorescence densely pinnate or subdigitate or rarely simple and distichous-flowered, slenderly fusiform or subcylindric, dense, up to 2 dm. long; primary bracts like the upper scape-bracts, at least their sheaths shorter than the axillary spikes; spikes sessile, strict, linear in outline, acute, 3-12 cm. long, 1 cm. wide at anthesis, complanate; floral bracts erect, imbricate, ovate, obtuse and apiculate but often appearing acute in drying, 15-22 mm. long, exceeding the sepals, coriaceous, even or slightly nerved toward the apex, glabrous or obscurely lepidote, ecarinate, often bright-red; flowers erect; pedicels very short; sepals lanceolate, acute, coriaceous, even,

glabrous, connate posteriorly; petals tubular-erect, ligulate, obtuse, 30–45 mm. long, violet; stamens and pistil exserted; capsule slenderly cylindric, acute, 4 cm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Florida; Bahamas, Cuba, Jamaica, and Hispaniola; Sinaloa to Vera Cruz and Yucatan, and southward to Panama; also in Venezuela.

ILLUSTRATIONS: Catesby, Nat. Hist. Car. 2: pl. 89; Belg. Hort. 29: pl. 6, 7.

65. *Tillandsia punctulata* Schlecht. & Cham. Linnaea 6: 53. 1831.

Tillandsia tricolor "Schlecht. & Cham."; E. Morren, Belg. Hort. 29: 162. 1879. Not *T. tricolor* Schlecht. & Cham. 1831.

Tillandsia melanopus E. Morren; Mez, in DC. Monog. Phan. 9: 680. 1896.

Plant stemless, 25–45 cm. high; leaves many in a dense rosette, equaling or exceeding the inflorescence but usually recurving, very densely and minutely appressed-lepidote throughout; sheaths broadly ovate or elliptic-oblong, 4–8 cm. long, deep-castaneous; blades linear-triangular, filiform-acuminate but with blunt apex, 5–10 mm. wide at the base, flat, complicate, involute or flat; scape erect; scape-bracts foliaceous but red-brown, all linear-laminate, usually subinvolucrate below the inflorescence; inflorescence simple and distichous-flowered or densely digitate from 2–5 spikes; primary bracts resembling the upper scape-bracts but very short-laminate, less than half as long as the axillary spikes; spikes sessile, ovate or lanceolate in outline, acute, 7–10 cm. long, 25–35 mm. wide, stout, slightly complanate; floral bracts erect, densely imbricate, broadly ovate, acute, up to 4 cm. long, exceeding the sepals, subinflated, strongly carinate, coriaceous with a broad membranaceous margin, nerved, minutely appressed-lepidote; flowers subsessile; sepals lance-oblong, acute, 30–35 mm. long, complicate, alate, subcoriaceous, densely and minutely brown-appressed-lepidote; petals tubular-erect, ligulate, broadly acute or obtuse, white near the apex, violet below; stamens and pistil long-exserted; capsule acute, 3 cm. long.

TYPE LOCALITY: Jalapa [Vera Cruz].

DISTRIBUTION: Puebla and Vera Cruz, and southward to Costa Rica; also in Surinam (Mez).

ILLUSTRATIONS: Belg. Hort. 29: pl. 10/11.

66. *Tillandsia fasciculata* Sw. Prodr. 56. 1788.

Renealmia polystachia Jacq. Sel. Stirp. Am. 93. pl. 183, f. 27. 1763. Not *R. polystachya* L. 1753.

Tillandsia compressa Bertero; Schultes, in R. & S. Syst. Veg. 7: 1210. 1830.

Tillandsia setacea "Sw."; Hook. Bot. Mag. pl. 3275. 1833. Not *T. setacea* Sw. 1797.

Vriesia glaucophylla Hook. Bot. Mag. pl. 4415. 1848.

Tillandsia eminens Lindl. & Paxt. Fl. Gard. 1: 160. 1850.

Platystachys setacea Beer, Bromel. 80, in part. 1857.

Platystachys glaucophylla Beer, Bromel. 82. 1857.

Platystachys havanensis Beer, Bromel. 85. 1857.

Tillandsia havanensis Beer, Bromel. 85, as synonym. 1857.

Tillandsia bracteata Chapm. Fl. S. U. S. 471. 1860.

Tillandsia glaucophylla Baker, Jour. Bot. 25: 243. 1887.

Tillandsia Wilsoni S. Wats. Proc. Am. Acad. 23: 266. 1888.

Tillandsia pungens Mez, in DC. Monog. Phan. 9: 684. 1896.

Vriesia setacea Hook.; Mez, in DC. Monog. Phan. 9: 688, as synonym. 1896.

Tillandsia Buchii Urban, Repert. Sp. Nov. 15: 99. 1917.

Tillandsia hystricina Small, Man. SE. Fl. 271. 1933.

Stemless, very variable in habit and size, 2–10 dm. high; leaves many in a crateriform rosette, 3–7 dm. long; sheaths ovate, nearly flat, large, very dark-castaneous at least toward the base, very finely and densely brown-appressed-lepidote, the surface appearing smooth and even lustrous; blades narrowly triangular, acuminate, rigid, 2–3 cm. wide, finely keeled below, almost always involute-subulate toward the apex, usually finely pale-appressed-lepidote on both sides; scape erect or rarely ascending, stout, shorter than the leaves; scape-bracts erect, densely imbricate, the lower foliaceous, the upper broadly ovate with linear-subulate blades, coriaceous, appressed-lepidote, red or green tinged with red, usually drying to yellow-brown; inflorescence simple or digitately or rarely pinnately compound with simple branches; primary bracts like the upper scape-bracts but with little or no blade, several times shorter than the axillary spikes, lepidote; spikes erect to spreading or rarely reflexed, sessile or subsessile or sometimes clavate with an elongate sterile base, usually dense, 6–26-flowered, with few to numerous, imbricate, reduced, sterile bracts at base, up to 3 dm. long and 4 cm. wide, more or less complanate; rachis straight, angled, glabrous; floral bracts erect, imbricate, broadly ovate or elliptic, acute, 2–5 cm.

long, usually exceeding the sepals, up to eight times as long as the internodes, coriaceous, rigid, even or nerved, carinate, usually glabrous or lepidote only near the apex, often colored; flowers erect, sessile; sepals lanceolate, acute, carinate, the posterior ones usually more or less connate; petals linear, tubular-erect, up to 6 cm. long, white to purple; stamens and pistil exerted; capsule stout, acuminate, 4 cm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Florida and the West Indies; Mexico and Central America; also in Trinidad, Guiana and Colombia.

ILLUSTRATIONS: Bot. Mag. *pl.* 3275, 4415; Fl. Serres 5: *pl.* 432; Jacq. Sel. Stirp. Am. *pl.* 183, f. 27.

NOTE: This highly polymorphic species has been divided into the following varieties by Mez (in DC. Monog. Phan. 9: 682. 1896). Var. *latispica* is the typical variety.

Spikes rarely less than 1 dm. long; floral bracts 35 mm. long or longer.

Floral bracts even or at most faintly nerved toward apex.

Spikes but slightly complanate.

Var. *convexispica*.

Spikes strongly complanate.

Var. *latispica*.

Spikes erect.

Var. *pendulispica*.

Spikes nodding, secund.

Var. *venosispica*.

Floral bracts prominently nerved.

Spikes, or at least their fertile portions, rarely over 1 dm. long; floral bracts scarcely more than 25 mm. long.

Spikes clavate with long slender sterile bases.

Var. *clavispica*.

Spikes short-stipitate.

Var. *densispica*.

Inflorescence ample.

Inflorescence few-branched.

Spikes lax.

Var. *laxispica*.

Spikes dense; floral bracts strongly incurved.

Var. *uncispica*.

67. *Tillandsia melanocrater* L. B. Smith, Contr.

Gray Herb. 117: 31. 1937.

Tillandsia melanopus E. Morren; Mez, in DC. Monog. Phan. 9: 680. 1896.

Plant stemless, not over 25 cm. high, often propagating by scaly branching rhizomes; leaves very numerous in a subspreading rosette, 15-20 cm. long, very densely and finely appressed-lepidote throughout; sheaths broadly ovate, very conspicuous, deep-castaneous; blades-curved-spreading, linear-triangular, long-acuminate, pungent, 8 mm. wide at the base, flat; scape erect or ascending, slender; scape-bracts erect, densely imbricate, broadly ovate, lepidote, at least the lower ones with a linear blade; inflorescence simple or digitate from a few spikes; primary bracts like the upper scape-bracts, scarcely longer than the floral bracts; spikes variable, from narrowly oblong in outline and acute to broadly elliptic and obtuse, 4-9 cm. long, 12-20 mm. wide, complanate with flat sides, often bearing several reduced sterile bracts toward the base; rhachis slender, nearly straight; floral bracts erect, imbricate but not always concealing the rhachis, ovate, acute or obtuse and apiculate, 20-25 mm. long, 9-12 mm. wide, exceeding the sepals, three to six times as long as the internodes, sharply carinate, coriaceous, even, glabrous or sparsely lepidote toward the apex; flowers sessile; sepals lanceolate, acute, 15-19 mm. long, much connate posteriorly; petals tubular-erect, narrow, 30-35 mm. long, violet; stamens and pistil exerted; capsules slenderly cylindrical, acute, 3 cm. long.

TYPE LOCALITY: Cartago, Costa Rica.

DISTRIBUTION: Guatemala, Costa Rica, and Panama.

ILLUSTRATION: Contr. Gray Herb. 117: *pl.* 2, f. 34.

68. *Tillandsia tricolor* Schlecht. & Cham. Linnæa 6: 54. 1831.

Vriisia xyphostachys Hook. Bot. Mag. *pl.* 5287. 1861.

Tillandsia complanata "Benth.," E. Morren, Belg. Hortie. 22: 300. 1872. Not *T. complanata* Benth. 1846.

Platystachys complanata E. Morren, Belg. Hortie. 22: 300. 1872.

Tillandsia xyphostachys Baker, Handb. Bromel. 170. 1889. Not *T. xyphostachys* Griseb. 1865.

Tillandsia Bolteri E. Morren; Baker, Handb. Bromel. 183. 1889.

Plant stemless, often propagating by scaly branching rhizomes, 30-45 cm. high; leaves many in a dense rosette, about equaling or shorter than the inflorescence, the outer ones arching-recurving, densely and minutely appressed-lepidote throughout; sheaths elliptic-oblong, large,

deep-castaneous; blades linear-triangular, long-acuminate, 1 cm. wide at the base, glaucous-green; scape erect, slender; scape-bracts erect, involute, densely imbricate, the lower foliaceous, the upper elliptic, acuminate, red; inflorescence simple and distichous-flowered or laxly subdigitate from a few spikes; primary bracts like the upper scape-bracts, scarcely larger than the floral bracts; spikes erect or divergent, subsessile, linear-lanceolate in outline, acute, cuneate, densely many-flowered, 6–18 cm. long, 18–25 mm. wide, strongly complanate with flat sides; floral bracts erect and very densely imbricate, ovate, acute, 3 cm. long, only about 18 mm. wide, much exceeding the sepals, six times as long as the internodes, sharply carinate, coriaceous, even, glabrous; flowers sessile; sepals lanceolate, acute, 2 cm. long, sharply carinate, coriaceous, even, glabrous, much connate posteriorly; petals tubular-erect, 7 cm. long, ligulate, obtuse, violet; stamens and pistil exerted; capsule slenderly cylindric, acute, about equaling the floral bracts.

TYPE LOCALITY: Jalapa [Vera Cruz].

DISTRIBUTION: Vera Cruz, Guatemala, Nicaragua, and Costa Rica.

ILLUSTRATIONS: Bot. Mag. *pl.* 5287; *Gartenflora* 33: *pl.* 1170; Belg. Hort. 22: *pl.* 23; *Addisonia pl.* 409.

69. *Tillandsia calothyrsus* Mez, in DC. Monog.

Phan. 9: 704. 1896.

Stemless, about 1 m. high; leaves many in a dense infundibuliform rosette, 6–7 dm. long, densely and finely appressed-lepidote throughout; sheaths broadly ovate, 12–15 cm. long, dark-brown; blades linear-triangular, caudate-acuminate, 3 cm. wide at the base; scape erect, probably short, 2 cm. in diameter at base, subglabrous; scape-bracts erect, densely imbricate, foliaceous with elongate blades; inflorescence compound with the lower branches typically much divided, densely thyrsoid, 45–65 cm. long, 15 cm. in diameter; primary bracts broadly ovate, much shorter than the axillary branches, the lower ones with long foliaceous blades much exceeding the branches, the upper merely acute; branches suberect, densely imbricate, the lower ones digitately divided, bearing 4–7 spikes; secondary bracts scarcely larger than the floral bracts; spikes stipitate with several imbricate sterile bracts at the base, 8–10-flowered, linear-lanceolate in outline, acute, 7–11 cm. long, 17 mm. wide, complanate; floral bracts erect, densely imbricate, ovate, obtuse, 25 mm. long, 16 mm. wide, equaling or slightly shorter than the sepals, three times as long as the internodes, carinate, coriaceous, even or faintly nerved toward the apex, pale-appressed-lepidote; flowers subsessile; sepals sublanceolate, acute, 25 mm. long, subcoriaceous, faintly nerved, lepidote; petals 4 cm. long; stamens known only in immature condition.

TYPE LOCALITY: "Mexico, prope Guayimapo."

DISTRIBUTION: Oaxaca.

70. *Tillandsia lineatispica* Mez, in DC. Monog.

Phan. 9: 699. 1896.

Plant stemless, 12 dm. high; leaves rosulate, 6 dm. long, densely pale-lepidote throughout; sheaths elongate, minutely appressed-lepidote; blades linear, filiform-acuminate, 25 mm. wide at the base, stiff, the scales appressed above, subspreading below; scape erect, stout, glabrous; scape-bracts erect, involute, imbricate, the lower ones foliaceous with long narrow strict blades reaching the inflorescence, the upper ones bright-red, lepidote; inflorescence subdensely tripinnate, 3 dm. long; axes glabrous; primary bracts strict, ovate, slenderly laminate, much shorter than the axillary branches, bright-red, lepidote; branches pinnate with 2 or 3 subequal digitate spikes; spikes strict, short-stipitate, linear in outline, densely 16–24-flowered, about 15 cm. long, 1 cm. wide; floral bracts erect, imbricate, ovate-elliptic, apiculate, up to 27 mm. long at anthesis, distinctly shorter than the sepals, coriaceous with a broad membranaceous margin, straight, carinate, closely and prominently nerved, purple-margined, the lowest minutely lepidote, the others glabrous; flowers erect; pedicels obconic, stout, 5 mm. long; sepals narrowly elliptic, acute and apiculate, about 21 mm. long, 11 mm. wide, coriaceous, prominently nerved, glabrous, posteriorly connate for 4 mm.; petals tubular-erect, 35 mm. long at least; stamens and pistil exerted.

TYPE LOCALITY: "Antillarum insula St. Jan."

DISTRIBUTION: Known only from the type collection.

71. *Tillandsia Roland-Gosselini* Mez, Repert.

Sp. Nov. 14: 249. 1916.

Plant stemless, large; leaves densely rosulate, 45 cm. long, densely and minutely pale-appressed-lepidote throughout; sheaths distinct, pale-brown-lepidote toward the base; blades long-acuminate, 4 cm. wide at the base, the outer ones bright-green, the inner reddish at anthesis; scape stout, slightly shorter than the leaves; scape-bracts densely imbricate, reddish, produced into slender elongate recurved blades; inflorescence exceeding the leaves, pinnately compound with simple branches, dense, subfusiform, 25 cm. long, 5 cm. in diameter, glabrous, bright-red; primary bracts much shorter than the axillary spikes, the lower ones with foliaceous blades exceeding the spikes; spikes strict, imbricate, long-stipitate with several imbricate sterile bracts at base, fusiform, 7 cm. long exclusive of the sterile base, subterete especially toward the apex; floral bracts densely imbricate, acute, 35 mm. long, much exceeding the sepals, sharply carinate, uncinately incurved, coriaceous, even, glabrous, lustrous; flowers erect; immature sepals broadly acute, 22 mm. long, subcoriaceous, prominently nerved, equally subfree.

TYPE LOCALITY: Near Colima, Colima, altitude 400 meters; described from cultivation.

DISTRIBUTION: Known only from the type collection.

72. *Tillandsia Kirchhoffiana* Wittm. Gartenflora 38: 107. 1889.

Tillandsia Fournieri E. Morren; Baker, Handb. Bromel. 183. 1889.

Plant stemless, 1 m. high; leaves many in a dense utriculate rosette, 8 dm. long; sheaths ovate, 1 dm. long, purple, obscurely brown-punctulate; blades arched-spreading, linear, caudate-acuminate, flat, not over 4 mm. wide for most of its length, glabrous; scape erect, about 5 mm. in diameter, glabrous; scape-bracts glabrous, their sheaths densely imbricate, ovate, red, their blades elongate, foliaceous; inflorescence compound, very lax, 5 dm. long, glabrous; primary bracts spreading, broadly lanceolate, red, closely enfolding the bases of the spikes, the lower ones foliaceous-laminate, the upper acute; branches simple; spikes stipitate, with several sterile bracts at the base, linear or linear-lanceolate in outline, acute, 10-12 cm. long, 12 mm. wide at anthesis, complanate; rhachis slender, nearly or quite straight, angled; floral bracts erect, barely imbricate and exposing the rhachis, ovate-oblong, acute, up to 23 mm. long, equaling or exceeding the sepals, two to three times as long as the internodes, ecarinate, at the extreme apex membranaceous, prominently nerved, and red, elsewhere coriaceous and even; flowers subsessile; sepals narrowly elliptic, acute, subfree; petals tubular-erect, narrow, obtuse, 35 mm. long, violet; stamens and pistil exerted.

TYPE LOCALITY: "Wahrscheinlich . . . aus Mexico"; described from cultivation.

DISTRIBUTION: Vera Cruz and Puebla.

ILLUSTRATIONS: Gartenflora 38: 108. f. 22.

73. *Tillandsia Rettigiana* Mez, Repert. Sp. Nov. 14: 249. 1916.

Plant stemless, 4 dm. high; leaves many in a dense rosette, finely appressed-lepidote throughout, dark-green, the outer ones with conspicuous elliptic flat sheaths brown-lepidote on the inside and filiform-acuminate blades, 15 mm. wide at the base, carinate, subcomplicate; scape erect, stout; scape-bracts densely imbricate, red, their blades foliaceous, reflexed, involute; inflorescence subclavately compound with the lower branches digitately divided, 23 cm. long, 9 cm. in diameter, glabrous; axis stout, bright-red; primary bracts with at least their sheaths shorter than the axillary branches and enfolding their sterile bases, red, the middle and lower ones with narrow green blades; spikes suberect, all distinctly stipitate with several sterile bracts at the base, lanceolate in outline, 6 cm. long, 1 cm. wide, densely 6-flowered; floral bracts 2 cm. long, exceeding the sepals, coriaceous, even, lustrous, green, sharply carinate, straight toward the apex; flowers sessile; sepals acute, 15 mm. long, subcoriaceous, green, posteriorly connate for 5 mm.; petals tubular-erect, 3 cm. long, pale-violet; stamens and pistil exerted.

TYPE LOCALITY: "Mexico, unde loco natali ignoto"; described from cultivation.

DISTRIBUTION: Known only from the type collection.

74. *Tillandsia Bourgaei* Baker, Jour. Bot. 25: 278. 1887.

Tillandsia cylindrica S. Wats. Proc. Am. Acad. 26: 155. 1891.

Tillandsia Langlasseana Mez, Bull. Herb. Boiss. II. 3: 142. 1903.

Plant stemless, 5–10 dm. high; rhizome very stout; leaves many in a dense crateriform rosette, 4 dm. long, completely covered with coarse, subspreading, cinereous or pale-brown scales; sheaths ovate; blades linear-triangular, caudate-acuminate, 25 mm. wide at the base; scape erect, 1 cm. in diameter at base; scape-bracts foliaceous with subinflated sheaths and elongate blades often exceeding the inflorescence; inflorescence compound, densely cylindric, 2–3 dm. long; axis sulcate, at first densely lepidote; primary bracts broadly ovate, enfolding the basal halves of the spikes, densely lepidote, often reddish, the lower ones with elongate foliaceous blades, the upper merely apiculate; spikes strict, sessile, densely imbricate, ovate in outline, acute, densely 10–14-flowered, 6–9 cm. long, 25–30 mm. wide, complanate; floral bracts erect, densely imbricate and completely concealing the rhachis, ovate, triangular-acute, 25–30 mm. long, equaling the sepals, five to seven times as long as the internodes, sharply carinate, densely lepidote before anthesis, coriaceous, even or slightly nerved toward the apex; flowers subsessile; sepals linear-lanceolate, acute, 6 mm. wide, lepidote, the posterior ones sharply carinate, short-connate; petals tubular-erect, linear, 4 cm. long; stamens exerted; capsules about equaling the floral bracts.

TYPE LOCALITY: "Rocks near Guadalupe" [Vera Cruz].

DISTRIBUTION: Vera Cruz, Guanajuato, and Chiapas.

ILLUSTRATIONS: Contr. Gray Herb. 89: pl. 3, f. 1, 2.

75. *Tillandsia mexicana* L. B. Smith, sp. nov.

Stemless, 7 dm. high; leaves in a dense rosette, suberect, 4 dm. long, very densely and finely appressed-lepidote throughout; sheaths elliptic, brownish; blades narrowly triangular, long-acuminate, 15–20 mm. wide, involute toward the apex; scape erect, shorter than the leaves, stout; scape-bracts erect, imbricate, lance-elliptic, the lower ones with long foliaceous blades; inflorescence erect, compound, densely and slenderly cylindric, 4 dm. long; primary bracts like the upper scape-bracts, suberect, their sheaths more than half as long as the axillary spikes; spikes strict, subsessile, very densely 6-flowered with a few reduced sterile bracts at base, lance-ovate, 8–9 cm. long, complanate; floral bracts erect, oblong-lanceolate, acuminate, 3–4 cm. long, exceeding the sepals, carinate, coriaceous, faintly nerved and lepidote toward the apex; flowers subsessile; sepals lanceolate, acuminate, 3 cm. long, subchartaceous, glabrous, the posterior ones connate and sharply carinate; capsules shorter than the sepals.

Acaulis, 7 dm. alta; foliis suberectis, 4 dm. longis, densissime minuteque lepidotis; laminis anguste triangularibus, 15–20 mm. latis; scapo erecto; scapi bracteis imbricatis, infimis longe laminigeris; inflorescentia dense angustaque cylindrica, 4 dm. longa; bracteis primariis lanceolato-ellipticis, spicas axillares plus quam medio aequantibus; spicis subsessilibus, strictis, 8–9 cm. longis; bracteis florigeris dense imbricatis, oblongo-lanceolatis, 3–4 cm. longis, sepala superantibus, ad apicem versus lepidotis, coriaceis; sepalis subchartaceis, glabris, posticis connatis.

Type collected in the vicinity of Guanajuato City, Guanajuato, A. Duges in January 1901, in the Gray Herbarium.

DISTRIBUTION: Known only from the type collection.

76. *Tillandsia Dugesii* Baker, Jour. Bot. 25: 278. 1887.

Stemless, 9 dm. or higher; leaves many in a dense rosette, strict, 8 dm. long, brown, densely pruinose-lepidote with fine brown or cinereous scales; sheaths ovate-oblong, 1 dm. long; blades linear-triangular, caudate-acuminate, involute-subulate toward apex, 2–3 cm. wide; scape erect, 10–15 mm. in diameter, glabrous; scape-bracts erect, densely imbricate, broadly ovate with a long foliaceous lamina sometimes exceeding the inflorescence, coriaceous, even, lustrous, glabrous except for the densely lepidote apex and lamina; inflorescence compound, densely cylindric, 3–4 dm. long, 5–8 cm. in diameter; primary bracts like the upper scape-bracts, suberect, much shorter than the axillary spikes but their usually reflexed laminae exceeding the

lower ones; spikes strict, linear-lanceolate, acute, densely 10-12-flowered with a few reduced sterile bracts at the base, 8-9 cm. long, 20-25 mm. wide, complanate; floral bracts suberect, four times as long as the internodes and completely concealing the rachis, elliptic, acute, 25-30 mm. long, equaling the sepals, 15 mm. broad, alate-carinate toward apex, slightly incurved but not cucullate, impressed toward the base, coriaceous, rigid, even, glabrous, lustrous, sometimes red; flowers subsessile; sepals lanceolate, acute, rigid, even, glabrous, the posterior ones much connate; petals linear, 4 cm. long, violet; stamens and pistil exerted.

TYPE LOCALITY: Guanajuato.

DISTRIBUTION: Guanajuato and Michoacán.

77. *Tillandsia Rodrigueziana* Mez, Repert. Sp. Nov. 16: 73. 1919.

Over 1 m. high; leaves 5 dm. long, covered with appressed canescent scales; blades involute-subulate, acuminate, 35 mm. wide at the base, finely keeled, rigid; scape erect, stout; scape-bracts densely imbricate, densely lepidote, broadly ovate with long foliaceous laminae; inflorescence pinnately compound, subthyrsiform, decurved toward the apex, up to 4 dm. long and 2 dm. thick; primary bracts like the scape-bracts but with short or no laminae, distinctly shorter than the axillary spikes; spikes sessile, erect to divergent, lance-oblong, complanate, very dense, 12-20-flowered, up to 12 cm. long and 23 mm. wide; floral bracts suberect, four to five times as long as the internodes and completely concealing the rhachis, ovate, cucullate, alate-carinate, 2 cm. long, equaling the sepals, rigidly coriaceous, glabrous, even, sublustrous; sepals elliptic, obtuse, coriaceous, even, glabrous, the posterior ones connate for about half their length; petals tubular-erect, 4 cm. long; stamens and pistil exerted.

TYPE LOCALITY: Guatemala.

DISTRIBUTION: Guatemala.

78. *Tillandsia subulifera* Mez, Repert. Sp. Nov. 16: 74. 1919.

Stemless, 15-19 cm. high; leaves few in a distinct but slenderly cylindric pseudobulb, erect, the inner ones up to 18 cm. long, the outer greatly reduced, appressed-canescens-lepidote, concolorous or with faint white cross-bands; sheaths about half as long as the blades, ample; blades linear, abruptly acute or obtuse, 5 mm. wide at the base, complicate, strongly angled; scape erect, slender, exceeded and largely concealed by the leaves; scape-bracts erect, imbricate, many-nerved, densely lepidote; inflorescence erect, simple, oblong or linear in outline, 5-7 cm. long, distichously 4-6-flowered; axis slender, geniculate, mostly not covered by the floral bracts, appressed-lepidote; floral bracts erect, elliptic, broadly acute, 2 cm. long, shorter than the sepals, incurved and more or less carinate toward the apex, prominently nerved, appressed-lepidote; flowers erect, short-pedicellate; sepals elliptic, narrowly obtuse, 22 mm. long, prominently nerved, appressed-lepidote, free; petals tubular-erect, 32 mm. long, yellow or white when dry; stamens exerted; capsule slenderly cylindric, acuminate, 6 cm. long.

TYPE LOCALITY: Loughdenville [Longdenville], Trinidad.

DISTRIBUTION: Panama; also in Trinidad.

79. *Tillandsia streptophylla* Scheidw.; Morren, Hort.

Belge 3: 252. 1836.

Vriesea streptophylla E. Morren, Cat. Bromél. Liège 17. 1873.

Tillandsia tortilis Brongn.; E. Morren, Cat. Bromél. Liège 17. 1873. Not *T. tortilis* Klotzsch, 1857.

Stemless, up to 45 cm. high and probably more; leaves 60-80, forming a dense pseudobulb up to 8 cm. in diameter, up to 5 dm. long, covered with coarse spreading cinereous scales; sheaths broadly ovate or elliptic, up to 1 dm. long; blades narrowly triangular, acuminate, usually flat for most of their length, at least the outer ones recurving and serving to support the plant, 2-3 cm. wide; scape erect, 7-8 mm. in diameter; scape-bracts densely imbricate, foliaceous with elongate spirally recurved or contorted blades, the upper ones with red sheaths; inflorescence pinnately compound with simple branches, laxly pyramidal, up to 3 dm. long; axes bright-red, densely lepidote; primary bracts like the upper scape-bracts, their sheaths only about a

third as long as the axillary spikes but sometimes their blades exceeding the lower ones; spikes suberect to spreading or even reflexed, short-stipitate with a few reduced sterile bracts, linear, acute, lax, 8-18-flowered, 8-23 cm. long, 15-18 mm. wide, complanate; rhachis straight or slightly flexuous, slender, densely lepidote; floral bracts suberect, about three times as long as the internodes, usually exposing the rhachis, elliptic-lanceolate, acute, 2-3 cm. long, exceeding the sepals, 8-13 mm. wide, subcoriaceous to chartaceous, densely lepidote with coarse subspreading scales, green; flowers erect, very short-stipitate; sepals elliptic-lanceolate, acute, 20-25 mm. long, subcoriaceous, even, glabrous; petals linear, tubular-erect, 35-40 mm. long, purple; stamens and pistil exerted; capsule subprismatic, acute, 35 mm. long.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Jamaica; Vera Cruz, Yucatan, British Honduras, Guatemala, and Honduras.

ILLUSTRATIONS: Hort. Belge 3: pl. opp. 252; Belg. Hort. 28: pl. 18, 19; Bot. Mag. pl. 6757; Gartenflora 38: f. 48.

80. *Tillandsia Seleriana* Mez; Loesener, Bull. Herb. Boiss.

II. 3: 84. 1903.

Stemless, 20-25 cm. high; leaves equaling or exceeding the inflorescence, covered with coarse cinereous or ferruginous spreading scales; sheaths broadly ovate or suborbicular, merging into the blades, forming an ovoid pseudobulb 7-12 cm. long; blades linear-triangular, acuminate, involute-subulate, contorted, up to 1 cm. in diameter at base; scape short, erect; scape-bracts erect, densely imbricate, foliaceous, their blades exceeding the inflorescence; inflorescence digitately or subpinnately compound from 3-6 spikes, compact, 6-10 cm. long; primary bracts broadly ovate or elliptic, slightly shorter than even the lowest axillary spikes, short-laminate or apiculate, densely lepidote; spikes sessile, broadly elliptic, strongly complanate, 6-7-flowered, 4 cm. long; rhachis straight, densely lepidote; floral bracts elliptic, acute, 20-28 mm. long, exceeding the sepals, four to five times as long as the internodes but exposing part of the rhachis, slightly carinate, densely cinereous with coarse spreading scales; flowers sessile; sepals narrowly elliptic, acute or obtuse, 17 mm. long, prominently nerved, glabrous, the posterior ones connate for 6 mm.; petals linear, tubular-erect, 35 mm. long, violet; stamens and pistil exerted; capsule stout, mucronate, 45 mm. long.

TYPE LOCALITY: "Mexico in Monte Santa Igués, 1500 m. supra mare."

DISTRIBUTION: Southern Mexico and Guatemala.

81. *Tillandsia pruinosa* Sw. Fl. Ind. Occ. 594. 1797.

Tillandsia breviscapa A. Rich. in Sagra, Hist. Cuba 11: 265. 1850.

Platystachys pruinosa Beer, Bromel. 265. 1857.

Stemless, 8-20 cm. high; leaves in an elongate pseudobulb, up to 2 dm. long, densely cinereous-lepidote or ferruginous-lepidote with coarse spreading scales; sheaths elliptic to suborbicular, 2-4 cm. long, strongly inflated, abruptly contracted into the blade at the apex and the inner ones closely enfolding the base of the inflorescence, castaneous; blades usually exceeding the inflorescence, linear, involute-subulate, filiform-acuminate, recurved or contorted, 2-4 mm. in diameter; scape none; inflorescence simple or rarely digitately compound from 2 or 3 spikes; spikes densely and distichously 5-15-flowered, up to 7 cm. long and 4 cm. wide but usually much smaller, acute, complanate; rhachis straight, angled, densely lepidote; floral bracts erect, four to five times as long as the internodes, ovate, acute, 20-26 mm. long, much exceeding the sepals, carinate toward the apex, subcoriaceous, pink at anthesis, densely lepidote with coarse spreading scales; flowers sessile; sepals broadly elliptic, obtuse, 13-19 mm. long, sparsely lepidote or glabrous, coriaceous, subfree; petals linear, obtuse or acute, 3 cm. long, violet; stamens exerted; capsule cylindrical, acute, up to 55 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Vera Cruz, Guatemala, and Costa Rica; Cuba, Jamaica, and Hispaniola; also in Venezuela, Colombia, Ecuador, and Brazil.

ILLUSTRATIONS: Belg. Hort. 26: pl. 16, 17.

82. *Tillandsia Butzii* Mez, in Engler, Pflanzenreich 4³²: 636. 1935.

Tillandsia variegata Schlecht. Linnaea 18: 429. 1844. Not *T. variegata* Vell. 1827.

Plant stemless, 2-3 dm. high; leaves few in a bulbous rosette, up to 5 dm. long, densely and finely pale-appressed-lepidote throughout, the margins at first ciliate with coarse scales; sheaths suborbicular, inflated, forming a pseudobulb 25-45 mm. in diameter, dark-brown or purple with numerous large, pale-green, often confluent spots; blades involute-subulate, filiform-acuminate, 3 mm. in diameter, contorted; scape erect, slender; scape-bracts foliaceous, imbricate; inflorescence digitate from a few subequal spikes or rarely simple; primary bracts subfoliaceous, concolorous, the broadly ovate sheath much shorter than the axillary spike, the linear blade often much exceeding it; spikes erect to spreading, linear in outline, acute, strongly complanate, 6-8 cm. long, about 1 cm. wide at anthesis, 5-8-flowered with 1 or 2 sterile bracts at base; floral bracts erect, imbricate, ovate, acute, 20-28 mm. long, 10 mm. wide, much exceeding the sepals, three to four times as long as the internodes, subcoriaceous, densely pale-appressed-lepidote, prominently nerved and sometimes incurved or slightly carinate toward the apex; flowers subsessile; sepals narrowly elliptic, narrowly obtuse, 12-15 mm. long, coriaceous, glabrous; petals tubular-erect, 30-35 mm. long, violet; stamens and pistil exerted; capsule slenderly cylindric, acute, short-beaked, 3 cm. long.

TYPE LOCALITY: Jalapa [Vera Cruz].

DISTRIBUTION: Vera Cruz, Oaxaca, Chiapas, Guatemala, Salvador, Honduras, Costa Rica, and Panama.

ILLUSTRATION: Garten-Zeitung 4: f. 44.

83. *Tillandsia bulbosa* Hook. Exot. Fl. pl. 173. 1826.

Tillandsia bulbosa var. *brasiliensis* Schultes, in R. & S. Syst. Veg. 7: 1212. 1830.

Tillandsia bulbosa var. *picta* Hook. Bot. Mag. pl. 4288. 1847.

Pourretia Hanisiana Morren, Ann. Soc. Agr. Bot. Gand 3: 255, as synonym. 1847.

Tillandsia inanis Lindl. & Paxt. Fl. Gard. 1: 159. 1850.

Tillandsia erythraea Lindl. & Paxt. Fl. Gard. 1: 160. 1850.

Tillandsia pumila Lindl. & Paxt. Fl. Gard. 1: 160. 1850.

Platystachys inanis Beer, Bromel. 82. 1857.

Platystachys bulbosa Beer, Bromel. 83. 1857.

Platystachys erythraea Beer, Bromel. 83. 1857.

Plants stemless, usually densely aggregated, 7-22 cm. high; leaves 8-15, often exceeding the inflorescence, covered with fine, closely appressed, cinereous scales; sheaths orbicular, abruptly contracted into the blades, greatly inflated, 2-5 cm. long, forming a dense ovoid pseudobulb, green or greenish-white, often with a narrow red or purple marginal band; blades involute-subulate, acuminate, contorted, spreading and at least the outer ones making a sharp angle with the apex of the sheath, up to 3 dm. long, 2-7 mm. in diameter; scape erect; scape-bracts foliaceous in form with elongate blades exceeding the inflorescence, the upper ones often red; inflorescence simple or subdigitate from a few spikes, red or green; primary bracts ovate, acute, much shorter than the axillary spikes but their foliaceous blades sometimes exceeding them; spikes spreading, lanceolate, acute, complanate, 2-5 cm. long, 2-8-flowered; rhachis slender, lepidote; floral bracts erect, imbricate, ovate, acute, 15 mm. long, exceeding the sepals, two to three times as long as the internodes, subchartaceous, densely and finely appressed-lepidote, carinate; flowers sessile; sepals oblong, apiculate, 13 mm. long, glabrous, more or less connate posteriorly; petals linear, acute, 3-4 cm. long, blue or violet; stamens and pistil exerted; capsule cylindric, up to 4 cm. long.

TYPE LOCALITY: Trinidad.

DISTRIBUTION: Southern Mexico and Central America; West Indies; also in Trinidad, Colombia, Venezuela, Guiana, and Brazil.

ILLUSTRATIONS: Hook. Exot. Fl. pl. 173; Bot. Mag. pl. 4288; Lindl. & Paxt. Fl. Gard. 1: f. 103, 104; Ann. Soc. Agr. Bot. Gand 3: pl. 142; Fl. Serres 3: pl. 221.

84. *Tillandsia caput-Medusae* E. Morren, Belg.

Hortic. 30: 90. 1880.

Tillandsia Langlassei Poisson & Menet, Bull. Mus. Paris 14: 237. 1908.

Stemless, 15-25 cm. high or rarely up to 4 dm.; leaves often exceeding the inflorescence, covered with coarse pale slightly spreading scales; sheaths broadly ovate or elliptic, large,

strongly inflated, forming an ovoid pseudobulb, merging gradually into the blades; blades linear-triangular, acuminate, involute-subulate, usually much contorted, up to 15 mm. wide; scape erect or ascending, slender; scape-bracts densely imbricate, foliaceous; inflorescence simple and distichous-flowered or digitately compound from 2-6 spikes; primary bracts broadly ovate, usually smaller than the floral bracts and with little or no blade, lepidote; spikes suberect to spreading, often curved, linear-lanceolate, acute, up to 15 cm. long, 6-12-flowered with several reduced sterile bracts at the base; rhachis nearly straight, slender, angled, glabrous; floral bracts suberect or divergent, imbricate, ovate-lanceolate, obtuse but the apex often inrolled so that it appears acute, ecarinate, up to 2 cm. long, equaling or slightly exceeding the sepals, barely more than twice as long as the internodes and exposing the rhachis, chartaceous, prominently nerved, nearly or quite glabrous, red, pink, and green; flowers subsessile; sepals oblong, obtuse, subcoriaceous to chartaceous, prominently nerved, glabrous, the posterior ones connate; petals linear, tubular-erect, 3-4 cm. long, violet; stamens and pistil exerted; capsule slenderly cylindrical, 3-4 cm. long.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Mexico, Guatemala, Salvador, and Costa Rica.

85. *Tillandsia circinnata* Schlecht. *Linnaea* 18: 430. 1844.

Tillandsia paucifolia Baker, Gard. Chron. II. 10: 748. 1878.

Tillandsia yucalana Baker, Jour. Bot. 25: 280. 1887.

Tillandsia intermedia Mez, Bull. Herb. Boiss. II. 3: 141. 1903.

Stemless, 10-45 cm. high; leaves thick, covered throughout with coarse, closely appressed, cinereous scales; sheaths large, broadly ovate, forming a narrowly ovoid or ellipsoid pseudobulb 5-15 cm. long, merging gradually into the blades, the outer ones much reduced and bladeless; blades involute-subulate, pungent, up to 2 dm. long but often much shorter even on a large plant, 3-7 mm. in diameter, curved or contorted or coiled; scape erect; scape-bracts erect, imbricate, foliaceous with spreading or recurved-coiling blades; inflorescence simple or digitately or pinnately compound from a few spikes; primary bracts like the scape-bracts, always somewhat shorter than the axillary spikes but their blades often exceeding them; spikes erect or suberect, linear-lanceolate, acute, often curved, up to 12 cm. long but normally much smaller, 2-10-flowered; floral bracts erect, imbricate, elliptic, acute, nearly or quite ecarinate, 2-3 cm. long, exceeding the sepals, two to three times as long as the internodes, subchartaceous, nerved, densely pale-appressed-lepidote; flowers sessile; sepals lance-oblong, acute, about 2 cm. long, subchartaceous, glabrous, nerved, the posterior ones more or less connate; petals linear, tubular-erect, 4 cm. long, violet; stamens and pistil exerted; capsule slenderly cylindrical, 4 cm. long.

TYPE LOCALITY: Near Hacienda de la Laguna, [Vera Cruz].

DISTRIBUTION: Southern Florida, Bahamas, Cuba, and Hispaniola; Mexico.

86. *Tillandsia Baileyi* Rose; Small, Fl. SE. U. S. 246, 1328. 1903.

Plant stemless, 2-4 dm. high, growing in dense masses; leaves several in a bulbous rosette, equaling or exceeding the inflorescence, densely appressed-cinereous-lepidote throughout; sheaths ovate, relatively small, forming an ovoid pseudobulb 2-5 cm. long, passing gradually into the blades, often conspicuously ciliate-lepidote; blades contorted, linear, involute-subulate, acuminate, 5 mm. in diameter at base; scape erect or ascending, 2 mm. in diameter, cinereous-lepidote; scape-bracts like the leaves but smaller and with narrow sheaths which are often shorter than the upper internodes; inflorescence simple or rarely of 2 spikes; primary bract like the upper scape-bracts, much shorter than the axillary spike; spikes linear, 4-10 cm. long, 12 mm. wide, subdensely 6-17-flowered, complanate, appressed-cinereous-lepidote; floral bracts suberect, loosely imbricate, ovate, acute, 2 cm. long, exceeding the sepals, about three times as long as the internodes, ecarinate, subchartaceous, prominently nerved, roseate; flowers subsessile; sepals lanceolate, acute, up to 16 mm. long, chartaceous, prominently nerved, cinereous-lepidote, short-connate posteriorly; petals ligulate, 3 cm. long, purple; stamens and pistil exerted; capsule slenderly cylindrical, 4 cm. long.

TYPE LOCALITY: Cameron County, Texas.

DISTRIBUTION: Extreme southern Texas.

87. *Tillandsia canescens* Sw. Prodr. 57. 1788.

Stemless, less than 20 cm. high; leaves numerous in a narrowly crateriform rosette, up to 23 cm. long, densely and minutely appressed-lepidote throughout; sheaths ovate, 3-6 cm. long, brown; blades linear-triangular, acuminate, flat for most of their length, up to 1 cm. wide at the base; scape erect or ascending, slender; scape-bracts erect, imbricate, the lower foliaceous, the upper broadly ovate, their foliaceous blades elongate but shorter than the inflorescence, membranaceous, reddish, lepidote; inflorescence subdigitately compound from a few simple branches, pyramidal, often much exceeded by the leaves; primary bracts like the upper scape-bracts, not more than half as long as the axillary spikes but their blades often exceeding the lower ones; spikes short-stipitate, divergent, lanceolate, acute, 25-30 mm. long, complanate, 3-flowered or 4-flowered with 1 or 2 sterile bracts at the base; rhachis slightly flexuous, slender, angled, glabrous; floral bracts erect, imbricate, elliptic, obtuse, 13-17 mm. long, about equaling the sepals, two to three times as long as the internodes, exposing the rhachis, chartaceous, nerved, soon glabrous, reddish; flowers sessile; sepals elliptic-oblong, obtuse, even, subglabrous, connate posteriorly for 5 mm.; petals linear, 3 cm. long, violet; stamens and pistil exerted; capsule cylindrical, acute, 28 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Cuba, Jamaica; Trinidad.

88. *Tillandsia chlorophylla* L. B. Smith, sp. nov.

Stemless; leaves many in a narrowly crateriform rosette, 5 dm. long, greatly exceeding the inflorescence; sheaths ovate-elliptic, 6 cm. long, green, scarcely darker than the blades, densely and finely appressed-lepidote; blades linear-triangular, acuminate, 1 cm. wide at the base, flat, densely lepidote beneath, soon glabrous above; scape erect, slender, largely hidden by the leaves; scape-bracts erect, densely imbricate, subfoliaceous but with pink sheaths; inflorescence subaxly compound from a few simple branches, slenderly pyramidal, 8-12 cm. long; primary bracts like the upper scape-bracts, shorter than the axillary spikes but the lower ones with elongate blades exceeding them; spikes divergent to spreading, lance-oblong, complanate, 3-5 cm. long, 7-10 mm. wide, 3-6-flowered; floral bracts erect, elliptic, obtuse, over twice as long as the internodes, distinctly shorter than the sepals, ecarinate, chartaceous, nerved, glabrous, pink; flowers sessile; sepals elliptic, obtuse, 11 mm. long, chartaceous, nerved, glabrous, equally short-connate; petals 25 mm. long, purple; stamens and pistil exerted.

Acaulis; foliis 5 dm. longis, inflorescentiam multo superantibus; vaginis viridibus, quam laminas haud atrioribus; laminis lineari-triangularibus, 1 cm. latis, subtus dense lepidotis, supra mox glabris; scapo erecto; scapi vaginis imbricatis; inflorescentia sublaxe composita, 8-12 cm. longa; bracteis primariis quam spicas axillares brevioribus; spicis lanceolato-oblongis, 3-5 cm. longis, 3-6-floris; bracteis florigeris ellipticis, obtusis, quam sepala brevioribus, chartaceis, glabris; sepalis ellipticis, obtusis, 11 mm. longis, equaliter brevi-connatis; petalis 25 mm. longis, purpureis; staminibus styloque exsertis.

Type collected on Monte Santa Teresa, Dept. Petén, Guatemala, *Lundell 2649*, in the Gray Herbarium.

DISTRIBUTION: Guatemala and British Honduras (*Schipp S-804*).

89. *Tillandsia flabellata* Baker, Jour. Bot. 25: 242. 1887.

Stemless, 2-3 dm. high; leaves many in a dense rosette, arched, spreading, up to 35 cm. long, inconspicuously punctulate-lepidote above, densely appressed-cinereous-lepidote below, sheaths broadly ovate, 4-6 cm. long, distinct; blades narrowly triangular, long-acuminate, flat, 17 mm. wide; scape erect, very short and so hidden by the rosette that the spikes look like separate simple inflorescences, slender; scape-bracts erect, densely imbricate, foliaceous, very large; inflorescence digitate from 3-8 spikes; primary bracts like the scape-bracts, their sheaths many times shorter than the axillary spikes, their blades nearly equaling them; spikes spreading to reflexed, very narrowly clavate, acute, strongly complanate, 15-22 cm. long, the lower half or two thirds sterile and covered by imbricate bracts, these decreasing evenly in size from the floral bracts down, the fertile part linear lanceolate, 4-9 cm. long, 10-15 mm. wide; rhachis

straight, slender, angled, sulcate, glabrous; floral bracts erect, densely imbricate and concealing the rachis at anthesis, three to four times as long as the internodes, lanceolate, acuminate, straight, sharply carinate, 25–35 mm. long, 9 mm. wide, chartaceous, strongly nerved, sparsely appressed-lepidote before anthesis but soon glabrous; flowers subsessile; sepals elliptic-oblong, obtuse, 15 mm. long, thin, even or medianly nerved, glabrous, free; petals 4 cm. long, violet; stamens and pistil exerted; capsule cylindric, short-beaked, 25 mm. long.

TYPE LOCALITY: Barranco Hondo, Guatemala, altitude 1150 meters.
DISTRIBUTION: Guatemala and Salvador.

90. *Tillandsia lepidosepala* L. B. Smith, Proc. Am. Acad. 70: 155. 1935.

Plants stemless or very short-caulescent, often aggregated in dense masses; leaves rosulate, up to 15 cm. long, covered with slightly spreading cinereous scales; sheaths broadly ovate or suborbicular, not at all inflated, 10–15 mm. long; blades erect or spreading, linear-triangular, acuminate, 7 mm. wide at the base, involute; scape short, almost hidden by the leaves; scape-bracts erect, densely imbricate, foliaceous, about equaling the inflorescence; inflorescence simple and distichous-flowered or rarely with a small second spike and primary bract like the upper scape-bracts, exceeded by the leaves; spikes 3–5 cm. long, 2–5-flowered; floral bracts lanceolate, acute, 20–35 mm. long, equaling or exceeding the sepals, three to four times as long as the internodes, submembranaceous, not at all carinate, densely cinereous-lepidote; flowers sessile; sepals lanceolate, acuminate, up to 20 mm. long, strongly nerved, densely lepidote, free, the lateral ones carinate; capsule cylindric, short-beaked, about equaling the floral bracts.

TYPE LOCALITY: Near Lake Cuitzco, Michoacán.
DISTRIBUTION: Hidalgo, Michoacán, and Puebla.
ILLUSTRATIONS: Proc. Am. Acad. 70: pl. 2, f. 2, 3.

91. *Tillandsia Mexiae* L. B. Smith, Contr. Gray Herb. 117: 32. 1937.

Stemless, 25 cm. high; leaves imperfectly known, probably exceeding the inflorescence, very densely appressed-cinereous-lepidote; sheaths broadly ovate, 5 cm. long, dark-castaneous; blades narrowly triangular, pale, 18 mm. wide; scape erect, 4 mm. in diameter; scape-bracts foliaceous, erect, very densely imbricate, caudate-acuminate, much exceeding the inflorescence; inflorescence densely compound, ovoid, 8 cm. long, densely cinereous-lepidote; primary bracts broadly ovate, about half as long as the spikes, the lower ones with very narrow linear blades much exceeding the spikes; spikes broadly elliptic, acute, 45 mm. long, 4-flowered, strongly complanate; floral bracts erect, densely imbricate, ovate, acuminate, up to 35 mm. long, equaling or exceeding the sepals, strongly carinate, membranaceous, red; flowers subsessile; sepals ovate, acuminate, 3 cm. long, membranaceous, densely pale-lepidote, posteriorly connate for 5 mm.; petals and stamens unknown.

TYPE LOCALITY: Arroyo de los Hornos, Hacienda del Ototal, Sierra Madre Occidental west of San Sebastian, Jalisco, altitude 1500 meters.
DISTRIBUTION: Known only from the type collection.
ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 2, f. 35, 36.

92. *Tillandsia vicentina* Standley, Jour. Wash. Acad. 13: 364. 1923.

