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HANDBOOK OF THE BROMELIACEÆ.

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# HANDBOOK

OF

# THE BROMELIACEÆ.

BY

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FIRST-ASSISTANT IN THE HERBARIUM OF THE ROYAL GARDENS, KEW.



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## PREFACE.

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THE present Handbook is uniform with those which I have already published on the FERN-ALLIES and AMARYLLIDÆ, and I hope to complete the series with a similar Handbook of the IRIDÆ, having dealt with the much larger order LILIACEÆ in another form in the 'Journal of the Linnean Society,' in eight papers, beginning in 1870 and ending in 1880. The material on which it is founded is as follows, *viz.*:—

1. The living collection at Kew, which for many years has contained from 150 to 200 species, which I worked through to prepare a Catalogue which was printed in the Kew Report for 1878.

2. The dried collections at Kew and the British Museum, which, taken together, contain specimens of about half the known species. During the last ten years our Kew collection has doubled in bulk, mainly through the contributions of our indefatigable correspondent, Dr. Glaziou, of Rio Janeiro. Founded on this material, I have published papers in the 'Journal of Botany' on ÆCHMEA, PITCAIRNIA, and the TILLANDSIÆ.

3. In 1887 the Bentham Trustees purchased and presented to the Kew Library the magnificent series of water-colour drawings collected by the late Prof. Edouard Morren, of Liège, who was universally and deservedly regarded for the twenty years previous to his death, in 1885, as the highest authority on the plants of this order. The collection contains

250 drawings, illustrating above 200 species, the drawings with very few exceptions being made from living cultivated plants, and accompanied by dissections and notes, which latter, however, did not reach Kew till late in 1888, after this Handbook was all written out.

4. The BROMELIACEÆ of the Berlin Herbarium, which, through the kind intervention of Dr. Urban, I had on loan for several weeks for leisurely study at Kew last year.

5. The Paris Herbarium, which I went through rapidly during a holiday visit to Paris in the autumn of 1888.

The present Handbook contains descriptions, more or less complete, of above 800 species, which is more than double Mr. Bentham's estimate of the number of species known in 1883. No doubt this is far short of the number that will ultimately be found. During the last year M. André has added 60 new species from his own gatherings in New Granada and Ecuador; and Dr. Wittmack about twenty from the collections of Consul Lehmann.

Handbooks of this kind only return to the author a small proportion of the expense of printing them; and I have further to thank the Bentham Trustees for a grant towards the expense of this one; and I also feel much indebted to Dr. Trimen and Mr. James Britten for giving me the opportunity of publishing in the 'Journal of Botany' the papers to which I have already referred.

J. G. BAKER.

KEW HERBARIUM,

*August 17th, 1889.*

## KEY TO THE GENERA.

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Tribe I. BROMELIÆ.—Ovary inferior. Fruit indehiscent. Leaves nearly always spine-margined.

\* *Petals united in a distinct tube, which is usually as long as the calyx-limb.*

1. KARATAS.—Inflorescence a central capitulum. Leaves sessile. Stigmas twisted.—*Tropical America.*

2. GREIGIA.—Inflorescence a lateral cluster. Leaves sessile. Stigmas short, not twisted.—*Subtemperate Chili.*

3. DISTIACANTHUS.—Inflorescence a central capitulum. Leaves petioled, with a broad blade. Stigmas linear.—*Columbia & Amazon Valley.*

\*\* *Petals free or joined only at the very base.*

† *Sepals united in a distinct tube above the cyathiform apex of the ovary.*  
† *Inflorescence capitate.*

4. CRYPTANTHUS.—Capitulum central. Petals white, spreading widely. Leaves sessile.—*Brazil, Guiana.*

5. DISTEGANTHUS.—Capitulum lateral. Petals yellow, spreading widely. Leaves petioled.—*Guiana.*

6. ORTGIESIA.—Capitulum or spike central. Petal-blade small. Leaves sessile. Fruit small.—*Uruguay & South Brazil.*

7. OCHAGAVIA.