Plant stemless; leaves many in a dense crateriform rosette, suberect to spreading, 25–30 cm. long, equaling the inflorescence; sheaths ovate, 15–20 mm. wide, dark-brown; blades linear-triangular, acuminate, 6–8 mm. wide at the base, straight, flat, green on the upper surface and covered with closely appressed scales, beneath silvery, covered with coarse loose whitish scales; scape erect, 4 mm. in diameter, lepidote; scape-bracts strict, imbricate, ovate with long filiform laminae, densely appressed-pale-lepidote; inflorescence densely digitate or short-pinnate from 5–14 spikes, 7–10 cm. long; primary bracts like the scape-bracts, their sheaths about a third as long as the axillary spikes, their blades equaling or exceeding the lower ones; spikes subsessile,

lance-oblong, acute, 6-8-flowered with several sterile bracts at the base, 4-7 cm. long, 14 mm. wide, strongly complanate; floral bracts erect, imbricate and concealing the slender rhachis, ovate, acute, 20-25 mm. long, exceeding the sepals, three times as long as the internodes, sharply carinate, subchartaceous, pink, densely appressed-cinereous-lepidote; flowers subsessile; sepals lanceolate, acute, 2 cm. long, subcoriaceous, sparsely lepidote or glabrous, short-connate posteriorly; petals linear, tubular-erect, 4 cm. long, violet; stamens and pistil exerted.

TYPE LOCALITY: Volcán de San Vicente, Salvador, altitude about 1500 meters.

DISTRIBUTION: Known only from the type locality.

93. *Tillandsia inflata* Mez, in DC. Monog.

Phan. 9: 701. 1896.

Leaves 55 cm. long, densely and minutely pale-appressed-lepidote; sheaths elliptic, large, indistinct; blades narrowly triangular, caudate-acuminate, flat, 4 cm. wide; scape stout, erect or ascending, up to 2 dm. long, glabrous; scape-bracts foliaceous, spreading or reflexed-spreading, linear-lanceolate, filiform-caudate, up to 2 dm. long, many times as long as the internodes, 25 mm. wide, coarsely pale-pruinose-lepidote toward the apex; inflorescence bipinnate, 4-10 dm. long, 25 cm. in diameter; primary bracts like the scape-bracts, the lower ones exceeding the axillary spikes, the upper shorter; spikes erect or divergent, oblong, 1-2 dm. long, 35-45 mm. wide; rhachis straight, glabrous; floral bracts spreading and exposing the rhachis although three to four times as long as the internodes, suborbicular, mucronulate, 3 cm. long, equaling or exceeding the sepals, inflated, ecarinate, glaucous outside, lepidote inside, roseate, finely nerved, thick, subchartaceous, probably fleshy in life, finely verrucose; flowers subsessile, divergent; sepals broadly elliptic, acute, 25-30 mm. long, subcoriaceous, even or nerved, glabrous, evenly connate for 3 mm.; petals purple, 4 cm. long, the claw linear, the blade elliptic, obtuse, narrowly white-margined; stamens and pistil exerted.

TYPE LOCALITY: "Mexico"; described from cultivation.

DISTRIBUTION: Sonora.

94. *Tillandsia Parryi* Baker, Jour. Bot. 25: 277. 1887.

Plant stemless, large, probably at least 15 dm. high; leaves many in a dense utriculate rosette, 4-8 dm. long, densely and finely appressed-lepidote throughout; sheaths broadly ovate or elliptic, 15 cm. long, ferruginous-lepidote; blades spreading, narrowly triangular, caudate-acuminate, 4 cm. wide at the base, gray-green, often finely purple-spotted; scape stout; scape-bracts erect, densely imbricate, foliaceous; inflorescence densely thyrsoid, at least 4 dm. long, 12 cm. in diameter, purplish; primary bracts with a broadly ovate sheath much shorter than the axillary spike and a narrow foliaceous blade often exceeding it, the uppermost merely apiculate; spikes strict, short-stipitate or sessile with several reduced sterile bracts at the base, oblong in outline, acute, 15-20 cm. long, 2-3 cm. wide, complanate with flat sides; rhachis slightly flexuous, slender, angled, glabrous; floral bracts erect, densely imbricate but so narrow as to expose the rhachis, ovate, acute, 35-45 mm. long, 12-20 mm. wide, exceeding the sepals, four to five times as long as the internodes, ecarinate, subchartaceous with a broad dark membranous margin, sparsely and obscurely punctulate-lepidote, even or faintly nerved; flowers subsessile; sepals lanceolate, acute, 25-30 mm. long, ecarinate, chartaceous, prominently nerved, glabrous, equally subfree; petals tubular-erect, linear, broadly acute, 4-5 cm. long, violet; stamens and pistil exerted.

TYPE LOCALITY: Mountains of San Luis Potosí, altitude 1800-2400 meters.

DISTRIBUTION: Nuevo León, Tamaulipas, San Luis Potosí, and Guanajuato.

95. *Tillandsia incurva* Griseb. Nachr. Ges. Wiss.

Gött. 1864: 15. 1865.

Tillandsia digitata Mez, in DC. Monog. Phan. 9: 715. 1896.

Tillandsia castaneo-bulbosa Mez & Wercklé; Mez, Bull. Herb. Boiss. II. 3: 140. 1903.

Stemless, 15-40 cm. long with the inflorescence extended; leaves many in a dense subbulbous rosette, 15-35 cm. long, very densely and finely appressed-lepidote throughout; sheaths

large, distinct, broadly ovate to suborbicular, dark-castaneous; blades narrowly triangular, long-acuminate, usually flat, 2-3 cm. wide, cinereous-lepidote; scape arching-decurved, slender, short, much obscured by the leaves, lepidote at least when young; scape-bracts barely imbricate, tubular-involute, obovate or elliptic, densely appressed-lepidote, at least the lower ones caudate; inflorescence pendulous, simple or digitate with 2-5 spikes; primary bracts like the scape-bracts, scarcely larger than the floral bracts; spikes strict, linear or lance-linear with several sterile bracts at the base, acute, 10-24 cm. long, strongly complanate, 7-16-flowered; rhachis flexuous, slender, strongly angled, excavated next the flowers, lepidote at first; floral bracts erect or slightly divergent, two to three times as long as the internodes but usually exposing most of the rhachis, elliptic, obtuse, 25-35 mm. long, much exceeding the sepals, ecarinate at maturity, red, submembranaceous, nerved to almost even, appressed-lepidote to glabrous; flowers distinctly pedicellate; sepals elliptic, obtuse or apiculate, 15-20 mm. long, ecarinate, even, soon glabrous, stramineous, thin, free; petals ligulate, 35 mm. long, yellow; stamens exerted at anthesis, anthers linear, 4 mm. long.

TYPE LOCALITY: Near Colonia Tovar, Venezuela, altitude 2000 meters.

DISTRIBUTION: Southern Florida; Cuba and Jamaica; Costa Rica; also in Venezuela, Colombia, and Bolivia.

96. *Tillandsia Valenzuelana* A. Rich. in Sagra, Hist.

Cuba 11: 267. 1850.

Platystachys Moritziana Beer, Bromel. 265, nomen. 1857.

Tillandsia Moritziana Klotzsch; Beer, Bromel. 265, hyponym. 1857.

Tillandsia laxa Griseb. Fl. Brit. W. Ind. 596. 1864.

Tillandsia Kunthiana "Gaud." Griseb. Nachr. Ges. Wiss. Gott. 1864: 15. 1865. Not *T. Kunthiana* Gaud. 1846.

Tillandsia brachypoda Baker, Jour. Bot. 25: 237. 1887.

Tillandsia sublaxa Baker, Jour. Bot. 25: 280. 1887.

Tillandsia polystachya var. *alba* Wittm. Bot. Jahrb. 11: 65. 1889.

Tillandsia Houzeavii E. Morren; Baker, Handb. Bromel. 183, as synonym. 1889.

Tillandsia Purpusii Mez, Repert. Sp. Nov. 14: 251, in part. 1916.

Tillandsia domingensis Mez, Repert. Sp. Nov. 16: 73. 1919.

Stemless, 2-6 dm. high; leaves numerous in a utriculate rosette, up to 4 dm. long, sometimes exceeding the inflorescence, the outer ones reduced to scale-like sheaths, very densely and finely appressed-cinereous-lepidote throughout, occasionally becoming glabrous above; sheaths large, ovate, concolorous with the blade; blades linear-triangular, acuminate, flat or slightly inrolled in drying, 10-25 mm. wide; scape central, erect or ascending, slender, glabrous; scape-bracts erect, imbricate, ovate, inflated, densely and finely cinereous-lepidote, pink or red, fading to olivaceous, at least the lower ones with linear subfoliaceous blades; inflorescence simple or pinnately compound with a few spikes; axes slender, soon glabrous; primary bracts like the upper scape-bracts, their sheaths much shorter than the axillary spikes but the elongate blades sometimes exceeding the lower ones; spikes divergent, oblong, acute, complanate, often rather lax, 6-17-flowered with the larger spikes usually in the simple inflorescences, especially the terminal spike with sterile bracts at base, 5-20 cm. long, 1-2 cm. wide; rhachis slender, angled, slightly flexuous; floral bracts erect or slightly divergent, mostly two to three times as long as the internodes, usually exposing the rhachis, elliptic-oblong, obtuse or apiculate, about 2 cm. long, 8 mm. wide, much exceeding the sepals, submembranaceous, prominently nerved, subglabrous, pink or red, usually drying to dull-olivaceous, ecarinate or sometimes carinate toward apex; flowers sessile; sepals oblong, obtuse, more or less connate posteriorly; petals linear, acute, 3 cm. long, lilac or violet; stamens exerted, the filaments undulate near apex; capsule prismatic, abruptly acute, 3 cm. long.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Southern Florida and Greater Antilles; southern Mexico and Central America; also in Colombia, Venezuela, and Bolivia.

ILLUSTRATION: *Addisonia* pl. 39.

97. *Tillandsia pueblensis* L. B. Smith, Contr.

Gray Herb. 104: 81. 1934.

Stemless, 16-24 cm. high; leaves rosulate, densely pruinose-gray-lepidote, the outer reduced to pointed sheaths, the inner up to 16 cm. long, often recurved; sheaths scarcely distinct;

blades narrowly triangular, about 10 mm. wide at the base, involute, pungent; scape erect, short; lower scape-bracts foliaceous, long-laminate, the upper ones lanceolate, acute, membranaceous, appressed-lepidote; inflorescence simple, linear-lanceolate in outline, laxly 5-7-flowered, up to 9 cm. long, 1 cm. broad; floral bracts erect, narrowly lanceolate, acute, imbricate but not concealing the rhachis, 25-30 mm. long, membranaceous, strongly nerved, appressed-gray-lepidote, bright-rose; flowers sessile; sepals narrowly lanceolate, acute, 20 mm. long, membranaceous, nerved, carinate, the posterior ones connate for 6 mm.; petals violet, 4 cm. long, tubular-convolute; stamens and pistil exerted.

TYPE LOCALITY: Zapotitlan, Puebla.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 104: pl. 3, f. 1, 2.

98. *Tillandsia chaetophylla* Mez, in DC. Monog.

Phan. 9: 726. 1896.

Tillandsia subulata E. Morren; Baker, Handb. Bromel. 170, hyponym. 1889; Mez in DC. Monog. Phan. 9: 726. 1896. Not *T. subulata* Vell. 1825.

Plant stemless, 2-4 dm. high; leaves many in a dense fasciculate rosette, mostly equaling or exceeding the inflorescence, erect or variously curved, densely appressed-lepidote throughout; sheaths conspicuous, triangular, ferruginous; blades linear-subulate to filiform; scape erect or ascending, slender; scape-bracts erect, involute, densely imbricate, the lower foliaceous, the upper ovate, acute, filiform-caudate, membranaceous, pale-red; inflorescence simple, distichous-flowered, lanceolate in outline, acute, 4-8 cm. long, densely 3-8-flowered, strongly complanate; floral bracts erect, imbricate, lance-ovate, acute, 25-35 mm. long, 10 mm. wide, exceeding the sepals and about five times as long as the internodes, carinate toward the apex, densely and finely appressed-lepidote, red, membranaceous, more or less prominently nerved; flowers sessile; sepals lanceolate, acuminate, up to 3 cm. long, chartaceous, glabrous, joined posteriorly for almost half their length; petals ligulate, obtuse, apiculate, 5-7 cm. long, violet; stamens included so far as known; pistil slightly exerted.

TYPE LOCALITY: "Mexico, loco ignoto."

DISTRIBUTION: Michoacán, Oaxaca, and Vera Cruz.

99. *Tillandsia Kegeliana* Mez, in DC. Monog.

Phan. 9: 725. 1896.

Plant stemless; leaves many in a dense rosette, 12-17 cm. long; sheaths broadly ovate, over 3 cm. long, membranaceous, castaneous-lepidote; blades often more or less secund, involute-subulate, acuminate, 5 mm. wide at the base, rigid, densely pale-lepidote; scape slender, ascending, very short, glabrous; scape-bracts erect, densely imbricate, lance-ovate, long-caudate, appressed-lepidote; inflorescence simple, exceeded by the leaves, densely 6-8-flowered, elliptic in outline, strongly complanate, 40-55 mm. long, 30-35 mm. wide; rhachis undulate, angled, glabrous; floral bracts suberect, densely imbricate, acuminate from a broadly elliptic base, strongly complanate, incurved, 3 cm. long, 16 mm. wide, fleshy, bright-red when fresh, minutely rugulose and blackish when dry, glabrous; flowers erect or suberect; pedicels short and thick; sepals elliptic, obtuse, 2 cm. long, 7.5 mm. wide, coriaceous when dry, probably fleshy when living, densely punctulate-lepidote, slightly nerved, free; petals over 4 cm. long, dark purple; stamens exerted; capsule subprismatic, over 5 cm. long.

TYPE LOCALITY: Near Paramaribo, Surinam.

DISTRIBUTION: Panama; also in Colombia and Surinam.

100. *Tillandsia achyrostachys* E. Morren; Baker Handb.

Bromel. 171. 1889.

Plant stemless, 2-4 dm. high; leaves densely rosulate, 20-27 cm. long, very densely and finely appressed-cinereous lepidote throughout; sheaths erect, subtriangular, elongate, merging insensibly into the blade; blades usually curved-spreading, very narrowly triangular, filiform-

acuminate, 1 cm. wide, flat; scape erect; scape-bracts erect, densely imbricate, the lower foliaceous, the upper broadly elliptic, filiform-caudate or apiculate, chartaceous, densely lepidote; inflorescence simple, densely distichous-flowered or sometimes the lower flowers polystichous (Mez!), linear in outline, acute, 1-2 dm. long, terete or subterete at anthesis, 8-15 mm. in diameter, glabrous; floral bracts erect, densely imbricate, ovate, acute, 3-4 cm. long, exceeding the sepals, three to four times as long as the internodes, ecarinate, chartaceous, closely and strongly nerved, bright-red; flowers sessile; sepals lanceolate, acuminate, up to 26 mm. long, carinate, membranaceous, prominently nerved, short-connate posteriorly; petals tubular-erect, 45 mm. long, ligulate, obtuse, yellow; stamens and pistil exerted; capsule slenderly ellipsoid, abruptly short-beaked, barely exceeding the sepals.

TYPE LOCALITY: "Mexico"; described from cultivation.

DISTRIBUTION: Jalisco, Guanajuato, Morelos, Oaxaca, and Vera Cruz.

101. *Tillandsia Ehrenbergiana* Klotzsch; Baker, Handb. Bromel. 169. 1889.

Distinctly caulescent; flowering plant 10-20 cm. high; stem simple or branched, 3-5 cm. long, much exceeded by the leaves; leaves densely polystichous-ranked, up to 15 cm. long, densely cinereous-villous with fine scales, these produced basally into long narrowly triangular lobes; sheaths broadly elliptic, distinct from the blades, the lower part membranaceous, glabrous, strongly nerved; blades mostly spreading or reflexed, involute-subulate, filiform-acuminate, 3 mm. in diameter; scape terminal, erect or ascending, less than 1 mm. in diameter, strongly sulcate, glabrous; scape-bracts imbricate, involute, much exceeding the internodes, lanceolate, acuminate, thin, strongly nerved, roseate, lepidote, the lower laminate; inflorescence always simple, elliptic, strongly complanate, 35 mm. long, 16 mm. wide, densely 3-8-flowered; rhachis slender, nearly straight; floral bracts imbricate and concealing the rhachis, three to four times as long as the internodes, lanceolate, acute, 26 mm. long, much exceeding the sepals, 8 mm. wide, membranaceous, strongly nerved, roseate, puberulent-lepidote, the upper half distinctly carinate; flowers subsessile; sepals lanceolate, acuminate, up to 17 mm. long, 5 mm. wide, carinate, membranaceous, strongly nerved, lepidote, subfree; petals tubular-erect, probably yellow; stamens and pistil exerted; ovary ellipsoid; capsule cylindric, acute, 25 mm. long.

TYPE LOCALITY: Regla, Hidalgo (?).

DISTRIBUTION: San Luis Potosí, Guanajuato, Hidalgo, and Federal District.

ILLUSTRATIONS: Proc. Am. Acad. 70: pl. 3, f. 7, 8.

102. *Tillandsia Schiedeana* Steud. Nom. Bot. ed. 2. 2: 688. 1841.

Tillandsia vestita Schlecht. & Cham. Linnaea 6: 52. 1831. Not *T. vestita* Willd. 1830.

Tillandsia flavescens Mart. & Gal. Bull. Acad. Brux. 10: 118. 1843.

Tillandsia Grisebachii Baker, Jour. Bot. 25: 305. 1887.

Tillandsia Eggersii Baker, Handb. Bromel. 170. 1889.

Distinctly caulescent; flowering plant up to 4 dm. long, but usually not much more than 2 dm., often pulvinate; stem 5-20 cm. long, simple or few-branched; leaves polystichous-ranked, varying greatly in density, up to 25 cm. long, densely cinereous-lepidote or ferruginous-lepidote; scales appressed near the apex of leaf, pruinose below; sheaths suborbicular, large, densely imbricate and making the stem appear very stout, at least the margin hyaline, glabrous only where covered; blades very narrowly triangular, filiform-acuminate, involute-subulate; scape terminal, erect, shorter than the leaves; scape-bracts imbricate and concealing the scape, the lower foliaceous, the upper thinner and usually roseate but usually with a distinct filiform lamina also; inflorescence always simple, distichous or sometimes polystichous at base, lanceolate, acuminate at both ends, terete, up to 7 cm. long and 8 mm. in diameter but often less than half as large, densely few-flowered; rhachis nearly straight, slender, strongly sulcate, glabrous; floral bracts densely imbricate and wholly concealing the rhachis, twice or thrice as long as the internodes, elliptic-lanceolate, obtuse or the basal ones minutely apiculate, about 30 mm. long and 10 mm. wide, much exceeding the sepals, membranaceous, roseate, strongly nerved, the lower ones appressed-lepidote, the upper ones often glabrous; flowers sessile, up to 46 mm. long; sepals lanceolate, acute, up to 20 mm. long, subcoriaceous, glabrous, even or few-nerved, the

posterior ones usually much connate; petals tubular-erect, yellow; stamens and pistil exserted; ovary ellipsoid; capsule cylindrical, up to 45 mm. long.

TYPE LOCALITY: Hacienda de la Laguna, near Actopan, Vera Cruz.

DISTRIBUTION: West Indies; Mexico and Central America; also in Colombia and Venezuela.

ILLUSTRATION: Proc. Am. Acad. 70: pl. 3, f. 9.

103. *Tillandsia imperialis* E. Morren; André, Bromel. Andr. 100, as synonym. 1889; Mez, in Engler, Pflanzenreich 4³²: 482. 1935.

Tillandsia strobilantha Baker, Jour. Bot. 26: 168. 1888. Not *T. strobilantha* Poir. 1817.

Guzmania imperialis Roehl; Baker, Handb. Bromel. 180, as synonym. 1889.

Stemless, 4 dm. high; leaves densely rosulate, 35-45 cm. long; sheaths distinct, ovate, 15 cm. long, violet on the inside toward the apex, brown-punctulate-lepidote; blades ligulate, acuminate, 4-5 cm. wide, often recurving near the apex, green or tinged with purple, inconspicuously punctulate-lepidote; scape erect, stout, much shorter than the leaves; scape-bracts densely imbricate, foliaceous with elongate blades, the upper ones often red, making a gradual transition into the primary bracts; inflorescence equaling or shorter than the leaves, compound with simple branches, substrobilate, 15-20 cm. long, 4-7 cm. in diameter; primary bracts erect, broadly ovate with elongate, narrowly triangular, red blades, much exceeding all the axillary spikes, subglabrous; spikes sessile, elliptic, 3-flowered or 4-flowered, 6 cm. long, strongly complanate; floral bracts elliptic, acute, 35-40 mm. long, exceeding the sepals, carinate, subchartaceous, slightly nerved, glabrous; flowers erect, short-pedicellate; sepals sublanceolate, obtuse, submembranaceous, slightly nerved, glabrous, equally subfree; petals linear, 6 cm. long, tubular-erect, violet; stamens and pistil exserted; capsule stout, subellipsoid, abruptly acute, 4 cm. long.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Vera Cruz, Puebla, and Oaxaca.

104. *Tillandsia Standleyi* L. B. Smith, Contr. Gray Herb. 95: 46. 1931.

Stemless, 1 m. long if the inflorescence is erected; leaves erect, rosulate, 40 cm. long, covered throughout with minute closely appressed scales; sheaths elliptic, 10 cm. long, 4.5 cm. wide, dark-purple with small light spots; blades narrowly triangular, 15 mm. wide at the base, pale; scape decurved, shorter than the leaves, wholly covered by its foliaceous bracts; inflorescence laxly bipinnate, pendulous; axis slender, slightly flexuous, glabrous; primary bracts very large, spreading, three to four times as long as the axillary spikes, lanceolate, acuminate, 26 cm. long, 2 cm. wide, enfolding the spikes, brilliant-red; spikes lanceolate, strongly compressed, stipitate, 6 cm. long, 2 cm. broad, densely 8-flowered, pale-green; rhachis strongly compressed, angled; floral bracts narrowly lanceolate, acuminate, concealing the rhachis, equaling the sepals, up to 35 mm. long but often much shorter, much impressed on the lower half of the back, even or slightly nerved toward apex, glabrous; sepals narrowly lanceolate, acuminate, strongly carinate, free, even, glabrous; capsule acute, shorter than the sepals.

TYPE LOCALITY: El Achote, Comayagua, Honduras, altitude 1500 meters.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Contr. Gray Herb. 95: pl. 9, f. 1-4.

105. *Tillandsia foliosa* Mart. & Gal. Bull. Acad. Brux. 10¹: 119. 1843.

Tillandsia Hahnii Mez, in DC. Monog. Phan. 9: 690. 1896.

Tillandsia Kirckhoffiana "Wittm." Mez, in DC. Monog. Phan. 9: 693. 1896. Not *T. Kirckhoffiana* Wittm. 1889.

Tillandsia modesta Mez, in Engler, Pflanzenreich 4³²: 481. 1935.

Plant stemless, 4 dm. high; leaves many in a dense utriculate rosette, 4-5 dm. long; sheaths broadly ovate or elliptic, 1 dm. long, brown, densely and finely appressed-brown-lepidote; blades linear-triangular, subfiliform-acuminate, 15 mm. wide at the base, glabrous above, densely

pale-appressed-lepidote below; scape erect or ascending, slender, glabrous; scape-bracts erect, imbricate, elliptic with elongate divergent to reflexed foliaceous blades, chartaceous, lepidote, red; inflorescence compound with simple branches, subcylindric, 15–30 cm. long, dense toward the apex, interrupted toward the base; primary bracts enfolding and concealing the axillary spikes, submembranaceous, the lower ones like the scape-bracts, the upper merely acute; spikes sessile with a sterile bract at base, narrowly lanceolate in outline, acute, 2–5 cm. long, complanate, 4–6-flowered; floral bracts erect, densely imbricate, elliptic, broadly acute or obtuse, 16–19 mm. long, about equaling the sepals, carinate, subcoriaceous, even, glabrous; flowers sessile; sepals lanceolate, obtuse, coriaceous, even, glabrous, much connate posteriorly; petals tubular-erect, narrow, 4 cm. long, violet; stamens and pistil exerted.

TYPE LOCALITY: Jalapa, Vera Cruz, altitude 1200 meters.
DISTRIBUTION: Vera Cruz.

106. *Tillandsia prodigiosa* (Lemaire) Baker, Handb.
Bromel. 186. 1889.

Vriesea prodigiosa Lemaire, Ill. Hort. 16: Misc. 92. 1869.
Tillandsia Cossoni Baker, Jour. Bot. 25: 279. 1887.

Stemless, over 6 dm. high; leaves densely rosulate, 5 dm. long; sheaths distinct, elliptic or ovate-oblong, about 15 cm. long, dark-brown, very densely and minutely brown-lepidote; blades narrowly triangular, acuminate, 4–6 cm. wide, pale-appressed-lepidote especially below; scape erect, stout, equaling the leaves; scape-bracts erect, very densely imbricate, foliaceous, the upper ones sometimes tinged with red; inflorescence compound with simple branches, subcylindric, usually dense, 3–6 dm. long, 10–15 cm. in diameter; primary bracts ovate, acuminate, exceeding the lower axillary spikes, densely and finely appressed-lepidote; spikes suberect to spreading, sessile or with a short stout naked stipe, broadly ovate or elliptic, strongly complanate, densely 10–12-flowered with a few sterile bracts at base, 5–9 cm. long, 3–5 cm. wide; floral bracts erect, densely imbricate and concealing the rachis, ovate, acuminate, sharply carinate, 30–35 mm. long, 24 mm. wide, equaling or exceeding the sepals, coriaceous, faintly nerved, glabrous or lepidote; flowers short-pedicellate; sepals lanceolate, acuminate, 3 cm. long, coriaceous, prominently nerved, glabrous, the posterior ones short-connate; petals linear, tubular-erect, 5 cm. long, violet; stamens and pistil exerted.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Southern Mexico.

107. *Tillandsia Yunckeri* L. B. Smith; Yuncker, Field Mus. Publ.
Bot. 17: 322. 1938.

Plant stemless, probably about 5 dm. high; leaves many in a crateriform rosette, straight, 4 dm. long, strongly suffused with purple; sheaths broadly elliptic, about 15 cm. long, densely punctulate-lepidote; blades ligulate, acute, up to 5 cm. wide, flat, glabrous above, obscurely punctulate-lepidote below; scape erect, stout, glabrous; scape-bracts erect, densely imbricate, foliaceous, large; inflorescence compound with simple branches, slenderly pyramidal, 2 dm. long, the apical half dense; primary bracts suborbicular with a short foliaceous blade, exceeding and closely enfolding the axillary spikes, bright-red, glabrous, lustrous; spikes sessile, broadly lanceolate, acute, densely 4-flowered with a sterile bract at the base, 65 mm. long, 25 mm. wide, complanate, the upper suberect, the lower spreading; floral bracts lance-ovate, acute, up to 45 mm. long, much exceeding the sepals, sharply carinate with flat sides, coriaceous, even or faintly nerved, glabrous; flowers sessile; sepals lanceolate, acuminate, 3 cm. long, coriaceous, glabrous, sharply carinate, the posterior ones much connate; petals tubular-erect, 5–6 cm. long; stamens probably exerted.

TYPE LOCALITY: Summit of range above El Achote, above the plains of Siguatepeque, Comayagua, Honduras, altitude 1800 meters.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATION: Field Mus. Publ. Bot. 17: pl. 10.

108. *Tillandsia strobilifera* E. Morren; Baker, Handb.
Bromel. 181. 1889.

Stemless, 4 dm. high; leaves many in a dense crateriform rosette, 4 dm. long; sheaths elliptic, green or pale-brown; blades narrowly triangular, acuminate, 25 mm. broad, flat for most of their length, densely appressed-canescens-lepidote especially below; scape erect, stout, much shorter than the leaves; scape-bracts erect, densely imbricate, foliaceous with elongate divergent to reflexed blades; inflorescence pinnately compound with simple branches, slenderly pyramidal or cylindric, 1-3 dm. long, 8 cm. in diameter, dense, of 9-12 spikes; primary bracts broadly elliptic-ovate, the lower ones with acuminate recurving blades and exceeding the axillary spikes; spikes suberect to spreading, sessile, elliptic or lanceolate, complanate, 4-7 cm. long; floral bracts erect, imbricate and concealing the rhachis, ovate, acute, 25 mm. long, 16 mm. wide, equaling the sepals, carinate, coriaceous, green, even or faintly nerved, densely lepidote; flowers sessile; sepals acuminate, membranaceous toward the apex, sharply keeled, lepidote, the posterior ones connate for 4 mm.; petals linear, tubular-erect; stamens and pistil exerted.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Central Mexico.

109. *Tillandsia violacea* Baker, Jour. Bot. 25: 279. 1887.

Platystachys violaceus Beer, Bromel. 264, hyponym. 1857.

Stemless, 6-7 dm. high; leaves densely rosulate, 3-4 dm. long; sheaths oblong-ovate, 1 dm. long, brown, densely and finely brown-lepidote; blades narrowly triangular, acuminate, 2-4 cm. wide, firm, densely pale-appressed-lepidote especially below; scape ascending, stout, shorter than the leaves; scape-bracts erect or suberect, densely imbricate, foliaceous, lepidote; inflorescence compound with simple branches, cylindric, dense at least toward the apex, 4 dm. or more long; axis glabrous; primary bracts broadly ovate or elliptic, exceeding and enfolding the axillary spikes, roseate, the lower ones with long foliaceous lepidote blades, the upper merely acute; spikes suberect to spreading with a stout naked stipe up to 15 mm. long, ovate or lanceolate, complanate, 6-8-flowered with a sterile bract at the base, 5-9 cm. long, 3-4 cm. wide; floral bracts erect, imbricate, elliptic, obtuse, ecarinate, 3 cm. long, equaling or slightly exceeding the sepals, 4-6 times as long as the internodes but partially exposing the rhachis, coriaceous, when dry deeply wrinkled as if shrunken, roseate, sparsely brown-punctulate-lepidote; flowers sessile; sepals elliptic, obtuse, coriaceous, even, glabrous, the posterior ones short-connate; petals linear, tubular-erect, 5 cm. long, violet; stamens and pistil exerted.

TYPE LOCALITY: High mountains near Toluca, Mexico.

DISTRIBUTION: Mexico [State], Morelos, and Oaxaca.

110. *Tillandsia plumosa* Baker, Jour. Bot. 26: 13. 1888.

Tillandsia Magnusiana Wittm. Bot. Jahrb. 11: 66. 1889.

Plants stemless, up to 18 cm. high, densely aggregated; leaves very numerous in a dense globular rosette, up to 18 cm. long, densely tomentose-lepidote with fine linear spreading cinereous or ferruginous scales; sheaths ovate-oblong, 1-2 cm. long, thin; blades spreading to reflexed, filiform-subulate; scape from 11 cm. long to almost none, about 2 mm. in diameter, usually curved; scape-bracts densely imbricate, elliptic with long foliaceous erect blades, densely tomentose-lepidote, membranaceous, strongly nerved, roseate; inflorescence capitate or corymbose, compound or appearing simple and polystichous-flowered by the reduction of each spike to a single flower, 3 cm. in diameter; primary bracts like the upper scape-bracts, exceeding the axillary spikes; spikes erect, broadly lanceolate, 1-3-flowered, complanate; floral bract lanceolate, acute, about equaling the sepals, carinate, membranaceous, strongly nerved, very finely tomentose-lepidote; sepals ovate-lanceolate, acuminate, 15 mm. long, thin, nerved, lepidote; petals linear, 13 mm. long, yellowish-green; capsule cylindric, short-beaked, 2 cm. long.

TYPE LOCALITY: Puebla.

DISTRIBUTION: South-central Mexico, Guatemala, and Honduras.

111. *Tillandsia Graebenerii* Mez, *Repert. Sp. Nov.* 14: 253. 1916.

Plant barely 4 dm. high; leaves very numerous in a dense infundibuliform rosette; sheaths broadly ovate, brown; blades linear, acuminate, arched-spreading, 4 dm. long, 12 mm. wide at the middle, strongly channeled, dark-green, subglabrous above, densely and minutely appressed-canescens-lepidote below; scape erect, stout, much shorter than the leaves, glabrous; scape-bracts erect or the upper ones suberect, much exceeding the internodes, bearing elongate decurved blades, glabrous; inflorescence laxly compound with simple branches, not at all strobilate, much shorter than the leaves, 16 cm. long; primary bracts like the scape-bracts, suberect with spreading or decurved blades, much exceeding the axillary spikes and forming a tube about them and their flowers at anthesis; spikes 1- or 2-flowered with a sterile rudiment at the apex, 15 mm. long, dense, glabrous; rhachis excavated; floral bracts strict, 13 mm. long, subcarinate, subcoriaceous, green tinged with red; flowers sessile, erect, 55 mm. long; sepals obtuse, 14 mm. long, submembranaceous, green, the posterior ones connate for nearly half their length; petals tubular-erect, bright-violet; stamens and pistil exerted.

TYPE LOCALITY: "E republica Mexicana loco non indicato."

DISTRIBUTION: Known only from the type collection.

112. *Tillandsia Diguettii* Mez & Rol.-Goss.; Mez, *Repert. Sp. Nov.* 14: 250. 1916.

Plant stemless, 7-8 cm. high; leaves many in a dense bulbous rosette, less than 1 dm. long, densely and coarsely subspreading-canous-lepidote; sheaths inflated, forming an ellipsoid pseudobulb; blades recurved and contorted, long-acuminate, flat, 1 cm. wide at the base, rigid; scape none; inflorescence sessile in the center of the leaf-rosette, compound, densely capitate, of 5 spikes; primary bracts foliaceous, much exceeding the axillary spikes but exposing them because of the reflexed blades; spikes strict, sessile, elliptic in outline, acute, densely 2-flowered or 3-flowered, 3 cm. long; floral bracts 2 cm. long, exceeding the sepals, barely imbricate, sharply carinate, slightly incurved toward the apex, coriaceous, slightly nerved, lepidote; flowers sessile; sepals obtuse, coriaceous, becoming membranaceous toward the apex, lepidote, the posterior ones connate for 3-4 mm.

TYPE LOCALITY: "Mexico occidentalis, prope Manzanillo"; described from cultivation.

DISTRIBUTION: Known only from the type collection.

113. *Tillandsia capitata* Griseb. *Cat. Pl. Cub.* 255. 1866.

Tillandsia tephrophylla Harms, *Notizbl. Bot. Gart. Berlin* 10: 800. 1929.

Plant stemless, 2-5 dm. high; leaves densely rosulate, curved, equaling or exceeding the inflorescence when extended, densely and coarsely pale-appressed-lepidote throughout; sheaths broadly ovate or elliptic, up to 9 cm. long, ferruginous; blades narrowly triangular, acuminate, 1-3 cm. wide at the base, involute-subulate toward the apex; scape erect or ascending, 6 mm. in diameter; scape-bracts densely imbricate, foliaceous, their blades exceeding the inflorescence or spreading to reflexed, the upper ones subinvolute below the inflorescence, usually tinged with red; inflorescence depauperate-compound or pseudo-simple and polystichous-flowered, densely capitate, ellipsoid, 4-7 cm. long; primary bracts like the upper scape-bracts but with very short blades, much exceeding the axillary spikes; spikes sessile, ovate, densely 1-5-flowered with 1 or 2 sterile bracts at the base; floral bracts ovate, acute, up to 35 mm. long, equaling the sepals, carinate, chartaceous, lepidote at least toward the apex; flowers subsessile; sepals lance-oblong, acute, membranaceous, glabrous, short-connate posteriorly; petals tubular-erect, narrow, 35-50 mm. long, blue; stamens exerted; capsule slenderly cylindrical, acute, 27 mm. long.

TYPE LOCALITY: Eastern Cuba.

DISTRIBUTION: Exposed cliffs, Cuba and Mexico.

114. *Tillandsia brachycaulos* Schlecht. *Linnaea* 18: 422. 1844.

Tillandsia cryptantha Baker, Jour. Bot. 26: 142. 1888.

Tillandsia Bradeana Mez & Tonduz; Mez, Repert. Sp. Nov. 14: 252. 1916.

Tillandsia flammea Mez, in Engler, Pflanzenreich 4³³: 478. 1935.

Stemless; leaves subrosulate, numerous, spreading to arching-decurved, often secund, 12-26 cm. long, much exceeding the inflorescence, densely and finely appressed-lepidote; sheaths distinct, ovate, 3-5 cm. long, brown-lepidote; blades linear, filiform-acuminate, 8-20 mm. wide, flat or involute; scape short to none, erect, slender, glabrous; scape-bracts foliaceous, very densely imbricate, equaling or exceeding the inflorescence; inflorescence compound at base or appearing simple and polystichous-flowered by the reduction of the spikes to a single flower each, densely capitate or subcorymbose, few-flowered; primary bracts like the scape-bracts with long foliaceous blades many times exceeding the axillary spikes; spikes 1-flowered or 2-flowered with a few sterile bracts at base; floral bracts lanceolate or oblong, obtuse, about equaling the sepals, membranaceous, prominently nerved, glabrous; flowers erect, sessile; sepals narrowly elliptic, obtuse, 12-17 mm. long, membranaceous, free or the posterior ones much connate even in the same spike; petals linear, 5-7 cm. long, tubular-erect, violet; stamens and pistil exerted; capsule cylindrical, acute, 4 cm. long.

TYPE LOCALITY: Hacienda de la Laguna [Vera Cruz].

DISTRIBUTION: Southern Mexico and Central America.

ILLUSTRATIONS: Belg. Hortic. 28: pl. 11; Engler, Pflanzenreich 4³²: f. 96.

115. *Tillandsia macrochlamys* Baker, Jour. Bot. 26: 142. 1888.

Stemless, 3-5 dm. high; leaves rosulate, 35 cm. long; sheaths elliptic, nearly 15 cm. long, brown, violet toward the apex, densely and minutely brown-appressed-lepidote; blades very narrowly triangular, acuminate, 27 mm. wide, densely pale-appressed-lepidote on both sides, flat, especially the inner ones red; scape ascending; scape-bracts densely imbricate, subfoliaceous with blades up to 3 dm. long, red; inflorescence compound with simple branches, densely ellipsoid, substrobilate, 15-20 cm. long; primary bracts like the scape-bracts, much exceeding the axillary spikes; spikes subsessile, 1-flowered to densely 4-flowered with a sterile bract at the base, 4 cm. long, 2 cm. wide; floral bracts ovate-elliptic, acute, 20-25 mm. long, equaling or exceeding the sepals, sharply carinate, coriaceous, glabrous; flowers erect, subsessile; sepals lance-ovate, acute, coriaceous, glabrous, the posterior ones carinate, short-connate; petals tubular-erect, 35 mm. long; stamens and pistil exerted.

TYPE LOCALITY: Central Mexico.

DISTRIBUTION: Sinaloa and central Mexico.

116. *Tillandsia erubescens* Schlecht. *Linnaea* 18: 427. 1844.

Tillandsia ionantha Planch. Fl. Serres 10: 101. 1855.

Pityrophyllum erubescens Beer, Bromel. 79. 1857.

Pityrophyllum gracile Beer, Bromel. 79. 1857.

Tillandsia Scopus Hook. f. Bot. Mag. under pl. 5892. 1871.

Tillandsia rubentifolia Poisson & Menet, Bull. Mus. Paris 14: 237. 1908.

Plant stemless, usually growing in dense masses; leaves 30-40 in a dense rosette, rarely over 6 cm. long, densely cinereous-lepidote throughout with coarse spreading scales; sheaths elliptic, about half as long as the blade; blades narrowly triangular, subulate-acuminate, stout, 5 mm. wide, the outer ones green, the inner deep-red when fresh; scape none; inflorescence sessile in the center of the leaves, all but the ends of the petals concealed by the leaves, appearing to be a simple abbreviated spike with polystichous flowers, but actually a reduced panicle with the axes aborted and the spikes reduced to a single flower each; primary bracts lance-ovate, acute, equaling or exceeding the sepals, membranaceous, lepidote toward the apex; floral bracts like the primary bracts but shorter than the sepals; flowers sessile, erect; sepals lanceolate, acute, 16 mm. long, membranaceous, free; petals tubular-erect, over 4 cm. long, violet, the claw linear, the blade broadly elliptic, subacute; stamens and pistil long-exserted; capsule subcylindric, acute, 3 cm. long.

TYPE LOCALITY: "S. Angel, S. Bartolo."

DISTRIBUTION: Tamaulipas, Vera Cruz, Puebla, Morelos, Guatemala, and Nicaragua.

ILLUSTRATIONS: Fl. Serres 10: *pl.* 1006; Bot. Mag. *pl.* 5892; Engler, Pflanzenreich 4²: *f.* 98.

117. *Tillandsia Benthamiana* Klotzsch; Baker, Jour.

Bot. 26: 15. 1888.

Anoplophytum vestitum Beer, Bromel. 266, excl. syn. 1857.

Tillandsia vestita "Cham. & Schlecht." Benth. Pl. Hartweg. 25. 1840. Not *T. vestita* Schlecht. & Cham. 1831.

Tillandsia Hartwegiana E. Morren; Baker, Handb. Bromel. 199, as synonym. 1889.

Plants stemless or short-caulescent, often aggregated in dense masses, 13–22 cm. high; leaves numerous, densely polystichous with the blades often secund and recurved, up to 2 dm. long, covered with a coat of coarse cinereous subappressed scales; blades merging imperceptibly with the inconspicuous oblong sheaths, narrowly triangular, acuminate, involute-subulate toward the apex, 5–15 mm. wide; scape erect or decurved, slender, equaling or shorter than the leaves; scape-bracts erect, densely imbricate, the lower foliaceous, the upper ovate with a short foliaceous blade, subinflated, membranaceous, roseate, sparsely lepidote, becoming glabrous; inflorescence usually simple and polystichous-flowered but sometimes compound at base, few-flowered, densely ellipsoid or fusiform, up to 9 cm. long and 3 cm. in diameter; axis short, straight, lepidote; primary bracts like the upper scape-bracts, strict, ample, acute, up to 75 mm. long, much exceeding the sepals or the axillary spike; spike 1-flowered or rarely 2-flowered, the acute membranaceous floral bracts about equaling the sepals; flowers erect, subsessile; sepals lanceolate, acute, 25–35 mm. long, membranaceous, white, strongly nerved, glabrous, equally short-connate; petals tubular-erect, linear, 7 cm. long, pale-green; stamens and pistil exerted; capsule cylindric, acute, about equaling the sepals.

TYPE LOCALITY: Central Mexico.

DISTRIBUTION: Nuevo León, Durango, and central Mexico.

ILLUSTRATION: Möller's Gärtner-Zeit. 29: 510. 1914.

118. *Tillandsia Andrieuxii* (Mez) L. B. Smith, Contr.

Gray Herb. 117: 31. 1937.

Tillandsia Benthamiana var. *Andrieuxii* Mez, in DC. Monog. Phan. 9: 736. 1896.

Plants stemless or short-caulescent, sometimes branching; leaves subrosulate, 10–15 cm. long, recurving and often more or less secund, covered with subspreading cinereous scales; sheaths variable in size, distinct; blades narrowly triangular, acuminate, involute-subulate for most of their length, 8 mm. wide; scape erect or slightly curved, slender, largely obscured by the leaves; scape-bracts erect, densely imbricate, elliptic with foliaceous laminae, membranaceous, subinflated, roseate, lepidote; inflorescence simple and polystichous-flowered by the reduction of the spikes to a single flower each, densely fusiform or ellipsoid, 2–8-flowered, 5–6 cm. long; axis straight, slender, short, lepidote; primary bracts like the upper scape-bracts but obtuse or apiculate, ample, 35–40 mm. long, much exceeding the sepals; floral bract lanceolate, membranaceous, much shorter than the sepals; flowers erect; sepals lanceolate, acute, membranaceous, 10–30 mm. long; petals linear, tubular-erect; 4–5 cm. long, violet; stamens and pistil exerted; capsule subcylindric, equaling the sepals.

TYPE LOCALITY: "Mexico, ad Chalco in ditone urbis Mexico."

DISTRIBUTION: Central Mexico and Costa Rica.

ILLUSTRATION: Bot. Mag. *pl.* 8576.

DOUBTFUL OR EXCLUDED SPECIES

TILLANDSIA BORYANA Gand. Bull. Soc. Bot. Fr. 66: 290. 1920. Described from San Domingo.

TILLANDSIA BRIGITTALIS E. H. L. Krause, Beih. Bot. Centr. 32: 336. 1914. Described from St. Vincent, W. I.; scarcely of this genus.

TILLANDSIA DISTACHYA Baker, Gard. Chron. II. 13: 200. 1880. Described from Honduras.

TILLANDSIA VARIABILIS Schlecht. Linnaea 18: 418. 1844. Described from Mexico.

6. *VRIESIA* Lindl. Bot. Reg. 29: pl. 10. 1843. (Nomen conservandum.) Not *Vriesia* Hassk. 1842.

Hexalepis Raf. Fl. Tell. 4: 24. 1838.

Neovriesia Britton; Britton & Wilson, Sci. Surv. Porto Rico 5: 141. 1923.

Vriesia subgenus *Alcantarea* E. Morren; Mez, in Mart. Fl. Bras. 3^o: 516. 1894.

Alcantarea Harms, Notizbl. Bot. Gart. Berlin 10: 802. 1929.

Large showy mostly epiphytic herbs. Leaves densely rosulate, often banded or mottled, entire. Inflorescence simple or compound, spikes usually distichous-flowered. Floral bracts conspicuous, enfolding or concealing the bases of the flowers. Flowers subsessile or with short pedicels. Sepals free. Petals free, ligulate, bearing either one or two scales each according to the species. Stamens included or exerted. Ovary nearly or quite superior; style elongate. Ovules many, usually caudate. Seeds fusiform, with a long straight basal coma.

Type species, *Tillandsia psittacina* Hook.

Spikes polystichous-flowered; inflorescence simple.

Spikes distichous, or distichous with the flowers becoming secund at anthesis.

Flowers not becoming secund at anthesis.

Inflorescence compound.

Floral bracts equaling or exceeding the sepals; spikes decurved.

Spikes eprophyllate.

Spikes prophyllate.

Floral bracts distinctly shorter than the sepals.

Flowers spreading; inflorescence bipinnate.

Flowers appressed to the rhachis; inflorescence amply tri-pinnate.

Inflorescence simple.

Floral bracts imbricate at anthesis, or at least erect or suberect and more than twice as long as the internodes.

Floral bracts carinate toward the apex.

Inflorescence dense, 6 cm. wide; leaves concolorous.

Inflorescence subax, 18 mm. wide; leaves with brown cross-bands.

Floral bracts convex, not at all carinate.

Floral bracts appearing rugose, at least under a lens.

Leaves broadly acute or obtuse, apiculate.

Floral bracts barely imbricate.

Floral bracts three to four times as long as the internodes.

Leaves acute, not apiculate.

Floral bracts broadly acute, much exceeding the sepals.

Floral bracts obtuse, barely exceeding the sepals.

Floral bracts even or longitudinally striate, not rugose.

Floral bracts shorter than the sepals.

Floral bracts exceeding the sepals.

Floral bracts densely imbricate and concealing the rhachis.

Floral bracts inrolled about the sepals and exposing the rhachis or barely imbricate.

Floral bracts up to 55 mm. long, distinctly more than twice as long as the internodes; leaves subobtusate, apiculate.

Floral bracts 22 mm. long, barely more than twice as long as the internodes; leaves acute.

Floral bracts spreading at anthesis, not imbricate.

Floral bracts much shorter than the sepals.

Floral bracts nearly or quite equaling the sepals.

Flowers becoming secund at anthesis.

Floral bracts, or at least the basal ones, acuminate.

Inflorescence usually compound; all the floral bracts acuminate.

Inflorescence simple; only the lower floral bracts acuminate.

Leaves concolorous, their blades 5 mm. wide, acuminate.

Leaves transversely brown-banded, their blades 3 cm. wide, acute.

Floral bracts acute or obtuse.

Spikes lax; nearly or quite all the floral bracts less than twice as long as the internodes.

Inflorescence simple.

Inflorescence compound.

Floral bracts 3 cm. long, equaling the sepals.

Floral bracts only about half as long as the sepals.

Branches at least half sterile, bearing a single prophyllum each.

Branches less than half sterile, usually bearing several prophylla each.

1. *V. Malzinei*.

2. *V. campoclada*.

3. *V. dissitiflora*.

4. *V. alta*.

5. *V. paniculata*.

6. *V. heliconioides*.

7. *V. Jimenezii*.

8. *V. rugosa*.

9. *V. gladioliflora*.

10. *V. pachyspatha*.

11. *V. macrantha*.

1. *V. Malzinei*.

12. *V. acuminata*.

13. *V. Brunci*.

14. *V. brachyphylla*.

15. *V. platynema*.

16. *V. macrostachya*.

17. *V. riugens*.

18. *V. graminifolia*.

19. *V. Schippii*.

20. *V. macrochlamys*.

3. *V. dissitiflora*.

21. *V. Swartzii*.

22. *V. Tuereckheimii*.

- Spikes dense; floral bracts distinctly more than twice as long as the internodes.
 Inflorescence amply and densely compound.
 Spikes eprophyllate. 2. *V. camptoclada*.
 Spikes prophyllate. 23. *V. Werckleana*.
 Inflorescence simple or laxly compound from a few spikes.
 Floral bracts remaining erect.
 Floral bracts obtusely carinate toward the apex. 24. *V. guadeloupensis*.
 Floral bracts broadly convex, ecarinate.
 Leaves broadly obtuse or acute, apiculate; floral bracts nearly or quite straight, three to four times as long as the internodes. 9. *V. gladioliflora*.
 Leaves acuminate; floral bracts cucullate, slightly more than twice as long as the internodes. 25. *V. Tonduziana*.
 Floral bracts becoming secund with the flowers.
 Plants coarse, up to 2 m. high; inflorescence usually compound; leaves dark-spotted. 26. *V. sanguinolenta*.
 Plants not more than 1 m. high; inflorescence always simple.
 Floral bracts exceeding the sepals.
 Inflorescence 12-20-flowered; sepals obtuse, 17-27 mm. long. 27. *V. Pittieri*.
 Inflorescence 4-flowered; sepals acute, 15 mm. long. 28. *V. diminuta*.
 Floral bracts about equaling the sepals.
 Leaf-blades 15 mm. wide; floral bracts chartaceous. 29. *V. subsecunda*.
 Leaf-blades 40-60 mm. wide.
 Scape elongate, not more than 4 mm. in diameter. 30. *V. viridiflora*.
 Scape short and stout. 31. *V. haplostachya*.

1. *Vriesia Malzinei* E. Morren, Belg. Hort. 24: 313. 1874.

Tillandsia Malzinei Baker, Rep. Kew Gard. 1878: 59. 1879.

Flowering plant up to 8 dm. high but usually less; leaves up to 3 dm. long, dark-red below or the sheaths green with red spots, green or green with red spots above; blades 4-5 cm. wide, ligulate, acute; scape erect, about equaling the leaves; scape-bracts imbricate, the lower ones produced into a short spreading blade, the upper ones abruptly acute; inflorescence simple, polystichous or subdistichous, cylindric, up to 17 cm. long, densely 10-24-flowered; floral bracts very broadly ovate, obtuse, 25 mm. long, 28 mm. wide, much shorter than the sepals, not at all carinate, red-brown or pale-green with a dark-green border; flowers erect, imbricate, 7-8 cm. long; pedicels very short and stout; sepals elliptic, obtuse, 32 mm. long, green; petals linear, greenish-white, each bearing 2 spatulate incised scales at the base, exceeding the stamens; pistil exceeding the stamens; ovules very minutely caudiculate; coma white.

TYPE LOCALITY: Vicinity of Cordoba, Vera Cruz.

DISTRIBUTION: Known only from the type locality, but introduced into cultivation.

ILLUSTRATIONS: Belg. Hort. 24: pl. 14; Bot. Mag. pl. 6495.

2. *Vriesia camptoclada* Mez & Wercklé; Mez, Repert.

Sp. Nov. 14: 247. 1916.

Flowering plant more than 12 dm. high, very stout, flavescent; leaves many in a dense subtriculate rosette, up to 45 cm. long, subglabrous, marked with fine longitudinal brown lines, 1 dm. wide above the sheath; scape very stout, nearly twice as long as the leaves; scape-bracts slightly imbricate, appressed, thick, marked like the leaves, minutely lepidote; inflorescence many-flowered, amply bipinnate, up to 5 dm. long, thyrsoïd; primary bracts like the scape-bracts, much shorter than the branches; spikes arching-recurved, 9 cm. long, eprophyllate, densely flowered; rhachis geniculate; floral bracts broadly ovate, obtuse, up to 22 mm. long, exceeding the sepals and often concealing the whole flower, not secund with the flowers, erect, inflated, not at all carinate, thick, coriaceous; flowers secund or not; pedicels very short and stout, obconic; sepals broadly elliptic, obtuse, up to 17 mm. long, thick, coriaceous; petals oblong, about 20 mm. long, each bearing 2 spatulate, acute, irregularly dentate scales near the base; stamens and pistil included.

TYPE LOCALITY: Vicinity of La Palma, Costa Rica.

DISTRIBUTION: Known only from the type collection.

3. *Vriesia dissitiflora* (C. Wright) Mez, in DC.

Monog. Phan. 9: 604. 1896.

Tillandsia dissitiflora C. Wright; Sauv. Anal. Acad. Ci. Habana 8: 54. 1872.
Vriesia Erioi Harms, Notizbl. Bot. Gart. Berlin 12: 533. 1935.

Flowering plant over 15 dm. high; leaves 1 m. long; sheaths large, elliptic, indistinct, brown, brown-punctulate-lepidote; blades ligulate, acuminate, 10 cm. wide, subglabrous, green, concolorous; scape erect, about 8 mm. in diameter, glabrous; scape-bracts erect, the lower ones foliaceous and much exceeding the internodes, the upper ones lance-elliptic and shorter than the internodes; inflorescence amply and laxly paniculate; axis slender, glabrous; primary bracts elliptic-ovate, acute, not much larger than the floral bracts, even or faintly striate, sparsely punctulate-lepidote; branches erect or suberect, about 25 cm. long, bearing several remote, tubular-involute, sterile bracts at the base; rhachis flexuous to geniculate; floral bracts becoming secund with the flowers, broadly ovate with a triangular apex, straight or slightly incurved, convex, 3 cm. long, equaling the sepals, less than twice as long as the internodes, obscurely punctulate, light-brown and striate when dry, coriaceous; flowers downwardly secund; pedicels stoutly obconic, 5 mm. long; sepals elliptic, broadly obtuse, 23 mm. long, 12 mm. wide, coriaceous, even and glabrous outside, striate and punctulate inside; petals narrowly elliptic, obtuse, 35 mm. long, bearing 2 oblong acute scales at base; stamens included; filaments somewhat thickened toward the apex.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Known only from the type locality.

4. *Vriesia alta* E. Morren; Mez, in DC.

Monog. Phan. 9: 617. 1896.

Tillandsia alta Baker, Handb. Bromel. 226. 1889.

Flowering plant about 2 m. high; leaves 1 m. long, nearly 1 dm. wide, acuminate, usually incurved at the apex, marked with dark-purple at the base; scape very stout; scape-bracts exceeding the internodes, subspreading, dark-purple at the base and green at the apex; inflorescence very large, amply paniculate, about 1 m. long; branches suberect, 2-6 dm. long, 10-15-flowered; floral bracts ovate to suborbicular, broadly obtuse, about 37 mm. long, much shorter than the sepals, carinate but not incurved, pale-green with brownish-purple markings; flowers divergent to spreading, not secund, up to 125 mm. long; pedicels very thick, 6 mm. long; sepals elliptic, broadly obtuse, 41 mm. long, 21 mm. wide, purple-bordered, carinate especially toward the base; petals fasciate, at first white, then yellow, and finally dull-reddish.

TYPE LOCALITY: Chiriqué, Panama.

DISTRIBUTION: Panama; Jamaica.

5. *Vriesia paniculata* (L.) Mez, in DC.

Monog. Phan. 9: 614. 1896.

Renalmia paniculata L. Sp. Pl. 286. 1753.

Tillandsia paniculata L. Sp. Pl. ed. 2. 410. 1762.

Alcantarea paniculata Harms, Notizbl. Bot. Gart. Berlin 10: 802. 1929.

Stemless, probably 2-3 m. high; leaves many in a dense rosette, relatively very short and exceeded by the scape; blades triangular, acuminate; scape erect, short, very stout; scape-bracts broadly triangular-ovate, equaling or slightly exceeding the internodes; inflorescence amply tripinnate, broadly pyramidal; primary bracts like the scape-bracts, mostly shorter than the sterile bases of the branches; branches elongate, spreading; spikes secund-erect from the branches, laxly few-flowered; floral bracts erect, lanceolate, acute, shorter than the sepals; flowers appressed to the rhachis; petals elongate, spirally recurved at anthesis, blue-violet, purple-punctate; stamens and pistil exerted. [Description compiled.]

TYPE LOCALITY: Dry slopes near Fond de Baudin, Léogane, Haiti.

DISTRIBUTION: Known only from Plumier's illustration.

ILLUSTRATION: Plumier, Pl. Am. pl. 237.

NOTE: The species has been identified with *Vriesia ringens*, *Vriesia alba*, and *Tillandsia Eleanora*, but in each case there are strong objections. Either it is a rare species which has not been rediscovered or else the drawing is too inaccurate to allow of correct identification.

6. *Vriesia heliconioides* (H. B. K.) Hook.; Walp.

Ann. Bot. 3: 623. 1852.

Tillandsia heliconioides H. B. K. Nov. Gen. & Sp. 1: 295. 1816.
Tillandsia disticha Willd.; Schultes, in R. & S. Syst. Veg. 7: 1226, as synonym. 1830.
Platytychys disticha Beer, Bromel. 264. 1857.
Vriesia Falkenbergii Bull. Gard. Chron. II. 13: 759. 1880.
Vriesia bellula Linden, Cat. 109: 7. 1853.
Vriesia disticha Kuntze, Rev. Gen. 3: 304, in part. 1898. (As to material cited.)
Guzmania obtusata Rusby, Mem. N. Y. Bot. Gard. 7: 212. 1927.

Flowering plant rarely over 4 dm. high; leaves about 2 dm. long, green above, suffused with red and sometimes spotted below; sheaths distinct, ovate-elliptic, obscurely punctulate-lepidote; blades ligulate, acute or acuminate, 15-30 mm. wide, subglabrous; scape erect, usually much shorter than the leaves; scape-bracts erect, very densely imbricate, very broadly ovate, abruptly acute; inflorescence simple, distichous, oblong in outline, densely 6-18-flowered, up to 20 cm. long, 6 cm. wide, strongly complanate; floral bracts very broadly ovate and triangular-acute or subrhombic, up to 45 mm. long and nearly as wide, chartaceous, the base suberect, the middle spreading horizontally and the apex incurved and sharply carinate, bright-red above the middle, greenish-yellow at the apex; flowers erect or suberect, subsessile, about 6 cm. long; sepals lanceolate, acuminate, 27 mm. long, thin; petals white, ligulate, acute, each bearing 2 ovate obtuse entire scales; stamens shorter than the petals; filaments not at all dilated apically; capsule about 5 cm. long; coma reddish-brown.

TYPE LOCALITY: Valley of the Río Magdalena, near Nares, Colombia.

DISTRIBUTION: Guatemala to Panama also from Colombia to Florida and Louisiana; Brazil.

ILLUSTRATIONS: Ill. Hortic. 30: pl. 490; Ant. Phyto-Te. Bromel. pl. 8; Gard. Chron. II. 21: f. 20.

7. *Vriesia Jimenezii* Mez & Tonduz; Mez, Repert.

Sp. Nov. 14: 246. 1916.

Flowering plant barely over 4 dm. high, slender; leaves subtriculate, up to 4 dm. long, barely 20 mm. wide, the sheaths and the lower part of the blades dorsally marked with transverse brown bands, acuminate, the apex produced into a mucro 10 mm. long but not pungent; scape erect, less than half as long as the leaves; scape-bracts with a mucronate blade like the leaves, exceeding the internodes; inflorescence lanceolate in outline, acute at both ends, 70 mm. long, 18 mm. wide, distichous, compressed, 3-flowered; floral bracts barely imbricate, ovate, acuminate, 45 mm. long, much exceeding the sepals, mucronate, slightly incurved, strongly carinate, glabrous; flowers erect, imperfectly known; sepals elliptic, broadly acute, 30 mm. long, 11 mm. wide, coriaceous, free.

TYPE LOCALITY: San Ramón, Costa Rica, altitude 1300-1400 meters.

DISTRIBUTION: Known only from the type collection.

8. *Vriesia rugosa* Mez & Wercklé; Mez, Bull.

Herb. Boiss. II. 4: 866. 1904.

Flowering plant nearly 1 m. high, very stout; leaves 15 to 20 in a cyathiform rosette, ligulate, up to 4 dm. long and 45 mm. wide, rounded-apiculate, concolorous, subglabrous, coriaceous and rigid when dry; scape erect, stout, exceeding the leaves; scape-bracts involute, exceeding the internodes, elliptic, abruptly acute, not at all foliaceous, thick, rigid, rugulose especially toward the apex, glabrous, somewhat shiny; inflorescence simple, rather laxly 11-flowered, subfusiform, 18 cm. long, 5 cm. wide, compressed; floral bracts erect or suberect, barely imbricate, ovate-elliptic, obtuse, about 42 mm. long, much exceeding the sepals, thick and rigid, not at all carinate nor incurved, rugose, slightly shiny; flowers 43 mm. long; pedicels very stout, 7 mm. long; sepals ovate-elliptic, obtuse, 37 mm. long, 25 mm. wide, stout, cori-

aceous, striate and very densely punctulate-lepidote; petals very broad, each bearing 2 scales near the base.

TYPE LOCALITY: Vicinity of Guardo Arias, Costa Rica.
DISTRIBUTION: Costa Rica.

9. *Vriesia gladioliflora* (Wendl.) Ant. Wiener
Ill. Gart. 5: 97. 1880.

Tillandsia gladioliflora H. Wendl. Hamb. Gartenz. 19: 31. 1863.

Plant up to 1 m. high; leaves rosulate, 6 dm. long, deep-green, especially above, often purplish; sheaths elliptic, inconspicuous, densely brown-punctulate-lepidote; blades ligulate, broadly acute or obtuse, apiculate, 6-8 cm. wide, concolorous, glabrous above, obscurely punctulate-lepidote beneath; scape erect, very stout; scape-bracts exceeding the internodes, elliptic, abruptly acute; inflorescence simple, densely many-flowered, subcylindric at anthesis, acute, 2-4 dm. long, up to 5 cm. wide; floral bracts distichous, erect, imbricate, very broadly ovate, obtuse, 45-55 mm. long, ecarinate, equaling to much exceeding the sepals, three to four times as long as the internodes, coriaceous, glabrous, green, purplish toward the apex, buff and finely rugulose when dry; flowers suberect, slightly or not at all secund; pedicels very short and stout; sepals broadly elliptic, obtuse, 20-45 mm. long, coriaceous; petals ligulate with sub-orbicular blade, 4-7 cm. long, greenish-white, bearing 2 obovate subincised scales at the base; stamens and pistil shorter than the petals.

TYPE LOCALITY: Described from cultivation.
DISTRIBUTION: Guatemala, Costa Rica, and Panama.
ILLUSTRATIONS: Wiener Ill. Gart. 5: *pl. 1*; Ant. Phyto-Ic. Bromel. *pl. 15*.

10. *Vriesia pachyspatha* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 867. 1904.

Flowering plant 5 dm. high, very stout; leaves 10-15 in a dense rosette, 4 dm. long, 3 cm. wide, linear, acute, concolorous, subglabrous at maturity, coriaceous and rigid when dry; scape erect, very stout, half as long as the leaves; scape-bracts foliaceous, strictly erect, densely imbricate; inflorescence simple, 20 cm. long, 75 mm. broad, rather laxly few-flowered (10 in the type), strongly compressed; floral bracts barely imbricate, suborbicular or broadly ovate, broadly acute, about 6 cm. long, much exceeding the sepals, thick, coriaceous, neither carinate nor incurved, under a lens minutely punctulate and transversely rugulose; flowers erect, not secund; pedicels very short and stout; sepals broadly elliptic, narrowly rounded at the apex, 37 mm. long, 19 mm. wide, very thick, minutely punctulate-lepidote, even or faintly striate toward the apex.

TYPE LOCALITY: Costa Rica.
DISTRIBUTION: Costa Rica.

11. *Vriesia macrantha* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 867. 1904.

Flowering plant probably more than 5 dm. high; leaves 6 dm. long, 4 cm. wide, concolorous, green, acute, densely covered especially toward the base and dorsally with minute pale appressed scales; scape very stout, apparently much shorter than the leaves; scape-bracts densely imbricate and concealing the scape, broadly elliptic, very thick, coriaceous, castaneous when dry, shining, the lower produced into short mucroniform blades, the upper abruptly acute; inflorescence simple, 12-flowered, lanceolate in outline, acute at both ends, 20 cm. long, 45 mm. wide, strongly compressed; floral bracts densely imbricate, broadly ovate, obtuse, 48 mm. long, slightly exceeding the sepals, very thick and rigid, under a lens appearing punctulate and transversely rugose, convex, not carinate; flowers strictly erect; pedicels very short and stout; sepals ovate-elliptic, narrowly rounded, 35 mm. long, 18 mm. wide, striate especially toward the apex.

TYPE LOCALITY: Costa Rica.
DISTRIBUTION: Known only from the type collection.

12. *Vriesia acuminata* Mez & Wercklé; Mez, Bull.

Herb. Boiss. II. 4: 868. 1904.

Flowering plant slightly over 5 dm. high; leaves 15 in a cyathiform rosette, broadly linear, acuminate, up to 6 dm. long and 4 cm. wide, concolorous, subglabrous, subcoriaceous; scape very stout, erect, shorter than the leaves at least when young; scape-bracts densely imbricate, foliaceous, strictly erect, elliptic-lanceolate, acuminate; inflorescence simple, 12-flowered in the type, fusiform, dense, compressed; floral bracts densely imbricate, erect or suberect, broadly ovate, about 4 cm. long, much exceeding the sepals, glabrous and slightly shiny, castaneous when dry, neither carinate nor incurved, the lower ones with a long acuminate apex, the upper ones merely acute or apiculate; flowers strictly erect; pedicels short and stout; sepals triangular, acute, striate, coriaceous.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type collection.

13. *Vriesia Brunei* Mez & Wercklé; Mez, Bull.

Herb. Boiss. II. 4: 865. 1904.

Plant stout, 35 cm. high; leaves about 20 in a cyathiform rosette, 3 dm. long, light-green, concolorous, obscurely punctulate-lepidote; sheaths elliptic, up to 15 cm. long; blades subobtusely, apiculate, 4 cm. wide; scape erect; scape-bracts erect, densely imbricate, making the scape appear over 1 cm. in diameter, elliptic, acute or short-acuminate, subcoriaceous, punctulate-lepidote especially toward the apex; inflorescence simple, oblong in outline, acute, 12-15 cm. long, 45 mm. wide, complanate, glabrous; axis 5 mm. in diameter, angled, geniculate; floral bracts erect or suberect and not at all secund, more than twice as long as the internodes, inrolled about the sepals, hence not truly imbricate and concealing the axis but slightly, very broadly ovate, obtuse, up to 55 mm. long, nearly 4 cm. wide, much exceeding the sepals, strongly convex, ecarinate, coriaceous, thick, even, opaque; flowers erect and not at all secund; pedicels stout, 6 mm. long; sepals ovate-elliptic, broadly acute, 37 mm. long, 19 mm. wide, coriaceous, even or somewhat nerved toward the apex; petals ligulate, broadly acute, 4 mm. longer than the sepals, green, bearing 2 large, acute, basally thickened, coriaceous scales near the base; stamens included, anthers 10 mm. long; capsule elliptic, acute, beaked, barely longer than the sepals.

TYPE LOCALITY: Near Candelaria, Costa Rica.

DISTRIBUTION: Costa Rica.

14. *Vriesia brachyphylla* Mez & Wercklé; Mez, Bull.

Herb. Boiss. II. 4: 869. 1904.

Flowering plant 3-4 dm. high; leaves up to 15 in a fasciculate rosette, 18 cm. long and 32 mm. wide, broadly linear, acute, green, concolorous, appressed-pale-lepidote, subcoriaceous when dry; scape erect, much exceeding the leaves, very slender, terete, glabrous; scape-bracts (known only from fragments) apparently shorter than the internodes, not at all foliaceous; inflorescence simple, laxly 4-8-flowered, up to 9 cm. long; rhachis angled when dry, slightly geniculate; floral bracts suberect to erect, not at all secund, broadly ovate-elliptic, apiculate, 22 mm. long, much exceeding the sepals, glabrous, even, coriaceous, rigid, not at all carinate; flower-pedicels stout, 5 mm. long; sepals broadly elliptic, obtuse, 15 mm. long, 8 mm. wide, even.

TYPE LOCALITY: Vicinity of La Palma, Costa Rica, altitude 1500 meters.

DISTRIBUTION: Known only from the type locality.

15. *Vriesia platynema* Gaud. Bot. Voy. Bonite pl. 66. 1846.*Vriesia corallina* Regel, Gartenflora 19: 354. 1870.*Encholirium corallinum* Linden; André, Ill. Hort. 18: 136. 1871.*Tillandsia corallina* K. Koch, Ind. Sem. Hort. Berol. 1873: App. 4: 5. 1874.*Tillandsia bicolor* "Brongn." Niederl. Result. Bot. Exp. Misiones 64. 1890. Not *T. bicolor* Brongn. 1828.

Plant 5-11 dm. high; leaves many in a spreading rosette, 4-8 dm. long; sheaths broadly ovate or elliptic, 10-15 cm. long, dark-brown, densely brown-punctulate-lepidote; blades ligu-

late, broadly acute or obtuse, apiculate, 4–8 cm. wide, glabrous above, obscurely punctulate-lepidote below, often finely and irregularly reticulate in drying; scape erect, 5–12 mm. in diameter, glabrous; scape-bracts erect and densely imbricate, foliaceous; inflorescence simple, linear in outline, laxly many-flowered, 1–6 dm. long; rhachis sulcate, flattened next the flowers; floral bracts spreading and not at all imbricate, very broadly ovate, obtuse, auricled and decurrent, 3 cm. long, reaching about the mid-point of the sepals, coriaceous, red, drying to buff, glabrous outside, punctulate-lepidote inside; flowers spreading to reflexed; pedicels stout, 1 cm. long; sepals elliptic, obtuse, 25–35 mm. long, flavous, coriaceous, glabrous outside, punctulate-lepidote inside; petals elliptic, obtuse, 35–40 mm. long, green, bearing 2 large ovate or obovate scales near the base; stamens barely shorter than the petals, filaments dilated toward the apex, anthers often appendaged at the apex; capsule ellipsoid, acute, beaked, up to 4 cm. long.

TYPE LOCALITY: Rio de Janeiro, Brazil.

DISTRIBUTION: Chiapas; Cuba and Jamaica; also in eastern Brazil and northeastern Argentina.

ILLUSTRATIONS: Gaud. Bot. Voy. Bonite *pl.* 66; Gartenflora 19: *pl.* 671; Ill. Hort. 18: *pl.* 70; Ant. Phyto-Te. Bromel. *pl.* 17.

16. *Vriesia macrostachya* (Bello) Mez, in DC.

Monog. Phan. 9: 601. 1896.

Caraguata macrostachya Bello, Anal. Soc. Esp. Hist. Nat. 12: 122. 1883.

Neovriesia macrostachya Britton; Britton & Wilson, Sci. Surv. Porto Rico 5: 142. 1923.

Flowering plant 1 m. or more high; leaves 1 m. long; sheaths large, dark-brown; blades ligulate, 8 cm. wide, rounded-apiculate, concolorous; scape very stout, erect; scape-bracts ovate-elliptic, acute, densely imbricate; inflorescence simple, 5–7 dm. long, many-flowered; rhachis over 1 cm. thick at the base; floral bracts broadly ovate, 6 cm. long, about equaling the sepals, with decurrent auricles, ecarinate, coriaceous; flowers spreading; pedicels stout, 13 mm. long; sepals ovate, obtuse, 42 mm. long, 17 mm. wide; coma whitish.

TYPE LOCALITY: Porto Rico.

DISTRIBUTION: Cuba and Porto Rico; also in Trinidad and Venezuela.

17. *Vriesia ringens* (Griseb.) Harms, Notizbl. Bot.

Gart. Berlin 10: 801. 1929.

Tillandsia ringens Griseb. Cat. Pl. Cub. 255. 1866.

Tillandsia Chagresiana Baker, Jour. Bot. 26: 109. 1888.

Tillandsia Veitchii Baker, Handb. Bromel. 223. 1889.

Vriesia Veitchii E. Morren; Baker, Handb. Bromel. 223, as synonym. 1889.

Vriesia paniculata Mez, in DC. Monog. Phan. 9: 614, excl. syn. 1896.

Flowering plant very variable in size; leaves up to 6 dm. long; sheaths ovate-elliptic, mostly indistinct, brown-punctulate-lepidote; blades ligulate, acute or acuminate, 6 cm. wide, green, concolorous, very obscurely punctulate-lepidote beneath; scape erect, stout; scape-bracts erect, densely imbricate, elliptic-lanceolate, acute, pale-green; inflorescence laxly few-branched or rarely simple, up to 3 dm. long; primary bracts like the scape-bracts but thinner, much shorter than the axillary branches; branches suberect, secondly few-flowered, bearing several imbricate sterile bracts at the base; floral bracts very broadly ovate, acuminate, 30–65 mm. long, enfolding the flowers, exceeding the sepals, straight, ecarinate, green; flowers erect, up to 8 cm. long, glabrous; sepals elliptic, acuminate, up to 35 mm. long, 13 mm. wide, subcoriaceous, lustrous; petals white, coiling-recurved, shorter than the stamens, flaccid, bearing 2 large spatulate acute scales at the base.

TYPE LOCALITY: Monteverde, eastern Cuba.

DISTRIBUTION: West Indies; Panama; also in Colombia.

18. *Vriesia graminifolia* Mez & Wercklé; Mez, Bull.

Herb. Boiss. II. 4: 868. 1904.

Flowering plant barely 4 dm. high, very slender; leaves up to 4 dm. long, 5 mm. wide, linear and grass-like, acuminate, appressed-pale-lepidote, chartaceous when dry; sheaths violet-tinged; blades green, concolorous; scape erect, very slender, terete, glabrous; scape-bracts lax,

very narrow, reddish with foliaceous blades; inflorescence simple, 3-flowered in the type, exceeded by the leaves, lax, 7 cm. long; axis slightly angled and undulate; floral bracts secund with the flowers and enfolding their bases on one side, membranaceous, striate, the lowest produced into a long acuminate blade, the others acute, 17 mm. long and about equaling the sepals; flowers suberect; pedicels stout, 5 mm. long; sepals elliptic, narrowly obtuse, 15 mm. long, 7 mm. wide, castaneous with a pale membranaceous border when dry, even and shiny; capsule acuminate, gray-black, opaque.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type locality.

19. *Vriesia Schippii* L. B. Smith, Contr. Gray Herb. 98: 18. 1932.

About 4 dm. high; leaves rosulate, up to 3 dm. long, minutely punctulate-lepidote, marked below with transverse dark-brown bands; sheaths large, elliptic; blades ligulate, acute, 3 cm. wide or slightly wider at base; scape erect, slender, glabrous; scape-bracts imbricate, acuminate from an ovate base, inflated, pale-brown, lepidote toward the apex but elsewhere glabrous, nearly even; inflorescence simple, laxly few-flowered; floral bracts broadly ovate, the lower ones acuminate, up to 43 mm. long, not at all carinate nor imbricate, becoming secund with the flowers; rhachis slender, flexuous; flowers secund; pedicels 5 mm. long; sepals broadly elliptic, obtuse, 17 mm. long, glabrous, faintly nerved; capsule slenderly ellipsoid, 3 cm. long.

TYPE LOCALITY: Middlesex, British Honduras, altitude 600 meters.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 98: pl. 5, f. 5, 6.

20. *Vriesia macrochlamys* Mez & Wercklé; Mez, Bull. Herb. Boiss. II. 4: 865. 1904.

Flowering up to 7 dm. high, very stout; leaves 45 cm. long, 35 mm. wide, abruptly acute, green with irregular violet spots, rigid, subglabrous at maturity; scape erect, stout, glabrous, slightly exceeding the leaves; scape-bracts imbricate, elliptic, abruptly acute, rigid, shiny; inflorescence simple, laxly about 10-flowered, 18 cm. long; floral bracts becoming secund with the flowers, very broadly ovate, obtuse, 42 mm. long, inflated-convex, not at all carinate, very thick and rigid, punctulate-lepidote with immersed scales; flower-pedicels very stout; sepals very broadly elliptic, obtuse, 26 mm. long, 20 mm. wide, very thick, even except for the finely striate apex.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type locality.

21. *Vriesia Swartzii* (Baker) Mez, in Engler, Pflanzenreich 4³²: 400. 1935.

Tillandsia Swartzii Baker, Jour. Bot. 26: 12. 1888.

Tillandsia paniculata Sw.; Baker, Jour. Bot. 26: 12, as synonym. 1888. Not *T. paniculata* L. 1762.

Flowering plant up to 13 dm. high; leaves 6-8 dm. long; sheaths distinct, ovate, darker than the blades; blades subligulate, acuminate, 4-6 cm. wide, glabrous above, obscurely pale-lepidote beneath; scape erect, about 6 dm. long; scape-bracts erect to somewhat spreading, much exceeding the internodes, narrowly lanceolate, acuminate; inflorescence very laxly bipinnate, 6-7 dm. long, about 15 cm. in diameter; primary bracts unknown, apparently soon deciduous; branches erect or ascending, very slender, up to 2 dm. long, at least the lower half sterile and strongly flattened with a single bract near the middle, the upper half bearing 4-6 downwardly secund flowers; floral bracts ovate, acute, about 1 cm. long; flowers subsessile; sepals narrowly oblong, obtuse, 16-20 mm. long, 4-6 mm. wide; petals linear-lanceolate, acuminate, each bearing 2 lanceolate acute scales near the base; stamens shorter than the petals.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica.

ILLUSTRATION: Torreya 11: 32.

22. *Vriesia Tuerckheimii* (Mez) L. B. Smith,
 Contr. Gray Herb. 117: 33. 1937.

Tillandsia Tuerckheimii Mez, Symb. Ant. 7: 174. 1912.

Habit of an agave, 2-3 m. high; leaves rosulate, 8-10 dm. long; sheaths large but scarcely wider than the blades, brown-punctulate-lepidote on both sides; blades linear, acuminate, 6-12 cm. wide, flat, firm, glabrous above, finely pale-appressed-lepidote beneath; scape erect; inflorescence compound with simple branches; primary bracts ovate, acute or acuminate, much shorter than the sterile bases of the spikes, red, densely brown-punctulate-lepidote; spikes laxly and secundly 20-flowered with an elongate sterile base bearing 1-3 bracts, 55 cm. long; floral bracts broadly ovate, obtuse and slightly cucullate, 7-12 mm. long, much shorter than the sepals, secund with the flowers, ecarinate, coriaceous, faintly nerved, densely brown-punctulate inside; flowers secund, spreading; pedicels very short and stout; sepals elliptic, narrowly obtuse, 15-20 mm. long, coriaceous, even, glabrous outside, brown-punctulate inside, roseate; petals ligulate with an elliptic blade, 30-35 mm. long, yellow-green when dry, bearing 2 scales near the base; stamens and pistil included; capsule ovate-oblong, mucronate, 25 mm. long.

TYPE LOCALITY: Rio del Medio, near Constanza, Santo Domingo, altitude 1180 meters.

DISTRIBUTION: Hispaniola.

ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 2, f. 37, 38.

23. *Vriesia Werckleana* Mez, Bull. Herb.
 Boiss. II. 3: 136. 1903.

Flowering plant about 2 m. high; leaves rosulate, 5 dm. long, obscurely punctulate-lepidote throughout; sheaths large, ovate-oblong; blades linear-triangular, acuminate, 8 cm. wide at base; scape erect, 3 cm. in diameter; scape-bracts erect, densely imbricate, obscurely dark-punctulate, the lower ones foliaceous, the upper very broadly ovate, acute, subinflated; inflorescence many-flowered, amply bipinnate, 1 m. long; primary bracts like the upper scape-bracts; branches strictly erect, densely secund-flowered, up to 4 dm. long, laxly prophyllate at the base; floral bracts erect, more or less secund with the flowers, broadly ovate to suborbicular, inflated, obtusely carinate toward the apex, 3 cm. long, about equaling the sepals and more than twice as long as the internodes, thick and rigidly coriaceous when dry, glabrous outside, densely and minutely punctulate-lepidote inside; flowers strongly secund and even nutant after maturity; pedicels stout, 10 mm. long; sepals elliptic, 22 mm. long, 12 mm. wide, obtuse, thick-coriaceous, not at all carinate; capsule stout, acute, beaked, 35 mm. long.

TYPE LOCALITY: Vicinity of Cartago, Costa Rica, altitude 1200-1600 meters.

DISTRIBUTION: Known only from the type collection.

24. *Vriesia guadelupensis* (Baker) Mez, in DC.
 Monog. Phan. 9: 596. 1896.

Tillandsia guadelupensis Baker, Handb. Bromel. 213. 1889.

Flowering plant about 1 m. high; leaves 5 dm. long, subglabrous above, appressed-lepidote below; blades linear, acuminate, 5 cm. wide; scape erect, very stout; scape-bracts densely imbricate, rigidly coriaceous, the very lowest foliaceous, the rest ovate and abruptly acute; inflorescence simple, dense, up to 26-flowered and over 3 dm. long, about 6 cm. wide; floral bracts erect or suberect, not becoming secund with the flowers, very broadly ovate, subacute, 5 cm. long, much exceeding the sepals, obtusely carinate toward the apex and not incurved, stiffly coriaceous, even, glabrous, concolorous or spotted with dark-brown; flowers suberect, becoming secund; pedicels very short and stout; sepals broadly ovate, acute, up to 30 mm. long and 15 mm. wide; petals obtuse, 36 mm. long; ovules conspicuously caudate; coma flavescent.

TYPE LOCALITY: Guadeloupe Island.

DISTRIBUTION: Guadeloupe and Montserrat.

25. *Vriesia Tonduziana* L. B. Smith, sp. nov.

About 8 dm. high; leaf-blades ligulate, acuminate, over 8 dm. long, 4 cm. wide; scape stout; scape-bracts erect, densely imbricate, broadly elliptic, apiculate; inflorescence simple, 15-flowered, 3 dm. long; floral bracts remaining erect, barely imbricate, very broadly ovate with a short, triangular, obtuse, cucullate apex, 45 mm. long, about equaling the sepals, ecarinate, thick-coriaceous, transversely rugose, obscurely punctulate; flowers secund, divergent; pedicels stout; sepals broadly ovate, obtuse, 40 mm. long, 28 mm. wide, coriaceous; petals elliptic-oblong, each bearing 2 large scales at the base.

Ca. 8 dm. alta; laminae foliorum lingulatis, acuminatis, ultra 8 dm. longis, 4 cm. latis; scapo valido; scapi bracteis dense imbricatis, apiculatis; inflorescentia simplicissima, 15-flora, 3 dm. longa; bracteis florigeris erectis, laxe imbricatis, latissime ovatis, apice cucullatis, 45 mm. longis, sepala subaequantibus, ecarinatis, crasse coriaceis, transverse rugosis, obscure punctulatis; floribus secundis; sepalis late ovatis, obtusis, 40 mm. longis, 28 mm. latis.

Type collected at La Palma, Province of San José, Costa Rica, altitude 1520 meters, *Tonduz 12349*, in the United States National Herbarium.

DISTRIBUTION: Known only from the type collection.

26. *Vriesia sanguinolenta* Cogn. & Marchal,

Pl. Ornem. *pl.* 52. 1874.

Tillandsia sanguinolenta Baker, Handb. Bromel. 226. 1889.

Vriesia Alfaroii Mez, Repert. Sp. Nov. 14: 247. 1916.

Tillandsia ingens Mez, Symb. Ant. 2: 256. 1900.

Vriesia Urbaniana Harms, Notizbl. Bot. Gart. Berlin 12: 532. 1935.

Flowering plant about 2 m. high; leaves about 10 in a dense rosette, suberect, 6-7 dm. long, green, usually with large irregular spots of deep-red especially near the base, obscurely punctulate-lepidote; sheaths ovate-elliptic, the same color as the blades and but slightly broader; blades ligulate, acute or subrounded with a long apiculus, 8-10 cm. wide; scape erect, greatly exceeding the leaves, well over 1 cm. in diameter at the summit, glabrous; scape-bracts erect, imbricate, very broadly ovate, acute or the lower ones triangular-laminate, glabrous, even, thick, coriaceous; inflorescence simple or laxly few-branched, up to 4 dm. long; primary bracts suberect, like the upper scape-bracts, covering only the sterile bases of the branches; branches suberect, secundly 11-12-flowered, the lateral ones 25 cm. long with 1 or 2 sterile bracts at the base, the terminal one nearly 4 dm. long with a sterile base as long as the fertile part and appearing like a continuation of the scape; rhachis stout, flexuous, strongly 4-angled, glabrous; floral bracts becoming secund with the flowers, suborbicular, abruptly acute, up to 45 mm. long, more than twice as long as the internodes, glabrous, even, rigid, coriaceous, green, drying to light-brown, incurved and carinate toward the apex; flowers spreading and downwardly secund; pedicels very stout, up to 12 mm. long; sepals very broadly elliptic, obtuse or broadly acute, 30 mm. long, rigid, coriaceous, even and glabrous outside, striate and punctulate-lepidote within; petals white, about 4 cm. long.

TYPE LOCALITY: Choco, Colombia.

DISTRIBUTION: Cuba; Costa Rica and Panama; also in Colombia.

ILLUSTRATIONS: Ill. Hortic. 22: *pl.* 200; Cogn. & Marchal, Pl. Ornem. *pl.* 52.

27. *Vriesia Pittieri* Mez, Bull. Herb. Boiss.

II. 3: 135. 1903.

Stemless, 5-10 dm. high; leaves 4-6 dm. long; sheaths elliptic, densely brown-punctulate-lepidote; blades ligulate, broadly acute to acuminate, 30-35 mm. wide, flat, soon glabrous above, very obscurely punctulate-lepidote beneath; scape erect or ascending, stout; scape-bracts erect, exceeding the internodes, the lower foliaceous, the upper elliptic, acute or apiculate, rigidly coriaceous, subinflated; inflorescence simple, secundly 12-20-flowered, dense, 15-20 cm. long; rhachis stout, angled, geniculate; floral bracts secund with the flowers, very broadly ovate, obtuse and minutely cucullate, usually appearing acute by the inrolling of the margins, 30-35 mm. long, exceeding the sepals, 2-3 times as long as the internodes, coriaceous, even,

deep-castaneous with a narrow pale margin, glabrous, lustrous; flowers subspreading, secund; pedicels stout, 7–10 mm. long; sepals broadly elliptic, obtuse, 17–27 mm. long, coriaceous, glabrous; petals broadly ligulate, 25–40 mm. long, pale-green; stamens and pistil included; capsule stout, short-beaked, 3 cm. long.

TYPE LOCALITY: Near Santa Clara do Copey, Costa Rica, altitude 2600–2700 meters.

DISTRIBUTION: Costa Rica.

28. *Vriesia diminuta* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 869. 1904.

Plant very slender, barely over 3 dm. high; leaves 2 dm. long; blades linear, long-acuminate, 15 mm. wide, chartaceous, brownish, suffused with brown-violet, covered especially near the base with coarse white scales with brown centers; scape erect, slender, exceeding the leaves; scape-bracts involute, exceeding the internodes, elliptic, abruptly acute, membranaceous, not at all foliaceous; inflorescence simple, densely 4-flowered, 4 cm. long; axis angled, slightly flexuous; floral bracts secund with the flowers, obtuse, about 23 mm. long, exceeding the sepals, ecarinate, subcoriaceous, nearly even, slightly lustrous; flowers suberect; pedicels very short; sepals narrowly elliptic, acute, 15 mm. long, subcoriaceous, prominently nerved.

TYPE LOCALITY: "Costarica, loco non indicato."

DISTRIBUTION: Known only from the type locality.

NOTE: It has not been possible to examine the type of this species, but from the description it seems extremely doubtful that it is distinct from *V. subsecunda*.

29. *Vriesia subsecunda* Wittm. Bot. Jahrb. 11: 69. 1889.

Tillandsia subsecunda Baker, Handb. Bromel. 217. 1889.

Flowering plant up to 45 cm. high, very slender; leaves 25–30 cm. long, densely appressed-lepidote, brownish-green; blades linear, acuminate, 15 mm. wide; scape slender, erect; scape-bracts imbricate, long-acuminate from an ovate base; inflorescence simple, densely few-flowered, 8–9 cm. long; floral bracts becoming secund with the flowers, broadly ovate, about 26 mm. long, equaling the sepals, convex and not carinate, strongly incurved toward the apex, even, chartaceous, light-brown; flowers suberect, becoming secund, 28 mm. long; pedicels very stout, 4 mm. long; sepals elliptic, rounded-apiculate, 22 mm. long, 10 mm. wide, thin, even, glabrous outside, dark-punctulate-lepidote inside; petals yellow, each bearing 2 lanceolate acute or bicuspidate scales near the base; stamens and pistil included; ovules with a short stout protuberance, not truly caudate.

TYPE LOCALITY: Vicinity of Río Sucio, Costa Rica.

DISTRIBUTION: Costa Rica and Panama.

30. *Vriesia viridiflora* (Regel) Wittm.; Mez, in Engler,
Pflanzenreich 4³²: 387. 1935.

Pitcairnia viridiflora Regel, Ind. Sem. Hort. Petrop. 1866: 81. 1867.

Tillandsia viridiflora Regel, Ind. Sem. Hort. Petrop. 1866: 81, as synonym. 1867.

Vriesia viminalis E. Morren, Belg. Hortie. 28: 257. 1878.

Tillandsia viminalis Hemsl. Biol. Centr. Am. Bot. 3: 323. 1884.

Flowering plant barely 1 m. high, slender; leaves densely rosulate, up to 35 cm. long; blades ligulate, acuminate, 4 cm. wide, green, concolorous, glabrous; scape erect, 4 mm. in diameter, elongate; scape-bracts erect and tubular-involute, slightly exceeding the internodes, broadly elliptic, acute, stramineous; inflorescence simple, densely distichous-flowered, 15 cm. long; floral bracts becoming secund with the flowers, very broadly ovate, obtuse, equaling the sepals, minutely verrucose, green with brown tips; flowers secund; pedicels very stout, 4–5 mm. long; sepals elliptic, obtuse, about 2 cm. long; petals oblong, subtruncate and emarginate, about 4 cm. long, white, spreading above the sepals, each bearing 2 acute serrulate scales at the base; stamens slightly shorter than the petals; capsule fusiform, 4 cm. long; coma white.

TYPE LOCALITY: Described from cultivation.

DISTRIBUTION: Irazu Volcano, near Cartago, Costa Rica.

ILLUSTRATIONS: Belg. Hortie. 28: pl. 14, 15; Ant. Phyto-1c. Bromel. pl. 14.

31. *Vriesia haplostachya* (C. Wright) L. B. Smith,
 Contr. Gray Herb. 114: 9. 1936.

Tillandsia haplostachya C. Wright; Sauv. Anal. Acad. Ci. Habana 8: 73. 1871.

Leaves 4–6 dm. long, very obscurely punctulate-lepidote; sheaths elliptic, ample, nearly half as long as the blade; blades ligulate, acuminate, flat, 6 cm. wide; scape erect, 7–8 mm. in diameter, glabrous; scape-bracts densely imbricate, subfoliaceous, elliptic, acuminate, densely punctulate toward the apex and rugulose in drying; inflorescence simple, secundly 12–22-flowered, 20–35 cm. long; rhachis stout, flexuous to geniculate, faintly angled; floral bracts secund with the flowers, very broadly ovate, obtuse, ecarinate, cucullate, equaling the sepals, faintly many-nerved, obscurely punctulate; flowers stoutly short-pedicellate; sepals elliptic-oblong, obtuse, 35 mm. long, coriaceous; petals ligulate, probably obtuse, 5 cm. long, green, bearing 2 large scales at the base; stamens included; capsule 45 mm. long, acuminate.

TYPE LOCALITY: Monteverde, Oriente.

DISTRIBUTION: Oriente, Cuba.

ILLUSTRATION: Contr. Gray Herb. 114: pl. 2, f. 6.

EXCLUDED SPECIES.

VRIESIA PSITTACINA var. *DECOLOR* Wawra. Erroneously attributed to Yucatan by Standley (Field Mus. Publ. Bot. 3: 223. 1930); actually limited to eastern Brazil.

7. *THECOPHYLLUM* André, Bromel. Andr. 107. 1889; Mez, Bull.
 Herb. Boiss. II. 3: 131. 1903.

Plant acaulescent or rarely caulescent, mostly epiphytic. Leaves entire, often conspicuously cross-banded or striped. Inflorescence always compound, though often very depauperately so, spikes polystichous-flowered or reduced to a single perfect flower, but the presence of floral bracts as well as primary bracts indicating a compound inflorescence. Branches of the inflorescence usually but not always aborted. Floral bracts relatively inconspicuous. Flowers perfect. Sepals free in all the North American species. Petals free, bearing 2 scales near the base. Stamens free, included. Pistil included; style filiform.

Type species, *Thecophyllum Poortmanii* André.

NOTE: The first of the two species originally proposed by André, *T. Wittmackii*, proves to be a *Guzmania*.

Branches of the inflorescence aborted with the flowers fascicled in the axils of the primary bracts, or else the perfect flowers solitary on each branch.

Flowers 1 or 2 in the axil of each primary bract.

Perfect flowers single in the axil of each primary bract, but the presence of its floral bract indicating a compound inflorescence.

Plant long-caulescent; scape short.

Plant stemless; scape elongate.

Flowers secund.

Flowers polystichous.

Perfect flowers 2 in the axil of each primary bract.

Pedicels slender, 1–2 cm. long.

Pedicels stout or lacking.

Floral bracts shorter than the sepals.

Leaves transversely marked with fine wavy lines.

Sepals 8 mm. long, slightly asymmetric.

Sepals 16–20 mm. long, symmetric.

Floral bracts suborbicular or reniform, broadly obtuse or truncate.

Floral bracts ovate, acute.

Leaves unmarked or sometimes with straight longitudinal stripes.

Sepals obovate or narrowly elliptic, twice as long as wide; flowers distinctly pedicellate.

Sepals less than twice as long as broad.

Inflorescence pendulous; primary bracts red and yellow.

Inflorescence erect.

Sepals 9 mm. long, orbicular.

Sepals 11–20 mm. long, mostly ovate or elliptic.

Inflorescence cylindrical, 20–27 cm. long; leaf-blades 30–45 mm. wide.

1. *T. insigne*.
2. *T. singuliflorum*.
3. *T. vittatum*.
4. *T. violascens*.
5. *T. lineatum*.
6. *T. irazuense*.
7. *T. pictum*.
8. *T. Sintenisii*.
9. *T. ororiense*.
10. *T. balanophorum*.

- Floral bracts ovate, acute, carinate. 11. *T. Standleyi*.
 Floral bracts suborbicular, obtuse, eciliate. 12. *T. viride*.
 Inflorescence not over 5 cm. long.
 Pedicels 8 mm. long, stout; leaf-blades 4-5 cm. wide. 13. *T. capitatum*.
 Pedicels lacking; leaf-blades 6-15 mm. wide.
 Floral bracts broadly elliptic, up to 12 mm. long. 14. *T. acuminatum*.
 Floral bracts squamiform, 2.5 mm. long. 15. *T. stenophyllum*.
 Floral bracts exceeding the sepals.
 Leaf-blades marked with fine irregular cross-bands. 16. *T. Pillieri*.
 Leaf-blades concolorous.
 Blades of the leaves and scape-bracts glabrous. 17. *T. Urbanianum*.
 Blades of the leaves and scape-bracts densely pale-appressed-lepidote.
 Inflorescence cyathiform with a coma of sterile bracts at the apex. 18. *T. comatum*.
 Inflorescence cylindrical, fertile throughout. 19. *T. spectabile*.
 Flowers 3 or more in the axil of at least each lower primary bract.
 Leaves cross-barred; floral bracts much shorter than the sepals.
 Primary bracts large, imbricate; floral bracts broadly reniform. 20. *T. Werckleanum*.
 Primary bracts small, remote; floral bracts suborbicular. 21. *T. montanum*.
 Leaves concolorous; floral bracts exceeding the sepals. 22. *T. bracteosum*.
 Branches of the inflorescence developed, the lower ones bearing at least 2 perfect flowers each.
 Flowers pedicellate.
 Pedicels 5-6 mm. long.
 Leaves wholly red; pedicels slender; sepals strongly asymmetric. 23. *T. rubrum*.
 Leaves green tinged with violet beneath; pedicels very stout. 24. *T. latissimum*.
 Pedicels 10 mm. long or longer.
 Pedicels slender; leaves 30-45 cm. long. 25. *T. pedicellatum*.
 Pedicels stout; leaves shorter.
 Branches 2-4-flowered; sepals symmetric. 26. *T. turbinatum*.
 Branches up to 12-flowered; sepals asymmetric. 27. *T. discolor*.
 Flowers subsessile (pedicels at most 4 mm. long and very stout).
 Flowers corymbose on the branch.
 Branches short, the lower ones 10-15-flowered. 28. *T. capituligerum*.
 Branches elongate, the lower ones 2-flowered. 29. *T. crassiflorum*.
 Flowers racemose on the branch.
 Sepals 20 mm. long; scape-bracts imbricate. 30. *T. angustum*.
 Sepals 8-9 mm. long; scape-bracts shorter than the internodes.
 Leaf-blades 2 cm. wide; branches of the inflorescence 4 cm. long. 31. *T. laxum*.
 Leaf-blades 5 cm. wide; branches of the inflorescence 13 cm. long. 32. *T. panniculatum*.

1. *Thecophyllum insigne* (E. Morren) Mez, Bull.

Herb. Boiss. II. 3: 131. 1903.

Pepinia insignis E. Morren; Baker, Handb. Bromel. 142, hyponym. 1889.
Guzmania insignis Mez, in DC. Monog. Phan. 9: 916. 1896.

Long-caulescent, the flowering scape 12 cm. high; stem 3-4 dm. long in addition, simple or branched, up to 6 mm. in diameter, wholly concealed by the leaf-sheaths; leaves very many, densely polystichous along the stem, 1-2 dm. long, fimbriate-lepidote along the margin; sheaths broadly elliptic-ovate, 3 cm. long, very dark-castaneous, densely pale-appressed-lepidote toward the apex; blades linear, acuminate, not over 5 mm. wide, flat, green, pale-appressed-lepidote beneath when young, soon glabrous; scape erect, very slender, distinguished from the stem only by the coloration of its bracts; scape-bracts erect or divergent, imbricate, bright-red, lanceolate with an elongate linear acuminate green blade; inflorescence laxly few-flowered, 4-9 cm. long, glabrous; primary bracts like the scape-bracts but at least the upper ones wholly bright-red, exceeding the sepals and all but the uppermost flowers; branches 1-flowered, slender, 2-3 mm. long, about equaling the pedicels and distinguished from them only by the position of the floral bracts, floral bracts 2 on each branch, one sometimes bearing a very reduced sterile flower, elliptic, obtuse, 5 mm. long, much shorter than the sepals, thin; flowers suberect to spreading, usually secund; sepals elliptic, obtuse, 8-9 mm. long, coriaceous, red, free; petals oblong-obovate, obtuse, 13-15 mm. long, dark-purple; stamens and pistil included; capsule slenderly ovoid, acute, barely exceeding the sepals.

TYPE LOCALITY: Chiriquí, Panama.

DISTRIBUTION: Costa Rica and Panama.

2. *Thecophyllum singuliflorum* Mez & Wercklé; Mez,
Bull. Herb. Boiss. II. 4: 870. 1904.

Stemless, the flowering plant about 25 cm. high, slender; leaves many in a dense rosette, about 20 cm. long; sheaths large, ovate-elliptic, castaneous toward the base and violet toward the apex; blades narrowly triangular, subulate-acuminate, 15–20 mm. wide, concolorous, obscurely brown-appressed-lepidote, rigid when dry; scape erect, about equaling the leaves, glabrous; scape-bracts strict, exceeding the internodes, foliaceous, violet; inflorescence laxly few-flowered, appearing simple but really compound with one-flowered branches as shown by the two series of bracts, subspicate, 75 mm. long, secund-flowered; primary bracts polystichous, becoming secund with the flowers, with a very broadly ovate base 17 mm. long and a slender curving-reflexed blade 20 mm. long, exceeding the flowers; branches wholly aborted; floral bracts ovate-elliptic, obtuse, 3 mm. long, thin; flowers spreading; pedicels 6 mm. long; sepals elliptic, thick, coriaceous, glabrous, even, the anterior ones 19 mm. long and acute, the posterior one 16 mm. long and broadly obtuse; petals about 25 mm. long.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type collection.

3. *Thecophyllum vittatum* Mez & Wercklé; Mez,
Bull. Herb. Boiss. II. 4: 871. 1904.

Stemless; flowering plant slender, up to 4 dm. high; leaves as many as 10 in a fasciculate rosette, 25–30 cm. long; sheaths brown at the extreme base, elsewhere densely pale-lepidote with immersed scales; blades linear, acuminate, about 25 mm. wide, subglabrous, dorsally marked with reddish-brown transverse bands especially near the base; scape erect, slender, slightly shorter than the leaves; scape-bracts appressed, involute, exceeding the internodes, ovate-elliptic with an acuminate apex; inflorescence few-flowered, very laxly subracemose, 14 cm. long; primary bracts unknown; axis glabrous, undulate, slightly angled; branches with axis wholly aborted, consisting of one perfect flower and one rudiment; flower-pedicels thick, up to 10 mm. long; sepals symmetrical, obtuse, unequal, one 26 mm. long, the others 2–3 mm. shorter, coriaceous, even, minutely punctulate-lepidote.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type collection.

4. *Thecophyllum violascens* Mez & Wercklé; Mez,
Bull. Herb. Boiss. II. 4: 877. 1904.

Stemless, 2–5 dm. high; leaves 10–15 in a cyathiform rosette, 2–4 dm. long; sheaths broadly elliptic, appearing whitish because densely pale-lepidote, marked on the back especially near the apex with longitudinal violet lines; blades acute, 3 cm. wide, subglabrous; scape erect, shorter than the leaves; scape-bracts erect, exceeding the internodes, elliptic, acute, subinflated, not at all foliaceous; inflorescence laxly few-flowered, subcylindric, 8–17 cm. long, 4–8 cm. in diameter, glabrous; primary bracts spreading or reflexed, broadly elliptic, acuminate, exceeding at least the lower axillary flowers, up to 45 mm. long and 17 mm. wide, chartaceous; branches lacking; floral bracts elliptic, obtuse, 5 mm. long, membranaceous, enfolding the base of the pedicel; flowers 2 in each axil, collateral, spreading; pedicels 1–2 cm. long; sepals free, broadly elliptic, obtuse, 7–8 mm. long, coriaceous; petals 15 mm. long; capsules slenderly ellipsoid, acute, 25 mm. long.

TYPE LOCALITY: Near La Palma, Costa Rica.

DISTRIBUTION: Costa Rica.

5. *Thecophyllum lineatum* Mez & Wercklé; Mez,
Bull. Herb. Boiss. II. 4: 875. 1904.

Stemless or short-caulescent, the flowering plant 5 dm. high, slender; leaves about 20 in a fasciculate rosette, about 3 dm. long, marked with thin wavy transverse lines especially near

the base; sheaths ovate-elliptic, castaneous at the extreme base; blades linear, acuminate, about 2 cm. wide, subglabrous, papery when dry; scape erect, much exceeding the leaves, slender, glabrous; scape-bracts strict, densely imbricate, broadly lanceolate, marked like the leaves; inflorescence densely cylindrical or somewhat interrupted at the base, 6–12 cm. long, 25 mm. in diameter; primary bracts spreading to recurved, narrowly triangular, 25 mm. long, exceeding the flowers, marked like the leaves and scape-bracts; branches not over 3 mm. long; floral bracts subreniform, convex, 8–9 mm. long, shorter than the sepals, rigidly coriaceous, even; flowers subsessile, 2 at the end of each lower branch; sepals suborbicular, barely emarginate, slightly asymmetric, 8 mm. long, thick, coriaceous, even; petals narrowly obovate, obtuse, 20 mm. long, each bearing 2 scales at base; stamens shorter than the petals.

TYPE LOCALITY: Vicinity of Cartago, Costa Rica, altitude 1200–1600 meters.

DISTRIBUTION: Costa Rica.

6. *Thecophyllum irazuense* Mez & Wercklé; Mez,
Bull. Herb. Boiss. II. 3: 138. 1903.

Stemless; flowering plant 1 m. or more high; leaves many in a dense rosette, erect, up to 4 dm. long; sheaths large, ovate-elliptic, very densely and minutely pale-lepidote, dark-reddish-brown at base; blades subligulate, acute, 7 cm. wide, rigid when dry, minutely lepidote, reddish-violet, very densely marked with faint wavy transverse lines, the apex recurved; scape stout, glabrous; scape-bracts erect and involute, exceeding the internodes, ovate-elliptic, short-caudate, subinflated; inflorescence many-flowered, dense, slenderly cylindrical, at least twice as long as the leaves, 15–30 cm. long, 4 cm. in diameter, glabrous; primary bracts reflexed, like the scape-bracts, the apex spirally revolute, the lower ones longer than the flowers, the upper about equaling them; branches wholly aborted; floral bracts suborbicular or reniform, 8–12 mm. long, much shorter than the sepals, obtuse, strongly convex, little or not at all carinate, thin; flowers 2 in the axil of each primary bract; sepals very broadly elliptic, obtuse, 20 mm. long, 15 mm. wide, thick, coriaceous, free.

TYPE LOCALITY: Vicinity of Irazu Volcano and Las Pacayas de Cartago, Costa Rica.

DISTRIBUTION: Province of Cartago, Costa Rica and Panama.

7. *Thecophyllum pictum* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 874. 1904.

Stemless, the flowering plant up to 5 dm. high; leaves many in a dense cyathiform rosette, suberect, about 3 dm. long, the outer ones disintegrating; sheaths elliptic, large, castaneous, very densely and minutely appressed-lepidote; blades subligulate, acuminate, 4 cm. wide, subcoriaceous when dry, minutely lepidote, densely marked with narrow wavy lines; scape erect, exceeding the leaves; scape-bracts erect, densely imbricate, foliaceous but only the lowest with markings; inflorescence few-flowered, abbreviated, subpyramidal at anthesis, 10 cm. long, 5 cm. in diameter; primary bracts suberect, broadly ovate, narrowly obtuse, coriaceous, obscurely punctulate-lepidote, the lower ones faintly marked with transverse lines and exceeding the axillary flowers; branches wholly aborted; floral bracts ovate, acute, shorter than the sepals; flowers 2 in the axil of each primary bract, sessile, 40–45 mm. long, stout; sepals elliptic, obtuse, about 16 mm. long and 10 mm. wide, coriaceous, punctulate-lepidote, free; petals oblong, white, each bearing 2 triangular scales just above the base.

TYPE LOCALITY: Vicinity of Desengañó, Costa Rica, altitude 1460 meters.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Engler, *Pflanzenreich* 4²: f. 89.

8. *Thecophyllum Sintenisii* (Baker) Mez, Bull.
Herb. Boiss. II. 3: 131. 1903.

Caraguata Sintenisii Baker, *Handb. Bromel.* 145. 1889.
Guzmania Sintenisii Mez, in DC. *Monog. Phan.* 9: 920. 1896.

Stemless, 3–6 dm. high, often purplish in drying; leaves many in a dense crateriform rosette, suberect or the innermost erect, 25–45 cm. long, chartaceous; sheaths subelliptic,

densely and very minutely brown-punctulate-lepidote; blades ligulate, acute or obtuse, apiculate, 25–35 mm. wide, flat, glabrous above, very obscurely punctulate-lepidote beneath, often bright-red toward the apex at anthesis; scape erect or ascending, 4 mm. in diameter, shorter than or rarely exceeding the leaves, glabrous; scape-bracts strict, exceeding the internodes, subfoliaceous, deep-red; inflorescence exceeding the leaves, few-flowered, 1–2 dm. long, lax at the base, dense toward the apex; axis glabrous; primary bracts suberect, elliptic, acute or acuminate, exceeding the axillary flowers, deep-red; branches almost wholly aborted; floral bracts very broadly ovate or obovate, obtuse, 8–18 mm. long, up to 15 mm. wide, enfolding the bases of the flowers, distinctly shorter than the sepals; flowers 2 in each axil; pedicels stout, obconic to subcylindric, 3–7 mm. long; sepals narrowly elliptic or obovate, obtuse, 15–27 mm. long, coriaceous, rigid, narrowly scarious-margined, glabrous; petals ligulate, obtuse, 3 cm. long, light-yellow; stamens included; capsule subcylindric, acute, 3 cm. long.

TYPE LOCALITY: Porto Rico.

DISTRIBUTION: Cuba, Jamaica, and Porto Rico.

9. *Thecophyllum ororiense* (Mez) Mez, Bull.
Herb. Boiss. II. 3: 131. 1903.

Guzmania ororiensis Mez, in DC. Monog. Phan. 9: 917. 1896.

Stemless, 5–8 dm. high; leaves many in a dense slenderly crateriform rosette, 35–55 cm. long; sheaths large, ovate, castaneous, densely and finely immersed-cinereous-lepidote throughout; blades ligulate, subobtuse and apiculate, 5–6 cm. wide, subrigid, soon glabrous above, conspicuously punctulate-lepidote beneath with brownish-purple scales; scape decurved, very stout, equaling or longer than the leaves; scape-bracts exceeding the internodes, very broadly ovate with a triangular acute blade, recurved or spirally involute toward the apex or rarely suberect, subinflated; inflorescence pendulous, many-flowered, densely cylindric especially toward the apex, up to 2 dm. long and 65 mm. in diameter, glabrous; primary bracts amply triangular-ovate, exceeding the axillary flowers, recurved, yellow at the base, bright-scarlet toward the apex; branches almost wholly aborted; floral bracts suborbicular, obtuse, 12 mm. long, distinctly shorter than the sepals, carinate, coriaceous, thick; flowers always 2 in each axil; pedicels very short and thick; sepals very broadly obovate, 2 cm. long, 15 mm. wide, coriaceous, thick, free; petals ligulate with a broadly elliptic obtuse blade, 3 cm. long, yellow, bearing 2 large lanceolate acuminate scales at the base; stamens included.

TYPE LOCALITY: Near Orori, Costa Rica.

DISTRIBUTION: Costa Rica.

10. *Thecophyllum balanophorum* (Mez) Mez, Bull.
Herb. Boiss. II. 3: 131. 1903.

Guzmania balanophora Mez, in DC. Monog. Phan. 9: 918. 1896.

Stemless; flowering plant up to 4 dm. high; leaves about 20 in a dense rosette, suberect, 35 cm. long; sheaths large, ovate, stiff, covered throughout with a white membrane of appressed scales, blackish below especially toward the base; blades linear, acuminate, 2–3 cm. wide, stiff, white-lepidote, pale below; scape erect, equaling or slightly exceeding the leaves, slender, slightly angled, glabrous; scape-bracts strict, exceeding the internodes, foliaceous but narrower than the leaves, lepidote; inflorescence few-flowered to many-flowered; primary bracts reflexed, triangular, acuminate; floral bracts like the sepals but exceeded by them; flowers 2 in the axil of each primary bract; sepals orbicular, 9 mm. long, broadly obtuse, coriaceous, glabrous, even outside, striate within, free; petals elliptic, obtuse, 2 cm. long, bearing 2 scales at the base; capsule slenderly obovoid, 20 mm. long, 7 mm. in diameter, cinereous; valves subligneous; seeds nearly 5 mm. long; coma reddish-brown.

TYPE LOCALITY: Irazu Volcano, Costa Rica.

DISTRIBUTION: Northeastern Costa Rica.

11. *Thecophyllum Standleyi* L. B. Smith, Contr.
Gray Herb. 117: 30. 1937.

Plant imperfectly known, probably stemless, up to 5 dm. high; leaves 4 dm. long, very densely and obscurely lepidote with pale-brown-centered scales; sheaths large, ovate-elliptic, in the type scarcely darker than the blade; blades ligulate, acute, flat, 3-4 cm. wide, green, concolorous; scape erect, glabrous; scape-bracts erect, densely imbricate, the lower ones foliaceous, the upper ovate, acuminate, red, densely pale-lepidote; inflorescence cylindric, 2 dm. long, 6 cm. in diameter, dense; primary bracts like the scape-bracts, spreading, or recurved toward the apex, exceeding the 2 flowers borne in each axil; branches aborted; floral bracts broadly ovate, acute, 12 mm. long, much shorter than the sepals, carinate, thin, minutely lepidote; flowers subsessile; sepals ovate, obtuse, cucullate, 20 mm. long, 11 mm. wide, obtusely carinate, coriaceous, pale-lepidote, free; petals known in immature state only, ligulate, green, bearing 2 scales at the base.

TYPE LOCALITY: Cerro de las Vueltas, Province San José, Costa Rica, altitude 2700-3000 meters.

DISTRIBUTION: Known from the type collection only.

ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 2, f. 30, 31.

12. *Thecophyllum viride* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 872. 1904.

Leaves about 5 dm. long; sheaths pale-lepidote with brown-centered scales; blades acuminate, 45 mm. wide, densely appressed-pale-lepidote, concolorous but densely and obscurely reticulate by transmitted light; scape erect, very stout, equaling or exceeding the leaves; scape-bracts densely imbricate, foliaceous, elongate; inflorescence many-flowered, dense, slenderly cylindric, 22-27 cm. long, 4-6 cm. in diameter; lower primary bracts reflexed, like the upper scape-bracts, very broadly ovate with a triangular recurved apex, much exceeding the flowers, the uppermost much reduced, shorter than the flowers; branches wholly aborted; floral bracts suborbicular, obtuse, 8 mm. long, strongly convex and somewhat carinate; flowers 22-25 mm. long, 2 in the axil of each primary bract, glabrous; pedicels very short and stout; sepals suborbicular, obtuse, 17 mm. long, 14 mm. wide, thick, coriaceous, free; petals oblong.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Costa Rica.

13. *Thecophyllum capitatum* Mez & Wercklé; Mez,
Bull. Herb. Boiss. II. 4: 873. 1904.

Leaves up to 15 in a dense cyathiform rosette, about 3 dm. long; sheaths very large, lepidote with appressed castaneous scales; blades ligulate, rounded-apiculate, 4-5 cm. wide, very rigid when dry, green and unmarked except for a purple spot at the apex, very minutely and obscurely immersed-lepidote; scape stout, erect, equaling or shorter than the leaves; scape-bracts erect, very densely imbricate, broadly elliptic, acute, rigid, brown and shiny at the base when dry; inflorescence few-flowered, subcapitate, about 5 cm. long and wide; primary bracts very broadly ovate, the lower apparently shorter than the flowers, submembranaceous and badly disintegrated in the only known material, bearing 2 flowers in their axils; floral bracts conspicuous, probably exceeding the sepals, membranaceous, not at all carinate; flower-pedicels very stout, about 8 mm. long; sepals elliptic, broadly obtuse, 19 mm. long, 16 mm. wide, rigid, even, castaneous outside, pale inside. [Description compiled.]

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type collection.

14. *Thecophyllum acuminatum* L. B. Smith, Contr.
Gray Herb. 117: 30. 1937.

Stemless or short-caulescent, 24-35 cm. high; leaves many in a dense cyathiform rosette, 15 cm. long, straight; sheaths ovate-elliptic, 5 cm. long, dark-castaneous, pale-punctulate-lepidote, blades ligulate, acuminate, flat, 15 mm. wide, green, concolorous; scape erect, slender,

brown-punctulate; scape-bracts foliaceous, erect, densely imbricate; inflorescence subcapitate, 35 mm. long, 75 mm. in diameter, dense; primary bracts ovate, acuminate, green, much exceeding the flowers, the lower ones with 2 flowers in each axil; branches aborted; floral bracts broadly elliptic, up to 12 mm. long, distinctly shorter than the sepals, membranaceous, densely brown-punctulate; flowers subsessile; sepals broadly elliptic, obtuse, 14 mm. long, 11 mm. wide, thinly coriaceous, brown-punctulate; petals unknown.

TYPE LOCALITY: La Palma, Province San José, Costa Rica, altitude about 1600 meters.

DISTRIBUTION: Mountain forests of Costa Rica.

ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 2, f. 28, 29.

15. *Thecophyllum stenophyllum* Mez & Wercklé; Mez,
Bull. Herb. Boiss. II. 4: 875. 1904.

Stemless, the flowering plant small and graceful, up to 22 cm. high; leaves as many as 20 in a fasciculate rosette, about 17 cm. long; sheaths elliptic, dark-castaneous basally, very minutely immersed-lepidote; blades linear, acuminate, 6–8 mm. wide, subglabrous, coriaceous when dry, marked toward the base with longitudinal red stripes; scape erect, slender, shorter than the leaves, glabrous; scape-bracts erect, densely imbricate, foliaceous; inflorescence few-flowered, about equaling the leaves, spiciform, 4 cm. long; primary bracts spreading to reflexed, triangular, acuminate to a very narrowly obtuse apex, about 28 mm. long, stiff; branches wholly aborted; floral bracts very broadly squamiform, obtuse, 2.5 mm. long, membranaceous, ecarinate; flowers sessile, 2 in the axil of each primary bract; sepals elliptic, obtuse, 11 mm. long, 7 mm. wide, thick, coriaceous, even.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type collection.

16. *Thecophyllum Pittieri* Mez, Bull. Herb.
Boiss. II. 3: 137. 1903.

Stemless, 4–5 dm. high; leaves many in a dense rosette, suberect, 2–4 dm. long; sheaths very broadly elliptic-ovate, about 8 cm. long, very dark-castaneous, densely but not completely covered with fine white immersed scales; blades ligulate, acute, 20–35 mm. wide, subfenestrate with fine brownish-purple lines especially toward the base, vinaceous toward the apex, chartaceous when dry, subglabrous; scape erect, stout, equaling or exceeding the leaves; scape-bracts strict, densely imbricate, foliaceous; inflorescence few-flowered, densely capitate or short-cylindric, 5–9 cm. long; primary bracts spreading, reflexed toward the apex, broadly lance-ovate, acuminate, much exceeding the axillary flowers, very obscurely punctulate-lepidote; branches almost wholly aborted; floral bracts broadly elliptic or suborbicular, up to 25 mm. long, exceeding and enfolding the flowers, carinate, subchartaceous; flowers 2 in each axil, subsessile; sepals very broadly elliptic, obtuse, up to 14 mm. long and 10 mm. wide, coriaceous, thick, obscurely punctulate; petals 22 mm. long, 7 mm. wide, bearing 2 triangular acuminate scales at the base.

TYPE LOCALITY: Near La Palma, Costa Rica, altitude 1500 meters.

DISTRIBUTION: Costa Rica.

17. *Thecophyllum Urbanianum* (Mez) Mez, Bull.
Herb. Boiss. II. 3: 131. 1903.

Guzmania Urbaniana Mez, in DC. Monog. Phan. 9: 920. 1896.

Stemless, up to 5 dm. high; leaves 10–20 in a dense crateriform rosette, mostly erect, 3 dm. long; sheaths distinct, elliptic, brown toward the base, densely and finely immersed-lepidote; blades ligulate, acute, 3–4 cm. wide, glabrous, green; scape erect, stout; scape-bracts strict, densely imbricate, foliaceous; inflorescence few-flowered, up to 11 cm. long and equally thick; primary bracts suberect, elliptic and probably red with a triangular, green, punctulate-lepidote blade, ample, much exceeding the axillary flowers; branches aborted; floral bracts ovate-oblong, obtuse, 3 cm. long, chartaceous; flowers 2 in each axil, collateral, on short, very stout pedicels; sepals 8 mm. long, 10 mm. wide, ligneous-coriaceous.

TYPE LOCALITY: Martinique.

DISTRIBUTION: Guadeloupe and Martinique.

18. *Thecophyllum comatum* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 871. 1904.

Stemless, the flowering plant 3 dm. tall; leaves up to 12 in a fasciculate rosette, about 25 cm. long, chartaceous when dry; sheaths large, ovate-elliptic, castaneous, densely lepidote; blades linear, acuminate, pungent, slightly recurved at the apex, 15 mm. wide, concolorous, very minutely punctulate-lepidote; scape erect, stout, half as long as the leaves; scape-bracts erect, densely imbricate, foliaceous; inflorescence abbreviated, subcorymbose, cyathiform, 70 mm. long, 85 mm. in diameter, terminating in a coma of sterile bracts; primary bracts ample, broadly triangular, somewhat foliaceous, exceeding the 2 flowers borne in each axil, minutely and obscurely punctulate-lepidote, green when dry, slightly decurved at the apex; floral bracts broadly elliptic, obtuse, 20 mm. long, 18 mm. wide, exceeding the flowers, membranaceous, slightly carinate; flowers sessile; sepals broadly elliptic, obtuse, about 12 mm. long, 9 mm. broad, thick, coriaceous, obscurely punctulate-lepidote, free; petals unknown; capsule stout, acorn-shaped, obtuse, 18 mm. long.

TYPE LOCALITY: Vicinity of Turrialba, Costa Rica, altitude 900 meters.

DISTRIBUTION: Known only from the type collection.

19. *Thecophyllum spectabile* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 873. 1904.

Leaves as many as 20 in a cyathiform rosette, about 4 dm. long; sheaths indistinct, brown, covered with very appressed brown scales; blades ligulate, abruptly acute, 35 mm. wide, stiffly coriaceous when dry, densely pale-appressed-lepidote; scape erect, stout, half as long as the leaves; scape-bracts very densely imbricate, foliaceous but much smaller and less rigid than the leaves, erect; inflorescence up to 16-flowered, dense, cylindric, 15 cm. long, 7 cm. in diameter; primary bracts suberect even to the apices, ovate, acute or obtusish, about 6 cm. long, exceeding the axillary flowers, finely lepidote below; branches wholly aborted; flowers 2 in the axil of each primary bract. [Description compiled.]

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type collection.

NOTE: The original description makes no note of the floral bracts, but Mez has keyed the species with those whose floral bracts exceed their sepals.

20. *Thecophyllum Werckleanum* Mez, Bull. Herb.
Boiss. II. 3: 139. 1903.

Stemless, up to 4 dm. high; leaves many in a dense rosette, erect, cross-banded with broad brownish-purple stripes, 3 dm. long; sheaths very broadly ovate, castaneous, densely covered with brown immersed punctiform scales; blades subligulate, obtuse and apiculate, 33 mm. wide, revolute toward the apex, rigid when dry, obscurely punctulate-lepidote; scape erect, stout, slightly exceeding the leaves; scape-bracts short, exceeding the internodes, broadly ovate, triangular-acute, subinflated, deflexed from about the middle; inflorescence short-cylindric, 9 cm. long; primary bracts like the scape-bracts, erect with reflexed blades, imbricate, polystichous, exceeding the axillary flowers, obscurely brown-punctulate-lepidote; branches almost wholly aborted; floral bracts very broadly reniform, truncate, 6 mm. long and more than twice as wide, much shorter than the sepals, ecarinate, enfolding the base of the flower, coriaceous; flowers 2 or 3 in each axil, collateral; sepals very broadly elliptic, obtuse, 12 mm. long, coriaceous, thick, even, glabrous.

TYPE LOCALITY: Near Cartago, Costa Rica, altitude 1200-1400 meters.

DISTRIBUTION: Known only from the type collection.

21. *Thecophyllum montanum* L. B. Smith; Yuncker,
Field Mus. Publ. Bot. 17: 319. 1938.

Stemless, 4 dm. high; leaves in a dense crateriform rosette, 25 cm. long, obscurely punctulate-lepidote, transversely marked with broad purple undulate stripes; sheaths elliptic, 1 dm. long;

blades ligulate, acute, 30–35 mm. wide, flat; scape erect, 5 mm. in diameter at the middle, glabrous; scape-bracts erect, slightly longer than the internodes, broadly elliptic, bearing a short triangular blade; inflorescence few-flowered, subdense, 5 cm. long; primary bracts elliptic, acuminate, about equaling the flowers, remote and not at all imbricate, the lowest bearing 3, the others 2 collateral flowers in the axil; floral bracts suborbicular, obtuse, 6–9 mm. long, much shorter than the sepals, broadly convex, not at all carinate, coriaceous, even, obscurely punctulate; flowers subsessile; sepals broadly elliptic, obtuse, 12–15 mm. long, coriaceous, glabrous and even outside.

TYPE LOCALITY: Summit of range above El Achote, above the plains of Siguatepeque, Comayagua, Honduras, altitude 1850 meters.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATION: Field Mus. Publ. Bot. 17: *pl.* 7.

22. *Thecophyllum bracteosum* Mez & Wercklé; Mez,
Repert. Sp. Nov. 14: 246. 1916.

Stemless, up to 6 dm. high, stout; leaves many in a dense subtriculate rosette, 4 dm. long; sheaths very broadly elliptic, up to 15 cm. long, densely brown-punctulate-lepidote; blades ligulate, acute, 25 mm. wide, spirally recurved at the apex, rigid when dry, glabrous above, obscurely punctulate-lepidote beneath, concolorous; scape erect, stout, exceeding the leaves; scape-bracts erect, slightly longer than the internodes, broadly elliptic with a short, spirally recurved, foliaceous blade, lustrous, glabrous; inflorescence strobilate, short-cylindric, obtuse, up to 12 cm. long and 5 cm. in diameter; primary bracts suberect, imbricate, very broadly ovate, abruptly acute, inflated, subcoriaceous, irregularly rugose when dry, exceeding the axillary flowers; branches aborted; floral bracts very broadly elliptic, acute, 30–35 mm. long, exceeding the sepals; flowers 3 in the axil of each primary bract, collateral, subsessile; sepals suborbicular, obtuse, 17 mm. long, coriaceous, rigid, even, glabrous.

TYPE LOCALITY: Near La Palma, Costa Rica, altitude 1500 meters.

DISTRIBUTION: Known only from the type collection.

23. *Thecophyllum rubrum* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 878. 1904.

Stemless; leaves as many as 40 in a handsome cyathiform rosette, up to 35 cm. long; sheaths scarcely broader than the blades, densely appressed-lepidote, lead-colored when dry; blades ligulate, rounded-apiculate, 8 cm. wide, subglabrous, without markings, suffused with red, flat when living, rigidly coriaceous when dry; scape short, erect, relatively slender, terete, glabrous; scape-bracts erect, short but exceeding the internodes, elliptic, abruptly acute, stiff; inflorescence erect, slenderly thyrsoid, rather lax, about 2 dm. long; axis stout, slightly angled when dry; primary bracts like the scape-bracts but reflexed, 3 cm. long, apparently exceeding the axillary branches; branches short, slender, 2-flowered or 3-flowered; floral bracts shorter than the pedicels; pedicels slender, 5–6 mm. long; sepals (undeveloped) 10 mm. long, obtuse, strongly asymmetric, slightly emarginate, chartaceous, glabrous, free.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type collection.

24. *Thecophyllum latissimum* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 1122. 1904.

Stemless; leaves up to 10 in a regular broadly infundibuliform rosette, 25 cm. long; sheaths barely broader than the blades, subcinereous-lepidote with very appressed scales, the margin with a broad violet band; blades broadly rounded and apiculate, 11 cm. broad, light-green above, deep-violet below, without markings, thick and rigid when dry; scape erect, very stout, probably exceeding the leaves; scape-bracts imperfectly known; inflorescence many-flowered, densely cylindric, 25 cm. long, 6 cm. in diameter, glabrous; axis very stout; primary bracts unknown; branches up to 3 cm. long, very stout, compressed, the lower and middle ones bearing 4 flowers near the apex; floral bracts shorter than the sepals; pedicels very stout, up to 6 mm.

long; sepals equal, elliptic, obtuse, 21 mm. long, 8 mm. wide, thick, coriaceous, glabrous and even outside, striate within.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type collection.

25. *Thecophyllum pedicellatum* Mez & Wercklé; Mez,
Bull. Herb. Boiss. II. 3: 136. 1903.

Stemless, 5–8 dm. high; leaves many in a dense rosette, not marked in any way, 30–45 cm. long; sheaths large, elongate, dark-brown toward the base, coarsely and densely pale-appressed-lepidote toward the apex; blades ligulate, acute or subobtuse, 25–35 mm. wide, coriaceous when dry; scape curved, stout, equaling the leaves; scape-bracts erect, mostly exceeding the internodes, lance-ovate, acute or acuminate; inflorescence many-flowered, cylindrical, 25 cm. long, 3–10 cm. in diameter, glabrous; primary bracts like the scape-bracts, erect to reflexed, mostly exceeding the axes of the branches but not their flowers; branches up to 3 cm. long, slender, curved, lax, the flowers pinnate and sometimes secund or subfasciculate; floral bracts broadly elliptic, obtuse, much shorter than the pedicels and enfolding their bases, membranaceous; pedicels slender, 1–2 cm. long; sepals broadly obovate-elliptic, obtuse, 7–11 mm. long, convex, ecarinate, coriaceous, even, free; petals oblanceolate, obtuse, 15 mm. long; stamens 12 mm. long; capsules slenderly ellipsoid, acuminate, 25 mm. long.

TYPE LOCALITY: Near Cartago, Costa Rica, altitude 1200–1600 meters.

DISTRIBUTION: Nicaragua and Costa Rica.

26. *Thecophyllum turbinatum* Mez & Wercklé; Mez,
Bull. Herb. Boiss. II. 4: 1122. 1904.

Stemless; leaves many in a very dense rosette, up to 25 cm. long; sheaths ovate, some castaneous at the base, the rest very densely pale-appressed-lepidote; blades about 55 mm wide, rounded, subglabrous, concolorous, rigid when dry; scape unknown; inflorescence many-flowered, very densely bipinnate, cylindrical, acute, 18 cm. long, 55 mm. in diameter, glabrous; axis very stout, terete; primary bracts reflexed, narrowly triangular, acuminate, exceeding the axillary branches, subglabrous; branches spreading or the uppermost reflexed-spreading, up to 2 cm. long, geniculate, bearing 2–4 flowers about 7 mm. apart; floral bracts elliptic-spatulate, obtuse, about 5 mm. long; flowers spreading; pedicels stout, slightly thickened apically, 11 mm. long; sepals broadly elliptic, symmetrical, obtuse, 10 mm. long, 7.5 mm. wide, thick, coriaceous, even outside, striate within; capsule slender and slightly angled, acuminate, 25 mm. long, 5 mm. in diameter.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type collection.

27. *Thecophyllum discolor* Mez & Wercklé; Mez,
Repert. Sp. Nov. 14: 246. 1916.

Leaves very broad, obtuse, green above, dark-violet-brown below; scape probably decurved, very stout, glabrous; scape-bracts much exceeding the internodes, foliaceous, glabrous; inflorescence many-flowered, very densely bipinnate, cylindrical, obtuse, 3 dm. long, 8 cm. in diameter, glabrous; axis stout, subterete; primary bracts shorter than the axillary branches; branches distinct, all about 5 cm. long, lax, bearing up to 12 secund flowers about 8 mm. apart, spreading to reflexed; floral bracts elliptic, obtuse, equaling or shorter than the pedicels, thick, coriaceous; flowers suberect; pedicels stout, 10 mm. long, slightly thickened toward the apex; sepal asymmetric, 8 mm. long, 6 mm. wide, thick, coriaceous, even; capsule 30 mm. long.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type collection.

28. *Thecophyllum capituligerum* (Griseb.) L. B. Smith,
 Contr. Gray Herb. 98: 14. 1932.

Tillandsia capituligera Griseb. Cat. Pl. Cub. 254. 1866.

Tillandsia fastuosa André, Enum. Bromel. 8. 13 D 1888; Rev. Hort. 60: 568. 16 D 1888.

Guzmania fastuosa André; Mez, in DC. Monog. Phan. 9: 926. 1896.

Guzmania capituligera Mez, in DC. Monog. Phan. 9: 926. 1896.

Thecophyllum fastuosum Mez, in Engler, Pflanzenreich 4²²: 423. 1935.

Stemless, 5–8 dm. high; leaves in a dense crateriform rosette, 7 dm. long; sheaths inconspicuous, brown, densely and minutely brown-lepidote; blades ligulate, acuminate, 6–8 cm. wide, glabrous above, obscurely punctulate-lepidote below; scape erect, stout, shorter than the leaves; scape-bracts erect, densely imbricate, foliaceous, green or red; inflorescence columnar, many-flowered, 3–5 dm. long; primary bracts divergent to spreading, suborbicular, the lower ones exceeding the axillary spikes and bearing a narrowly triangular acuminate blade; spikes on a stout stipe up to 1 cm. long, subglobose, corymbose, 10–15-flowered, 3–4 cm. in diameter; floral bracts broadly elliptic or ovate, obtuse and apiculate, 25–30 mm. long, equaling or exceeding the sepals, chartaceous, prominently nerved; flowers erect on short stout pedicels, complanate; sepals elliptic, obtuse, 2 cm. long, ecarinate, coriaceous, even, glabrous; petals linear, obtuse, 28 mm. long, free, bearing 2 linear acuminate scales near the base, white; capsule slenderly ellipsoid, barely exceeding the sepals.

TYPE LOCALITY: Eastern Cuba.

DISTRIBUTION: Cuba, Jamaica, and Hispaniola; also in Colombia.

ILLUSTRATIONS: André, Bromel. Andr. pl. 37; Engler, Pflanzenreich 4²²: f. 90.

29. *Thecophyllum crassiflorum* Mez & Wercklé; Mez, Bull.
 Herb. Boiss. II. 3: 138. 1903.

Apparently stemless but imperfectly known; leaves unknown; scape probably erect, stout, 5 dm. long, subglabrous; scape-bracts all exceeding the internodes, the lower ones foliaceous, narrowly triangular, acuminate, erect, very minutely and obscurely immersed-lepidote, the upper ones elliptic-ovate with short reflexed blades; inflorescence very densely cylindric, stout, slightly interrupted at the base, 23 cm. long, 4 cm. in diameter; primary bracts suberect with recurved apices, very broadly ovate, triangular-acute, inflated, obscurely brown-punctulate, bright-red toward the apex, the lower ones exceeding the flowers; floral bracts strongly asymmetric, obliquely truncate, 12 mm. long, 8 mm. wide, coriaceous, scarcely or not at all lepidote; flowers 1 or 2 in the axil of each primary bract, sessile or with very short and stout pedicels, 30 mm. long; sepals subelliptic, obtuse, asymmetric, 16 mm. long, 14 mm. wide, thick, coriaceous, rigid when dry, even, dull.

TYPE LOCALITY: Vicinity of Cartago, Costa Rica, altitude 1200–1400 meters.

DISTRIBUTION: Known only from the type collection.

30. *Thecophyllum angustum* Mez & Wercklé; Mez, Bull.
 Herb. Boiss. II. 4: 1121. 1904.

Leaves as many as 15 in a fasciculate rosette and forming a slender pseudobulb, 4 dm. long; sheaths narrowly elliptic, densely lepidote with light-brown, closely appressed scales; blades linear, acuminate, about 20 mm. wide, concolorous, pale-lepidote, green, canescent and chartaceous when dry; scape erect, shorter than the leaves, slender, slightly furfuraceous; scape-bracts erect, very densely imbricate, foliaceous; inflorescence exceeded by the leaves, densely bipinnate, cylindric, 13 cm. long, 4 cm. in diameter, brilliant-red due to the bracts; primary bracts suberect, very broadly ovate, large, inflated, punctulate-lepidote, submembranaceous, the lower ones exceeding the flowers and with long acuminate erect blades; branches up to 12 mm. long, 2-flowered or 3-flowered, compressed; floral bracts subreniform, suberect, inflated, 6–9 mm. long, much shorter than the sepals; pedicels 2–3 mm. long, very stout; sepals free but twisted into a slender tube, narrowly elliptic, obtuse, 20 mm. long, 5 mm. wide, prominently nerved.

TYPE LOCALITY: Carillo, Costa Rica, altitude 300 meters.

DISTRIBUTION: Known only from the type locality.

31. *Thecophyllum laxum* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 1123. 1904.

Stemless, the flowering plant slender, up to 5 dm. high; leaves as many as 13 in a dense rosette, erect or suberect, about 25 cm. long; sheaths indistinct, ovate-elliptic, pale-lepidote, usually marked with pale-violet longitudinal lines; blades acuminate, about 2 cm. wide, sub-chartaceous when dry; scape strict, very slender, nearly twice as long as the leaves, glabrous; scape-bracts erect, appressed, distinctly shorter than the internodes, elliptic, acute, not at all foliaceous; inflorescence laxly few-flowered, 13 cm. long, 3 cm. in diameter, glabrous; primary bracts like the scape-bracts, shorter than the sterile base of the spike; branches about 7, erect, compressed, the lower ones up to 4 cm. long, bearing a flower and a rudiment at the apex and a second flower 10 mm. below the apex; floral bracts elliptic, obtuse, 4 mm. long, much shorter than the sepals, membranaceous; pedicels very short and stout; sepals broadly elliptic, obtuse, 8 mm. long, 6 mm. wide, coriaceous, free.

TYPE LOCALITY: Costa Rica.
DISTRIBUTION: Costa Rica.

32. *Thecophyllum panniculatum* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 1123. 1904.

Leaves up to 25 cm. long; sheaths relatively narrow, very densely pale-lepidote, lead-colored when dry; blades acute, about 5 cm. wide, coriaceous when dry, subglabrous, marked with wavy dark-purplish-brown lines especially near the base; scape erect, slender, undoubtedly much exceeding the leaves, at least 4 dm. long; scape-bracts very imperfectly known, apparently shorter than the internodes and not at all foliaceous; inflorescence laxly bipinnate, 25 cm. long, 9 cm. in diameter; primary bracts unknown; branches erect or ascending, up to 13 cm. long, slender, slightly compressed at the base, bearing 3 second flowers near the apex; flower-pedicels very stout, up to 4 mm. long; sepals equal, broadly elliptic, obtuse, subsymmetrical, 9 mm. long, 6 mm. wide, rigidly coriaceous, even.

TYPE LOCALITY: Vicinity of La Palma, Costa Rica.
DISTRIBUTION: Known only from the type collection.

8. *GUZMANIA* R. & P. Fl. Per. 3: 37. 1802.

Caraguata Lindl. Bot. Reg. 13: under *pl. 1068*. 1827.
Devillea Bertero; Schultes, in R. & S. Syst. Veg. 7: 1229, hyponym. 1830.
Massangea E. Morren, Belg. Hort. 27: 59, 199. 1877.
Sodirola André, Bull. Soc. Bot. Fr. 24: 167. 1877.
Schlumbergera E. Morren, Belg. Hort. 33: 46. 1883. Not *Schlumbergera* Lemaire. 1858.

Plant acaulescent or rarely long-caulescent, mostly epiphytic. Leaves entire, the sheaths conspicuous. Inflorescence simple or compound, the spikes always polystichous-flowered. Flowers perfect. Sepals usually somewhat connate. Petals connate or closely conglutinated, naked, yellow or white. Stamens usually included, the filaments more or less fused to the petals. Ovary wholly superior, pyramidal, ellipsoid or ovoid, glabrous. Ovules many, densely glomerate. Capsule septicidal. Seeds with a long, basal, straight, usually brownish coma.

Type species, *Guzmania tricolor* R. & P.

Inflorescence simple.

Inflorescence cyathiform, the outer bracts much enlarged.

Inner bracts similar in form to the outer; leaf-blades not over 25 mm. wide.

Inner bracts differing in form from the outer, much reduced.

Inflorescence scapose; inner bracts cucullate, persistent, exceeding the sepals.

Inflorescence sunk in the leaf-rosette; inner bracts straight, membranaceous, soon disintegrating.

Inflorescence not cyathiform, the outer bracts relatively inconspicuous. Plant caulescent; blades of the leaves and scape-bracts narrowly triangular.

Flowers sessile; sepals not dilated at the apex, connate for only 3 mm.

Flowers slenderly pedicellate for 8 mm.; sepals dilated at the apex, connate for 15 mm.

Plant stemless, or where the base is unknown, the blades of the scape-bracts sublingulate.

1. *G. minor*.

2. *G. lingulata*.

3. *G. crateriflora*.

4. *G. angustifolia*.

5. *G. obtusiloba*.

- Flowers spreading or divergent; floral bracts not imbricate, usually shorter than the sepals.
- Sepals subchartaceous, connate for more than half their length. 6. *G. dissitiflora*.
- Sepals coriaceous, short-connate. 7. *G. Roezli*.
- Flowers erect; floral bracts imbricate, equaling or exceeding the sepals.
- Floral bracts coriaceous.
- Floral bracts 12–18 mm. long, suborbicular, obtuse, lustrous. 8. *G. coriostachya*.
- Floral bracts up to 65 mm. long, broadly ovate, acute. 9. *G. Wrightii*.
- Floral bracts membranaceous or chartaceous.
- Inflorescence sterile toward the apex.
- Sepals coriaceous or subcoriaceous; floral bracts densely imbricate; inflorescence 2–4 cm. in diameter.
- Flowers up to 6 cm. long, distinctly longer than the floral bracts.
- Flowers not over 3 cm. long, about equaling the floral bracts. 10. *G. Berteroniana*.
- Sepals membranaceous; floral bracts barely imbricate; inflorescence slender. 11. *G. monostachya*.
- Inflorescence fertile throughout. 12. *G. stenostachya*.
- Sepals coriaceous; leaves subglabrous. 13. *G. erythrolepis*.
- Sepals membranaceous; leaves densely pale-appressed-lepidote beneath. 14. *G. nicaraguensis*.
- Inflorescence compound.
- Floral bracts equaling or longer than the sepals.
- Spikes densely corymbose, at least the lower ones exceeded by the primary bracts.
- Floral bracts broadly obtuse. 15. *G. Harrisii*.
- Floral bracts acute. 16. *G. megastachya*.
- Spikes more or less elongate, not corymbose.
- Inflorescence short and compact; the spikes pressed together. 17. *G. glomerata*.
- Inflorescence more or less elongate and interrupted.
- Floral bracts acute. 18. *G. plicatifolia*.
- Floral bracts emarginate. 19. *G. polycephala*.
- Floral bracts shorter than the sepals.
- Spikes dense, usually short; at least some of the floral bracts imbricate.
- Scape-bracts lax, at least the upper ones not imbricate; inflorescence lax, depauperately compound; primary bracts shorter than the sterile bases of the branches.
- Scape-bracts all imbricate; inflorescence dense; primary bracts mostly exceeding the lower branches. 20. *G. patula*.
- Inflorescence digitate or subcorymbose, not over 75 mm. long; spikes all sessile.
- Primary bracts shorter than the axillary spikes; sepals acute. 21. *G. subcorymbosa*.
- Primary bracts exceeding the lower spikes; sepals obtuse. 22. *G. compacta*.
- Inflorescence pyramidal to cylindrical, 11–80 cm. long; at least the lower spikes stipitate.
- Flowers corymbose in the axils of the primary bracts.
- Sepals acute; flowers subsessile. 16. *G. megastachya*.
- Sepals obtuse; flowers slenderly pedicellate. 23. *G. Dussii*.
- Flowers capitate, spicate or racemose.
- Inflorescence 5–8 dm. long; leaves concolorous; sepals 24–30 mm. long. 24. *G. Ekmanii*.
- Inflorescence not more than 25 cm. long; leaves longitudinally dark-striped; sepals 16–18 mm. long.
- Branches 2–3-flowered; floral bracts ecarinate. 25. *G. Donnellsmithii*.
- Branches 5–12-flowered; floral bracts carinate. 26. *G. Zahnii*.
- Spikes lax, elongate.
- Sepals connate for 10 mm.
- Floral bracts carinate; primary bracts about half as long as the axillary branches. 27. *G. Scherzeriana*.
- Floral bracts ecarinate; primary bracts much less than half as long as the axillary branches. 28. *G. guatemalensis*.
- Sepals not connate for more than 3 mm.
- Sepals 24–32 mm. long.
- Floral bracts lanceolate, acute, 25–35 mm. long. 29. *G. Fawcettii*.
- Floral bracts oblong or elliptic, obtuse, only 16 mm. long. 24. *G. Ekmanii*.
- Sepals not more than 18 mm. long.
- Scape-bracts lax, at least the uppermost shorter than the internodes.
- Scape-bracts dense, all exceeding the internodes. 7. *G. Roezli*.
- Sepals acute, lanceolate. 30. *G. Plumierii*.
- Sepals obtuse.
- Floral bracts slightly shorter than the sepals; inflorescence densely tripinnate. 31. *G. condensata*.
- Floral bracts much shorter than the sepals; inflorescence laxly bipinnate. 32. *G. costaricensis*.

1. *Guzmania minor* Mez, in DC. Monog. Phan. 9: 901. 1896.

Stemless; leaves many in a dense rosette, about 3 dm. long, suberect, much exceeding the inflorescence; sheaths conspicuous, ovate, punctate-lepidote; blades ligulate, acute or acuminate with a caudate apex, 25 mm. wide or less, glabrous above, obscurely punctate-lepidote below; scape very short, glabrous; scape-bracts densely imbricate, elliptic-lanceolate, acuminate, 65 mm. long, the lower foliaceous, the upper bright-red and forming a showy involucre exceeding the flowers; inflorescence simple, few-flowered, corymbose; floral bracts like the upper scape-bracts but smaller and thinner; flowers 35 mm. long; pedicels short, angled, compressed; sepals linear-oblong, acute, free, 20 mm. long; petals linear, obtuse, white, agglutinated for most of their length; stamens about equaling the petals; filaments connate with the petals for most of their length; ovary elongate; capsule subprismatic, about 3 cm. long.

TYPE LOCALITY: Near Granada, Nicaragua.

DISTRIBUTION: Nicaragua to Panama; also in Pará, Brazil.

2. *Guzmania lingulata* (L.) Mez, in DC. Monog. Phan. 9: 899. 1896.

Tillandsia lingulata L., Sp. Pl. 286. 1753.

Caraguata lingulata Lindl. Bot. Reg. 13: under pl. 1068. 1827.

Tillandsia clavata D. Dietr. Syn. Pl. 2: 1060. 1840. Not *T. clavata* Lam. 1783.

Caraguata splendens Planch. Fl. Serres 11: 31. 1856.

Caraguata virens Brongn.; Baker, Handb. Bromel. 143, hyponym. 1889.

Stemless, the flowering plant about 3 dm. high; leaves 15–30 in a dense rosette, 30–45 cm. long; sheaths ovate, conspicuous, densely brown-punctulate-lepidote, more or less castaneous at the base, sometimes marked dorsally with fine violet longitudinal stripes; blades ligulate, acute, 3–4 cm. wide, obscurely punctulate-lepidote; scape erect, usually much shorter than the leaves, stout; scape-bracts strict, densely imbricate and wholly concealing the scape, the lower ones foliaceous, the uppermost lanceolate, usually red-tinged, forming an involucre which overtops the flowers; inflorescence simple, corymbiform, up to 7 cm. wide, 10–50-flowered; floral bracts linear, cucullate, shorter than the flowers; flowers erect, 45 mm. long; pedicels very short and stout; sepals free, linear, obtuse, glabrous; petals linear, cucullate, white; stamens highly connate with the petals; ovary ellipsoid; capsule subellipsoid, 3 cm. long, short-beaked; coma reddish-brown.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: West Indies; British Honduras, Nicaragua, and Costa Rica; also from Guiana to Colombia and southward to Bolivia and southwestern Brazil.

ILLUSTRATIONS: Fl. Serres, 11: pl. 1091; Ill. Hortic. 27: pl. 374.

NOTE: The color of the bracts surrounding the inflorescence varies considerably. In *C. lingulata* var. *cardinalis* André, of Colombia and Ecuador, they are bright-scarlet instead of red, while they are wholly green in the plant named *Caraguata virens* Brongn.

3. *Guzmania crateriflora* Mez & Wercklé; Mez, Bull. Herb. Boiss. II. 5: 110. 1905.

Stemless, the flowering plant about 2 dm. high, stout and compact; leaves up to 15 in a cyathiform rosette, up to 2 dm. long; sheaths scarcely broader than the blades, very densely appressed-brown-lepidote; blades ligulate, 3 cm. wide, rounded-apiculate, rigid when dry, all or only the inner ones bright-red; scape completely lacking; inflorescence nidular in the center of the leaf-rosette, simple, corymbose, about 7-flowered; involucre leaves shorter than the others but otherwise much the same; floral bracts triangular, acute, not at all cucullate, exceeding the sepals, membranaceous; flowers erect; pedicels slender, about 5 mm. long, angled; sepals elliptic, broadly obtuse, 16 mm. long, connate for 4 mm., subcoriaceous but thinner toward the apex, glabrous, even, slightly lustrous; capsule acuminate, 40–45 mm. long.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Costa Rica and Cocos Island.

ILLUSTRATION: Am. Jour. Bot. 22: pl. 6, f. 2.

4. *Guzmania angustifolia* (Baker) Wittm. Bot.
Jahrb. 11: 62. 1889.

Caraguata angustifolia Baker, Gard. Chron. II. 22: 616. 1884.

Guzmania Bulliana André, Rev. Hort. 58: 324. 1886.

Guzmania caulescens Mez & Sodiro; Mez, Bull. Herb. Boiss. II. 5: 112. 1905.

Stem from quite short to about 2 dm. long; leaves densely and evenly distributed along the stem, 8–15 cm. long, green above, purplish below; sheaths distinct, elliptic, densely brown-punctulate-lepidote; blades very narrowly triangular, acuminate, 10 mm. wide, suberect or slightly spreading, punctulate-lepidote; scape slender, almost wholly concealed by the leaves; inflorescence few-flowered, stoutly fusiform, up to 65 mm. long and 40 mm. in diameter, sterile toward the apex; floral bracts ample, ovate-elliptic, acute or subacuminate, erect, much exceeding the sepals, slightly shorter than the flowers at anthesis, membranaceous, bright-red with dark tips; flowers subsessile; sepals elliptic, obtuse, 15–20 mm. long, membranaceous, glabrous, connate for 3 mm.; petals bright-yellow, 7 cm. long, connate in a slender tube for 6 cm., the free lobes subelliptic, obtuse; stamens 4 mm. shorter than the petals; filaments connate with the petals for nearly their whole length; capsule prismatic, acute, 28 mm. long.

TYPE LOCALITY: Colombia.

DISTRIBUTION: Costa Rica and Panama; also in Colombia and Ecuador.

ILLUSTRATION: Bot. Mag. pl. 7137.

5. *Guzmania obtusiloba* L. B. Smith, Contr.
Gray Herb. 104: 74. 1934.

Sodirola Andreana Wittm. Bot. Jahrb. 11: 57. 1889. Not *Guzmania Andreana* Mez, 1896.

Stem up to 1 m. long but only a few millimeters in diameter; leaves evenly and densely distributed along the stem, about 16 cm. long; sheaths subelliptic, imbricate, dark-castaneous, minutely brown-punctulate-lepidote; blades suberect to spreading, very narrowly triangular, acuminate, 4 mm. wide, chartaceous, glabrous above, minutely appressed-lepidote below; inflorescence sessile, shorter or longer than the upper leaves, up to 5-flowered, corymbose; floral bracts erect, ample, broadly ovate, apiculate, 25 mm. long, shorter than the sepals, membranaceous, bright-red; pedicels slender, 8 mm. long; sepals membranaceous, connate into a slender tube for 15 mm., glabrous, reddish-yellow, the free lobes broadly elliptic, obtuse; petals bright-yellow, highly connate, the free lobes elliptic, obtuse; stamens slightly shorter than the petals; filaments connate with the petals for most of their length; pistil barely exerted; capsule slenderly clavate, 25 mm. long; coma flavescent.

TYPE LOCALITY: Vicinity of Amalfi, Antioquia, Colombia, altitude 2000 meters.

DISTRIBUTION: Costa Rica; also in Colombia.

6. *Guzmania dissitiflora* (André) L. B. Smith,
Contr. Gray Herb. 104: 74. 1934.

Sodirola dissitiflora André, Enum. Bromél. 5. 13 D 1888; Rev. Hort. 60: 565. 16 D 1888.

Stemless but usually stoloniferous, the flowering plant 4–9 dm. high; leaves rosulate, suberect, 3–9 dm. long; sheaths elliptic, distinct, dark-castaneous at base, the rest pale-green with fine brown longitudinal stripes, densely and finely lepidote; blades linear, acuminate, 7–12 mm. wide, obscurely punctulate-lepidote beneath; scape erect, 3–5 mm. in diameter, much shorter than the leaves, glabrous; scape-bracts erect, imbricate, the lower foliaceous, the upper elliptic, acute, bright-red, glabrous; inflorescence simple, very laxly 7–12-flowered, about equaling the leaves; axis nearly straight, slender, glabrous, sulcate; floral bracts like the upper scape-bracts, usually shorter than the sepals and closely enfolding them; flowers mostly spreading; pedicels slender, 5–8 mm. long; sepals up to 3 cm. long, subchartaceous, glabrous, connate into a slender tube for more than half their length, the free segments oblong, obtuse; petals white when dry; capsule slenderly cylindrical, equaling the sepals.

TYPE LOCALITY: Banks of the Río Nembí, southwestern cordillera of Colombia, altitude 990 meters.

DISTRIBUTION: Costa Rica; also in Colombia.

ILLUSTRATIONS: André, Bromel. Andr. pl. 13, f. c.

7. *Guzmania Roezli* (E. Morren) Mez, in DC.

Monog. Phan. 9: 948. 1896.

Schlumbergeria Roezli E. Morren, Belg. Hort. 28: 311. 1878.*Tillandsia rigidula* Baker, Jour. Bot. 26: 44. 1888.

Stemless, 6–10 dm. high; leaves many in a dense crateriform rosette, 4 dm. long; sheaths broadly ovate, finely brown-lepidote, concolorous or longitudinally purple-striped; blades ligulate, rounded-apiculate, 3–4 cm. wide, glabrous above, very obscurely punctulate-lepidote beneath; scape erect, slender, exceeding the leaves, glabrous; scape-bracts ovate, obtuse or apiculate, shorter than the internodes; inflorescence laxly few-branched, glabrous; primary bracts like the scape-bracts, enfolding the sterile bases of the spikes; spikes spreading, elongate with long sterile prophyllate bases, lax or subdense; floral bracts ovate, narrowly obtuse, shorter than the sepals, green; flowers suberect to spreading, sessile, 23 mm. long; sepals elliptic, obtuse, 16–18 mm. long, coriaceous, connate for 2 mm.; corolla white, its lobes recurved-spreading; stamens and pistil barely exerted.

TYPE LOCALITY: Mountains of Peru, altitude 1200–4900 meters.

DISTRIBUTION: Costa Rica; also in Guiana, Colombia, and Peru.

ILLUSTRATIONS: Belg. Hort. 29: pl. 19; Oester. Bot. Zeits. 32: pl. opp. 279; Engler, Pflanzenreich 4²¹: f. 116.8. *Guzmania coriostachya* (Griseb.) Mez, in DC.

Monog. Phan. 9: 914. 1896.

Caraguata coriostachya Griseb. Nachr. Ges. Wiss. Gött. 1864: 21. 1865.*Tillandsia nigrescens* André, Enum. Bromél. 8. 13 D 1888; Rev. Hort. 60: 568. 16 D 1888.*Guzmania strobilifera* Mez & Wercklé; Mez, Bull. Herb. Boiss. II. 5: 110. 1905.

Plant 4–10 dm. high; leaves rosulate, suberect, 3–6 dm. long; sheaths narrowly ovate, 8 cm. long, very densely and finely brown-lepidote, castaneous toward the base, green with many fine longitudinal violet stripes toward the apex; blades ligulate, acute to acuminate, 15–30 mm. wide, glabrous above, very obscurely punctulate-lepidote below; scape erect, 5–8 mm. in diameter; scape-bracts erect, densely imbricate, the lower subfoliaceous, the upper ovate with castaneous and striped base and narrowly triangular apex; inflorescence simple, strobilate, many-flowered, ovoid or cylindrical, 5–8 cm. long, 2–3 cm. in diameter, glabrous; floral bracts erect, densely imbricate, suborbicular with a broadly triangular obtuse apex, ecarinate, 12–18 mm. long, about equaling the sepals, coriaceous, even, lustrous, pale to castaneous; flowers subsessile; sepals ovate, obtuse, 13–16 mm. long, coriaceous, the posterior ones carinate; corolla white, 6–10 mm. longer than the sepals, its lobes elliptic, obtuse; stamens and pistil included; capsule slenderly cylindrical, abruptly short-beaked.

TYPE LOCALITY: Between Marácas and Choroní, Venezuela.

DISTRIBUTION: Costa Rica; also in Colombia and Venezuela.

ILLUSTRATION: André, Bromel. Andr. pl. 14, f. B.

9. *Guzmania Wrightii* L. B. Smith, Contr.

Gray Herb. 117: 11. 1937.

Known from fragments only, at least 7 dm. high; leaves unknown; scape straight, 8 mm. in diameter, glabrous; scape-bracts erect, densely imbricate, sublingulate, acute, up to 12 cm. long, very obscurely punctulate-lepidote; inflorescence simple, about 2 dm. long, densely cylindrical; floral bracts imbricate, broadly ovate, acute, up to 65 mm. long, coriaceous, punctulate, the lower ones much exceeding the sepals; flowers erect; pedicels stout, cylindrical, 8–9 mm. long; sepals elliptic, obtuse, 3 cm. long, 17 mm. wide, coriaceous, faintly nerved; petals and stamens unknown.

TYPE LOCALITY: Near Monte Verde, Oriente, Cuba.

DISTRIBUTION: Known from the type collection only.

ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 1, f. 17, 18.

10. *Guzmania Berteroniana* (Schultes) Mez, in DC.

Monog. Phan. 9: 904. 1896.

Caraguata Berteroniana Schultes, in R. & S. Syst. Veg. 7: 1229. 1830.*Devillea speciosa* Bertero; Schultes, in R. & S. Syst. Veg. 7: 1229, as synonym. 1830.*Tillandsia Caraguata* D. Dietr. Syn. Pl. 2: 1059. 1840.*Caraguata grandiflora* Baker, Handb. Bromel. 145. 1889.

Stemless, the flowering plant up to 4 dm. high; leaves many in a dense rosette, about 4 dm. long; sheaths ovate, inconspicuous, obscurely brown-punctulate-lepidote; blades ligulate, acute or acuminate, 5 cm. wide, pale-green, glabrous; scape erect, much shorter than the leaves, glabrous; scape-bracts erect and densely imbricate, elliptic, the lower ones foliaceous, the upper ones dark-red and bracteiform; inflorescence simple, many-flowered, about equaling the leaves, densely cylindric, up to 25 cm. long and 4 cm. in diameter, acute, sterile toward the apex; floral bracts erect and very densely imbricate, broadly elliptic, the lower acuminate, the upper apiculate, bright-miniate, glabrous, membranaceous; flowers subsessile, up to 6 cm. long, bright-yellow, definitely exceeding the bracts; sepals very broadly elliptic, obtuse, 22 mm. long, connate for 2 mm., glabrous, subcoriaceous, striate; corolla-lobes elliptic, obtuse, subspreading; stamens 4 mm. shorter than the petals; capsule subprismatic, acute, 3 cm. long; coma white.

TYPE LOCALITY: Porto Rico.

DISTRIBUTION: Santo Domingo and Porto Rico.

NOTE: Specific name spelled *Berteroana* by Mez.11. *Guzmania monostachia* (L.) Rusby; Mez, in DC.

Monog. Phan. 9: 905. 1896.

Renealmia monostachia L. Sp. Pl. 287. 1753.*Tillandsia monostachia* L. Sp. Pl. ed. 2. 410. 1762.*Tillandsia clavata* Lam. Encyc. 1: 617. 1785.*Pourretia sympaganthera* R. & P. Syst. Veg. Fl. Per. 1: 82. 1789.*Guzmania tricolor* R. & P. Fl. Per. 3: 38. 1802.*Guzmania comosa* Bertero; Schultes, in R. & S. Syst. Veg. 7: 1232. 1830.*Guzmania sympaganthera* Beer, Bromel. 103. 1857.*Tillandsia pachycarpa* Baker, Jour. Bot. 25: 238. 1887.*Tillandsia gymnophylla* Baker, Jour. Bot. 26: 41. 1888.*Guzmania platysepala* Mez & C. F. Baker; Mez, Bull. Torrey Club 30: 437. 1903.*Guzmania clavata* Urban, Repert. Sp. Nov. 15: 99. 1917.

Stemless, the flowering plant 2-4 dm. high; leaves many in a dense rosette, obscurely punctulate-lepidote, soon glabrous; sheaths broadly ovate, brownish; blades ligulate, 2 cm. wide, acute, yellow-green, paler below; scape erect, much shorter than the leaves, 4-8 mm. in diameter, glabrous; scape-bracts ovate, acute, imbricate, pale-green; inflorescence of a single elongate polystichous spike, cylindric, acute, 8-15 cm. long, 2-3 cm. in diameter, sterile toward the apex; axis straight, glabrous; floral bracts imbricate, ovate, acute, membranous, the fertile ones pale with conspicuous brown longitudinal stripes, about equaling the flowers, the sterile bright-red; flowers erect, white, 23-29 mm. long; sepals joined equally for about one fourth their length, 18 mm. long, obovate, broadly obtuse, even, coriaceous; petals fused for most of their length, the lobes elliptic, obtuse; stamens included, filaments connate with the petals for most of their length; capsule cylindric, 2-3 cm. long; coma white.

TYPE LOCALITY: South America.

DISTRIBUTION: Southern Florida and West Indies; Nicaragua, Costa Rica, and Panama; also in Venezuela, Colombia, Ecuador, and Bolivia.

ILLUSTRATIONS: R. & P. Fl. Per. 3: pl. 261; Bot. Cab. 5: pl. 462; Lindl. Coll. pl. 8; Fl. Serres 9; pl. 918; Bot. Mag. pl. 5220; Hook. Exot. Fl. pl. 163 [bis].

NOTE: Specific name spelled *monostachys* by Mez.12. *Guzmania stenostachya* L. B. Smith, Contr.

Gray Herb. 117: 9. 1937.

Plant stemless; leaves 10-20 in a dense subfasciculate rosette, 3-4 dm. long, equaling or exceeding the inflorescence, the lower half marked with fine longitudinal purple stripes; sheaths ovate, 9 cm. long, brown-punctulate; blades linear, acute, 10-17 mm. wide, subglabrous; scape

erect, slender; scape-bracts erect, densely imbricate, the lower foliaceous, the upper broadly elliptic, apiculate, red; inflorescence simple, slenderly cylindric, subaxly few-flowered, 12 cm. long, probably about 15 mm. in diameter at anthesis, sterile toward the apex; floral bracts like the scape-bracts but with small or no apiculus, 3-4 cm. long, ample, much exceeding the sepals, erect, subinflated, chartaceous; flowers slenderly short-pedicellate; sepals broadly elliptic, subtruncate, 16 mm. long, free, membranaceous; capsule slenderly clavate, acute, 3 cm. long.

TYPE LOCALITY: Yerba Buena, northeast of San Isidro, Province Heredia, Costa Rica, altitude about 2000 meters.

DISTRIBUTION: Costa Rica.

ILLUSTRATION: Contr. Gray Herb. 117: *pl. 1, f. 15.*

13. *Guzmania erythrolepis* Brongn.; Planch. Fl.

Serres 11: 25. 1856.

Plant stemless, 4 dm. high; leaves 12-20 in a dense rosette, 4 dm. long, green, often purplish below, very obscurely punctulate-lepidote throughout; sheaths small and inconspicuous, narrower than the blade; blades linear-lanceolate, acute, 4 cm. wide, chartaceous when dry; scape erect, short and largely concealed by the leaves, glabrous; scape-bracts erect, densely imbricate, the lower and middle foliaceous or red toward the base, the upper broadly elliptic, apiculate, bright-red with pale margins and greenish apex; inflorescence simple, ellipsoid, strobilate, fertile throughout, 10-15 cm. long, 30-45 mm. in diameter, glabrous or subglabrous; axis 8 mm. in diameter; floral bracts like the upper scape-bracts but broadly acute or obtuse, 4 cm. long, 2 cm. wide, much exceeding the sepals, subchartaceous, even when fresh, finely striate when dry; flowers subsessile; sepals elliptic, broadly obtuse, 2 cm. long, coriaceous, dark-castaneous especially toward the base, connate for 4 mm.; petals barely exerted from the bracts, connate for most of their length, white, the free lobes elliptic, obtuse; stamens 5 mm. shorter than the petals, the filaments highly connate with the petals; ovary slender.

TYPE LOCALITY: Santiago, Cuba.

DISTRIBUTION: Cuba, Jamaica, and Porto Rico.

ILLUSTRATION: Fl. Serres 11: *pl. 1089.*

14. *Guzmania nicaraguensis* Mez & C. F. Baker; Mez,

Bull. Torrey Club 30: 436. 1903.

Guzmania bracteosa "André" Donn.-Smith, Bot. Gaz. 47: 262. 1909. Not *G. bracteosa* André, 1896.

Leaves 10-15 in a dense cyathiform rosette, 3-6 dm. long, usually much exceeding the inflorescence, chartaceous, densely and minutely pale-appressed-lepidote below, becoming glabrous, often marked with fine longitudinal red stripes; sheaths ovate, 1 dm. long, castaneous toward the base; blades ligulate, acute, apiculate, 20-25 mm. wide; scape erect, short and largely concealed by the leaves, glabrous; scape-bracts erect, densely imbricate, the lower foliaceous, the upper broadly elliptic, apiculate, subinflated, bright-red to reddish-brown; inflorescence simple, densely fusiform, few-flowered, fertile throughout, 7-10 cm. long, glabrous; floral bracts like the upper scape-bracts but obtuse or broadly acute, not apiculate, 5 cm. long, densely imbricate, membranaceous; flowers short-pedicellate, erect; sepals subelliptic, broadly obtuse, up to 25 mm. long, 8 mm. wide, membranaceous, short-connate; petals connate into a slenderly cylindric tube for most of their length, over 6 cm. long, yellow, the free portion elliptic, obtuse; stamens barely included, the filaments highly connate with the petals, anthers 4 mm. long; ovary slenderly pyramidal.

TYPE LOCALITY: Volcano Mombacho, Granada, Nicaragua.

DISTRIBUTION: Guatemala, Nicaragua, and Costa Rica.

15. *Guzmania Harrisii* Mez, in DC. Monog. Phan. 9: 927. 1896.

Stemless, the flowering plant 1 m. high or more; leaves (only the inner ones known) thick, coriaceous, glabrous throughout or minutely punctulate-lepidote dorsally, 6 dm. long; blades linear, acuminate, firm, 7 cm. wide; scape very stout; scape-bracts densely imbricate, stiffly

erect, similar to the leaves but narrower; inflorescence very dense, almost strobiliform, 20 cm. long, 9 cm. in diameter, many-flowered, known only in a very immature state; primary bracts very ample, acuminate from a very broadly ovate base, the lower ones 12 cm. long, exceeding the axillary spikes; spikes very short, sessile, corymbose; floral bracts broadly elliptic, obtuse, about 30 mm. long, exceeding the sepals, subcoriaceous, glabrous; flowers slenderly pedicellate for 6 mm.; sepals subelliptic, acute, free.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Known only from the type locality.

16. *Guzmania megastachya* (Baker) Mez, in DC.
Monog. Phan. 9: 928. 1896.

Tillandsia foliosa Griseb. Fl. Brit. W. Ind. 597. 1864. Not *T. foliosa* Mart. & Gal. 1843.

Tillandsia megastachya Baker, Jour. Bot. 26: 46. 1888.

Tillandsia magna Baker, Handb. Bromel. 210. 1889.

Stemless, the flowering plant 7 dm. or higher; leaves 5 dm. long; sheaths ovate, brown-punctulate-lepidote; blades linear, 4 cm. wide, acute, obscurely punctulate-lepidote; scape erect, stout; scape-bracts densely imbricate, elliptic-lanceolate, acute; inflorescence many-flowered, subcylindric; primary bracts broadly ovate, acute, 55–80 mm. long, exceeding the axillary spikes; spikes subsessile, corymbose; floral bracts subtriangular, 40 mm. long, nearly equaling to exceeding the sepals, strongly carinate, submembranaceous; flowers 62 mm. long, subsessile; sepals linear, acute, free, strongly nerved; petals conglutinated into a narrow tube for most of their length, the lobes narrowly elliptic, obtuse; stamens included; capsule subclavate, 37 mm. long.

TYPE LOCALITY: St. Vincent.

DISTRIBUTION: Lesser Antilles.

ILLUSTRATION: Contr. Gray Herb. 98: pl. 5, f. 12.

17. *Guzmania glomerata* Mez & Wercklé; Mez,
Repert. Sp. Nov. 14: 256. 1916.

Stemless, the flowering plant nearly 1 m. high, stout; leaves up to 20 in a dense rosette, erect, coriaceous, green, concolorous, 8 dm. long, subglabrous, 30 mm. wide; scape erect, stout; scape-bracts much exceeding the internodes, with castaneous base and short acute erect blade; inflorescence erect, slightly exceeding the leaves, densely capitate, 65 mm. in diameter, composed of about 10 spikes; primary bracts very broadly ovate, shorter than the spikes, brown; spikes crowded together, densely strobiliform, very short-stipitate, suberect, subellipsoid, about 45 mm. long; floral bracts imbricate, elliptic, acute, equaling or slightly exceeding the sepals, submembranaceous; flowers glabrous; pedicels 3 mm. long; sepals 22 mm. long, connate for 10 mm., acute.

TYPE LOCALITY: Vicinity of La Palma, Costa Rica.

DISTRIBUTION: Known only from the type locality.

18. *Guzmania plicatifolia* L. B. Smith, Proc.
Am. Acad. 68: 146. 1933.

Epiphytic or terrestrial, short-caulescent, 9–11.5 dm. high; leaves about 15, erect, 8–13 dm. long, very minutely and obscurely lepidote; sheaths purple, often striped with green above and minutely punctulate-lepidote; blades linear, 2 cm. wide, narrowly acuminate, strongly plicate; scape 8 mm. in diameter, erect, soon glabrous; scape-bracts foliaceous, erect, densely imbricate; inflorescence laxly bipinnate, composed of 15 spikes, subcylindric, 3 dm. long; primary bracts lance-ovate, ample, membranaceous, soon disintegrating, the lower ones much longer than the spikes; spikes stoutly short-stipitate, broadly ovoid, 4–5 cm. long, densely 12–15-flowered; floral bracts imbricate, broadly elliptic or ovate, acute, 25 mm. long, exceeding the sepals, membranaceous, prominently nerved, subglabrous; flowers subsessile; petals yellow; sepals

free, narrowly lanceolate, acute, 16 mm. long, glabrous, sulcate; capsule slenderly ellipsoid, about equaling the sepals.

TYPE LOCALITY: La Palma, Province of San José, Costa Rica, altitude 1459 meters.

DISTRIBUTION: Provinces of San José and Cartago, Costa Rica.

ILLUSTRATIONS: Proc. Am. Acad. 68: pl. 2, f. 4, 5.

19. *Guzmania polycephala* Mez & Wercklé; Mez,
Repert. Sp. Nov. 14: 254. 1916.

Flowering plant over 1 m. high; leaves about 1 m. long; blades acuminate, up to 45 mm. wide, green, subglabrous, rigidly coriaceous; scape stout, exceeding the leaves; scape-bracts foliaceous, strict, densely imbricate; inflorescence many-flowered, cylindric, laxly bipinnate with branches 35 mm. apart, 3-4 dm. long, 75 mm. in diameter; primary bracts broadly ovate, the lower ones suberect, exceeding the spikes and with a long triangular-acuminate apex, the upper spreading, equaling or shorter than the spikes and apiculate; spikes suberect, densely strobilate, globose, 20-25-flowered, 4-6 cm. long, the lower ones very short-stipitate, the upper sessile; floral bracts very broadly elliptic, broadly rounded and emarginate, exceeding the sepals, strongly convex, rigidly coriaceous, glabrous, prominently nerved; flowers short-stipitate; sepals obtuse, 16 mm. long, connate for 2 mm., coriaceous, capsule 20 mm. long.

TYPE LOCALITY: Vicinity of La Palma, Costa Rica, altitude 1500 meters.

DISTRIBUTION: Costa Rica and Panama.

20. *Guzmania patula* Mez & Wercklé; Mez, Repert.
Sp. Nov. 14: 255. 1916.

Stemless, the flowering plant 5-6 dm. high, very slender; leaves many in a dense rosette, up to 25 cm. long; sheaths especially marked with longitudinal red stripes; blades 20-35 mm. wide, acute, spirally recurved at the apex, subglabrous, subcoriaceous; scape erect, much exceeding the leaves, glabrous; scape-bracts lax, much shorter than the internodes, erect, very broadly ovate, acute, glabrous, stramineous when dry; inflorescence depauperate-compound, composed of a 20-flowered terminal spike, 6 cm. long and 2 cm. in diameter and a remote much smaller lateral spike on a long stipe; primary bract like the scape-bracts; spikes dense, subcylindric; floral bracts suberect, barely imbricate, 15 mm. long, shorter than the sepals, ecarinate, coriaceous with a narrow membranous margin; flowers suberect, glabrous; pedicels very short; sepals slightly asymmetric, obtuse, 14 mm. long, connate for 1.5 mm., even and glabrous outside; petals white, 20 mm. long, the free lobes elliptic, obtuse, spreading at anthesis; stamens and pistil slightly shorter than the petals.

TYPE LOCALITY: Paso Río Naranja, near Navarro, Costa Rica.

DISTRIBUTION: Costa Rica; also in Colombia.

21. *Guzmania subcorymbosa* L. B. Smith, Contr.
Gray Herb. 117: 10. 1937.

Guzmania compacta "Mez" L. B. Smith, Contr. Gray Herb. 98: 32. 1932. Not *G. compacta* Mez, 1896.

Plant stemless, 3-6 dm. high; leaves many in a dense cyathiform rosette, usually marked toward the base with fine longitudinal purple stripes; sheaths ovate, 7 cm. long, densely brown-punctulate, often castaneous toward the base; blades linear-triangular, acuminate, 10-15 mm. wide, glabrous above, obscurely punctulate below; scape erect, slender; scape-bracts erect, densely imbricate, foliaceous; inflorescence compound, few-branched, digitate, subcorymbose, green, primary bracts ovate, acute, half as long as the axillary spikes, coriaceous, even; spikes subellipsoid, sessile or subsessile, densely 3-10-flowered, 25-40 mm. long, bearing a single sterile bract at the base; floral bracts ovate, broadly acute or obtuse, slightly but constantly shorter than the sepals, coriaceous, even, strongly convex, ecarinate, subglabrous; flowers subsessile; sepals elliptic, acute, 10-12 mm. long, equally short-connate, sharply carinate, coriaceous; petals white; capsule slenderly cylindric, 3 cm. long; coma reddish-brown.

TYPE LOCALITY: Dagua Valley, Cordoba, El Valle, Colombia, altitude 80-100 meters.

DISTRIBUTION: Costa Rica and Panama; also in Colombia.

ILLUSTRATION: Contr. Gray Herb. 117: pl. 1, f. 16.

22. *Guzmania compacta* Mez, in DC. Monog.
Phan. 9: 947. 1896.

Guzmania capitulata Mez & Wercklé; Mez, in Repert. Sp. Nov. 14: 255. 1916.

Plant stemless, nearly 5 dm. high; leaves 4 dm. long, glabrous or minutely punctulate-lepidote below at maturity, longitudinally red-striated toward the base; blades 25 mm. wide; scape conspicuous, erect, stout; scape-bracts strict, very densely imbricate, linear, acute or acuminate, subpungent, longitudinally red-striate below, chartaceous when dry; inflorescence compound, very densely digitate, ovoid, subobtusate, 40-75 mm. long, bright-red when dry; primary bracts erect, broadly ovate, acuminate, much exceeding the lower axillary spikes; spikes erect, sessile, globose, strobiliform, 3-10-flowered; floral bracts imbricate, broadly elliptic, obtuse, about 11 mm. long, distinctly shorter than the sepals, strongly convex, ecarinate, coriaceous, prominently nerved; flowers glabrous, 16-18 mm. long; pedicels short but distinct; sepals subsymmetrical, broadly obtuse, shiny, granular-punctulate especially toward the apex, coriaceous; petals conglutinate into a long slender tube, the lobes elliptic, obtuse; stamens included, the filaments highly connate with the petals, the anthers 3 mm. long; ovary slenderly ellipsoid; ovules obtuse.

TYPE LOCALITY: Near Conada Yarica, Matagalpa, Nicaragua.
DISTRIBUTION: Nicaragua and Costa Rica.

23. *Guzmania Dussii* Mez, in DC. Monog. Phan. 9: 923. 1896.

Thecophyllum Dussii Mez, Bull. Herb. Boiss. II. 3: 131. 1903.

Stemless, flowering plant 15 dm. high or higher; leaves up to 6 dm. long; sheaths distinct, finely and densely brown-lepidote, purple toward the apex, especially above; blades acuminate, pungent, 75 mm. wide, glabrous above, very minutely punctulate below; scape erect, stout; scape-bracts foliaceous, large, erect, densely imbricate, reddish-purple toward the apex; inflorescence many-flowered, densely bipinnate, cylindrical, 3 dm. long and 15 cm. in diameter; primary bracts very broadly ovate, triangular-acute, flat, wholly concealing the axis, up to 1 dm. long, exceeding the axillary flowers, punctulate-lepidote below, coriaceous; branches almost wholly aborted and the flowers therefore in fascicles; floral bracts 32 mm. long, elliptic, much exceeded by the sepals, membranaceous, striate; flowers erect; pedicels slender, 12-15 mm. long; sepals elliptic, obtuse, 22-28 mm. long, brown with a pale margin when dry, even, glabrous, nearly free; petals linear, obtuse, cucullate, 32 mm. long, dark-yellow when dry, connate for nearly half their length; capsule ellipsoid, beaked, about equaling the sepals; coma flavous.

TYPE LOCALITY: Guadeloupe.
DISTRIBUTION: Guadeloupe.
ILLUSTRATIONS: Contr. Gray Herb. 98: pl. 5, f. 13, 14.

24. *Guzmania Ekmanii* Harms, Notizbl. Bot. Gart. Berlin, 10: 804,
as synonym. 1929; Harms; Mez, in Engler,
Pflanzenreich 4³²: 626. 1935.

Schlumbergeria Ekmanii Harms, Notizbl. Bot. Gart. Berlin 10: 804. 1929.

Plant 7-9 dm. high; leaves presumably rosulate, over 6 dm. long; sheaths broadly ovate, 12 cm. long, densely and finely brown-appressed-lepidote, castaneous; blades ligulate, acute and apiculate, 5 cm. wide, green, concolorous, lepidote below, soon glabrous above; scape erect, 10-14 mm. in diameter, glabrous; scape-bracts erect or slightly spreading toward the apex, densely imbricate, foliaceous, up to 2 dm. long; inflorescence bipinnate, dense toward the apex, thyriform, 5-8 dm. long, 5-9 cm. in diameter, sparsely and finely white-appressed-lepidote throughout, flavous or often purplish; primary bracts suberect to spreading, ovate-lanceolate or the upper broadly ovate, acuminate, the lower subfoliaceous and much exceeding the axillary branches, up to 12 cm. long, the upper only about half as long as the branches; racemes spiciform, suberect, subdensely 7-12-flowered, ellipsoid, the lower short-stipitate; rhachis stout, angled, 25-30 mm. long; floral bracts oblong or elliptic, obtuse, 16 mm. long, much shorter than the sepals, convex, ecarinate, submembranaceous when dry but wrinkled as if quite fleshy

when alive; flowers suberect to spreading; pedicels stout, 3–4 mm. long; sepals symmetrical, lanceolate, acute or obtuse, 24–30 mm. long, subcoriaceous, prominently nerved; corolla slenderly cylindrical, 45 mm. long, yellow, the lobes elliptic, obtuse; stamens barely shorter than the petals.

TYPE LOCALITY: Haiti.

DISTRIBUTION: Haiti.

25. *Guzmania Donnellsmithii* Mez; Donn. Smith,
Bot. Gaz. 35: 9. 1903.

Plant stemless, over 3 dm. high; leaves rosulate, up to 6 dm. long, minutely pale-appressed-lepidote especially below; sheaths large, ovate, densely and evenly marked with fine longitudinal violet lines; blades ligulate, acuminate, 3 cm. wide at the base; scape erect; scape-bracts erect, densely imbricate, concealing the scape and even the lower part of the inflorescence, foliaceous, acuminate; inflorescence short-thyrsoïd, densely bipinnate, 11 cm. long; axes glabrous; primary bracts spreading, acuminate from a broadly ovate base, bright-red, appressed-lepidote toward the apex, the lower longer than the axillary branches and the upper shorter; spikes distinctly stipitate, densely 2- or 3-flowered; rhachis barely over 1 cm. long; floral bracts suborbicular, ecarinate, 8–10 mm. long, much shorter than the sepals, membranaceous, glabrous; flowers subsessile, erect, slender; sepals tubular-erect, slightly asymmetric, narrowly elliptic, obtuse, ecarinate, 16 mm. long, coriaceous, glabrous or sparsely white-lepidote, equally short-connate; corolla tubular-erect, 21 mm. long, its lobes ovate, obtuse; stamens included; style slender; capsule slenderly cylindrical, 2 cm. long.

TYPE LOCALITY: Llanuras de Santa Clara, Costa Rica, altitude 300 meters.

DISTRIBUTION: Costa Rica.

26. *Guzmania Zahnii* (Hook. f.) Mez, in DC.
Monog. Phan. 9: 940. 1896.

Caraguata Zahnii Hook. f. Bot. Mag. pl. 6059. 1873.

Stemless or slightly caulescent and branching, the flowering plant about 5 dm. high; leaves 20–30 in a rosette, suberect to spreading, up to 6 dm. long; sheaths narrowly ovate, scarcely distinct, obscurely brown-lepidote, flavous with dark-red longitudinal stripes; blades lingulate, acuminate, 27 mm. wide, chartaceous to membranaceous, glabrous at maturity, purple-red throughout or green near the apex, marked dorsally or on both sides with red-brown longitudinal stripes; scape slightly shorter than the leaves, erect, glabrous, red; scape-bracts erect and densely imbricate, narrowly lanceolate, acuminate, glabrous, bright-scarlet; inflorescence densely bipinnate, pyramidal or short-thyrsoïd, up to 25 cm. long and 10 cm. in diameter, glabrous, bright-yellow in all its parts; primary bracts very broadly ovate with an acuminate lamina, the lower ones purple-tipped and exceeding the axillary spikes; spikes suberect to spreading, the lower distinctly stipitate, subcapitate, 5–12 flowered, less than 5 cm. long including the flowers; floral bracts broadly elliptic to suborbicular, broadly obtuse, strongly convex, carinate, 10 mm. long, shorter than the sepals; flowers subsessile; sepals narrowly elliptic, obtuse, 18 mm. long, connate for 2.5 mm., strongly carinate; petals elliptic, obtuse, about 3 cm. long, connate for 7 mm.; filaments connate with the petals for most of their length; pistil exceeding the petals; capsule cylindrical, 24 mm. long, 3 mm. in diameter; coma subferruginous.

TYPE LOCALITY: Chiriquí Volcano, Panama.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Bot. Mag. pl. 6059; Belg. Hortie. 23: pl. 19, 20.

27. *Guzmania Scherzeriana* Mez, in DC. Monog.
Phan. 9: 949. 1896.

Leaf-blades at least 4 dm. long, linear, 43 mm. wide, green, glabrous, submembranaceous when dry, scape erect, short, stout; scape-bracts erect, densely imbricate, ovate, long acuminate, pungent; inflorescence paniculate, bipinnate, subdense, probably up to 4 dm. long; and many-

flowered; axes angled, glabrous; primary bracts broadly ovate, about half as long as the axillary branches, strongly convex, brown when dry, glabrous outside, sparsely white-punctulate inside, the lower acuminate, the upper acute; branches suberect to spreading, up to 7 cm. long, about 5-flowered with the flowers 1 cm. apart; floral bracts suberect, broadly ovate, obtuse, 17 mm. long, much shorter than the sepals, strongly convex, the lower ones strongly carinate; flowers 33 mm. long, glabrous; sepals narrowly elliptic, obtuse, 25 mm. long, 8.5 mm. wide, coriaceous, connate for 10 mm.; petals connate for most of their length.

TYPE LOCALITY: Near Cartago, Costa Rica, altitude 1700 meters.
DISTRIBUTION: Known only from the type collection.

28. *Guzmania guatemalensis* L. B. Smith, Contr.
Gray Herb. 117: 8. 1937.

Plant 6 dm. high, probably stemless; leaves over 6 dm. long; sheaths large, ovate; blades ligulate, acute, apiculate, 45 mm. wide; scape erect, 7 mm. in diameter; scape-bracts foliaceous, erect, densely imbricate; inflorescence very laxly bipinnate, subpyramidal, 25 cm. long, glabrous; primary bracts very broadly ovate, acute, reaching only the second flower of the axillary branch; racemes ascending or spreading, 10-12 cm. long, very laxly 10-12-flowered; rhachis nearly straight; floral bracts very broadly elliptic, obtuse, 2 cm. long, much exceeded by the sepals, inflated, not at all carinate, subcoriaceous, even, stramineous when dry; flowers spreading; pedicels stout, 4 mm. long; sepals elliptic, obtuse, 25 mm. long, ecarinate, connate for 10 mm.; petals 33 mm. long.

TYPE LOCALITY: Dept. Alta Verapaz, Chama, Guatemala, altitude 330 meters.
DISTRIBUTION: Known only from the type collection.
ILLUSTRATION: Contr. Gray Herb. 117: *pl. 1, f. 13.*

29. *Guzmania Fawcettii* Mez, in DC. Monog. Phan. 9: 951. 1896.

Flowering plant over 1 m. high; leaves up to 6 dm. long; blades ligulate, acuminate, 5 cm. wide, coriaceous, dark-green when dry, glabrous above, obscurely appressed-lepidote below; scape terete, over 1 cm. in diameter; scape-bracts foliaceous, suberect, densely imbricate; inflorescence laxly bipinnate, subthyrsoid, about 4 dm. long and 2 dm. in diameter; primary bracts reflexed, very ample, the lower exceeding the axillary branches, the upper equaling them; branches nodding, laxly many-flowered, up to 1 dm. long; floral bracts lanceolate, acute, 25-35 mm. long; flowers spreading; pedicels stout, 5 mm. long; sepals narrowly triangular, acuminate, 32 mm. long, free; capsule subcylindric, shorter than the sepals; coma dark-ferruginous.

TYPE LOCALITY: Jamaica.
DISTRIBUTION: Jamaica.

30. *Guzmania Plumierii* (Griseb.) Mez, in DC.
Monog. Phan. 9: 950. 1896.

Brocchinia Plumierii Griseb. Fl. Brit. W. Ind. 593. 1864.
Tillandsia martinicensis Baker, Jour. Bot. 26: 45. 1888.
Pitcairnia Plumieri Baker, Handb. Bromel. 107. 1889.

Flowering plant often over 1 m. high; leaves rosulate, about 4 dm. long; sheaths inconspicuous, elongate, sparsely brown-punctulate-lepidote; blades ligulate, up to 75 mm. wide, subglabrous, broadly acute with a pungent apiculus, red toward the apex; scape erect, equaling or exceeding the leaves, stout, glabrous; scape-bracts much exceeding the internodes, foliaceous, acute, pungent; inflorescence bipinnate or tripinnate, up to 4 dm. long; primary bracts ovate, acute or the lower triangular-laminate, usually much shorter than the axillary branches; branches suberect to spreading, up to 12 cm. long, laxly polystichous-flowered, bearing 12-15 more or less secund flowers; floral bracts broadly ovate or elliptic, obtuse, strongly convex, 15 mm. long, shorter than the sepals, red, subglabrous, thin and striate when dry; flowers glabrous; pedicels stout, 3 mm. long; sepals lanceolate, acute, 18 mm. long, free or equally short-connate; stamens highly connate with the petals; capsule slenderly ellipsoid, 13 mm. long.

TYPE LOCALITY: St. Kitts and Dominica.
DISTRIBUTION: Lesser Antilles.

31. *Guzmania condensata* Mez & Wercklé; Mez, Bull.

Herb. Boiss. II. 3: 228. 1903.

Over 1 m. high; leaves densely rosulate, 6 dm. long; sheaths elliptic, conspicuous, deep-castaneous at the extreme base; blades ligulate, acuminate, 2 cm. wide, glabrous above, very finely brown-punctulate-lepidote beneath, green, concolorous; scape stout, erect, glabrous; scape-bracts densely imbricate, elongate, foliaceous; inflorescence many-flowered, tripinnate, thyrsoid, 4-7 cm. long; primary bracts like the scape-bracts, the upper ones much reduced; branches erect to spreading, the lower shorter than the primary bracts, the upper up to 11 cm. long, divided into 3 or 4 spikes; spikes laxly about 10-flowered; floral bracts suberect, not concealing the rhachis, very broadly ovate-elliptic, abruptly acute or obtuse, 12 mm. long, 9 mm. wide, slightly shorter than the sepals, subcoriaceous, nerved, glabrous; sepals oblong, obtuse, coriaceous, striate toward the apex, free, the posterior ones carinate; corolla white when dry, 15 mm. long; capsule stout, short-beaked, about 15 mm. long.

TYPE LOCALITY: Cartago, Costa Rica.

DISTRIBUTION: Costa Rica.

32. *Guzmania costaricensis* Mez & Wercklé; Mez,

Repert. Sp. Nov. 16: 78. 1919.

Flowering plant 15 dm. high or higher; leaves up to 65 cm. long, 55 mm. wide above the sheath, narrowly acuminate into a pungent brown apex, stiff, glabrous; scape stout; scape-bracts foliaceous, spinose-pungent, erect, much exceeding the internodes; inflorescence many-flowered, laxly bipinnate, 5 dm. long, 12 cm. in diameter, thyrsoid; axis minutely furfuraceous-lepidote; primary bracts acuminate from an ovate base, pungent, suberect to spreading, much shorter than the axillary branches; branches ascending, up to 13 cm. long, laxly up to 20-flowered, the sterile base very short; floral bracts suberect, coriaceous, nerved, scarcely or not at all carinate, ovate-elliptic, obtuse, much shorter than the sepals; flowers 20 mm. long; pedicels stout, 5 mm. long; sepals narrowly elliptic, obtuse, 16 mm. long, coriaceous, prominently nerved, free; petals slightly exceeding the sepals, acute; stamens and pistil included.

TYPE LOCALITY: Las Conchavos, Costa Rica.

DISTRIBUTION: Known only from the type collection.

EXCLUDED SPECIES.

GUZMANIA BRACTEOSA André. Incorrectly reported from Guatemala by John Donnell Smith (Bot. Gaz. 47: 262. 1896) on the basis of material that is actually *G. nicaraguensis* Mez & C. F. Baker.

9. *CATOPSIS* Griseb. Fl. Brit. W. Ind. 599. 1864.

Tussacia Willd.; Beer, Bromel. 21, 99. 1857. Not *Tussacia* Reichenb. 1827.
Pogospermum Brongn. Ann. Sci. Nat. V. 1: 327. 1864.

Stemless herbs. Leaves densely utriculate-rosulate, entire, minutely appressed-lepidote, green, the sheath large. Scape conspicuous. Inflorescence usually bipinnate, rarely simple or tripinnate, exceeding the leaves, its branches polystichous-flowering. Flowers small or minute, sessile or subsessile, perfect or functionally dioecious. Sepals free, usually rounded, strongly asymmetric in most cases, glabrous. Petals free, naked. Stamens included; anthers ovate or elliptic. Ovary superior, broadly ovoid or ellipsoid; style shorter than the ovary or lacking; ovules few to several, long-caudate. Capsule septicial. Seeds with coma apical and folded over, their bases projecting from the capsule.

Type species, *Tillandsia nutans* Sw.

Sepals 10-18 mm. long.

Floral bracts much exceeding the flowers, cucullate.

Floral bracts shorter than the sepals, straight toward the apex.

Sepals subsymmetric, 15-18 mm. long.

Sepals distinctly asymmetric, 10-15 mm. long.

Petals bright-yellow, much exceeding the submembranaceous

sepals; scape slender, usually decurved.

Petals white, equaling or shorter than the coriaceous sepals; scape

erect, stout.

1. *C. cucullata*.2. *C. Wauranea*.3. *C. nutans*.4. *C. Berteroniana*.

- Sepals not more than 9 mm. long.
 Scape-bracts all shorter than the internodes.
 Sepals not more than 4.5 mm. long; inflorescence delicate with very slender axes; leaves about 10–15 cm. long. 5. *C. apicroides*.
- Sepals 5–9 mm. long.
 Leaves in a cylindrical rosette, usually strict; sepals cuneate on the right with the wing much exceeding the midnerve, 5–6 mm. long. 6. *C. nitida*.
- Leaves in a cyathiform rosette, arching-divergent; sepals curved on both sides of the base with the wing scarcely if at all exceeding the midnerve, 7–9 mm. long.
 Leaf-blades up to 53 mm. wide; branches of the inflorescence with elongate sterile bases. 7. *C. Werckleana*.
- Leaf-blades not more than 25 mm. wide; branches of the inflorescence, if any, with short sterile bases.
 Flowers perfect, suberect; capsule short-beaked. 8. *C. sessiliflora*.
 Flowers dioecious, spreading; capsule beakless. 9. *C. aloides*.
- Scape-bracts equaling or exceeding the internodes, or rarely the uppermost slightly shorter.
 Primary bracts equaling or exceeding the lower axillary branches.
 Lower primary bracts filiform-acuminate; spikes lax. 10. *C. delicatula*.
 Lower primary bracts not filiform-acuminate; spikes dense or subdense.
 Leaf-blades with conspicuous pale or white margins; leaves 10–18 cm. long.
 Leaf-blades narrowly triangular, acuminate. 11. *C. brevifolia*.
 Leaf-blades ligulate, broadly acute or obtuse, apiculate. 12. *C. Morreniana*.
- Leaf-blades concolorous; leaves 25–40 cm. long.
 Inflorescence tripinnate; flowers perfect. 13. *C. Hahnii*.
 Sepals 9 mm. long. 14. *C. comparia*.
 Sepals 5 mm. long. 15. *C. Oerstediana*.
 Inflorescence densely bipinnate; flowers dioecious.
- Primary bracts all shorter than the axillary branches.
 Inflorescence pendulous, 3–5 dm. long.
 Petals broadly elliptic, symmetric; scape much longer than the leaves; flowers dioecious. 16. *C. pendula*.
 Petals ligulate, asymmetric; scape much shorter than the leaves; flowers perfect. 17. *C. mexicana*.
- Inflorescence erect, 3–40 cm. long.
 Floral bracts exceeding the sepals, cucullate. 18. *C. Wangerini*.
 Floral bracts distinctly shorter than the sepals, not cucullate.
 Leaf-blades ligulate, broadly acute or obtuse, apiculate. 12. *C. Morreniana*.
 Leaf-blades acuminate.
 Spikes densely flowered, short-stipitate; inflorescence usually dense and tripinnate.
 Leaf-blades broad, merging indistinguishably with the sheaths. 14. *C. compacta*.
 Leaf-blades narrow, sharply distinct from the sheaths. 19. *C. subulata*.
- Spikes either laxly flowered or long-stipitate or both.
 Leaf-blades 15–33 mm. wide.
 Branches of the inflorescence strict; spikes long-stipitate. 20. *C. floribunda*.
 Branches of the inflorescence spreading; spikes short-stipitate. 21. *C. montana*.
 Leaf-blades not more than 5 mm. wide.
 Leaf-sheaths conspicuous. 22. *C. juncifolia*.
 Leaf-sheaths inconspicuous. 23. *C. Lundelliana*.

1. *Catopsis cucullata* L. B. Smith, Contr. Gray

Herb. 104: 72. 1934.

Leaves rosulate, thin, up to 22 cm. long, very minutely punctulate-lepidote; sheaths broadly elliptic, but hardly distinct; blades subtriangular, acute and apiculate, 2 cm. wide at the base; scape erect or decurved; scape-bracts ovate, acute, exceeding the internodes; inflorescence simple or barely paniculate, pendulous; primary bracts of the compound inflorescence broadly ovate, acute, much shorter than the suberect axillary spikes; spikes up to 10 cm. long; floral bracts suberect, broadly ovate, acute, 10–15 mm. long, much exceeding the flowers, cucullate-incurved at the apex, thin, nerved, obscurely punctulate-lepidote or glabrous; flowers perfect; sepals broadly obovate, asymmetric, 10 mm. long; petals but slightly longer than the sepals; stamens distinctly unequal; style very short.

TYPE LOCALITY: Jalapa, Vera Cruz, altitude 1300–1550 meters.

DISTRIBUTION: Vera Cruz and Guatemala.

ILLUSTRATIONS: Contr. Gray Herb. 104: pl. 3, f. 3–5.

2. *Catopsis Wawraea* Mez, in DC. Monog. Phan. 9: 626. 1896.

Plant up to 35 cm. high; leaves few, up to 2 dm. long; blades ligulate, 4 cm. wide, broadly rounded, apiculate; scape suberect or decurved; scape-bracts shorter than the internodes; staminate inflorescence compound with 3-5 spikes, these up to 8 cm. long; pistillate inflorescence simple and dense or with 1 or 2 few-flowered spikes at the base; primary bracts all much shorter than the axillary branches; floral bracts suberect to spreading, membranaceous, sparsely lepidote, prominently nerved, the staminate sublanceolate, acute, the pistillate ovate-triangular, obtuse, distinctly shorter than the sepals; flowers suberect, dioecious, the staminate slender, the pistillate stout; sepals subsymmetric, membranaceous, sparsely lepidote, prominently nerved, the staminate lanceolate, acute, mucronulate, 15 mm. long, the pistillate broadly elliptic, subobtuse, 18 mm. long; petals, stamens, and pistil unknown.

TYPE LOCALITY: "Mexico, circum Passo-Majo."

DISTRIBUTION: Southern Mexico, British Honduras, and Costa Rica.

3. *Catopsis nutans* (Sw.) Griseb. Fl. Brit. W. Ind. 599. 1864.

Tillandsia nutans Sw. Prodr. 56. 1788.
Tillandsia vitellina Link, Klotzsch, & Otto, Ic. Pl. Rar. 101. 1843.
Tussacia vitellina Klotzsch; Beer, Bromel. 99. 1857.
Pogospermum flavum Brongn. Ann. Sci. Nat. V. 1: 328. 1864.
Pogospermum nutans Brongn. Ann. Sci. Nat. V. 1: 328. 1864.
Catopsis fulgens Griseb. Nachr. Ges. Wiss. Gött. 1864: 21. 1865.
Catopsis vitellina Baker, Jour. Bot. 25: 176. 1887.

Plant 14-40 cm. high, the majority of specimens small; leaves about 10 in a subfasciculate rosette, erect or curving outward, up to 24 cm. long, obscurely punctulate-lepidote, white-cretaeous, especially toward the base; sheaths elliptic, about half as long as the blades; blades subtriangular, acuminate, 25 mm. wide; scape usually decurved, slender; scape-bracts erect, lanceolate or elliptic, acuminate, typically much shorter than the internodes; inflorescence simple or rarely few-branched; primary bracts like the scape-bracts, shorter than the sterile naked base of the spike; spikes laxly 3-15-flowered, up to 2 dm. long; rhachis glabrous, angled, nearly or quite straight; floral bracts broadly ovate or elliptic, obtuse or broadly acute, the lower ones barely shorter than the sepals, the upper much shorter; flowers perfect, erect to spreading; sepals strongly asymmetric, broadly elliptic, obtuse, 15 mm. long, submembranaceous, prominently nerved, glabrous; petals ligulate with flaring blade, broadly acute or obtuse, bright-yellow, 2 cm. long; stamens unequal, the first series much longer than the second, the anthers sagittate; ovary stoutly ovoid; style very short but distinct; capsule ovoid, long-beaked, 15-20 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Cuba, Jamaica, and Haiti; Vera Cruz to Panama; also in Ecuador and Venezuela.

ILLUSTRATIONS: Link, Klotzsch, & Otto, Ic. Pl. Rar. pl. 40; Ann. Sci. Nat. V. 1: pl. 23.

Catopsis nutans var. *stenopetala* (Baker) L. B. Smith. *Catopsis stenopetala* Baker, Jour. Bot. 25: 176. 1887. *Catopsis tenella* Mez, in DC. Monog. Phan. 9: 631. 1896. Flowers functionally dioecious; pistillate plants in fruit indistinguishable from typical *C. nutans*; staminate plants generally with more delicate and ampler inflorescence, slenderly cylindrical calyces, and sepals 12 mm. long. TYPE LOCALITY: Guatemala. DISTRIBUTION: Southern Mexico, Guatemala, and Salvador. ILLUSTRATION: Engler, Pflanzenreich 4³¹: f. 93.

4. *Catopsis Berteroniana* (Schultes) Mez, in DC. Monog. Phan. 9: 621. 1896.

Renealmia pendula Gaertn. Fruct. 3: 13. 1805. Not *Catopsis pendula* Baker, 1889.
Tillandsia pendula Thunb.; Gaertn. Fruct. 3: 13. 1805.
Tillandsia Berteroniana Schultes, in R. & S. Syst. Veg. 7: 1221. 1830.
Pogospermum Berteronianum Brongn. Ann. Sci. Nat. V. 1: 328. 1864.
Catopsis Mosenii Mez, in DC. Monog. Phan. 9: 622. 1896.

Plant 4-9 dm. high; leaves several in a subfasciculate rosette, up to 4 dm. long, densely white-cretaeous, especially toward the base, light-green; sheaths elliptic, about as long as the blades; blades triangular, acute, 4-5 cm. wide; scape erect, 5-10 mm. in diameter, soon glabrous; scape-bracts erect, the lower foliaceous and densely imbricate, the upper very broadly ovate, apiculate, often shorter than the internodes; inflorescence bipinnate or rarely simple, up to 3

dm. long; primary bracts very broadly ovate, apiculate, mostly shorter than the sterile base of the spike; spikes suberect, long-stipitate, rather laxly many-flowered; floral bracts broadly ovate to suborbicular, obtuse, 6–8 mm. long, coriaceous; flowers perfect, suberect; sepals strongly asymmetric, obovate, up to 12 mm. long and 9 mm. wide, equaling or exceeding the petals, coriaceous; petals ovate-elliptic, white; stamens included, unequal, the first series distinctly longer than the second; filaments of the second series short-connate with the petals; anthers obtuse, .2 mm. long; style distinct, one third as long as the ovary; capsule stoutly ellipsoid, barely exceeding the sepals.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Southern Florida; Bahamas, Cuba, Jamaica, and Santo Domingo; British Honduras, Guatemala, and Panama; also in Trinidad, British Guiana, and eastern Brazil.

5. *Catopsis apicoides* (Schlecht. & Cham.) Baker

Jour. Bot. 25: 174. 1887.

Tillandsia apicoides Schlecht. & Cham. Linnaea 6: 55. 1831.

Tussacia apicoides Beer, Bromel. 263. 1857.

? *Catopsis Schindleri* Mez & Wercklé; Mez, Bull. Herb. Boiss. V. 4: 1124, as to staminate plant. 1904.

? *Catopsis tenuis* Cufod. Archivio Bot. 9: 181. 1933.

Plant 12–45 cm. high with the inflorescence extended, but most specimens relatively small; leaves few in a cyathiform rosette, usually about 10–15 cm. long, sparsely and obscurely punctulate-lepidote throughout; sheaths elliptic, often as long as the blade but only slightly wider; blades ligulate, 10–25 mm. wide, the outer ones often acute, the inner always rounded and apiculate; scape suberect or decurved, 1–1.5 mm. in diameter, glabrous; scape-bracts remote, erect, involute, elliptic, apiculate; inflorescence laxly bipinnate or rarely the lower branches divided, pyramidal; axis flexuous to geniculate; primary bracts like the scape-bracts, not attaining more than the lowest flower of the axillary spike or branch; spikes ascending, laxly many-flowered, 2–11 cm. long, the stipe about 1 cm. long, naked; rhachis straight, very slender; floral bracts ovate, broadly acute or obtuse, 3–4 mm. long, equaling or shorter than the sepals; flowers dioecious, spreading or subspreading; sepals asymmetric, broadly elliptic, membranaceous, up to 4.5 mm. long; petals elliptic, obtuse, 6 mm. long, yellow; stamens very unequal in the male flowers; ovary large in the female flower, ovoid; style short.

TYPE LOCALITY: Jalapa, Vera Cruz.

DISTRIBUTION: Puebla, Vera Cruz, Oaxaca, British Honduras, Guatemala, Honduras, Costa Rica, and Panama.

6. *Catopsis nitida* (Hook.) Griseb. Fl. Brit. W.

Ind. 599. 1864.

Tillandsia nitida Hook. Exot. Fl. pl. 218. 1827.

Tussacia nitida Beer, Bromel. 100. 1857.

Tussacia cornucopia Bertero; Beer, Bromel. 101, as synonym. 1857.

Pogospermum nitidum Brongn. Ann. Sci. Nat. V. 1: 328. 1864.

Plant up to 45 cm. high; leaves few in an elongate cylindrical rosette, up to 3 dm. long, narrowly scarious-margined, not at all cretaceous, very inconspicuously punctulate-lepidote; sheaths very indistinct, about as long as the blades but scarcely wider; blades ligulate, rounded-apiculate, flat, up to 4 cm. wide; scape erect or somewhat curved, shorter or longer than the leaves, slender, glabrous; scape-bracts remote, erect and enfolding the scape, lance-ovate, obtuse and apiculate; inflorescence laxly compound with simple or rarely divided branches, equaling or exceeding the leaves, 5–20 cm. long, glabrous; primary bracts lanceolate, acute, much shorter than the usually naked sterile base of the axillary spikes; spikes divergent, 3–12 cm. long, lax, up to 15-flowered; floral bracts broadly ovate, acute, distinctly shorter than the sepals; flowers perfect; sepals strongly asymmetric with the left side broadly elliptic and the right side cuneate at the base, and at the apex expanded into a large wing which overtops the midnerve, 5–6 mm. long, prominently nerved when dry but not wrinkled, subcoriaceous; petals elliptic, obtuse, yellowish-white, barely exerted; stamens unequal; style lacking.

TYPE LOCALITY: Mountains of Jamaica.

DISTRIBUTION: Cuba, Jamaica, Hispaniola, and Porto Rico; Guatemala, Honduras, and Costa Rica; also in Guiana.

ILLUSTRATIONS: Hook. Exot. Fl. pl. 218; Contr. Gray Herb. 117: pl. 1, f. 12.

7. *Catopsis Werckleana* Mez, Bull. Herb.

Boiss. II. 4: 1125. 1904.

Plant up to 54 cm. high with the inflorescence extended; leaves about 10 in a cyathiform rosette, up to 23 cm. long, not at all cretaceous; sheaths very large, densely and minutely brown-punctulate; blades short, up to 53 mm. wide, rounded, apiculate or retuse; scape decurved, up to 25 cm. long, terete, glabrous; scape-bracts remote, elliptic, abruptly acute; inflorescence very lax; branches simple, 15 cm. long with elongate sterile naked bases; primary bracts much shorter than the branches, laxly flowered; floral bracts ovate, obtuse, 5 mm. long, much shorter than the sepals; flowers probably dioecious, only the fruiting pistillate ones known; sepals strongly asymmetric, 9 mm. long, subcoriaceous, prominently nerved, brown-spotted at apex; capsules slenderly ovoid, acute, 15 mm. long.

TYPE LOCALITY: Near Tucurrique, Costa Rica, altitude 800 meters.

DISTRIBUTION: Costa Rica.

8. *Catopsis sessiliflora* (R. & P.) Mez, in DC.

Monog. Phan. 9: 625. 1896.

Tillandsia sessiliflora R. & P. Fl. Per. 3: 42. 1802.

Tussacia sessiliflora Beer, Bromel. 101. 1857.

Pogospermum sessiliflorum Brongn. Ann. Sci. Nat. V. 1: 328. 1864.

Catopsis nutans var. *erecta* Wittm. Bot. Jahrb. 11: 71. 1889.

Catopsis modesta Fritz Müll. Gartenflora 42: 717. 1893.

Plant 1-3 dm. high; leaves 4-13 in a tubular rosette, 8-20 cm. long, obscurely punctulate-lepidote throughout, not at all cretaceous; sheaths inconspicuous, about as long as the blades but scarcely wider; blades curving outward, not strict, ligulate, rounded-apiculate, 12-25 mm. wide, flat, narrowly scarious-margined; scape erect, slender, glabrous; scape-bracts erect, much shorter than the internodes, broadly elliptic, apiculate; inflorescence simple or compound from 2 or 3 undivided spikes, lax, up to 11 cm. long, glabrous; primary bracts like the scape-bracts, 7-8 mm. long, much shorter than the naked sterile base of the axillary branches; spikes divergent, 2-9 cm. long, laxly flowered; floral bracts broadly ovate, obtuse, much shorter than the sepals, thin, nerved; flowers suberect, perfect; sepals asymmetric, suborbicular, 7-8 mm. long, subchartaceous, nerved, wrinkled when dry as if shrunken; petals lance-ovate, barely exerted, white; stamens unequal; ovary ovoid, the style very short; capsule ovoid, distinctly short-beaked, 12 mm. long.

TYPE LOCALITY: Peru.

DISTRIBUTION: West Indies; southern Mexico and Central America; also from Tobago and Trinidad to southern Brazil, Colombia, and Peru.

ILLUSTRATIONS: R. & P. Fl. Per. 3: *pl.* 271, *f.* b; Contr. Gray Herb. 117: *pl.* 1, *f.* 11.

9. *Catopsis aloides* (Schlecht. & Cham.) Baker,

Handb. Bromel. 154. 1889.

Tillandsia aloides Schlecht. & Cham. Linnaea 6: 55. 1831.

Tussacia aloides E. Morren; André, Bromel. Andr. 61, as synonym. 1889.

Catopsis vitellina Baker, Jour. Bot. 25: 176, in part. 1887.

Plant 14-46 cm. high; leaves few in a slenderly crateriform rosette, up to 25 cm. long, obscurely punctulate-lepidote throughout, narrowly scarious-margined; sheaths inconspicuous, about as long as the blades but scarcely wider; blades ligulate, broadly acute or obtuse, apiculate, flat, 23 mm. broad; scape erect or arching, slender, angled or narrowly winged, glabrous; scape-bracts erect and folding the scape, much shorter than the internodes, broadly elliptic-ovate, apiculate; inflorescence simple or laxly compound from 2-4 spikes, up to 15 cm. long, glabrous; primary bracts like the scape-bracts, usually shorter than the sterile bases of the axillary branches; spikes cylindric, densely flowered except toward the base, 3-13 cm. long; floral bracts ovate, obtuse, much shorter than the sepals, often with a dark castaneous spot at the apex, subchartaceous, finely nerved; flowers spreading, dioecious; sepals asymmetric, very

broadly subelliptic, 8 mm. long, usually castaneous at the apex; petals slightly exerted, yellow; capsule ovoid, acute but not beaked, 10-15 mm. long.

TYPE LOCALITY: Jalapa, Vera Cruz.

DISTRIBUTION: Southern Mexico, British Honduras, and Guatemala.

10. *Catopsis delicatula* L. B. Smith, Contr.
Gray Herb. 117: 4. 1937.

Plant known only in immature condition, 28 cm. high; leaves few in a subfasciculate rosette, up to 27 cm. long, obscurely brown-punctulate, the outer ones greatly reduced; sheaths small, elliptic, indistinct; blades linear-triangular, long-acuminate, 12 mm. wide at the base, flat; scape erect, very slender, glabrous; scape-bracts erect, much exceeding the internodes, very narrowly lanceolate, subfiliform-acuminate; inflorescence laxly paniculate, 13 cm. long; axis geniculate; primary bracts like the scape-bracts, the lower about equaling the young axillary spikes, the upper much reduced; spikes spreading, up to 4 cm. long, laxly few-flowered; floral bracts broadly ovate, 4 mm. long, shorter than the sepals, very obscurely punctulate-lepidote; flowers spreading; sepals elliptic, strongly asymmetric, 5 mm. long; petals lingulate, broadly acute, 6 mm. long; stamens very unequal.

TYPE LOCALITY: San Felipe, Dept. Retalhuleu, Guatemala, altitude 670 meters.

DISTRIBUTION: Known from the type collection only.

ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 1, f. 4, 5.

11. *Catopsis brevifolia* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 1127. 1904.

Plant 2-3 dm. high; leaves many in a dense rosette, 1 dm. long, not cretaceous-coated; sheaths large, ovate, minutely brown-punctulate-lepidote; blades very narrowly triangular, acuminate, 2 cm. wide, obscurely punctulate, the margin pale; scape erect, slightly exceeding the leaves, slender, subterete, glabrous; scape-bracts suberect, exceeding the internodes, foliaceous; inflorescence laxly and sparsely bipinnate, composed of 3 or 4 or rarely up to 10 spikes; lower primary bracts foliaceous and about equaling the axillary spikes, the upper much shorter; spikes subdensely 7-flowered, distinctly stipitate, 3 cm. long; rhachis terete or slightly angled, glabrous; floral bracts suberect, broadly ovate, obtuse, 4 mm. long, distinctly shorter than the sepals, prominently nerved; flowers suberect, dioecious, only the pistillate known, 6-7 mm. long; sepals strongly asymmetric, obtuse, coriaceous, prominently nerved, punctulate on the inside; petals broadly ligulate, slightly longer than the sepals; reduced stamens present in the pistillate flowers; ovary very large, pyramidal-ovoid; stigmas subsessile.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type locality.

12. *Catopsis Morreniana* Mez, in DC. Monog. Phan. 9: 628. 1896.

Catopsis Bakeri Mez, Bull. Torrey Club 30: 435. 1903.

Plant 2-4 dm. high; leaves 10-20 in a dense rosette, 10-18 cm. long, often with a thin white-cretaceous coat near the base, sparsely appressed-lepidote, soon glabrous; sheaths elliptic, much shorter than the blades; blades ligulate, broadly acute or obtuse, apiculate, 15-25 mm. wide, bearing a very conspicuous narrow white margin; scape erect, 1.5 mm. in diameter, glabrous; scape-bracts erect or slightly divergent, foliaceous, conspicuously white-margined, at least the lower much exceeding the internodes, the upper sometimes shorter; inflorescence laxly bipinnate or the staminate sometimes tripinnate, 6-17 cm. long, glabrous, stramineous; primary bracts like the upper scape-bracts, conspicuous but usually shorter than the axillary spikes; spikes suberect to spreading, the lower long and slenderly stipitate, the staminate subdense, many-flowered, up to 7 cm. long, the perfect or pistillate densely few-flowered, 4-5 cm. long; floral bracts broadly ovate, broadly acute or obtuse, shorter than the sepals, prominently nerved; flowers perfect or dioecious, spreading; sepals strongly asymmetric, thin, prominently nerved, the staminate 3 mm. long, the perfect or pistillate 5-6 mm. long; stamens in-

cluded, very unequal, anthers suborbicular; ovary ovoid; style very short and stout; capsule ovoid, acute, 1 cm. long.

TYPE LOCALITY: Near Mirador, Orizaba, Mexico.

DISTRIBUTION: Vera Cruz, British Honduras, Guatemala, Honduras, Nicaragua, and Costa Rica.

13. *Catopsis Hahnii* Baker, Jour. Bot. 25: 175. 1887.

Plant 5 dm. or more high; leaves up to 4 dm. long, bearing a slight white-cretaceous coating on the back; sheaths elliptic, longer than the blades; blades triangular-acute, 4 cm. wide; scape erect or arching; scape-bracts erect, densely imbricate, foliaceous, large; inflorescence tripinnate for half its length, densely subthyrsoid, 20–25 cm. long, 7 cm. in diameter; primary bracts suberect, ovate-lanceolate, acuminate, the lower equaling or exceeding the axillary branches; secondary bracts small, ovate, about equaling the short stipes of the spikes; spikes densely flowered, 4 cm. long; floral bracts suberect, ovate-elliptic, obtuse, 7–8 mm. long, distinctly shorter than the sepals; flowers suberect, perfect; sepals asymmetric, 9 mm. long, even; petals 11 mm. long, white.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Vera Cruz and Oaxaca.

14. *Catopsis compacta* Mez, Bull. Herb. Boiss. II. 3: 140. 1903.

Plant 35–60 cm. high; leaves many in a subtriculate rosette, strict, 2–3 dm. long, very obscurely brown-punctulate, bearing a fine cretaceous coat especially toward the base; sheaths elliptic-oblong, usually longer than the blades and merging imperceptibly with them, 6 cm. wide; blades triangular, acuminate, more or less revolute toward the apex; scape erect, its bracts foliaceous, erect, densely imbricate; inflorescence subdensely 3-pinnate, ellipsoid, 15–23 cm. long, glabrous; primary bracts broadly ovate, long-acuminate, shorter than the axillary branches or rarely the lowest longer; lower branches bearing 3 or 4 subfasciculate spikes, divergent; spikes short-stipitate, cylindric, densely flowered, 3–5 cm. long; floral bracts broadly ovate, obtuse, slightly shorter than the sepals, thin; flowers perfect, suberect; sepals strongly asymmetric, 5 mm. long; petals barely exerted, white; stamens unequal; style very short.

TYPE LOCALITY: Macaltepec, Oaxaca.

DISTRIBUTION: Oaxaca.

15. *Catopsis Oerstediana* Mez, in DC. Monog. Phan. 9: 630. 1896.

Plant 5 dm. high; leaves several in a dense subfasciculate rosette, up to 25 cm. long, not cretaceous; sheaths elliptic, about as long as the blades; blades triangular, acuminate, 45 mm. wide; scape erect; scape-bracts foliaceous, large, erect, densely imbricate; inflorescence bipinnate, thyriform, very dense toward the apex, 11 cm. long, 35 mm. in diameter; primary bracts suberect, like the scape-bracts, all but the uppermost exceeding the axillary branches; branches strict, 45 mm. long, the lower half sterile, the upper densely 7-flowered; floral bracts ovate-elliptic, obtuse, about 6 mm. long, distinctly shorter than the sepals, glabrous, faintly nerved; flowers dioecious, only the pistillate known, suberect, up to 9 mm. long; sepals strongly asymmetric, broadly elliptic, obtuse, 8 mm. long, subcoriaceous, glabrous, even, yellow or yellowish-green when dry; petals suborbicular, obtuse, white, barely exceeding the sepals; stamens much reduced in the pistillate flowers, the anthers subsagittate, minute, sterile; ovary large, stoutly ovoid.

TYPE LOCALITY: Summit of El Viejo, Nicaragua; erroneously stated as Costa Rica in the original description.

DISTRIBUTION: Honduras and Nicaragua.

16. *Catopsis pendula* Baker, Handb. Bromel. 155. 1889.

Catopsis paniculata E. Morren, Cat. Hort. Makoy., nomen. 1883.

Plant up to 1 m. long extended; leaves about 12 in a crateriform rosette, 3–4 dm. long, cretaceous especially toward the base; sheaths elliptic, about as large as the blades and scarcely

distinct from them; blades triangular, acuminate, 3–6 cm. wide; scape deflexed, much longer than the leaves; scape-bracts densely imbricate, strict, foliaceous; inflorescence amply tripinnate, 3 to often more than 5 dm. long; primary bracts like the scape-bracts, acuminate, hardly reaching the lowest flowers of the axillary branches; branches weak, elongate; spikes many-flowered, long-stipitate, the staminate subdense, 65 mm. long, the pistillate lax, up to 25 cm. long; floral bracts broadly ovate, obtuse, much shorter than the sepals; flowers functionally dioecious, suberect to spreading, the staminate 7 mm. long, the pistillate up to 12 mm. long; sepals strongly asymmetric, suborbicular, subcoriaceous with a broad membranaceous margin, prominently nerved, the staminate 5 mm. long, the pistillate 5–9 mm. long; petals exceeding the sepals; stamens unequal; ovary stout, ovoid; capsule up to 18 mm. long, short-beaked.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Southern Mexico, Guatemala, and Costa Rica.

17. *Catopsis mexicana* L. B. Smith, Contr.
Gray Herb. 114: 4. 1936.

Plant 6 dm. high with inflorescence erected; leaves lanceolate with practically no distinction between sheath and blade, acuminate, 4 dm. long, 7 cm. wide, flat, scarious-margined, obscurely brown-punctulate, verruculose; scape slender, arching, glabrous; its bracts erect, much exceeding the internodes, foliaceous; inflorescence subpendulous, rather densely 3-pinnate, over 3 dm. long, glabrous; primary bracts very broadly ovate, long-acuminate, much shorter than the axillary branches; spikes slenderly long-stipitate, subsecund, up to 1 dm. long, densely flowered; floral bracts squamiform-ovate, about one third as long as the sepals; flowers perfect, suberect; sepals elliptic-oblong, strongly asymmetric, 9 mm. long; petals ligulate, asymmetric, white, barely exerted; styles 3, short but distinct.

TYPE LOCALITY: Tejupilco, Mexico [State], altitude 1340 meters.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 114: pl. 1, f. 10, 11.

18. *Catopsis Wangerini* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 1126. 1904.

Catopsis pusilla Mez & Wercklé; Mez, Repert. Sp. Nov. 14: 248. 1916.

Staminate plants 3–4 dm. high; leaves several in a cyathiform rosette, not over 18 cm. long; sheaths conspicuous, elliptic-ovate, brown-punctulate-lepidote; blades ligulate, acuminate, 22 mm. wide, glabrous; scape decurved, very slender, equaling or exceeding the leaves; scape-bracts lanceolate, acuminate, equaling or exceeding the internodes; inflorescence compound with simple or compound branches, 15 cm. long, glabrous; primary bracts like the scape-bracts, slightly exceeding the sterile bases of the axillary branches; spikes 5–7 cm. long, dense or subdense; floral bracts elliptic, acute, cucullate above the sepals, thin, prominently nerved; flowers suberect; sepals asymmetric with the right side produced into a large wing, 5 mm. long, chartaceous; petals narrowly ligulate, exerted only 2 mm.; stamens unequal. Pistillate plants 10–25 cm. high; scape erect or slightly curved, slender, shorter than the leaves; scape-bracts broadly elliptic, acute, equaling or exceeding the internodes; inflorescence simple, dense, 3–7 cm. long and 15 mm. in diameter; sepals 7 mm. long.

TYPE LOCALITY: Near Cartago and Candelaria, Costa Rica.

DISTRIBUTION: Costa Rica.

19. *Catopsis subulata* L. B. Smith, Contr.
Gray Herb. 114: 5. 1936.

Plant 3–6 dm. high; leaves many in an ellipsoid pseudobulb, 15–30 cm. long, obscurely brown-punctulate; sheaths ample, elliptic, about twice as long as the blades and sharply distinct from them; blades narrowly triangular, acuminate, about 1 cm. wide at the base, involute-subulate, contorted; scape erect, much exceeding the leaves; its bracts densely imbricate, lanceolate, acuminate, involute-subulate, recurved toward the apex; inflorescence bipinnate or

tripinnate, dense or subdense, ovoid or pyramidal, 6–21 cm. long, glabrous; primary bracts much shorter than the axillary branches, broadly ovate with an acuminate involute recurved tip; branches erect to spreading, simple or the lowest with 3 digitate spikes; spikes short-stipitate, cylindric, densely flowered, 2–7 cm. long; floral bracts broadly ovate, acute, slightly over half as long as the sepals at anthesis, thin, prominently nerved; flowers functionally dioecious, suberect; sepals obovate, strongly asymmetric, 9 mm. long when extended; petals oblong, obtuse, included, white; stamens unequal; style short.

TYPE LOCALITY: Mountains near Fenia (?), Chiapas.

DISTRIBUTION: Chiapas, Guatemala, and Honduras.

ILLUSTRATION: Contr. Gray Herb. 114: *pl. 1, f. 12.*

20. *Catopsis floribunda* (Brongn.) L. B. Smith,
Contr. Gray Herb. 117: 5. 1937.

Pogospermum floribundum Brongn. Ann. Sci. Nat. V. 1: 329, nomen provisorium. 1864.

Catopsis nutans Griseb. Fl. Brit. W. Ind. 599, excl. syn. 1864.

Plant 4–7 dm. high; leaves many in a dense rosette, suberect, stiff, 2–4 dm. long, obscurely punctulate-lepidote throughout, not at all cretaceous-coated; sheaths elliptic, from half as long to as long as the blades, faintly castaneous toward the base; blades narrowly triangular, acuminate, 15–30 mm. wide at the base, flat or involute with extreme age; scape erect, 2–4 mm. in diameter, glabrous; scape-bracts erect, exceeding the internodes, the lower foliaceous, the upper very narrowly triangular from an ovate base; inflorescence laxly bipinnate or tripinnate, 15–40 cm. long, glabrous; primary bracts like the upper scape-bracts, usually much shorter than the sterile bases of the axillary branches; branches strict; spikes slenderly long-stipitate, subdensely 8–36-flowered, up to 16 cm. long including the stipe; floral bracts subspreading, broadly ovate, obtuse, 3–5 mm. long, distinctly shorter than the sepals, prominently nerved, green, the broad margin turning dark-brown with age; flowers suberect; sepals strongly asymmetric, broadly elliptic, 4–6 mm. long, exactly like the floral bracts in texture and coloration; petals elliptic, 7 mm. long, obtuse, white; stamens distinctly unequal, the second series connate with the petals for 1.5 mm.; ovary stoutly ellipsoid; stigmas subsessile; capsule slenderly ovoid, acute, 9–11 mm. long.

TYPE LOCALITY: Martinique.

DISTRIBUTION: Southern Florida and West Indies; British Honduras and Costa Rica; also in Venezuela.

ILLUSTRATIONS: E. & P., Nat. Pfl. ed. 2. 15a: *f. 48*; Engler, Pflanzenreich, 4²²: *f. 91, A–J.*

21. *Catopsis montana* L. B. Smith, Contr.
Gray Herb. 117: 6. 1937.

Plant 6 dm. high; leaves many in a cyathiform rosette, 40–45 cm. long, covered with a cretaceous powder; sheaths elliptic, about as long as the blades but indistinct, obscurely punctulate-lepidote; blades linear-lanceolate, acuminate, up to 33 mm. wide, flat; scape erect, slender, glabrous; scape-bracts erect, the lower ones subfoliaceous, densely imbricate, the upper ones long-acuminate from an ovate base, equaling the internodes; inflorescence laxly paniculate, many-flowered, 25 cm. long; primary bracts like the scape-bracts, much shorter than the sterile bases of the branches; lower branches slightly divided, divergent; upper branches simple, spreading; spikes short-stipitate, 3–13 cm. long, laxly many-flowered; floral bracts broadly ovate, subacute, 3–4 mm. long, much shorter than the sepals, prominently nerved; flowers subspreading, probably perfect; sepals broadly elliptic, strongly asymmetric, 6 mm. long with the lateral wing extended; petals elliptic, obtuse, 6 mm. long but slightly exerted, flavous; stamens slightly unequal; style short but distinct.

TYPE LOCALITY: Sierra de Vifiales, Pinar del Rio, Cuba.

DISTRIBUTION: Western Cuba.

ILLUSTRATIONS: Contr. Gray Herb. 117: *pl. 1, f. 9, 10.*

22. *Catopsis juncifolia* Mez & Wercklé; Mez, Bull.
Herb. Boiss. II. 4: 1124. 1904.

Plant slender, up to 23 cm. high; leaves many in a subbulbous rosette, 9 cm. long, not at all cretaceous; sheaths very large, ovate-elliptic, densely and minutely brown-punctulate-lepidote; blades junciform-subulate, acuminate, 5 mm. wide at the base, obscurely pale-punctulate; scape erect, slender, terete, glabrous; scape-bracts exceeding the internodes; inflorescence sparsely bipinnate, lax, strict, composed of a terminal spike of about 10 flowers and 2 long-stipitate lateral spikes of 2 or 3 flowers; primary bracts ovate-lanceolate, acuminate, not attaining the lowest flowers of the axillary spikes; floral bracts suberect, very broadly ovate, obtuse, much shorter than the sepals, subcoriaceous, prominently nerved; flowers suberect, dioecious, only the pistillate known, about 4 mm. long, glabrous; sepals strongly asymmetric, obtuse; petals very broadly subelliptic, obtuse or retuse, barely longer than the sepals; stamens present in the pistillate flowers but sterile, the anthers mucronate; ovary pyramidal.

TYPE LOCALITY: Costa Rica.

DISTRIBUTION: Known only from the type locality.

23. *Catopsis Lundelliana* L. B. Smith, Contr.
Gray Herb. 117: 6. 1937.

Plant 25–30 cm. high; leaves many in a dense subglobose rosette, 1 dm. long, densely and obscurely punctulate-lepidote; sheaths narrowly ovate or elliptic, 15–30 mm. long, not at all inflated; blades linear, acuminate, 5 mm. wide at the base, involute-subulate toward the apex in drying; scape erect, very slender, glabrous; scape-bracts erect, exceeding the internodes, lanceolate with an elongate linear acuminate blade; inflorescence laxly compound from 3 or 4 branches, 7–12 cm. long; primary bracts like the upper scape-bracts, shorter than the sterile bases of the axillary branches; spikes divergent, straight, very laxly subtristichous-flowered, up to 95 mm. long; floral bracts broadly ovate, obtuse, thin, prominently nerved, much shorter than the sepals, obscurely punctulate-lepidote; flowers suberect; sepals obovate, obtuse, strongly asymmetric, 5 mm. long, thin, prominently nerved, obscurely pale-lepidote; petals barely exerted, broadly elliptic, obtuse; stamens unequal; style short but distinct.

TYPE LOCALITY: Limestone valley, Valentin, El Cayo District, British Honduras.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Contr. Gray Herb. 117: pl. 1, f. 6–8.

10. *GLOMEROPITCAIRNIA* Mez, Bull.
Herb. Boiss. II. 5: 232. 1905.

Pitcairnia subgenus *Glomeropitcairnia* Mez, in DC. Monog. Phan. 9: 463. 1896.

Large stemless herbs. Leaves rosulate, linear, not constricted between sheath and blade, entire. Scape elongate, erect. Inflorescence of sessile or short-stipitate heads or short spikes, bipinnate or tripinnate. Flowers perfect. Sepals free, subsymmetrical. Petals free, bearing 2 scales at base. Stamens included. Ovary about half inferior. Capsule imperfectly dehiscent. Seeds with a pappiform coma at both ends.

Type species, *Tillandsia penduliflora* Griseb.

1. *Glomeropitcairnia penduliflora* (Griseb.) Mez, in
Bull. Herb. Boiss. II. 5: 232. 1905.

Tillandsia penduliflora Griseb. Fl. Brit. W. Ind. 597. 1864.

Caraguata penduliflora Wittm. Bot. Jahrb. 11: 59. 1889.

Pitcairnia penduliflora Mez, in DC. Monog. Phan. 9: 463. 1896.

Plant about 2 m. high; leaves 6–10 dm. long; sheaths large, narrowly ovate, dark-punctulate-lepidote especially on the inside; blades acute, 7 cm. wide, soon glabrous, reddish toward apex; scape over 15 mm. in diameter; inflorescence very laxly and amply tripinnate, red throughout, glabrous; primary bracts lance-ovate, about half as long as the sterile bases of the branches; branches spreading, up to 45 cm. long, bearing 6–8 spikes, the sterile base about 1 dm. long,

usually bearing a single prophyllum slightly smaller than the primary bract; secondary bracts exactly like the floral bracts, much shorter than the axillary spikes; spikes recurved, subsessile, densely ovoid or ellipsoid, 4-8 cm. long; floral bracts erect, densely imbricate, narrowly ovate, abruptly acute, 25-35 mm. long, about equaling the sepals, slightly convex, keeled, prominently nerved, thick, coriaceous; flowers subsessile; sepals narrowly triangular, acute, 24 mm. long, 5 mm. wide, thick, coriaceous, prominently nerved, some alate-carinate, others flat, free; petals ligulate, equaling the sepals, bearing 2 large lanceolate closely attached scales at the base; ovary half superior; capsule 30-35 mm. long, the lower half ellipsoid, the upper half very slenderly conic and acuminate; seeds slenderly cylindric with a long poorly divided coma on both ends.

TYPE LOCALITY: Dominica.

DISTRIBUTION: Guadeloupe, Dominica, and Martinique.

Subfamily 3. BROMELIOIDEAE.

Herbs, terrestrial or epiphytic. Leaves usually spinose-serrate. Flowers perfect. Ovary wholly inferior in the North American species. Seeds naked.

NOTE: The following key is largely artificial since the characters of greatest significance in this group are so fugacious as to be impractical for general identification.

- | | |
|---|------------------|
| Flowers slenderly pedicellate. | 11. AECHMEA. |
| Flowers sessile. | |
| Spikes distichous-flowered. | 11. AECHMEA. |
| Spikes polystichous-flowered. | |
| Inflorescence simple. | |
| Scape lacking; inflorescence sunk in the center of the leaf-rosette; petals naked. | 12. GREIGIA. |
| Scape evident; petals bearing 2 scales or oblique folds. | |
| Ovaries fusing to form a compound fruit; inflorescence bearing a coma of sterile foliaceous bracts at the apex. | 13. ANANAS. |
| Ovaries always distinct; inflorescence usually without an apical coma. | |
| Flowers 5-6 cm. long; sepals unarmed; pollen-grains sulcate. | 14. BILLBERGIA. |
| Flowers 2-5 cm. long; sepals usually pungent or mucronate; pollen-grains porate. | 11. AECHMEA. |
| Inflorescence compound. | |
| Petals joined to the filament-tube centrally but their margins free, fleshy, 25-40 mm. long. | 15. BROMELIA. |
| Petals free; filaments not forming a tube. | |
| Spikes very dense, strobilate. | |
| Spikes subcorymbose; pollen grains with more than 5 pores. | 16. GRAVISIA. |
| Spikes spherical, ellipsoid, or cylindric; pollen-grains with not more than 4 pores. | |
| Floral bracts entire or at most obscurely denticulate; inflorescence amply paniculate. | 17. HOHENBERGIA. |
| Floral bracts serrate; inflorescence densely digitate. | 11. AECHMEA. |
| Spikes lax. | |
| Ovules few in each cell; flowers minute; floral bracts pectinate in the only North American species. | 18. ARAEOCOCCUS. |
| Ovules many in each cell. | |
| Petals bearing 2 scales each; floral bracts 10-12 mm. long. | 11. AECHMEA. |
| Petals naked. | |
| Anthers naked; spikes slenderly cylindric, 9-25 cm. long, many-flowered. | 19. WITTMACKIA. |
| Anthers bearing 2 large scales dorsally; spikes subglobose or ovoid, short, 1-5-flowered. | 20. ANDROLEPIS. |

11. AECHMEA R. & P. Fl. Per. Prodr. 47. 1794.

- Hoiriri* Adans. Fam. Pl. 2: 67, 584. 1763.
Oechmea J. St.-Hil. Expos. Fam. 1: 103. 1805.
Eriostax Raf. Fl. Tell. 4: 25. 1838.
Pothuava Caud. Bot. Voy. Bonite pl. 116, 117. 1847.
Marschneria Vriese, Jaarb. Nederl. Maatsch. Tuinb. 1853 14. 1853.
Hoplophytum Beer, Flora 37: 348. 1854.
Echinostachys Brongn.; Planch. Hort. Donat. 25. 1854.
Libonia Lemaire, Ill. Hort. 2: pl. 48. 1855.
Lamprococcus Beer, Bromel. 21, 103. 1857.
Ortgesia Regel, Gartenflora 16: 193. 1867.

Large or medium-sized stemless herbs. Leaves rosulate, usually linear. Scape conspicuous. Inflorescence of various types. Flowers usually sessile. Sepals often asymmetric,

usually mucronate. Petals free, bearing two scales near the base or high up. Second series of stamens more or less joined to the petals. Pollen-grains with 2 or 4 pores or sometimes aborted. Style shorter than the stamens, the stigma-lobes linear, often twisted. Ovules caudate or obtuse. Berry usually dry. Seeds small, rugose, dark-colored.

Type species, *Aechmea paniculata* R. & P.

Flowers slenderly pedicellate.

Petals yellow.

Petals red to blue.

Sepals 6 mm. long; lower branches of the inflorescence much divided.

Sepals 3.5 mm. long; lower branches of the inflorescence simple or slightly divided.

Flowers sessile.

Spikes polystichous-flowered.

Inflorescence amply paniculate, elongate; spikes 4-8-flowered.

Inflorescence simple or densely digitate from a few spikes; spikes many-flowered.

Floral bracts serrate or serrulate, nearly or quite as long as the flowers.

Spikes globose; inflorescence usually compound.

Spike ovoid or conic to cylindric; inflorescence simple.

Floral bracts sharply reflexed above the middle, equaling or longer than the mature flowers.

Floral bracts merely spreading above the middle, slightly shorter than the mature flowers.

Floral bracts entire or wanting, much exceeded by the sepals or even by the ovary.

Sepals unarmed; inflorescence strobilate, densely white-lanate.

Sepals mucronate.

Scape-bracts reflexed, densely spinose-serrate.

Inflorescence cylindric.

Inflorescence ellipsoid or subcapitate.

Scape-bracts erect, nearly or quite entire.

Floral bracts minute or wanting.

Floral bracts conspicuous, the lower ones broad.

Spikes distichous-flowered; inflorescence amply compound in most cases.

Floral bracts alate-decurrent and forming a pouch about the flowers below, 10-20 mm. long.

Primary bracts densely serrate.

Inflorescence digitate or rarely simple; sepals subfree.

Inflorescence densely pinnate; sepals connate for 2 mm.

Primary bracts entire.

Floral bracts uniform, their mucro short, subapical; spikes oblong.

Floral bracts tapering into a terminal mucro 4-5 mm. long, the lower ones much larger than the others.

Spikes sessile or subsessile, polystichous on the main axis.

Spikes all but the uppermost distinctly stipitate, distichous on the main axis.

Floral bracts not at all decurrent, 2-13 mm. long.

Floral bracts with overlapping edges, forming tubular sheaths about the bases of the flowers.

Floral bracts cymbiform or flat, their edges not meeting to form a tube.

Floral bracts 2-8 mm. long.

Rhachis of the spike terete; floral bracts flat, minute, many times shorter than the ovary at anthesis.

Rhachis of the spike angled; floral bracts more or less cymbiform, equaling or exceeding the ovary at anthesis.

Inflorescence soon glabrous, 7-15 cm. long; sepals unarmed or obscurely apiculate; flowers erect.

Inflorescence persistently pale-lepidote; sepals mucronate.

Branches simple, 20-45 mm. long, dense; inflorescence cylindric.

Branches often divided, 10-65 cm. long; spikes lax; inflorescence thyrsoid or pyramidal.

Floral bracts 10-17 mm. long.

Spikes lax; floral bracts one to one and a half times as long as the internodes.

Spikes dense or subdense; floral bracts at least twice as long as the internodes.

1. *Ae. Galeottii*.

2. *Ae. mexicana*.

3. *Ae. Luddemanniana*.

4. *Ae. Iguana*.

5. *Ae. magdalenae*.

6. *Ae. Veitchii*.

7. *Ae. Germinyana*.

8. *Ae. bromeliaefolia*.

9. *Ae. Mariae-reginae*.

10. *Ae. Lalindei*.

11. *Ae. nudicaulis*.

12. *Ae. Tondusii*.

13. *Ae. Kienastii*.

14. *Ae. serrata*.

15. *Ae. dichlamydea*.

16. *Ae. Smithiorum*.

17. *Ae. lavandulacca*.

18. *Ae. setigera*.

19. *Ae. paniculigera*.

20. *Ae. Schultesiana*.

21. *Ae. angustifolia*.

22. *Ae. bracteata*.

23. *Ae. Pittieri*.

Floral bracts imbricate and concealing the rhachis, 14–17 mm. long, faintly nerved near the margins, carinate.

24. *Ae. dactylina*.

Floral bracts spreading and exposing the rhachis, 10–13 mm. long, prominently and uniformly nerved.

25. *Ae. pubescens*.

1. *Aechmea Galeottei* Baker, Handb. Bromel. 51. 1889.

Plant up to 45 cm. high; leaves 4 dm. long; sheaths elliptic, densely alutaceous-lepidote on both sides; blades ligulate, subobtuse, apiculate, 4 cm. wide, glabrous above at maturity, minutely pale-appressed-lepidote beneath, chartaceous when dry, armed with spines 1 mm. long; scape erect, rather stout, densely white-flocculose; scape-bracts longer than the internodes, lanceolate, acute, entire, membranaceous; inflorescence amply paniculate, cylindric, 2 dm. long, 6 cm. in diameter, densely furfuraceous; primary bracts linear to subfiliform, all but the lowest much shorter than the axillary branches, membranaceous; branches simple, laxly and polystichously 5–10-flowered; floral bracts minute or obsolete, subulate; flowers divergent; pedicels slender, 4 mm. long; sepals asymmetric with a lateral wing, 4 mm. long including the terminal mucro, free; petals ligulate, obtuse, 7 mm. long, yellow, bearing 2 scales near the base; epipetalous stamens much connate with the petals; ovary slenderly cylindric, 5 mm. long; epigynous tube practically obsolete; ovules borne in the upper half of the cell, broadly caudate.

TYPE LOCALITY: "Mountains of Central Mexico; Oaxaca, Cordova, &c."

DISTRIBUTION: Vera Cruz and Oaxaca.

2. *Aechmea mexicana* Baker, Jour. Bot. 17: 165. 1879.

Hoplophytum grande E. Morren; Baker, Handb. Bromel. 50, as synonym. 1889.

Aechmea Bernoulliana Wittm. Bot. Jahrb. 14: Beibl. 32: 1. 1891.

Plant from 7 dm. to well over 1 m. high; leaves many in a dense utriculate rosette, 6–12 dm. long; sheaths rather indistinct, ovate, brown, densely and finely brown-lepidote; blades ligulate, acute to rounded-apiculate, pungent, 6–12 cm. wide, armed with straight spines up to 2 mm. long, finely pale-lepidote especially beneath; scape erect, stout, pale-furfuraceous; scape-bracts up to 18 cm. long, much exceeding the internodes, linear-lanceolate, acuminate, entire, membranaceous, stramineous, pale-lepidote, the upper ones deflexed; inflorescence amply paniculate, subcylindric to slenderly pyramidal, 3–7 dm. long, furfuraceous; primary bracts linear to subfiliform, much shorter than the axillary branches, membranaceous; branches spreading, the basal ones much divided and up to 17 cm. long; racemes laxly few-flowered; floral bracts filiform, many times shorter than the pedicels; flowers divergent to spreading; pedicels slender, 4–16 mm. long; sepals broadly triangular-ovate, strongly asymmetric, mucronate, 6 mm. long, free; petals ligulate, emarginate, 10–15 mm. long, red or lilac, bearing 2 scales near the base; epipetalous stamens much connate with the petals; ovary globose or ellipsoid, 6 mm. long, often enlarging in fruit; ovules borne at the top of the cell, distinctly caudate.

TYPE LOCALITY: Orizaba, Vera Cruz.

DISTRIBUTION: Vera Cruz, Guatemala, and Costa Rica; also in Ecuador.

3. *Aechmea Luddemanniana* Brongn.; Mez, in Engler, Pflanzenreich 4³²: 120. 1934.

Pironneava Luddemanniana K. Koch, Wochenschr. Gärtn. 9: 182. 1866.

Aechmea Luddemanniana Brongn.; K. Koch, Wochenschr. Gärtn. 9: 182, as synonym. 1866.

Lamprocaerus caeruleus Regel, Acta Hort. Petrop. 1: 93. 1871.

Aechmea caerulea E. Morren, Cat. 1871: 1. 1871.

Hoplophytum caeruleus E. Morren, Cat. 1873: 9. 1873.

Aechmea caeruleus Baker, Jour. Bot. 17: 227. 1879.

Plant 25–70 cm. high; leaves about 20 in a cyathiform rosette, nearly straight, 3–6 dm. long, densely pale-appressed-lepidote especially below; sheaths large, elliptic; blades ligulate, acute or rounded-apiculate, pungent, 45 mm. wide, armed with fine antrorse spines 1 or rarely 2 mm. long; scape erect, slender, white-farinose; scape-bracts longer than the internodes, entire, membranaceous, white, the lower erect, elliptic, apiculate, the upper spreading to deflexed,

linear-lanceolate, acuminate; inflorescence amply paniculate, cylindric to slenderly pyramidal, 12–30 cm. long, 5–10 cm. in diameter, white-farınose; primary bracts linear to subfiliform, entire, membranaceous, all but the lowest much shorter than the axillary branches; branches simple or the lowest sometimes divided; racemes laxly few-flowered; floral bracts filiform, much shorter than the pedicels; flowers divergent; pedicels slender, 6 mm. long; sepals asymmetric with a broad lateral wing, mucronate, 3.5 mm. long, free; petals ligulate, emarginate, 9 mm. long, rose and blue, turning dark-carmine, bearing 2 subfimbriate scales near the base; ovary subcylindric, 6 mm. long; epigynous tube very short; ovules borne in the upper part of the cell, short-caudate; berry ellipsoid, 12 mm. long, bluish-white

TYPE LOCALITY: Described from cultivation without indication of its origin.

DISTRIBUTION: Vera Cruz and British Honduras.

ILLUSTRATIONS: *Gartenflora* 20: f. 694; Engler, *Pflanzenreich* 4³²: f. 32.

4. *Aechmea Iguana* Wittm. Bot. Jahrb. 14: Beibl. 32: 3. 1891.

Leaves unknown; scape-bracts remotely serrate; inflorescence large, amply paniculate; axis stout; primary bracts lance-oblong, 15–18 cm. long, 40–45 mm. wide, the lower half spinose-serrate; branches 10–12 cm. long, much divided; spikes short, polystichously 4–8-flowered; floral bracts triangular-ovate, ending in a horny mucro, 10–12 mm. long including the mucro; flowers sessile; sepals lanceolate, 15 mm. long, including the stout, spreading, 5 mm. long mucro; petals 15 mm. long, 2 mm. wide, bearing 2 subdenticulate scales well above the base; stamens 12 mm. long; pistil equaling the stamens; ovary ovoid or subglobose, 15 mm. long, 8–10 mm. in diameter; seeds numerous, rectangular-ovoid, about 2 mm. long.

TYPE LOCALITY: Costa Cuca, between Cavallo Blanco and Ocos, Guatemala.

DISTRIBUTION: Known only from the type collection.

5. *Aechmea magdalenae* (André) André; Baker, Handb. Bromel. 65. 1889.

Chevalliera Magdalenae André, Enum. Bromél. 3. 13 D 1888; Rev. Hortic. 60: 563. 16 D 1888.

Bromelia Magdalenae C. H. Wright, Kew Bull. 1923: 267. 1923.

Ananas magdalenae Standley; Standley & Cald. Lista Prelim. Pl. S. Salvador 45. 1925.

Flowering plant about 1 m. high; leaves several in a laxly crateriform rosette, up to 2 m. long; sheaths short and inconspicuous, barely wider than the blades, denticulate, densely and minutely brown-appressed-lepidote; blades linear, acuminate, pungent, 5–10 cm. wide, glabrous above, densely and finely pale-appressed-lepidote between the nerves beneath, laxly armed with dark uncinat spines up to 5 mm. long; scape erect, stout, white-flocculose when young; scape-bracts foliaceous, greatly exceeding the internodes, the upper ones massed below the inflorescence and reflexed; inflorescence simple or more often compound from a few subequal heads, compact, broadly pyramidal; spikes sessile, globose, 12 cm. in diameter; floral bracts decurved from the middle, ovate with a triangular acuminate pungent apex, up to 65 mm. long, coriaceous, thick, densely spinose-serrate, densely appressed-cinereous-lepidote beneath; flowers sessile, up to 5 cm. long, much compressed dorsally; sepals asymmetric, narrowly triangular, acuminate, pungent, the anterior one up to 38 mm. long, the posterior ones to 35 mm., coriaceous, thick, rigid, free, appressed-cinereous-lepidote; petals 4 cm. long with a linear claw and elliptic acute blade, flavous when dry, bearing 2 minute truncate scales well above the base; stamens much shorter than the petals and the second series connate with them; pollen smooth, irregular, probably abortive; ovary broadly elliptic in outline, enlarged in fruit; ovules borne in the upper half of the cell; seeds curved, 6 mm. long, dull-black, reticulate.

TYPE LOCALITY: Colombia.

DISTRIBUTION: Mexico, Guatemala, Salvador, Costa Rica, and Panama; also in Colombia and Ecuador.

ILLUSTRATION: André, Bromel. Andr. pl. 3.

6. *Aechmea Veitchii* Baker, Bot. Mag. *pl.* 6329. 1877.

Chevalliera Veitchii E. Morren, Belg. Hort. 28: 177. 1878.

Stoloniferous, about 1 m. high; leaves 12-17 in a loosely cyathiform rosette, coriaceous, almost straight, 3-10 dm. long; sheaths short and indistinct; blades ligulate, abruptly acute, apiculate, pungent, 4-6 cm. wide, glabrous and pale-green above with spots of dark-green, beneath densely and finely appressed-cinereous-lepidote, armed with spinuliform teeth 1 mm. long and 1-2 mm. apart, broadly channeled down the middle; scape erect, stout; scape-bracts erect, densely imbricate, foliaceous, acute or acuminate, spinulose-serrate; inflorescence simple with flowers many-ranked, densely spicate, cylindric or slenderly conic, 1-4 dm. long, 30-55 mm. in diameter; floral bracts equaling or longer than the flowers but with the upper half sharply reflexed, lance-ovate, acuminate, pungent, 12-15 mm. long, densely spinose-serrate, bright-red, glabrous above, sparsely white-furfuraceous beneath; flowers sessile, suberect, 2 cm. long; sepals asymmetric, acute, pungent, 13 mm. long, white with the extreme apex rose, free; petals fugacious, ligulate, obtuse, barely exerted, bearing 2 oblique denticulate scales near base; stamens included, the second series short-connate with the petals; ovary stoutly obconic, glabrous, white; ovules pendent from the top of the cell, caudate.

TYPE LOCALITY: Colombia.

DISTRIBUTION: Costa Rica; also in Colombia.

ILLUSTRATIONS: Bot. Mag. *pl.* 6329; Belg. Hort. 28: *pl.* 9; Rev. Hort. 52: 450; Garden *pl.* 290; Engler, Pflanzenreich 4²²: *f.* 44.

7. *Aechmea Germinyana* (Carr.) Baker, Handb. Bromel. 66. 1889.

Chevalliera Germinyana Carr. Rev. Hort. 53: 230. 1881.

Bromelia daguensis Carr. Rev. Hort. 53: 230, as synonym. 1881.

Leaves 20-30 in a spreading rosette, often more than 1 m. long, subchartaceous; sheaths ovate, distinct, large, densely and finely appressed-lepidote throughout; blades ligulate, sub-obtuse, ending in a broad pungent brown mucro, closely serrulate with teeth 1 mm. long, appressed-lepidote beneath; scape stout, erect; scape-bracts lance-elliptic, imbricate, green, serrulate, pungent; inflorescence simple, many-flowered, ovoid to cylindric, up to 9 cm. long and 65 mm. in diameter, with a coma of sterile bracts at the apex; floral bracts with apices spreading at anthesis, densely imbricate, ovate-elliptic, broadly acute, slightly shorter than the mature flowers, scarlet, appressed-lepidote when young, becoming subglabrous, serrulate, subcoriaceous; flowers sessile, about 32 mm. long; sepals strongly asymmetric, subelliptic, 13 mm. long, mucronulate, glabrous, free; petals about twice as long as the sepals, acute, white, appendaged about one fourth of the way from the base; stamens shorter than the petals, the second series connate with the petals up to the scales; anthers sublinear, 6 mm. long, mucronulate; ovary 6 mm. long, 3-angled; epigynous tube wanting; style about equaling the stamens; berry globose, 7 mm. in diameter; seeds subfusiform, 3 mm. long.

TYPE LOCALITY: Described from cultivated material of unknown origin.

DISTRIBUTION: Panama; also in Colombia.

ILLUSTRATIONS: Rev. Hort. 53: *pl.* opp. 230.

8. *Aechmea bromeliaefolia* (Rudge) Baker;
Benth. & Hook. Gen. Pl. 3: 664. 1883.

Tillandsia bromeliaefolia Rudge, Pl. Guian. 32. 1807.

Bromelia melanantha Ker, Bot. Reg. 9: *pl.* 766. 1824.

Billbergia clavata Lindl. Bot. Reg. 13: under *pl.* 1068. 1827.

Bromelia tinctoria Mart.; Spix & Mart. Reise in Brasilien 2: 554. 1828.

Tillandsia vestita Willd.; Schultes, in R. & S. Syst. Veg. 7: 1228. 1830.

Billbergia tinctoria Mart.; Schultes, in R. & S. Syst. Veg. 7: 1256. 1830.

Macrochordion tinctorium Vriese, Jaarb. Nederl. Maatsch. Tuinb. 1853: 14. 1853.

Aechmea melanantha Vriese, Tuinb.-Fl. 1: 356. 1854.

Macrochordium melananthum Beer, Bromel. 146. 1857.

Macrochordium bromeliaefolium Beer, Bromel. 146. 1857.

Macrochordium pulchrum Beer, Bromel. 147. 1857.

Macrochordium strictum Beer, Bromel. 147. 1857.

Macrochordium macracanthum Regel, Gartenflora 35: 297. 1886.

Aechmea conspicuarmata Baker, Handb. Bromel. 67. 1889.

Aechmea macroneollia Baker, Handb. Bromel. 68. 1889.

- Aechmea tinctoria* Mez, in Mart. Fl. Bras. 3^o: 373. 1892.
Aechmea pulchra Mez, in Mart. Fl. Bras. 3^o: 374. 1892.
Hoiriri bromeliaefolia Kuntze Rev. Gen. 3^o: 303. 1898.
Nidularium macracanthum "Regel" Durand & Jacks. Ind. Kew. Suppl. 1: 293. 1903.
Aechmea eriostachya Ule, Bot. Jahrb. 42: 197. 1908.
Aechmea ellipsoidea Rusby, Mem. N. Y. Bot. Gard. 7: 212. 1927.
Aechmea bromeliaefolia var. *Renaudii* Mez, in Engler, Pflanzenreich 4^{2o}: 166. 1935.

Plant 7-9 dm. high; leaves 12-20 in a tubular rosette, 6-12 dm. long, covered on both sides with a membrane of white coalesced scales; sheaths ovate to elliptic-oblong, 1-3 dm. long, usually much broader than the blade and very distinct, entire or with a few teeth toward the apex; blades ligulate, very variable, from acuminate to naturally rounded-apiculate even on the same plant or rounded-apiculate by the decay of the point, 4-9 cm. wide, green, concolorous, laxly armed with antrorse spines up to 1 cm. long but often quite small or varying even on the same leaf; scape erect, stout, densely white-lanate; scape-bracts ovate-lanceolate, acute, entire, thin, densely and finely pale-lepidote, the upper ones densely imbricate, the lower sometimes shorter than the internodes; inflorescence simple, densely spicate, fertile throughout, ellipsoid or cylindrical, up to 15 cm. long, 3-4 cm. in diameter, densely white-lanate with only the petals exposed at first; floral bracts broader than long, truncate, thick, coriaceous, 2-keeled, enfolding the ovary, much shorter than the sepals; sepals suborbicular, emarginate, 7 mm. long, coriaceous, equally short-connate; petals erect, oblong, emarginate, 15 mm. long, greenish-yellow, soon turning black, bearing 2 fimbriate scales well above the base; ovary tomentose; ovules borne high in the ovary, long-caudate.

TYPE LOCALITY: Guiana.

DISTRIBUTION: British Honduras and Guatemala; also from Venezuela, Trinidad, and Guiana to Bolivia and northeastern Argentina.

ILLUSTRATIONS: Rudge, Pl. Guian. pl. 50; Bot. Reg. 9: pl. 766; Ann. Soc. Agr. Bot. Gand pl. 114; Gartenflora 35: 297. f. 34; Mart. Fl. Bras. 3^o: pl. 73; Bull. Soc. Bot. Genève II. 8: f. 77; Engler, Pflanzenreich 4^{2o}: f. 43.

9. *Aechmea Mariae-reginae* H. Wendl. Hamb. Gartenz. 19: 32. 1863.

Plant 4-9 dm. high; leaves 15-30 in a dense spreading rosette, the outer ones 8-9 dm. long, the inner progressively shorter; sheaths elliptic, up to 16 cm. wide, coriaceous, densely and finely brown-appressed-lepidote; blades ligulate, subrounded or abruptly acute, apiculate, pungent, 8-10 cm. wide, densely and finely appressed-cinereous-lepidote especially beneath, densely serrate with antrorsely curved spines up to 3 mm. long; scape erect, stout, white-farinose; scape-bracts reflexed, crowded just beneath the inflorescence, elliptic, acute, 1-2 dm. long, densely spinose-serrate, subchartaceous when dry, bright-rose, finely appressed-cinereous-lepidote especially beneath; inflorescence simple, densely spicate with many-ranked flowers, cylindrical, 1-2 dm. long, up to 53 mm. in diameter; floral bracts very narrowly triangular, from 4 mm. long to almost lacking, membranaceous; flowers sessile, spreading; sepals elliptic with a very large irregular lateral wing overtopping the apex, mucronate, 11 mm. long, farinose; petals erect, oblong, emarginate, 15-20 mm. long, white toward the base, blue toward the apex, bearing 2 large, oblong, sparsely fimbriate scales at the base; stamens equaling the petals, the second series highly connate with the petals; ovary obconic, 5 mm. long, deeply sulcate, the epigynous tube wanting; ovules borne at the top of the cell, caudate.

TYPE LOCALITY: Sarapiquí Valley, near San Miguel, Costa Rica.

DISTRIBUTION: Costa Rica.

ILLUSTRATIONS: Bot. Mag. pl. 6441; Floral Mag. n. s. pl. 8.

10. *Aechmea Lalindei* Linden & Rodigas; Rodigas, Ill. Hort. 30: 45. 1883.

- Aechmea gigas* E. Morren; C. H. Wright, Bot. Mag. pl. 8107. 1906.
Aechmea Mariae-reginae "Wendl." Möbius, Gartenflora 49: 337. 1900.

Plant 15 dm. high; leaves about 30 in a great rosette, 15-18 dm. long, rigid; blades arching, ligulate, acute, armed with minute green teeth; scape stout, erect; scape-bracts densely imbricate, the lowest foliaceous, the upper large, elliptic, acute, serrulate, bright-red, reflexed and

massed at the base of the inflorescence; inflorescence simple, ellipsoid or subcapitate, densely many-flowered, 12 cm. long, 6 cm. in diameter; flowers sessile; sepals elliptic, strongly asymmetric, mucronate, pilose-lepidote, greenish-white with a roseate spot at the apex; petals 15 mm. long, obtuse, white or greenish, often with a violet or red spot at the apex; second series of stamens much connate with the petals.

TYPE LOCALITY: Colombia.

DISTRIBUTION: Costa Rica (according to Mez); also in Colombia.

ILLUSTRATIONS: Ill. Hort. 30: pl. 481; Gartenflora 49: pl. 1477; 339, f. 43; Bot. Mag. pl. 8107.

11. *Aechmea nudicaulis* (L.) Griseb. Fl. Brit.
W. Ind. 593. 1864.

- Bromelia nudicaulis* L. Sp. Pl. 286. 1753.
Bromelia lutea G. Meyer, Fl. Esseq. 145. 1818.
Bromelia Hookeri Sweet, Hort. Brit. 425. 1826.
Billbergia nudicaulis Lindl. Bot. Reg. 13: under pl. 1068. 1827.
Tillandsia unispicata Vell. Fl. Flum. 132. 1825; Vell. Fl. Flum. Ic. 3: pl. 124. 1827.
Billbergia oblonga Mart.; Schultes, in R. & S. Syst. Veg. 7: 1256. 1830.
Billbergia lutea Schultes, in R. & S. Syst. Veg. 7: 1258. 1830.
 ? *Bromelia gigantea* Schultes, in R. & S. Syst. Veg. 7: 1283. 1830.
Pothuara spicata Gaud. Bot. Voy. Bonite pl. 117. 1847.
Billbergia pyramidata Beer, Bromel. 123. 1857.
Hoplophytum unispicatum Beer, Bromel. 138. 1857.
Hoplophytum lanuginosum Beer, Bromel. 138. 1857.
Billbergia lanuginosa Beer, Bromel. 138, as synonym. 1857.
Hoplophytum spicatum Beer, Bromel. 140 (not 134). 1857.
Hoplophytum nudicaule K. Koch, Ind. Sem. Hort. Berol. 1856: App. 6. 1857.
Aechmea Hookeri Lemaire, Ill. Hort. 11: misc. 42. 1864.
Hohenbergia nudicaulis Baker, Refug. Bot. pl. 284. 4. 1871.
Pothuara nudicaulis Regel, Gartenflora 31: 291. 1882.
Aechmea nudicaulis var. *distans* Wittm. Garten-Zeitung 3: 378. 1884.
Aechmea Cornui Carr. Rev. Hort. 57: 36. 1885.
Billbergia quadricolor Baker, Handb. Bromel. 62, as synonym. 1889.
Aechmea sulcata Lindm. Sv. Vet.-Akad. Handl. 24^o: 31. 1891.
 ? *Tillandsia serrata* Sessé & Moc. Fl. Mex. ed. 2. 81. 1894.
Aechmea nudicaulis var. *sulcata* Mez, in DC. Monog. Phan. 9: 269. 1896.

Plant very variable in proportions, 3-7 dm. high; leaves numerous in a dense fasciculate rosette, 3-10 dm. long; sheaths large, elliptic, forming an urceolate pseudobulb, purple or castaneous, densely and finely brown-appressed-lepidote; blades ligulate, broadly obtuse and apiculate, not at all constricted at the base, 6-10 cm. wide, coriaceous, densely pale-appressed-lepidote below, glabrous above, spinose-serrate with coarse black teeth up to 4 mm. long; scape slender, erect or arching, white-floccose; scape-bracts erect, imbricate, congested below the inflorescence, elliptic, acute, entire, red; inflorescence simple, polystichous-flowered, cylindrical, fertile throughout, 5-25 cm. long, pale floccose-lepidote, becoming glabrous; floral bracts minute or sometimes wanting, entire; flowers sessile, 22 mm. long; sepals very asymmetric, mucronate, 5-10 mm. long, free; petals ligulate, acute, 12 mm. long, yellow, bearing 2 fimbriate scales 4 mm. above the base; ovary subglobose, the epigynous tube conspicuous; ovules short-caudate, borne at the middle of the placenta.

TYPE LOCALITY: Tropical America.

DISTRIBUTION: Mexico and the West Indies, and southward to southern Brazil.

ILLUSTRATIONS: Hook. Exot. Fl. pl. 113; Gaud. Bot. Voy. Bonite pl. 117; Gartenflora 31: pl. 1096; Rev. Hort. 57: pl. opp. 36; Sv. Vet.-Akad. Handl. 24^o: pl. 5, f. 12-21.

12. *Aechmea Tonduzii* Mez & Pittier; Mez, Bull.
Herb. Boiss. II. 3: 132. 1903.

Leaves over 1 m. long; the inner sheaths erect, tubular-involute, elongate; blades ligulate, broadly obtuse, minutely apiculate, laxly and minutely spinulose serrate, becoming almost entire toward the apex, 5 cm. wide, light-green, concolorous, densely and coarsely pale appressed-lepidote below; scape erect, slender, less than a third as long as the leaves; scape-bracts erect, slightly exceeding the internodes, lanceolate, acuminate into a weak mucro, entire or with a few minute teeth toward the apex, membranaceous; inflorescence simple, densely spicate, cylindrical, 7 cm. long, about 16-flowered; floral bracts spreading to reflexed, triangular, acuminate, sub-

pungent, much shorter than the fruiting ovary, entire, the lower ones broad; flowers sessile; sepals free, 3 mm. long including the long terminal spine; berry stout, ovoid, even, conic at the apex, 18 mm. long, 15 mm. in diameter.

TYPE LOCALITY: Alto del Pito, near San Marcos, Costa Rica, altitude 1400 meters.
DISTRIBUTION: Known only from the type locality.

13. *Aechmea Kienastii* E. Morren; Mez, in DC.
Monog. Phan. 9: 243. 1896.

Aechmea squarrosa Baker, Jour. Bot. 28: 305. 1890. Not *A. squarrosa* Baker. 1889.

Leaves several in a fasciculate rosette, very variable in proportions, 5–9 dm. long, minutely appressed-lepidote throughout; sheaths elliptic, 2–15 cm. long, often castaneous toward the base; blades linear, acuminate, not narrowed at the base, 10–65 mm. wide, densely armed with straight brown spines up to 3 mm. long; scape much shorter than the leaves, 1–5 mm. in diameter, sparsely white-floccose, soon glabrous; scape-bracts remote, lanceolate, acuminate, submembranaceous, densely and coarsely serrate, bright-red; inflorescence digitately compound or rarely simple, if pinnate, then with elongate spikes, fertile throughout, sparsely white-floccose when young; primary bracts like the scape-bracts, suberect to reflexed, longer or shorter than the axillary spikes; spikes suberect, oblong in outline, 4–11 cm. long, 15 mm. wide at anthesis, densely and distichously 6–30-flowered; rhachis straight, square, stout, wing-angled with the wings prolonged upon and adnate to the base of the floral bracts; floral bracts erect and imbricate at anthesis, spreading afterwards, broadly elliptic, acute, mucronulate, 10–17 mm. long, equaling the sepals at anthesis, navicular, ecarinate, entire, prominently nerved, chartaceous; flowers sessile; sepals asymmetric, elliptic, broadly obtuse, mucronulate, 7–10 mm. long, subfree; petals ligulate, acute, mucronulate, 13 mm. long, dark-purple with pale margin when dry, bearing 2 fimbriate scales high above the base; ovary much enlarged in fruit; berry ellipsoid, 7–10 mm. long.

TYPE LOCALITY: "Mexico, loco ignoto."

DISTRIBUTION: Oaxaca, Tabasco, British Honduras, Guatemala, Honduras, Nicaragua, Costa Rica, and Panama; also in Colombia.

NOTE: This species differs from *Ae. tillandsioides* not in the number of flowers in its spikes, but in having the inflorescence digitate or simple, or if pinnate, then with elongate spikes. All Central American material formerly referred to *Ae. tillandsioides* really belongs to *Ae. Kienastii*.

14. *Aechmea serrata* (L.) Mez, in DC. Monog.
Phan. 9: 243. 1896.

Tillandsia serrata L. Sp. Pl. 286. 1753.

Caraguata serrata Schultes, in R. & S. Syst. Veg. 7: 1231. 1830.

Platystachys Plumieri Beer, Bromel. 91. 1857.

Aechmea Plumieri E. Morren; Baker, Handb. Bromel. 45, as synonym. 1889. Not *A. Plumieri* Baker, Handb. Bromel. 50. 1889.

Aechmea martinicensis Baker, Jour. Bot. 17: 132. 1879.

Leaves up to 8 dm. long; sheaths ovate, 9 cm. or more wide, densely appressed-castaneous-lepidote, castaneous on the inside; blades ligulate, acuminate, mucronate, 33 mm. wide, armed with coarse pale teeth 5 mm. long, densely appressed-white-lepidote especially below; scape erect, 8 mm. in diameter; scape-bracts tubular-involute, erect, imbricate, ovate, acuminate, serrate, densely brown-appressed-lepidote; inflorescence very densely bipinnate, ovoid, many-flowered, exceeded by the leaves, 15 cm. long, 10 cm. in diameter; primary bracts like the scape-bracts, equaling or exceeding the axillary spikes, serrate; spikes densely 10–20-flowered; rhachis compressed, 4-winged with the wings decurrent on the backs of the floral bracts; floral bracts very broadly ovate, entire or minutely serrulate, mucronulate, equaling the sepals, strongly convex, combining with the rhachis-wings to form a pouch about the flower, prominently nerved, the lower ones with a median wing; flowers sessile, 26 mm. long; sepals strongly asymmetric, 13 mm. long including the slender, 4 mm. long, terminal mucro, connate for 2 mm.; petals mucronate, 18 mm. long, bearing 2 fimbriate scales 3 mm. above the base; stamens slightly shorter than the petals, anthers 6 mm. long, acute; ovary ellipsoid, 8 mm. long, constricted

toward the apex, the epigynous tube deep, infundibuliform; berry scarcely enlarged from the ovary; seeds 2.5 mm. long, ovoid, acute, brown.

TYPE LOCALITY: Tropical America.

DISTRIBUTION: Martinique.

ILLUSTRATION: *Burm. Am. pl.* 75, f. 1.

NOTE: Only the habit of the Burmann illustration is correct, the details have obviously been copied from some species of *Guzmania*.

15. *Aechmea dichlamydea* Baker, *Jour. Bot.* 17: 133. 1879.

Aechmea bracteata Griseb. *Fl. Brit. W. Ind.* 592, as to description and most of the material cited. 1864.
Aechmea Nichollisii Baker, *Kew Bull.* 1892: 128. 1892.

Leaves 6–10 dm. long; sheaths subelliptic, conspicuous, up to 12 cm. wide, densely and minutely brown-appressed-lepidote; blades ligulate, acuminate to rounded-apiculate, 4–7 cm. wide, inconspicuously pale-punctulate-lepidote especially beneath, armed with fine acicular teeth up to 3 mm. long; scape erect (?), elongate, relatively slender, white-flocculose; scape-bracts lanceolate, acute, entire, bright-red, the upper ones suberect to spreading; inflorescence amply compound, up to 5 dm. long, lax, cylindric to narrowly pyramidal, white-flocculose; primary bracts like the scape-bracts, reflexed, decreasing evenly in size; branches simple, ascending or spreading; stipes slender, the lower ones longer than the spikes, flattened dorsally, naked; spikes oblong, densely distichously 5–20-flowered, strongly complanate, up to 8 cm. long; rhachis winged and attached to the sides of the floral bracts; floral bracts spreading, uniform, cymbiform, broadly ovate, short-mucronate, 12–15 mm. long, slightly exceeding the ovary, entire, prominently nerved; flowers sessile, divergent to spreading; sepals strongly asymmetric, mucronate, up to 19 mm. long; petals erect, linear, mucronulate, 21 mm. long, yellow, bearing 2 dentate scales at the base; stamens included, the second series short-connate; ovary stout, 7 mm. long, enlarged in fruit, the epigynous tube large, crateriform; ovules borne near the top of the cell, numerous, short-caudate.

TYPE LOCALITY: Tobago.

DISTRIBUTION: Montserrat, Guadeloupe, and Martinique; also in Tobago and Trinidad.

Aechmea dichlamydea var. *trinitensis* L. B. Smith, *Proc. Am. Acad.* 68: 145, 185. 1933.
Stipes short and stout; inflorescence denser. TYPE LOCALITY: Trinidad. DISTRIBUTION: St. Vincent; also in Trinidad. ILLUSTRATION: *Proc. Am. Acad.* 68: pl. 1, f. 3.

16. *Aechmea Smithiorum* Mez, in DC. *Monog. Phan.* 9: 246. 1896.

Plant 55 cm. high; leaves 7 dm. long; sheaths distinct, elliptic, obscurely brown-punctulate; blades ligulate, rounded-mucronate, 4–5 cm. wide, pale-green, minutely punctulate-lepidote, densely armed with dark-brown, antrorsely uncinat spines up to 3 mm. long; scape erect (?), slender, sparsely tomentulose; scape-bracts erect, lanceolate, acuminate, entire; inflorescence compound with simple branches, densely ellipsoid, obtuse, 12 cm. long, 5 cm. in diameter, cinereous-pubescent; lower primary bracts like the scape-bracts, exceeding the axillary branches; spikes sessile or subsessile, erect, dense, polystichous on the main axis, distichously 6–13-flowered, fertile throughout, ovate or oblong, acute, 4–5 cm. long, 3 cm. wide, strongly complanate; floral bracts cymbiform, 11 mm. long without the 5 mm. long mucro, distinctly exceeded by the sepals, forming a pouch with the broadly winged rhachis, entire, prominently nerved; flowers sessile, suberect, 2 cm. long; sepals asymmetric, 1 cm. long without the 3 mm. long terminal mucro, cinereous-tomentulose, connate for 1 mm.; petals bearing 2 slightly incised scales at base; ovary 5 mm. long, enlarged in fruit, the epigynous tube short; ovules borne at the top of the cell, caudate.

TYPE LOCALITY: St. Vincent, altitude 300–500 meters.

DISTRIBUTION: Known only from the type locality.

17. *Aechmea lavandulacea* C. H. Wright, *Bot. Mag. pl.* 8005. 1905.

Leaves many in a spreading rosette, 5–8 dm. long; sheaths elliptic, large, densely and minutely brown-lepidote on both sides; blades ligulate, subobtus, apiculate, pungent, 5 cm.

wide, green with red margin and spines up to 3 mm. long; scape rather slender, decurved, bright-rose, white-furfuraceous; scape-bracts erect, exceeding the internodes, ovate-oblong, obtuse and apiculate, furfuraceous, the lower ones scarious, the upper rose; inflorescence compound with simple branches, ellipsoid to subcylindric, dense, 18–25 cm. long, white-furfuraceous; primary bracts like the upper scape-bracts, entire, at least the lower ones equaling or exceeding the axillary branches; spikes divergent to spreading, short-stipitate, lance-ovate, acute, strongly complanate, 5–6 cm. long, 3 cm. broad, distichous on the main axis, densely distichous-flowered; rhachis strongly winged; floral bracts ovate-oblong, acuminate, aristate, up to 2 cm. long, usually equaling or exceeding the sepals at anthesis, green with a broad scarious lavender margin; flowers suberect; sepals asymmetric, lance-ovate, aristate, 12 mm. long, coriaceous, green; petals oblanceolate, mucronate, 23 mm. long, deep-violet, bearing 2 scales at the base, the scales much prolonged next the petal as folds; epipetalous stamens short-connate with the petals; ovary lepidote.

TYPE LOCALITY: St. George, Grenada.

DISTRIBUTION: Montserrat and Grenada.

ILLUSTRATIONS: Bot. Mag. *pl.* 8005; Engler, *Pflanzenreich* 4²: f. 38.

18. *Aechmea setigera* Mart.; Schultes, in R. & S.
Syst. Veg. 7: 1273. 1830.

Aechmea Prieuriana Baker, Handb. Bromel. 39. 1889.

Echinostachys Prieuriana Brongn.; Baker, Handb. Bromel. 35, as synonym. 1889.

Plant 1–3 m. high with the inflorescence extended; leaves 1 m. long, coriaceous; sheaths suborbicular, 9 cm. long, entire, very dark-brown, covered below with a castaneous membrane of coalesced scales, densely subfloccose-lepidote above; blades ligulate, scarcely or not at all constricted at base, acute or broadly rounded with a broad triangular apiculus, 35–70 mm. wide, glabrous above, densely white-appressed-lepidote below, densely spinose-serrate toward the base, sometimes subentire toward the apex, the teeth stout, black, straight or uncinat, up to 11 mm. long; scape arching-decurved, 13 mm. in diameter, sparsely tomentose-lepidote; scape-bracts suberect, linear-lanceolate, acuminate, coarsely spinose-serrate, 2 dm. long, many times exceeding the internodes, subchartaceous, bright-red, appressed-pale-lepidote; inflorescence pendulous, densely bipinnate or the lowest fertile branches divided, cylindric, attaining over 1 m. in length and 9 cm. in diameter, pale-tomentulose, soon glabrous, sterile at the base and apex and at the apices of the remaining spikes; primary bracts slenderly spiniform from a small triangular base, 3 cm. long, dark-brown; spikes laxly and distichously 2–4-flowered; rhachis 25 mm. long, terete; floral bracts subreniform, asymmetric, 1 cm. long, forming a tubular sheath about the base of the calyx, green, prominently nerved, bearing a slender, dark-brown, terminal spine up to 25 mm. long, those toward the apex of the spike sterile and gradually reduced to just the spine; flowers sessile; sepals very asymmetric, subelliptic, obtuse, 16 mm. long, entire, not mucronulate, pale-yellow-green, free; petals ligulate, obtuse, 3 cm. long, pale-greenish-yellow, bearing 2 fimbriate scales at the base; filaments free; ovary much enlarged in fruit, the epigynous tube large, urceolate; ovules caudate, borne near the summit of the cell; berry ellipsoid, 1 cm. long, glabrous; seeds ovoid, straight, 5 mm. long, black.

TYPE LOCALITY: "In sylvâ Gabo prope Caldeirad Prov. Rio Negro Brasiliae."

DISTRIBUTION: Panama; also in French Guiana and Amazonia.

ILLUSTRATION: Mart. Fl. Bras. 3^o: *pl.* 68.

19. *Aechmea paniculigera* Griseb. Fl. Brit.
W. Ind. 593. 1864.

Bromelia paniculigera Sw. Prodr. 56. 1788.

? *Hoplophytum paniculatum* Beer, Bromel. 130. 1857.

Hohenbergia paniculigera Baker, Refug. Bot. *pl.* 284. 2. 1871.

Aechmea Mertensii "Schultes" Wittm. Gartenflora 38: 516. 1889. Not *Ae. Mertensii* Schultes, 1830.

Flowering plant up to 75 cm. high; leaves 20–25 in a dense rosette, nearly 1 m. long, longer than the inflorescence but spreading; sheaths suborbicular, 2 dm. in diameter; blades ligulate,

8 cm. wide, broadly rounded, mucronate, armed with coarse teeth up to 5 mm. long, thick, coriaceous, deep-green, evenly punctulate-lepidote throughout with coarse white scales; scape erect, 1 cm. or more in diameter, sparsely subfarinose-lepidote; scape-bracts erect except for the uppermost which form a spreading coma beneath the inflorescence, ample, up to 2 dm. long, bright-purple, entire or sparsely denticulate; inflorescence many-flowered, densely cylindric, acute, paniculate, up to 34 cm. long, 8 cm. in diameter; axes green, subfarinose-lepidote; lower primary bracts like the scape-bracts but much narrower, exceeding the axillary branches, the upper narrowly triangular, acuminate, not reaching even the lowest flower of the spike; all the branches fertile throughout, 2-flowered or 3-flowered, the lower ones fascicled, the upper single; rhachis slender, geniculate; floral bracts spiniform from a minute reniform base, 2.5 mm. long, entire, margins free from the rhachis; flowers sessile, erect; sepals strongly asymmetric, 7 mm. long including the stout, spreading, 2 mm. long mucro, free, glabrous, bluish-white toward the base, reddish toward the apex; petals 14 mm. long, obscurely mucronulate, pale-violet, bearing 2 fimbriate scales 3 mm. above the base; stamens much shorter than the petals, the filaments of the second series highly connate with the petals, the anthers linear, acute, 3.5 mm. long, the pollen biporate; pistil exceeding the stamens but shorter than the petals, very sparsely furfuraceous, the epigynous tube short but distinct; ovules borne near the top of the cell, distinctly caudate.

TYPE LOCALITY: West Indies.

DISTRIBUTION: Jamaica.

ILLUSTRATIONS: *Gartenflora* 38: 516, f. 77; 517, f. 78.

20. *Aechmea Schultesiana* Mez, in Mart. Fl. Bras. 3³: 334. 1892.

Billergeria paniculata Mart.; Schultes, in R. & S. Syst. Veg. 7: 1268. 1830. Not *Aechmea paniculata* R. & P. 1802.

Aechmea Friedrichsthali Mez & Smith; Donn-Smith, Bot. Gaz. 19: 263. 1894.

Aechmea inermis Mez, Bull. Herb. Boiss. II. 4: 620. 1904.

Leaves 5-7 dm. long, chartaceous when dry; sheaths conspicuous, ovate, appressed-brown-lepidote especially below; blades ligulate, not constricted at the base, abruptly acute, apiculate, 2-4 cm. wide, pale-appressed-lepidote below, soon glabrous, subentire or armed toward the base with fine teeth 1 mm. or less long; scape erect, 3-5 mm. in diameter, furfuraceous-lepidote at first, soon glabrous; scape-bracts erect, the lower remote, the upper clustered below the inflorescence, lanceolate or elliptic, acute or acuminate, entire or very sparsely and obscurely denticulate, membranaceous, bright-red; inflorescence paniculate, bipinnate or the lower branches divided, subdensely ellipsoid, 7-15 cm. long, fertile throughout, soon glabrous; primary bracts like the scape-bracts, the lower equaling or exceeding the axillary branches, the upper no larger than the floral bracts; spikes suberect to spreading, linear, 35 mm. long, distichously 6-10-flowered, the internodes 4-5 mm. long; floral bracts suborbicular, minutely mucronulate, 2-5 mm. long, equaling the ovary at anthesis, strongly convex, entire, chartaceous, prominently nerved, margins free from the rhachis; flowers sessile, erect and appressed to the rhachis; sepals asymmetric, subovate, obtuse, entire or with a very short blunt obscure mucro, 4-6 mm. long, free or subfree; petals linear, mucronulate, 13 mm. long, bearing 2 fimbriate scales above the base; stamens slightly shorter than the petals, the filaments of the second series highly connate with the petals; ovary ellipsoid or subglobose, much enlarged in fruit, the epigynous tube short; ovules attached near the apex of the cell.

TYPE LOCALITY: Japurá River, Alto Amazonas, Brazil.

DISTRIBUTION: Costa Rica; also in Venezuela, Amazonia, and Peru.

21. *Aechmea angustifolia* Poepp. & Endl. Nov.

Gen. & Sp. 2: 43. 1837.

Hoplophytum angustifolium Beer, Bromel. 132. 1857.

Hohenbergia angustifolia Baker, Refug. Bot. pl. 284. 3. 1871.

Aechmea *Cumingtonii* Baker, Jour. Bot. 17: 227. 1879.

Aechmea boliviana Rusby, Bull. N. Y. Bot. Gard. 4: 456. 1907.

Aechmea cylindrica Mez, Repert. Sp. Nov. 12: 413. 1913.

Aechmea inconspicua Harms, Notizbl. Bot. Gart. Berlin 10: 786. 1929.

Plant up to 75 cm. high; leaves 10-15 in a dense utriculate ellipsoid rosette, 5-7 dm. long; sheaths elliptic, 1 dm. long, densely and finely brown-appressed-lepidote; blades ligulate, 3-6 cm. wide, appressed-cinereous-lepidote, spinose-serrate, concolorous; scape erect, white-flocculose, becoming glabrous; scape-bracts elliptic, acute, denticulate, red; inflorescence dense or lax, compound with simple branches, cylindric, fertile throughout, 15-36 cm. long; axes puberulent; lowest primary bracts like the scape-bracts, exceeding the axillary spikes, the others abruptly reduced to about the size of the floral bracts, ovate or narrowly triangular, acuminate; spikes spreading or reflexed, distichously 10-flowered, 20-45 mm. long; rhachis undulate, compressed; floral bracts spreading, cymbiform, broadly ovate with a straight mucro, convex, puberulent, 5 mm. long, barely exceeding the ovary; flowers sessile, 12-16 mm. long; sepals asymmetric, mucronate, 4-5 mm. long, subglabrous, free; petals linear, mucronate, 8-10 mm. long, bearing 2 scales well above the base; ovary ellipsoid; ovules borne at the summit of the cell, caudate.

TYPE LOCALITY: Tocache and Yurimaguas, Prov. Maynas, Peru.

DISTRIBUTION: Costa Rica and Panama; also in Colombia, Brazil, and Bolivia.

ILLUSTRATIONS: Poepp. & Endl. Nov. Gen. & Sp. pl. 159; Mart. Fl. Bras. 3^o: pl. 69.

22. *Aechmea bracteata* (Sw.) Griseb. Fl. Brit.

W. Ind. 592. 1864.

Bromelia bracteata Sw. Prodr. 56. 1788.

Aechmea Schiedeana Schlecht. Linnaea, 18: 437. 1844.

Aechmea laxiflora Benth. Bot. Voy. Sulph. 173. 1846.

Hoplophytum bracteatum K. Koch, Wochenschr. Gärtn. 3: 306. 1860.

Hohenbergia laxiflora Baker, Refug. Bot. pl. 284. 3. 1871.

Hohenbergia bracteata Baker, Refug. Bot. pl. 284. 3. 1871.

Aechmea regularis Baker, Jour. Bot. 17: 229. 1879.

Aechmea macracantha Brongn.; André, Ill. Hort. 27: 59. 1880.

Aechmea Barleei Baker, Gard. Chron. II. 20: 102. 1883.

Aechmea isabellina Baker, Jour. Bot. 28: 305. 1890.

? *Tillandsia spinosa* Sessé & Moc. Fl. Mex. ed. 2, 81. 1894.

Plant 5 to over 17 dm. high; leaves about 20 in a dense utriculate ellipsoid rosette, from 3 to over 10 dm. long; sheaths elliptic, very large and conspicuous, densely and finely brown-lepidote; blades ligulate, from acuminate to rounded-apiculate, 3-10 cm. wide, coriaceous, pale-green, concolorous, soon glabrous above, densely white-appressed-lepidote beneath, coarsely repand-serrate, the teeth lax, spreading, straight or uncinat, up to 1 cm. long; scape erect, relatively slender in most cases, finely white-lanate at first; scape-bracts erect or the upper ones divergent to curved-spreading, usually imbricate, lanceolate, acute, entire, bright-red; inflorescence amply paniculate, thyrsoïd or pyramidal with the lower branches elongate and much divided, 10-65 cm. long; axes red, white-pubescent; lower primary bracts like the scape-bracts, sometimes exceeding the axillary branches, the upper like the floral bracts and as small; spikes spreading, laxly and distichously 4-17-flowered; rhachis slender, compressed, angled, flexuous; floral bracts spreading, broadly ovate, acute, aciculose, 5-8 mm. long, much exceeded by the sepals, about equaling the internodes, more or less prominently nerved, the margins free and entire; flowers sessile, divergent; sepals triangular-ovate, strongly asymmetric, mucronulate, 3-4 mm. long, white-pubescent, soon glabrous; petals linear, up to 1 cm. long, yellow, bearing 2 coarsely dentate scales well above the base; stamens included, the second series short-connate with the petals; ovary stoutly ellipsoid or subglobose, enlarged in fruit, white-pubescent; ovules borne near the top of the cell, caudate.

TYPE LOCALITY: Yucatan.

DISTRIBUTION: Mexico, British Honduras, Guatemala, Honduras, Nicaragua, and Costa Rica; also in Colombia.

ILLUSTRATIONS: Gartenfl. 41: f. 78; 43: f. 46.

23. *Aechmea Pittieri* Mez, in DC. Monog.

Phan. 9: 231. 1896.

Leaves at least 8 dm. long; sheaths unknown; blades ligulate, acuminate, pungent, 75 mm. wide, lepidote especially below, laxly spinose-serrate with stout, nearly straight, brown-tipped

teeth up to 1 cm. long; scape erect, stout, white-tomentulose; scape-bracts erect, tubular-involute, densely imbricate, lance-elliptic, pungent, entire or rarely with a few teeth, bright-red; inflorescence paniculate, laxly tripinnate, pyramidal, 33 cm. long, 20 cm. in diameter; axes tomentulose at first, soon glabrous; primary bracts like the scape-bracts, the lower about half as long as the axillary branches, the upper much reduced; branches all fertile throughout, subspreading, long-stipitate with the spikes clustered at the end; secondary bracts barely larger than the floral bracts; spikes laxly about 10-flowered, linear in outline, up to 1 dm. long; rhachis strongly geniculate, complanate, excavated next the flowers; floral bracts erect, suborbicular, broadly rounded with a mucro 2 mm. long at the apex, 10 mm. long including the mucro, 9 mm. wide, only one to one and a half times as long as the internodes, exceeding the sepals, entire, prominently nerved, minutely white-arachnoid, soon glabrous, entire, the margin free from the rhachis; flowers appressed to the rhachis; sepals barely asymmetric, 4 mm. long, minutely mucronate, white-tomentulose especially toward the base, free; petals 10 mm. long, not mucronate, bearing 2 fimbriate scales high above the base; stamens much shorter than the petals, the filaments of the second series much connate with the petals, the anthers narrow, 1.5 mm. long, mucronulate; pistil about equaling the petals, the epigynous tube very short; ovary 3-angled.

TYPE LOCALITY: Boruca, near Buenos-Aires, Costa Rica.

DISTRIBUTION: Known only from the type localities.

24. *Aechmea dactylina* Baker, Jour. Bot. 17: 161. 1879.

Plant over 8 dm. high; leaves 5-14 dm. long; sheaths very large, elliptic, pale-punctulate-lepidote; blades ligulate, acute, pungent, 45-75 mm. wide, rigid, pale-green, armed with straight spreading spines up to 1 cm. long; scape erect, elongate, up to 1 cm. in diameter, white-flocculose, becoming glabrous; scape-bracts erect, elliptic, acute or acuminate, pale-green or the upper ones sometimes red; inflorescence amply paniculate, subthyrsoid, 25-60 cm. long; axes angular, white-arachnoid; primary bracts spreading or reflexed, narrowly lanceolate, acuminate, much shorter than the axillary branches, flaccid, bright-red, sparsely lepidote or glabrous; branches divergent to spreading, the lower ones usually divided and bearing 2-8 spikes, up to 25 cm. long; spikes linear, acute, 5-16 cm. long, 10-16 mm. wide, strongly complanate, densely distichous-flowered; floral bracts all fertile, erect, densely imbricate, very broadly ovate or suborbicular, 14-17 mm. long, 10-15 mm. wide, equaling or exceeding the sepals, mucronulate with free entire margins, sharply carinate toward the apex, coriaceous, glabrous, finely nerved near the margins; flowers sessile, 17 mm. long; sepals lanceolate, acute, wing-carinate, 7-8 mm. long, connate for 1 mm.; petals ligulate, acute, yellow; stamens included; ovary sharply 3-angled, 7 mm. long, glabrous, the epigynous tube short; ovules few, borne at the top of the cell, caudate.

TYPE LOCALITY: Chagres, Panama.

DISTRIBUTION: Costa Rica and Panama; also in Colombia.

25. *Aechmea pubescens* Baker, Jour. Bot. 17: 135. 1879.

? *Aechmea Standleyi* Cufod. Arch. Bot. 9: 182. 1933.

Plant 4-10 dm. high; leaves few in a dense utriculate suburceolate rosette, up to 1 m. long, green and chartaceous except for a broad pale subcoriaceous channeled median portion, the outer leaves bladeless, squamiform; sheaths broadly elliptic, 15 cm. long, densely brown-punctulate; blades narrowed for nearly half the distance above the base but not truly petiolate, ligulate, acute, apiculate, 25-35 mm. wide, white-appressed-lepidote below, soon glabrous above, the basal half laxly serrate with straight or retrorse green teeth up to 5 mm. long, the apical half subentire; scape erect, slender, white-lanate, soon glabrous; scape-bracts erect, tubular-involute, densely imbricate, lance-ovate, acute, entire, membranaceous, bright-red, pale-appressed-lepidote; inflorescence paniculate, bipinnate or the lower branches divided, oblong or pyramidal, 10-35 cm. long, fertile throughout, lax at least toward the base, at first densely white-floccose-lepidote throughout but often becoming nearly glabrous at maturity; primary bracts like the scape-bracts but narrower, the lower ones equaling or exceeding the axillary branches, the upper ones no larger than the floral bracts; spikes linear, densely and distichously 5-16-flowered; rhachis straight or slightly geniculate, flattened next the flowers but

not excavated; floral bracts spreading and exposing the rhachis, broadly ovate, acuminate, pungent, 10–13 mm. long, equaling or exceeding the sepals, entire with margins free from the rhachis, navicular, carinate toward the apex, subcoriaceous, prominently nerved; flowers sessile; sepals strongly asymmetric, subtriangular, 6 mm. long, mucronulate, strongly carinate; petals ligulate, obtuse, 10 mm. long, bearing 2 fimbriate scales high above the base; stamens much shorter than the petals; ovary subellipsoid, 3-angled, slightly enlarged in fruit; ovules attached near the summit of the cell.

TYPE LOCALITY: Portobello, Panama.

DISTRIBUTION: Honduras, Nicaragua, Costa Rica, and Panama; also in Colombia.

DOUBTFUL OR EXCLUDED SPECIES.

AECHMEA MERTENSII (Meyer) Schultes. According to Mez (in DC. Monog. Phan. 9: 214. 1896) the only record from North America is almost certainly based on an error.

12. *GREIGIA* Regel, *Gartenflora* 14: 137. 1865.

Large coarse herbs, stemless or caulescent. Leaves narrowly triangular, spinose-serrate at the base or throughout. Inflorescence lateral or central and sunk in the leaf-rosette, simple, corymbose or capitate. Sepals free or nearly so, symmetric. Petals connate, fleshy, naked. Filaments connate with the petals; anthers narrow, acute; pollen-grains large, spherical, unmarked. Ovary glabrous, triangular. Berry fleshy.

Type species, *Bromelia sphaelata* R. & P.

1. *Greigia sylvicola* Standley, *Jour. Wash. Acad.*
17: 160. 1927.

Plants large, terrestrial, arising from elongate rootstocks, the stems stout, 1–1.5 m. high, densely leafy; leaves up to 13 dm. long; sheaths 3–4 cm. wide, slightly inflated, entire, densely brown-appressed-lepidote; blades linear, acuminate, 12–18 mm. wide, obscurely brown-lepidote, finely striate, thin, bright-green when fresh, serrate to 15–18 cm. above the base with numerous antrorse, dark-brown, spinose teeth 1.5–3 mm. long and 8–22 mm. apart, along the middle unarmored or with very minute and remote teeth, the apex finely and densely spinose-serrate for 20–25 cm.; inflorescence terminal, nearly hidden among the leaves, capitate, many-flowered, about 5 cm. in diameter, borne on a stout bracted scape 4 cm. long; bracts linear-lanceolate or the outermost ovate, long-acuminate, the outer equaling the sepals, thin, sparsely brown-lepidote, entire below, toward the apex densely serrate with coarse brown incurved teeth; flowers sessile; ovary 3-angled, 10–15 mm. long, 5 mm. in diameter; sepals free, lanceolate, acuminate, mucronate, 2 cm. long, entire, green, sparsely brown-lepidote; immature fruit about 1.5 cm. long and 1 cm. thick, many-seeded.

TYPE LOCALITY: Near Laguna de la Escuadra, northeast of El Copey, Province of San José, Costa Rica, altitude about 2200 meters.

DISTRIBUTION: Dense wet forests of the high mountains of the Cantón de Dota, Costa Rica.

13. *ANANAS* Mill. *Gard. Dict. Abr. ed.* 4. 1754.

Leaves densely rosulate, scarcely enlarged at the base, acuminate-pungent, usually spinose-serrate. Scape erect, stout, spiny-bracted. Inflorescence densely strobiliform, crowned with a tuft of sterile foliaceous bracts. Flowers sessile, violet or red. Sepals free, obtuse, slightly asymmetric. Petals free, erect, each bearing 2 slenderly infundibuliform scales. Stamens included; pollen-grains ellipsoid with 2 pores. Ovaries coalescing with each other and with the bracts and axis to form a fleshy compound fruit, the epigynous tube short. Ovules borne near the top of the cell. Berry sterile in the cultivated varieties and forms.

A single variable species of which the common cultivated variety is typical taxonomically.

Type species, *Bromelia Ananas* L.

1. *Ananas comosus* (L.) Merrill, Interpr. Rumph.
Amb. 133. 1917.

Bromelia Ananas L. Sp. Pl. 285. 1753.

Bromelia comosa L. Herb. Amboin. 21. 1754.

Ananassa saliva Lindl. Bot. Reg. 13: under *pl. 1068*, nomen nudum. 1827; Spach, Hist. Vég. 12: 400. 1846.

Ananas sativus Schultes, in R. & S. Syst. Veg. 7: 1283. 1830.

Ananas Ananas Voss, in Vilm. Blumeng. ed. 3. 1: 964. 1895.

Characters of the genus.

TYPE LOCALITY: Described from cultivation.

DISTRIBUTION: Brazil and the Guianas; cultivated and occasionally spontaneous in southern Florida and the West Indies and from southern Mexico to Panama.

14. *BILLBERGIA* Thunb. Pl. Bras. Dec. 30. 1821.

Eucallias Raf. Fl. Tell. 4: 25. 1838.

Jonghea Lemaire, Jard. Fleur. 2: under *pl. 181/182*. 1852.

Cremobotrys Beer, Flora 37: 348. 1854.

Helicodea Lemaire, Ill. Hort. 11: *pl. 421*. 1864.

Plants stemless. Leaves rosulate or rarely fasciculate; sheaths large; blades ligulate, spinose-serrate, often banded. Scape erect or arching; scape-bracts red, membranaceous, Inflorescence simple in the North American species. Flowers large, showy. Sepals free, erect. Petals free, actinomorphic or slightly zygomorphic, bearing 2 scales on the inner surface near the base, the claw long, the blade narrow. Stamens exserted at anthesis, both series free or the second joined to the petals only as high as the scales. Pollen-grains with longitudinal folds but no pores. Style exceeding the stamens; epigynous tube large. Ovules many.

Type species, *Billbergia speciosa* Thunb.

Flowers sessile.

Floral bracts suborbicular, much shorter than the ovary.

Flowers erect or suberect.

Flowers spreading or reflexed.

Floral bracts narrowly oblong, equaling or exceeding the ovary of all but the uppermost flowers.

Flowers slenderly long-pedicellate.

1. *B. pallidiflora*.

2. *B. mexicana*.

3. *B. macrolepis*.

4. *B. viridiflora*.

1. *Billbergia pallidiflora* Liebm. Ind. Sem. Hort. Haun. 1854: 26.
1854; Ann. Sci. Nat. IV. 2: 373. 1854.

Leaves tubular-rosulate, 6 dm. long; sheaths large, narrowly ovate; blades ligulate, acute, 45 mm. wide, spinose-serrate with upwardly curved teeth 3 mm. long; scape arching, 7 mm. in diameter, white-farinose; scape-bracts erect, densely imbricate, lance-elliptic, acuminate, over 15 cm. long; inflorescence simple, densely cylindric, many-flowered, 2 dm. long, densely white-farinose throughout; floral bracts suborbicular, many times shorter than the ovary; flowers sessile, erect or suberect; sepals ovate-oblong, broadly acute and apiculate, unequal, 9-12 mm. long, subcoriaceous; petals linear, acute, up to 52 mm. long, green, imperfectly revolute, bearing 2 large coarsely fimbriate scales near the base; ovary slenderly ovoid, 12-18 mm. long, coarsely sulcate with the ridges soon glabrous, the epigynous tube narrow, 6 mm. long; ovules borne between the middle and the apex of the cell.

TYPE LOCALITY: Nicaragua.

DISTRIBUTION: Sinaloa, Oaxaca, Chiapas, and Nicaragua.

2. *Billbergia mexicana* Mez, Repert. Sp. Nov. 16: 6. 1919.

Leaves up to 6 dm. long; sheaths large, narrowly ovate-oblong; blades ligulate, acuminate, 3-4 cm. wide, densely serrate with upwardly curved teeth 2.5 mm. long, densely and minutely appressed-white lepidote, concolorous; scape arching, stout, farinose; scape-bracts imbricate, ample, over 15 cm. long; inflorescence simple, many-flowered, laxly spicate, cylindric, over 3 dm. long, axis stout, sulcate, white-farinose; floral bracts reflexed, squamiform ovate, apiculate, 4 mm. long, densely farinose, flowers spreading or reflexed, probably at least 6 cm. long, sessile;

sepals narrowly ovate, obtuse, soon glabrous, unequal, one 17 mm. long, the others 15 mm.; petals linear, spirally recurved at anthesis, green; ovary slenderly ellipsoid, 15–20 mm. long, densely white-farinose, coarsely sulcate with the ridges soon glabrous, the epigynous tube narrow, 3 mm. long.

TYPE LOCALITY: La Correa [Guerrero].

DISTRIBUTION: Known only from the type locality.

3. *Billbergia macrolepis* L. B. Smith, Contr. Gray Herb. 114: 3. 1936.

Billbergia pallidiflora "Liebm." Mez, in DC. Monog. Phan. 9: 303, in part. 1896. Not *B. pallidiflora* Liebm. 1854.

Plant one meter or more in length if the pendent inflorescence is extended; leaves up to 12 dm. long; sheaths elliptic, large; blades linear-triangular, long-acuminate, 3 cm. wide, sparsely serrate with nearly straight teeth up to 3 mm. long, entire toward the apex, densely and minutely pale-lepidote, gray-green, marked below with large white spots; scape pendulous, 3–4 mm. in diameter, sparsely white-floccose, soon glabrous; scape-bracts erect, imbricate, lanceolate, acuminate, up to 24 cm. long, membranaceous, red, white-floccose; inflorescence simple, cylindrical, up to 4 dm. long, laxly many-flowered, densely white-farinose throughout; floral bracts spreading or reflexed, narrowly oblong or the uppermost ovate, obtuse and apiculate, up to 35 mm. long, except for the uppermost equaling or exceeding the ovary, membranaceous, dark-brown when dry; flowers suberect to spreading, sessile; sepals symmetric, broadly ovate, broadly acute and apiculate, equal, 10 mm. long, 8 mm. wide, coriaceous, prominently nerved; petals linear, acute, up to 43 mm. long, 4 mm. wide, bronze-green, spirally recurved at anthesis, bearing 2 coarsely crenate scales at the base; ovary subglobose, 15 mm. long, coarsely sulcate with the ridges soon glabrous, the epigynous tube 3 mm. long; ovules attached between the middle and the apex of the cell.

TYPE LOCALITY: Along Río Chagres, between the Río Pequeñ and the Río Indio, Panama, altitude 66 meters.

DISTRIBUTION: Costa Rica and Panama.

ILLUSTRATION: Contr. Gray Herb. 114: *pl. 1, f. 6*.

4. *Billbergia viridiflora* H. Wendl. Allg. Gart. 22: 154. 1854.

Leaves 12–15, tubular-rosulate, 6–10 dm. long, minutely appressed-white-lepidote, green; sheaths large, narrowly ovate, barely wider than the blades, entire; blades ligulate, acuminate, 4–9 cm. wide, spinose-serrate with teeth 1–4 mm. long, marked with broad white cross-bands on the back; scape suberect to arching, about equaling the leaves, 3–5 mm. in diameter, white-floccose, becoming glabrous with age; scape-bracts erect, imbricate, elliptic-oblong, acute and apiculate, up to 14 cm. long, minutely serrulate, membranaceous, red, white-floccose; inflorescence simple, laxly racemose, 2–5 dm. long; axis slender, glabrous; floral bracts linear-triangular, acuminate, the lowest up to 2 cm. long, membranaceous, white-floccose; pedicels spreading, up to 5 cm. long, 1 mm. in diameter, glabrous; flowers glabrous; sepals asymmetric, lance-triangular, acuminate, 21 mm. long, green; petals linear-lanceolate, acute, 4–5 cm. long, green, slightly recurved at anthesis, bearing 2 subentire scales at the base; ovary ellipsoid, 10–12 mm. long, green, glabrous, the epigynous tube infundibuliform, 2–4 mm. long; ovules caudate, borne at the apex of the cell.

TYPE LOCALITY: Described from cultivation; origin unknown, but later wrongly attributed to Brazil.

DISTRIBUTION: Northern Guatemala and British Honduras.

ILLUSTRATIONS: Fl. Serres 10: *pl. 1019, 1020*; Belg. Hort. 26: *pl. 20, 21*; Wiener III. Gart. 6: 4.

15. BROMELIA [Plumier] L. Sp. Pl. 285. 1753.

Karatas Plum. Gen. 10. 1703.

Pinguin Dill. Hort. Elth. 320. 1732.

Karatas [Plumier] Mill. Gard. Dict. Abr. ed. 4. 1754.

Pseudodelia Neck. Elem. 3: 150. 1790.

Agallosiachys Beer, Bromel. 16, 35. 1857.

Distiacanthus Baker, Handb. Bromel. 13. 1889.

Coarse terrestrial herbs, spreading by subterranean stolons. Leaves usually rosulate, with large curved spines along the margin. Inflorescence sessile or stipitate, always paniculate. Sepals free or somewhat united, obtuse or acute, rarely mucronulate. Petals rarely with a definite claw, dorsally united by the filaments, but their margins free, eligulate, fleshy in most species. Stamens included, often much conjoined by their filaments. Anthers narrow, acute. Ovary passing gradually into the thick pedicel, the epigynous tube conspicuous to nearly lacking. Berry succulent, relatively large. Seeds few to many, flattened, naked.

Type species, *Bromelia Pinguin* L.

Inflorescence a densely capitiform panicle, scapeless and sunk in the center of the leaf-rosette.

Floral bracts much dilated toward apex; sepals broadly elliptic.

1. *B. superba*.

Floral bracts but slightly dilated toward apex; sepals oblong or linear-lanceolate.

Indument of very coarse black-brown scales; corolla-tube over 2 cm. long.

2. *B. Karatas*.

Indument of fine buff or white scales; corolla-tube not over 12 mm. long.

3. *B. Wercklei*.

Inflorescence an elongate lax panicle, terminating a definite scape.

Sepals acute or obtuse, not mucronate.

Floral bracts subulate; petals densely tomentose at the apex.

4. *B. Pinguin*.

Floral bracts broader, triangular; petals glabrous or scantily lepidote at the apex.

5. *B. sylvestris*.

Sepals mucronate.

Branches abbreviated, 2-flowered.

6. *B. Palmeri*.

Branches elongate, up to 4-flowered.

7. *B. mucronata*.

1. *Bromelia superba* Mez, Symb. Ant. 2: 252. 1900.

Flowering plant extremely large; leaves 2 m. long or longer, not at all constricted between the blade and the sheath; blades linear, acuminate, 5-6 cm. wide, pungent, pale-green when dry, glabrous and shining above, densely and very minutely appressed-lepidote below, armed with brownish teeth 4-8 mm. long; inflorescence corymbose-capitiform, many-flowered, sunk in the center of the leaf-rosette; axes densely lepidote with coarse dark-brown scales; primary bracts unknown; floral bracts greatly dilated toward the apex, about 7 cm. long, attaining the middle of the sepals, glabrous within, coarsely spreading-lepidote outside toward the apex, membranaceous, lacinate-serrate toward the apex, ecarinate; flowers up to 8 cm. long; sepals erect, broadly elliptic, obtuse, entire, 32 mm. long, straight, lanate but soon glabrous, prominently striate, free; petals only about 5 mm. longer than the sepals, narrowly elliptic, obtuse, joined nearly to the middle, erect at anthesis, glabrous; ovary cylindrical, very densely lepidote with coarse dark-brown scales.

TYPE LOCALITY: Mountains near Port Royal, Jamaica.

DISTRIBUTION: Known only from the type locality.

2. *Bromelia Karatas* L. Sp. Pl. 285. 1753.

Bromelia Acanga L. Syst. Nat. ed. 12. 2: 232, in part. 1767.

Bromelia acaulis Stokes, Bot. Mat. Med. 2: 204. 1812.

Nidularium Karatas Lemaire; Griseb. Fl. Brit. W. Ind. 591. 1864.

Karatas Plumieri E. Morren, Belg. Hort. 22: 131. 1872.

Flowering plant up to 3 m. in diameter, barely 3 dm. high; leaves many in a dense rosette, 15 dm. long, not at all constricted between the sheath and the blade; sheaths large, broadly triangular, entire or somewhat serrate toward the apex, densely lepidote with elongate coarse dark-brown scales; blades linear, acuminate, pungent, 3-5 cm. wide, very minutely appressed-lepidote below, densely serrate with stout brown teeth 5-8 mm long; inflorescence many-flowered, densely capitiform, flat-topped, sunk in the center of the leaf-rosette, surrounded by the cinnabar-red inner leaves; primary bracts like the inner leaves but with shorter blades; axes of the inflorescence much abbreviated; floral bracts narrowly oblanceolate, attaining the middle of the sepals, entire or sparsely serrate, membranaceous, coarsely lepidote; flowers 6-9 cm. long; pedicels very short and stout; sepals narrowly lanceolate, acute but not mucronate, 3 cm. long, erect, free, coarsely brown-lepidote; petals narrowly lanceolate, up to 4 cm. long, connate for

more than 2 cm., glabrous, fleshy, rose with white base and margins; ovary triangular-prismatic, densely ferruginous-lepidote; berry fusiform, 8 cm. long, 2 cm. in diameter.

TYPE LOCALITY: Tropical America.

DISTRIBUTION: Mexico and the West Indies, and southward to Guiana and Colombia.

ILLUSTRATIONS: Jacq. Hort. Vindob. 1: *pl.* 31, 32; Ant. Phyto-Ic. Bromel. *pl.* 21, 22; Engler, Pflanzenreich 4³²: *f.* 8.

3. *Bromelia Wercklei* Mez, Repert. Sp. Nov. 16: 2. 1919.

Leaves not at all constricted between the blade and the sheath; blades linear, acuminate, coarsely serrate; inflorescence many-flowered, densely capitiform, flat-topped, sunk in the center of the leaf-rosette, densely lepidote with fine elongate buff scales; primary bracts large, with very broadly ovate base and long foliaceous blade; floral bracts narrowly oblanceolate, 45 mm. long, attaining or slightly surpassing the middle of the sepals, the upper half coarsely laciniate-serrate; flowers up to 6 cm. long; pedicels short and indistinct; sepals oblong, entire, acute, 24 mm. long; petals ligulate, acute, 3 cm. long, connate for 12 mm., fleshy, glabrous or slightly puberulous at the apex; ovary 25 mm. long, obtusely trigonous.

TYPE LOCALITY: Vicinity of San José, Costa Rica.

DISTRIBUTION: Mexico, Salvador, Nicaragua, and Costa Rica.

4. *Bromelia Pinguin* L. Sp. Pl. 285. 1753.

Bromelia ignea Beer, Bromel. 35. 1857.

Agallostachys Pinguin Beer, Bromel. 36. 1857.

Karatas Pinguin Baker, Handb. Bromel. 25, as synonym. 1889.

Karatas Plumieri Devansaye; Baker, Handb. Bromel. 25, as synonym. 1889.

Leaves many, rosulate, often over 2 m. long, not at all constricted between the sheath and the blade; sheaths very broad, densely and coarsely tomentose-lepidote; blades linear, acuminate, 4 cm. wide, deep-green above, pale-green and very minutely pale-appressed-lepidote below, armed with stout teeth up to 10 mm. long; scape stout, white-farinose; scape-bracts foliaceous but with the sheaths roseate and subinflated; inflorescence many-flowered, narrowly pyramidal, white-farinose; primary bracts like the scape-bracts but the upper ones entire; branches up to 12-flowered; floral bracts linear-subulate from a short broad base, 3 cm. long; flowers up to 6 cm. long, distinctly pedicellate; sepals erect, very narrowly triangular-subulate, pale; petals 3 cm. long, 5.5–6 mm. wide, linear-elliptic, rose with white base and margins, densely white-tomentose at the apex; ovary slenderly ellipsoid, 2 cm. long; berry ovoid, about 35 mm. long, yellow or ochraceous, strongly verrucose, acidulous, aromatic.

TYPE LOCALITY: "Habitat in Jamaica, Barbados."

DISTRIBUTION: West Indies and Mexico, and southward to Panama and Guiana.

ILLUSTRATION: Redouté, L'il. *pl.* 396.

5. *Bromelia sylvestris* Willd.; Link. Enum. 1: 308. 1821.

Agallostachys sylvestris Beer, Bromel. 35. 1857.

Flowering plant nearly 1 m. high; leaves many in a dense rosette, about 1 m. long, not at all constricted between the sheath and the blade; sheaths large, ovate, lacinate-serrate near the summit, very densely white-tomentose-lepidote; blades linear, acuminate, pungent, armed with stout teeth 5 mm. long, glabrous and lustrous deep-green above, densely pale-appressed-lepidote below; scape stout, densely white-floccose; scape-bracts with inflated roseate sheath and spreading foliaceous coral-red blade; inflorescence subthyrsoid, often interrupted toward the base, densely white-floccose throughout; primary bracts like the scape-bracts but with smaller blades, the upper ones ovate, acute, entire; floral bracts narrowly triangular, flat, not at all subulate, shorter than the sepals, entire, thin; flowers up to 5 cm. long; pedicels very short and stout; sepals erect, lance-triangular, acute or obtuse, 15–18 mm. long; petals barely spreading at anthesis, lanceolate, obtuse, 25 mm. long, fleshy, blue or rose with white margin, glabrous or very scantily lepidote at the apex, connate for only 3 mm.; ovary cylindrical; berry subglobose, strongly verrucose, 2 cm. in diameter.

TYPE LOCALITY: Described from cultivation.

DISTRIBUTION: Vera Cruz, the Yucatan Peninsula, and Honduras.

ILLUSTRATION: Bot. Mag. *pl.* 2392.

6. *Bromelia Palmeri* Mez, in DC. Monog. Phan. 9: 40. 1896.

Flowering plant imperfectly known; leaves at least 5 dm. long, not at all constricted between the sheath and the blade; sheaths very large, covered with a membrane composed of coarse appressed scales; blades linear, acuminate, very rigid, 35 mm. wide, armed with large stout teeth, scantily lepidote above, densely below; scape short, slender; scape-bracts linear, acuminate, 13 cm. long, 6 mm. wide, lacinate-serrate, densely and coarsely brown-villous-lepidote toward the apex; inflorescence few-flowered, laxly and scantily paniculate, narrowly thyrsoid, 2 dm. long; primary bracts like the scape-bracts but smaller; branches extremely short, 2-flowered; floral bracts broadly ovate, triangular-acute, much shorter than the ovary, subentire; flowers strict, up to 55 mm. long; sepals subelliptic, rounded-mucronate, 12 mm. long, brown-puberulent, becoming glabrous with age; petals 3 cm. long, very short-connate, glabrous; ovary subclavate, 25 mm. long, ferruginous-puberulent, becoming glabrous.

TYPE LOCALITY: Manzanillo, Colima.

DISTRIBUTION: Known only from the type collection.

7. *Bromelia mucronata* Mez, Bull. Herb.

Boiss. II. 3: 131. 1903.

Leaves 1 m. long or more, not at all constricted between the blade and the sheath; blades linear, acuminate, pungent, armed with stout teeth 3 mm. long, glabrous and shiny above; scape slender, elongate, geniculate toward the summit; scape-bracts linear-lanceolate, small, serrate, coarsely villous-lepidote toward the apex; inflorescence many-flowered, broadly and laxly subthyrsoid, 3 dm. long, 11 cm. in diameter; primary bracts like the scape-bracts but less serrate, reflexed; branches well developed, elongate, laxly 4-flowered; floral bracts narrowly triangular, acuminate, much shorter than the ovary, entire or faintly crenulate; flowers suberect, slender, up to 55 mm. long; sepals erect, elliptic-oblong, broadly acute and mucronate, free, brown-furfuraceous; petals 3 cm. long, acute and mucronate, short-connate, flavous, slightly lepidote toward the apex; ovary slenderly cylindrical, slightly sulcate.

TYPE LOCALITY: La Correa, Guerrero.

DISTRIBUTION: Known only from the type collection.

EXCLUDED SPECIES.

BROMELIA HUMILIS Jacq. Reported from Mexico by Mez (in DC. Monog. Phan. 9: 26. 1896), but actually limited to Venezuela, Curaçao and Trinidad.

16. *GRAVISIA* Mez, in Mart. Fl. Bras. 3³: 180. 1891; 299. 1892.

Stemless plants with densely rosulate, linear, spinulose leaves. Scape central, large, its bracts entire. Inflorescence bipinnate or tripinnate, many-flowered. Sepals free, erect, asymmetric, short-mucronate. Petals free, erect, bearing 2 coarsely crenate or deeply incised scales near the base. Stamens included, the second series more or less connate with the petals. Pollen-grains with more than 5 pores. Ovary sessile, the epigynous tube conspicuous. Ovules many, caudate, borne on the upper half of the placenta.

Type species, *Bromelia exsudans* Lodd.

1. *Gravisia aquilega* (Salisb.) Mez, in Mart. Fl. Bras. 3³: 300, hyponym. 1892; in DC. Monog. Phan. 9: 173. 1896.

Bromelia aquilega Salisb. Parad. Lond. pl. 40. 1806.

Bromelia bracteata "Sw." Ait. Hort. Kew. ed. 2. 2: 201. 1811. Not *B. bracteata* Sw. 1788.

Bromelia exsudans Lodd. Bot. Cab. pl. 301. 1824.

Bromelia paniculigera "Sw." Reichenb. Ic. Exot. 3: 14. 1827-30. Not *B. paniculigera* Sw. 1788.

Billbergia capituligera Reichenb. Ic. Exot. 3: 14. 1827-30.

Tillandsia exsudans Desf. Cat. Hort. Par. ed. 3. 50. 1829. [Incorrectly attributed to Loddiges.]

Bromelia surinamensis Miq. Linnæa 18: 378. 1844.

Hoplophytum bracteatum K. Koch, Wochenschr. Gärtn. 3: 306, as to material cited, not as to name-bringing synonym. 1860.

Aechmea aquilega Griseb. Fl. Brit. W. Ind. 592. 1864.

Hohenbergia exsudans E. Morren, Belg. Hortie. 29: 352. 1879.

Bromelia capituligera E. Morren, Belg. Hortie. 29: 352. 1879. [Incorrectly attributed to Reichenb.]

- Aechmea Meyeri* Baker, Jour. Bot. 18: 16. 1880.
Aechmea exsudans Baker, Handb. Bromel. 44. 1889.
Aechmea chrysocoma Baker, Handb. Bromel. 44. 1889.
Hohenbergia chrysocoma E. Morren; Baker, Handb. Bromel. 44, as synonym. 1889.
Aechmea aquilegioides Kuntze, Rev. Gen. 698. 1891.
Gravisia chrysocoma Mez, in Mart. Fl. Bras. 3^a: 301. 1892.

Plant 1 m. high or more; leaves 10–15 dm. long, 5–10 cm. wide above the sheath; scape stout, densely farinose; inflorescence of 10–20 stipitate heads, interrupted-thyrsoïd, 4 dm. long, axes tomentulose-lepidote, becoming glabrous; primary bracts lanceolate, broad, reflexed, bright-pink, the lower much exceeding the axillary branches; floral bracts ovate, pungent, shorter than the sepals, broadly convex, carinate toward the apex, entire, coriaceous, glabrous; flowers 36 mm. long, glabrous; sepals 14 mm. long, pungent; petals mucronate, flavous; ovary 10 mm. long, trigonous.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica; Costa Rica; also in Tobago, Trinidad, Guiana, Venezuela, and northern Brazil.

ILLUSTRATIONS: Salisb. Parad. Lond. pl. 40; Bot. Cab. pl. 801; Reichenb. Ic. Exot. pl. 239, 240.

17. HOHENBERGIA Schultes, in R. & S. Syst.

Veg. 7: lxxi, 1251. 1830.

Stemless, usually epiphytic herbs. Leaves rosulate, with ligulate spinose blades. Scape well developed. Inflorescence bipinnate or tripinnate, composed of dense strobiliiform spikes. Floral bracts always present. Flowers perfect, sessile, compressed. Sepals nearly or quite free, distinctly asymmetric, mucronate. Petals suberect to spreading at anthesis, acute, nearly or quite free, each bearing 2 scales on the inner surface. Stamens shorter than the petals, the first series free, the second much connate with the petals. Pollen with 2 or 4 pores. Ovary wholly inferior, compressed and subulate, usually changing little in fruit. Ovules several in each cell, obtuse or caudate.

Type species, *Hohenbergia stellata* Schultes.

Floral bracts obtuse or very broadly acute, abruptly mucronate.

Spikes all sessile.

Spikes suberect to spreading, cylindric; mucro of the floral bracts 4 mm. long.

Spikes erect or ascending, ovoid; mucro of the floral bracts minute.

Spikes remote.

Spikes densely aggregated, at least toward the summit of the inflorescence.

Spikes, at least the lower ones, definitely stipitate.

Spikes blackish-brown-tomentose, dark-brown.

Spikes nearly or quite glabrous.

Floral bracts about 20 mm. long.

Floral bracts not over 13 mm. long.

Stipes about as long as the lower spikes.

Stipes always much shorter than the spikes.

Floral bracts even, dark-brown.

Floral bracts strongly nerved, stramineous.

Floral bracts acute or acuminate.

Floral bracts 2–3 cm. long.

Spikes subglobose; floral bracts squarrose.

Spikes slenderly ellipsoid or subcylindric; floral bracts strict or substrict.

Floral bracts not over 15 mm. long including the terminal mucro.

Mucro of the floral bracts not over 1 mm. long; spikes long-stipitate.

Mucro of the floral bracts 2–7 mm. long.

Lower spikes shorter than their stipes.

Lower spikes equaling or longer than their stipes.

Floral bracts tapering evenly from the broadest point to the dark apex; leaves acuminate.

Floral bracts distinctly contracted between the broadest point and the apex; leaves usually rounded-apiculate.

Scape-bracts shorter than the internodes; spikes subglobose.

Scape-bracts exceeding the internodes; spikes usually ellipsoid to short-cylindric.

Mucro much shorter than the base of the sepal.

Mucro nearly or quite as long as the base of the sepal.

Spikes sessile or subsessile and erect.

Spikes distinctly stipitate and somewhat spreading.

1. *H. negrilensis*.
2. *H. gnetacea*.
3. *H. polycephala*.
4. *H. eriostachya*.
5. *H. Urbaniana*.
6. *H. inermis*.
7. *H. Fawcettii*.
8. *H. Brittoniana*.
9. *H. stellata*.
10. *H. antillana*.
6. *H. inermis*.
11. *H. distans*.
12. *H. attenuata*.
13. *H. portoricensis*.
14. *H. penduliflora*.
15. *H. spinulosa*.
16. *H. caymanensis*.

1. *Hohenbergia negrilensis* Britton; L. B. Smith,
Proc. Am. Acad. 70: 151. 1935.

Flowering plant probably well over 1 m. high; leaves very large, rigidly coriaceous; blades ligulate, 15 cm. wide, rounded and triangular-apiculate, serrulate with spines barely 1 mm. long, glabrous above, densely pale-appressed-lepidote below; scape about 7 mm. in diameter; scape-bracts linear-lanceolate, acuminate, very densely imbricate, chartaceous, pale; inflorescence elongate-thyrsoid, densely bipinnate, more than 5 dm. long, 1 dm. in diameter; primary bracts like the scape-bracts, elongate, the lower three times as long as the axillary spikes, the upper about half as long as the spikes; spikes all sessile, suberect or spreading, cylindrical, up to 6 cm. long, 2 cm. in diameter; floral bracts 2-3 mm. long without the mucro, 5 mm. wide, very broadly acute or obtuse, obscurely nerved, bearing a mucro 4 mm. long at the apex; flowers 9 mm. long in fruit; sepals strongly asymmetric, about 5 mm. long, short-mucronate, pale-lepidote; ovary 3-angled, appressed-pale-lepidote.

TYPE LOCALITY: Vicinity of Negril, Jamaica.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Proc. Am. Acad. 70: *pl. 1, f. 7, 8.*

2. *Hohenbergia gnetacea* Mez, in Mart. Fl. Bras. 3³: 272. 1891.

Leaves unknown; scape stout, strongly angled, glabrous; scape-bracts erect, remote, broadly ovate, acute, subglabrous; inflorescence laxly bipinnate; primary bracts subspreading, broadly triangular, about 3 cm. long, equaling or exceeding the axillary spikes, glabrous; spikes remote, sessile, suberect, slenderly ovoid, acute, up to 25 mm. long; floral bracts suborbicular, obtuse, minutely apiculate, about 10 mm. long, equaling the sepals, strongly convex, rigid, glabrous; flowers strongly compressed; sepals triangular-ovate, acute, minutely mucronate, asymmetric, wing-carinate, 6 mm. long, free; ovary 4 mm. long; ovules borne near the top of the cell.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Known only from the type collection.

ILLUSTRATIONS: Mart. Fl. Bras. 3³: *pl. 60, f. 1*; Engler, Pflanzenreich 4³²: *f. 23.*

3. *Hohenbergia polycephala* (Baker) Mez, in DC.
Monog. Phan. 9: 133. 1896.

Aechmea polycephala Baker, Jour. Bot. 17: 164. 1879.

Aechmea pycnantha Baker, Handb. Bromel. 44. 1889.

Pothuava pycnantha Baker, Handb. Bromel. 44, as synonym. 1889.

Hohenbergia pycnantha Mez, in Mart. Fl. Bras. 3³: 273. 1891.

Leaves about 12 in a utriculate rosette, often over 1 m. long; sheaths narrow, subglabrous below, densely immersed-lepidote above; blades rounded with the point usually more or less aborted, 85 mm. wide, densely serrulate with teeth not over 1 mm. long; scape shorter than the leaves, very stout, soon glabrous except for tufts of floccose scales at the bases of the bracts; scape-bracts erect, densely imbricate, linear-lanceolate, acuminate, dentate, pungent, membranaceous, pale-brown; inflorescence densely bipinnate; axis floccose-lepidote, soon glabrous; primary bracts like the scape-bracts but entire, spreading to reflexed, the lower ones exceeding the spikes; spikes all sessile, ovoid, up to 45 mm. long, brown-tomentose-lepidote, soon glabrous; floral bracts broadly ovate, somewhat asymmetric, obtuse, short-mucronate, convex, about 12 mm. long, coriaceous, even; sepals triangular-ovate, asymmetric, 7 mm. long, acute, mucronate, carinate, soon glabrous; petals about 10 mm. long, linear, acute, white; ovary bialate, tomentose-lepidote; ovules obtuse, borne near the top of the cell.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica.

4. *Hohenbergia eriostachya* Mez, Symb. Ant. 2: 255. 1900.

Flowering plant at least 75 cm. high; leaves about 1 m. long; sheaths elliptic-ovate, large, densely lepidote with very minute immersed brown scales, brown; blades rounded with a broad

apiculate summit, 10 cm. wide, densely pale-appressed-lepidote throughout but especially below, armed with dark spines 3 mm. long but decreasing in size toward the leaf-apex; scape erect, elongate but much shorter than the leaves, 4–5 mm. in diameter, sulcate, soon glabrous; scape-bracts ovate, acute, chartaceous, the upper shorter than the internodes; inflorescence bipinnate with 20–30 spikes; primary bracts very narrowly triangular, mostly shorter than the stipes, entire; spikes all distinctly stipitate, broadly ellipsoid, 2 cm. long, the lower about the length of their stipes, the upper distinctly longer, densely tomentose with smoky-ferruginous scales; floral bracts erect, broadly ovate, obtuse, short-mucronate, 11 mm. long, exceeded by the sepals, 12 mm. wide, broadly convex, striate toward the apex; flowers strongly compressed; sepals strongly asymmetric, emarginate, mucronate, 5 mm. long, even, rigid, free; petals lance-linear, acute, 8 mm. long, each bearing 2 thick scales extending for most of their length and with a very narrow free margin; ovules obtuse.

TYPE LOCALITY: Between Lancaster and Moody's Gap, Jamaica, altitude 750 meters.
DISTRIBUTION: Jamaica.

5. *Hohenbergia Urbaniana* Mez, Symb. Ant. 2: 253. 1900.

Leaves usually over 1 m. long; sheaths distinct, elliptic, brown, densely punctulate with minute brown scales; blades 10 cm. wide, rounded-apiculate, rigid, spinulose with brown teeth 2 mm. long, glabrous above, densely pale-lepidote below; scape shorter than the leaves, stout, white-floccose but soon becoming glabrous; scape-bracts exceeding the internodes, elliptic, acute, entire, chartaceous; inflorescence densely bipinnate with about 9 spikes; axis glabrous, angled, sulcate; primary bracts ovate, entire, shorter than the spikes; spikes erect or ascending, cylindric, about 8 cm. long or sometimes twice as much, obtuse or acute, glabrous, the lower ones with short, strongly complanate stalks, the upper ones sessile and digitately glomerate; floral bracts erect, imbricate, broadly ovate, convex, short-mucronate, about 20 mm. long, shiny, prominently nerved near the margins and apex; flowers much compressed, distinctly exceeding the bracts; sepals lanceolate, asymmetric, short-mucronate, 10 mm. long, carinate, acute, rigidly coriaceous; petals linear-lanceolate, acute, 15 mm. long, each bearing 2 infundibuliform scales, these much produced upward along the petals; ovules obtuse; berry scarcely enlarged from the ovary; seeds small, clavate, obscurely striate.

TYPE LOCALITY: Vicinity of New Green, Manchester, Jamaica, altitude 660 meters.
DISTRIBUTION: Jamaica.

6. *Hohenbergia inermis* Mez, Repert. Sp. Nov. 12: 414. 1913.

Flowering plant over 1 m. long; leaves about 9 dm. long; sheaths scarcely wider than the blades; blades ligulate, 8 cm. wide, rounded with a pungent mucro, entire except for a few minute teeth near the base, stiffly coriaceous, pale-appressed-lepidote, concolorous; scape decurved, stout, much shorter than the leaves, white-furfuraceous at first, especially at the bases of the bracts; scape-bracts erect, slightly exceeding the internodes, lanceolate, furfuraceous; inflorescence hanging down outside the leaf-rosette, many-flowered, laxly bipinnate or the lowest branches occasionally bearing a small second spike at the base of the first, dense only at the apex, 4 dm. long, 22 cm. in diameter; primary bracts narrowly lanceolate, acuminate, the lower about equaling the spikes; uppermost spikes sessile, the lower on stout angled spreading stalks as long as they, slenderly cylindric, acute, 20-flowered, 40–55 mm. long and 23 mm. in diameter, subglabrous; floral bracts erect, ovate, broadly acute with a very short mucro, 13 mm. long, about equaling the sepals, coriaceous, strongly nerved, yellow, strongly convex; flowers subsessile, much compressed and bialate, 20 mm. long, white; sepals asymmetric, lance-oblong, 8 mm. long with a minute mucro; petals acute, 14 mm. long, 3 mm. wide, lance-oblong, each bearing 2 infundibuliform scales with flaring mouths produced upward along the petal, the scales situated just below the middle of the petal; ovules obtuse.

TYPE LOCALITY: Vicinity of Darliston, Jamaica, altitude 400 meters.
DISTRIBUTION: Jamaica.

7. *Hohenbergia Fawcettii* Mez, Symb. Ant. 2: 254. 1900.

Leaves 1 m. or longer; sheaths very large, brown, very densely and minutely brown-punctulate-lepidote; blades broadly rounded and emarginate with a subpungent apiculus, up to 1 dm. wide, rigidly coriaceous, soon glabrous above, densely and minutely pale-lepidote below, serrulate with teeth 1 mm. long; scape shorter than the leaves, green, glabrous; scape-bracts entire, coriaceous, pungent, floccose; inflorescence bipinnate, of 15-40 spikes; axis floccose; primary bracts like the scape-bracts, equaling or slightly shorter than the spikes; spikes spreading, narrowly ellipsoid to cylindrical, 3-5 cm. long, three times as long as their stipes, glabrous; floral bracts very broadly ovate, obtuse with a minute mucro, strongly convex, rigid, even, dark-brown, shiny, shorter than the sepals; flowers 10-12 mm. long without the petals; sepals strongly asymmetric, emarginate, minutely mucronate, of the same texture and surface as the bracts.

TYPE LOCALITY: Near Chester Vale, Jamaica, altitude 1000 meters.

DISTRIBUTION: Jamaica.

8. *Hohenbergia Brittoniana* L. B. Smith, Contr.

Gray Herb. 98: 8. 1932.

Leaves up to 5 dm. long, densely and minutely lepidote throughout; blades ligulate, 7-8 cm. wide at the base, minutely spinulose-serrate, broadly rounded and apiculate at the apex; inflorescence laxly bipinnate, glabrous, 3 dm. long or more; primary bracts narrowly lanceolate, about equaling the stipes; spikes all slenderly stipitate, up to 8 cm. long, 12 mm. in diameter, 40-50-flowered; floral bracts broadly ovate, broadly acute or obtuse, mucronate, much shorter than the sepals, stramineous, strongly nerved; flowers much compressed, 9 mm. long without the petals; sepals asymmetric, nerved, 5 mm. long; ovules not known.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATIONS: Contr. Gray Herb. 98: pl. 1, f. 12-14.

9. *Hohenbergia stellata* Schultes, in R. & S. Syst.

Veg. 7: 1251. 1830.

Hohenbergia erythrostachys Brongn. Ann. Imp. Soc. Hort. 45: July 1854; Rev. Hortie. IV. 4: 244 1855.

Pironneava roseo-caerulea K. Koch, Wochenschr. Gärtn. 4: 189. 1861.

Aechmea glomerata Hook. f. Bot. Mag. pl. 5668, excl. syn. 1887.

Pironneava Morreniana Regel, Gartenflora 23: 257. 1874.

Aechmea oligosphaera Baker, Handb. Bromel. 48. 1889.

Aechmea longisepala Baker, Handb. Bromel. 48. 1889.

Hohenbergia oligosphaera Mez, in DC. Monog. Phan. 9: 124. 1896.

Aechmea oligosepala Durand & Jacks. Ind. Kew. Suppl. 1: 12. 1902. Error.

Plant often 1 m. high; leaves many in a crateriform rosette, 7-11 dm. long, firm, minutely pale-appressed-lepidote; sheaths large, broadly elliptic; blades ligulate, abruptly acute or obtuse, apiculate, 75 mm. wide, laxly serrate, the teeth up to 3.5 mm. long; scape erect, stout; scape-bracts erect, densely imbricate, ovate, membranaceous, red or stramineous; inflorescence equaling or exceeding the leaves, tripinnate, dense toward the apex, interrupted below; axis flocculose near the nodes; primary bracts like the scape-bracts, spreading or reflexed, shorter than the axillary branches; upper branches simple, very short, the lower up to 4 cm. long with 2 or 3 spikes fasciculate at the end; spikes subglobose, 4 cm. long; floral bracts with suborbicular or broadly ovate base contracted into a long acuminate apex, squarrose, 2-3 cm. long, obscurely denticulate, coriaceous, prominently nerved, purple when fresh; sepals triangular, acute, carinate, glabrous, 15-18 mm. long, the posterior ones distinctly longer than the anterior; petals 2 cm. long, bearing 2 elongate scales, the blade elliptic, acute, violet-purple; anthers acute; ovary strongly compressed, glabrous.

TYPE LOCALITY: State of Bahia, Brazil.

DISTRIBUTION: Martinique; also in Tobago, Trinidad, Venezuela, and northern Brazil.

ILLUSTRATIONS: Jour. Imp. Soc. Hort. July 1854; Bot. Mag. pl. 5668; Rev. Hortie. 41: 217; Gartenflora 23: pl. 80; Proc. Am. Acad. 68: pl. 1, f. 8; 70: pl. 1, f. 9; Engler, Pflanzenreich 4²: f. 22.

10. *Hohenbergia antillana* Mez, in DC. Monog.
Phan. 9: 137. 1896.

Leaves 1 m. long or longer; sheaths scarcely broader than the blades, densely and minutely pale-appressed-lepidote on both sides; blades ligulate, broadly acute or rounded, terminating in a stout dark-brown pungent mucro, up to 12 cm. wide, armed with stout dark-brown teeth 2.5 mm. long; scape erect, very stout, densely white-farinose; scape-bracts erect, densely imbricate, lanceolate, acuminate, sparsely serrate, pale, subchartaceous, white-farinose; inflorescence bipinnate, dense toward the apex, ellipsoid, shorter than the leaves, 2-3 dm. long, white-farinose throughout; axis very stout, straight, sulcate; primary bracts like the scape-bracts but entire, exceeding the lower spikes; spikes slenderly ellipsoid or subcylindric, 15-20-flowered, 5-8 cm. long, the lower ones with very thick stipes up to 2 cm. long, the upper sessile; floral bracts strict or substrict, broadly triangular-ovate, acuminate, pungent, 25 mm. long, equaling or exceeding the flowers, coriaceous, prominently striate; sepals strongly asymmetric, lance-ovate, wing-keeled, mucronate, 10-12 mm. long; petals 16 mm. long, white, the claw linear, the blade lanceolate, acute; ovary suborbicular; ovules obtuse, borne along the whole length of the cell; berry much enlarged from the ovary.

TYPE LOCALITY: In woods near Bayamon, Porto Rico.

DISTRIBUTION: Porto Rico.

11. *Hohenbergia distans* (Griseb.) Baker,
Refug. Bot. 4: pl. 284. 2. 1871.

Aechmea distans Griseb. Fl. Brit. W. Ind. 592. 1864.

Leaves up to 7 dm. long; sheaths indistinct, scarcely broader than the blades, densely punctulate-lepidote above, covered with a membrane of dark appressed scales below; blades linear-ligulate, broadly rounded with a rigid apiculus, up to 9 cm. wide, armed with minute very remote teeth or practically entire; scape decurved, shorter than the leaves, slender, scantily brown-puberulous; scape-bracts erect, imbricate, lanceolate, acuminate, entire, membranaceous; inflorescence very laxly bipinnate, subpyramidal, exceeding the leaves; primary bracts like the scape-bracts, shorter than the stipes, spreading or reflexed; branches spreading, up to 12 cm. long, their sterile bases twice to ten times longer than the spikes; spikes slenderly ellipsoid, acute, 10-flowered, 3 cm. long, 17 mm. in diameter, glabrous; floral bracts broadly ovate, acuminate, 15 mm. long including the elongate mucro, prominently nerved; flowers 18 mm. long; sepals strongly asymmetric, 6 mm. long including the terminal mucro; petals narrowly oblong, acute, 12 mm. long, white or greenish when dry; second series of stamens much connate with the petals; ovary 5 mm. long, angled, barely constricted at the summit, the epigynous tube lacking; ovules obtuse, borne along the upper half of the cell.

TYPE LOCALITY: Near the Dolphin, Jamaica.

DISTRIBUTION: Jamaica.

12. *Hohenbergia attenuata* Britton; Britton & Wilson,
Sci. Surv. Porto Rico 5: 134. 1923.

Flowering plant over 6 dm. high; leaves ligulate, up to 6 dm. long, 3-6 cm. wide, subcoriaceous, minutely lepidote beneath, serrate with fine brown teeth, 1-1.5 mm. long and averaging about 6 mm. apart, acuminate, terminating in an elongate dark-brown horny mucro; scape erect, much shorter than the leaves, 5-6 mm. in diameter, glabrous at least in age; scape-bracts erect, densely imbricate, narrowly lanceolate, acuminate, chartaceous, pungent, spinulose; inflorescence bipinnate, thyrsoid, 1-3 dm. long, 6-7 cm. in diameter, dense at the apex, interrupted toward the base; primary bracts like the scape-bracts, much indurated toward the apex, the lower serrulate and much exceeding the spikes, the upper entire and shorter than the spikes; spikes broadly ellipsoid, 2-3 cm. long, short-stalked or sessile; floral bracts ovate-lanceolate, evenly acuminate into a broad flat dark-brown spine, 10-14 mm. long; sepals strongly asym-

metric, 5 mm. long including the short mucro, sparsely lepidote with pale appressed scales; ovary much enlarged in fruit, sparsely lepidote; seeds fusiform, 2 mm. long.

TYPE LOCALITY: Vicinity of Río Icaco, Sierra de Naguabo, Porto Rico, altitude 465-720 meters.
DISTRIBUTION: Porto Rico.

13. *Hohenbergia portoricensis* Mez, in DC.

Monog. Phan. 9: 136. 1896.

Leaves 5-8 dm. long; sheaths subelliptic, barely distinct from the blades, violet toward the apex, densely lepidote with pale-brown appressed scales; blades ligulate, rounded and triangular-apiculate, 5 cm. wide, serrulate with teeth barely 1 mm. long, glabrous above, appressed-lepidote below; scape about 3 mm. in diameter, white-floccose when young but soon glabrous; scape-bracts ovate-lanceolate, erect, shorter than the internodes, pungent, sparsely serrulate; inflorescence equaling or slightly exceeding the leaves, rather laxly bipinnate, 2 dm. long, sparsely white-floccose; primary bracts like the scape-bracts but entire, slightly shorter than the spikes; spikes spreading, about 12-flowered, subglobose, the upper sessile, the lower on stalks about equaling them; floral bracts ovate, acuminate, 15 mm. long including the mucro, equaling the sepals, prominently striate; sepals 6-7 mm. long including the stout brown mucro; petals linear-lanceolate, acute, 11 mm. long, each bearing 2 long scales with very narrow free margins; ovary subglobose, glabrous, with a shallow epigynous tube; ovules borne at the top of the cell, obtuse; berry slightly enlarged from the ovary; seeds subellipsoid, 2-2.5 mm. long, purplish.

TYPE LOCALITY: Sierra de Naguabo, Porto Rico.
DISTRIBUTION: Porto Rico.

14. *Hohenbergia penduliflora* (A. Rich.) Mez, in DC.

Monog. Phan. 9: 135. 1896.

Pitcairnia penduliflora A. Rich. in Sagra, Hist. Cuba 11: 262. 1850.

Aechmea Wrightii Baker, Jour. Bot. 17: 163. 1879.

Aechmea virens Brongn; Baker, Handb. Bromel. 45. 1889.

Hohenbergia ferruginea "Carr." Mez, in DC. Monog. Phan. 9: 138. 1896. Not *H. ferruginea* Carr. 1881.

Hohenbergia virens Mez, in Engler, Pflanzenreich 4²²: 87. 1934.

Plant rather variable; leaves 5-10 dm. long; sheaths indistinct, densely brown-punctulate-lepidote on both sides; blades linear-ligulate, broadly rounded with a broad triangular apiculus, up to 12 cm. wide, pale-lepidote on both sides, becoming glabrous above, serrate with teeth up to 2 mm. long or sometimes subentire; scape more or less arching, floccose, often becoming glabrous; scape-bracts erect, imbricate, lanceolate, acuminate, entire, pale, chartaceous; inflorescence bipinnate, cylindric, dense at least toward the apex, 2-4 dm. long, equaling or exceeding the leaves, more or less floccose-lepidote; primary bracts like the scape-bracts, the lower ones usually exceeding the spikes; spikes spreading or reflexed, ellipsoid or subcylindric, 15-45 mm. long, at least the lower ones distinctly stipitate; stipes 1.5-3 mm. in diameter, from very short to 15 mm. long; floral bracts broadly ovate, acuminate, 7-15 mm. long, prominently striate, stramineous when dry; flowers up to 17 mm. long; sepals strongly asymmetric, mucronate, 4-8 mm. long, carinate; petals linear-lanceolate, acuminate, 12 mm. long, white, each bearing 2 infundibuliform scales; ovary compressed; ovules obtuse, borne near the apex of the cell; berry subglobose.

TYPE LOCALITY: Cuba.
DISTRIBUTION: Cuba and Jamaica.

15. *Hohenbergia spinulosa* Mez, Symb. Ant. 2: 253. 1900.

Leaves about 1 m. long, rigidly coriaceous, concolorous; sheaths narrowly ovate, scarcely distinct, densely and finely brown-lepidote above, pale-lepidote beneath; blades 10-12 cm. wide, glabrous above, densely punctulate-lepidote below, rounded with a stout horny black persistent or sometimes aborting mucro, remotely serrulate, the teeth 2 mm. long, brown, decreasing in

size toward the apex; scape erect, slender, probably much concealed by the leaves, densely white-farinoso at first, becoming glabrous; scape-bracts narrowly lanceolate, acuminate, much longer than the internodes, chartaceous, stramineous, the upper spreading or reflexed; inflorescence many-flowered, probably shorter than the leaves, very dense, slenderly ellipsoid or sub-cylindric, bipinnate; axis white-tomentose; primary bracts like the scape-bracts, exceeding all but the uppermost spikes; spikes ellipsoid, many-flowered, glabrous, 18–22 mm. long, sessile or the lowest with extremely short stalks; floral bracts ovate, 15 mm. long, terminating in a slender pungent mucro as long as the base, stramineous, the base shorter than the sepals and the mucro equaling or exceeding them; sepals strongly asymmetric, coriaceous, 7.5 mm. long including the mucro which is as long as the base, free, ecarinate; petals linear-lanceolate, 13 mm. long, 2.5 mm. wide, mucronate, green, each bearing 2 infundibuliform scales with lacerate margins about one third up from the base; anthers mucronate; pollen ellipsoid, biporate; ovules obtuse, borne at the top of the cell; berry scarcely enlarged from the ovary; seeds brown, clavate, longitudinally striate.

TYPE LOCALITY: Between New Green and Manchester, Jamaica, altitude 660 meters.
DISTRIBUTION: Jamaica.

16. *Hohenbergia caymanensis* Britton; L. B. Smith,
Proc. Am. Acad. 70: 150. 1935.

Leaves large, about 8 cm. wide, broadly rounded and apiculate, serrulate with teeth scarcely 1 mm. long, minutely brown-punctulate throughout; scape 8 mm. in diameter, densely ferruginous-lepidote with ferruginous scales; scape-bracts imbricate, linear-lanceolate, membranaceous, lepidote, minutely serrulate; inflorescence rather laxly bipinnate, 4 dm. long, ferruginous-lepidote; primary bracts like the scape-bracts, the lower ones much longer than the spikes; spikes densely ellipsoid, 3 cm. long, all stipitate, the lower ones for 2 cm.; floral bracts 12 mm. long, with a mucro as long as the triangular-ovate base, strongly nerved, the upper ones sterile; flowers 14 mm. long; sepals free, 6 mm. long, strongly asymmetric, mucronate with a spine as long as the base; petals blue when dry, oblong-lanceolate, acute, 10 mm. long, each bearing 2 infundibuliform scales much produced upward along the petal; stamens included, the second series highly connate with the petals; ovule obtuse.

TYPE LOCALITY: Grand Cayman.
DISTRIBUTION: Known only from the type locality.
ILLUSTRATIONS: Proc. Am. Acad. 70: pl. 1, f. 5, 6.

18. *ARAEOCOCCUS* Brongn. Ann. Sci. Nat. II. 15: 370. 1841.

Low herbs, mostly epiphytic. Leaves appressed-lepidote. Inflorescence laxly paniculate, scapose. Flowers small, inconspicuous. Sepals connate for half their length, rounded, glabrous. Petals free, reflexed at anthesis, naked. Stamens shorter than the petals; filaments free; anthers longer than the filaments; pollen-grains ellipsoid with a pore at each end. Ovary terete, glabrous; epigynous tube none. Style longer than the petals, the stigma-lobes scarcely twisted. Ovules few (up to 10), borne at the top of the cell, long-caudate. Seeds narrowly ovoid-cylindric, acute at both ends.

Type species, *Araeococcus micranthus* Brongn.

1. *Araeococcus pectinatus* L. B. Smith, Contr.
Gray Herb. 95: 41. 1931.

Plant very slender, nearly 1 m. high, producing stolons at the base; leaves linear, 70 cm. long, acute, fasciculate; sheaths narrowly ovate, large; blades remotely spinose-serrate, constricted at the base, the inner ones channeled, 50 cm. long and 2 cm. wide, the outer ones much reduced and shorter than the sheaths; scape slender, elongate; scape-bracts narrow, membranaceous, the lower longer than the internodes; inflorescence glabrous, few-branched, brilliant-red, 15–22 cm. long; primary bracts small, ovate, acuminate, membranaceous, spreading; spikes elongate, many-flowered, 1 cm. broad, erect; rhachis flexuous, sulcate; floral bracts ovate, acute

or mucronulate, strongly pectinate, 7 mm. long, concealing the flowers, auricled, reflexed; flowers sessile; berry broadly ovoid, 5 mm. long; seeds few, ovoid, curved.

TYPE LOCALITY: Pozo Azul de Pirris, Pacific foot-hills, Costa Rica, altitude 95 meters.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Contr. Gray Herb. 95: *pl. 11, f. 6*.

19. WITTMACKIA Mez, in Mart. Fl. Bras. 3³: 180, 274. 1891.

Large showy herbs. Leaves rosulate, abruptly acute or rounded, closely serrate. Scape central, often decurved, its bracts membranaceous. Inflorescence laxly bipinnate, composed of several elongate, laxly polystichous-flowered spikes. Floral bracts minute, acuminate. Flowers sessile. Sepals nearly or quite free, mucronate, the right side extended into a broad membranaceous wing. Petals free, acute, recurved at anthesis, naked. Anthers naked. Ovary glabrous, sessile, the epigynous tube short. Style longer than the stamens. Ovules borne along the upper half of the cell, obtuse. Fruit dry, scarcely changed from the ovary. Seeds many, curved, obtuse, naked.

Type species, *Bromelia lingulata* L.

1. *Wittmackia lingulata* (L.) Mez, in Mart. Fl. Bras. 3³: 275. 1891.

Bromelia lingulata L. Sp. Pl. 285. 1753.

Billbergia odora Miq. Linnaea 18: 377. 1844.

Hoplophytum lingulatum Beer, Bromel. 139. 1857.

Lamprococcus ramosus Beer, Bromel. 106. 1857.

Aechmea surinamensis Van Houtte; Beer, Bromel. 106. 1857.

Chevalliera lingulata Griseb. Fl. Brit. W. Ind. 591. 1864.

Hohenbergia odora Baker, Refug. Bot. *pl. 284*. 3. 1871.

Aechmea lingulata Baker, Jour. Bot. 17: 164. 1879.

Aechmea odora Baker, Jour. Bot. 17: 226. 1879.

Aechmea Plumieri Baker, Handb. Bromel. 50. 1889.

Leaves up to 13 dm. long; sheaths elliptic, very large; blades ligulate, 5–10 cm. wide, rounded-apiculate, finely spinose-serrate; scape slender, at first light-floccose, later glabrous; scape-bracts lanceolate, acuminate, entire or sparingly fine-dentate, bright-red; inflorescence ample, its branches 9–25 cm. long, suberect to spreading and often arching; primary bracts like the scape-bracts, much shorter than the axillary branches, spreading; floral bracts narrowed from a broadly ovate base into a bristle-like point, about equaling the ovary; flowers 12–18 mm. long; sepals 3 mm. long without the mucro, glabrous; petals 7–10 mm. long; stamens shorter than the petals, anthers mucronate; ovary ellipsoid-cylindric to clavate, 7 mm. long; fruit white or red.

TYPE LOCALITY: Tropical America.

DISTRIBUTION: Porto Rico and Lesser Antilles; Costa Rica; also in Trinidad, Guiana, and northern Brazil.

ILLUSTRATIONS: Plumier, Pl. Am. *pl. 64, f. 1*; Bot. Mag. *pl. 8056*; Engler, Pflanzenreich 4²: *f. 24*.

20. ANDROLEPIS Brongn.; Houlet, Rev. Hortic. 42: 12. 1870.

Large showy epiphytic herbs. Leaves rosulate, spinose-serrate. Scape central, erect. Inflorescence compound with simple, reduced, or divided branches. Spikes polystichous-flowered. Flowers perfect, sessile. Sepals free, asymmetric, mucronate. Petals short-conate, naked. Stamens included; filaments short, adnate; anthers each bearing 2 foliaceous appendages at the apex. Ovary wholly inferior; epigynous tube short. Ovules numerous, borne along the upper part of the cell, acute.

Type species, *Pothuava Skinneri* K. Koch.

Branches of the inflorescence very short; flowers subs fasciculate.

1. *A. Skinneri*.

Branches of the inflorescence well developed and the lower ones often divided.

2. *A. Donnell-Smithii*.

1. *Androlepis Skinneri* (K. Koch) Brongn.; Houliet,
Rev. Hort. 42: 12. 1870.

Pothuava Skinneri K. Koch, Wochenschr. Gärtn. 4: 190. 1861.

Billbergia Skinneri K. Koch, Wochenschr. Gärtn. 4: 190. 1861.

Aechmea leucostachys Baker, Handb. Bromel. 39. 1889.

Aechmea Skinneri Baker, Handb. Bromel. 49. 1889.

Leaves up to 20, 6 dm. long; sheaths large, suborbicular, dark-brown, very closely and finely brown-lepidote; blades ligulate, acute or acuminate, 5-8 cm. wide, glabrous above, closely and finely pale-lepidote beneath, densely spinulose-serrate; scape up to 3 dm. long, stout, white-farinose; scape-bracts large, imbricate, elliptic, acute, pungent, spinulose-serrate, stramineous, the lower erect, the upper with their upper halves deflexed; inflorescence laxly compound, subcylindric, 2 dm. long, 3 cm. in diameter; primary bracts linear-triangular, acuminate, entire, membranaceous, farinose, the lowest exceeding the axillary branches; branches very short, suberect, subglobose 1-5-flowered; floral bracts minute, sometimes wanting; flowers up to 2 cm. long; sepals broadly triangular with a large wing, 5 mm. long, strongly convex, thick, coriaceous, green, farinose; petals erect at anthesis, elliptic, 1 cm. long, flavous; ovary stoutly ovoid or cylindric, much enlarged in fruit.

TYPE LOCALITY: Described from cultivation and doubtfully referred to Mexico.

DISTRIBUTION: Guatemala.

ILLUSTRATIONS: Hook. Ic. pl. 1851; Engler, Pflanzenreich 4²²: f. 20; Rev. Hort. 42: f. 1.

2. *Androlepis Donnell-Smithii* (Baker) Mez, in DC.
Monog. Phan. 9: 161. 1896.

Aechmea Donnell-Smithii Baker, Jour. Bot. 28: 305. 1890.

Plant over 1 m. high; leaves imperfectly known, certainly 1 m. long; blades ligulate, acute or acuminate, 4-8 cm. wide, flat, involute-pungent, densely serrate with spines up to 3 mm. long, glabrous above, finely pale-lepidote beneath between the nerves; scape 1 cm. or more in diameter, over 4 dm. long, buff-furfuraceous; scape-bracts lanceolate, acute, much longer than the internodes, membranaceous toward the base, much thickened and coriaceous toward the apex, pungent, densely and closely pale-lepidote; inflorescence amply compound, usually dense, narrowly pyramidal or cylindric, 3-6 dm. long, up to 15 cm. in diameter at the base, furfuraceous; primary bracts linear, membranaceous, deflexed, the lowest ones often longer than the axillary branches, the upper much reduced; branches spreading, well developed, the lower ones usually divided; spikes distinctly longer than broad, usually lax, 4-5-flowered; floral bracts minute, shorter than the ovary, ovate or triangular, acuminate, pungent; flowers suberect, up to 14 mm. long; sepals broadly triangular with a large wing, 5-6 mm. long, thick, coriaceous, strongly convex, soon glabrous; petals elliptic, 1 cm. long; stamens slightly shorter than the petals; ovary usually not much enlarged in fruit.

TYPE LOCALITY: Rfo Dolce, Dept. Livingston, Guatemala, near sea-level.

DISTRIBUTION: Guatemala, Honduras, and Costa Rica.

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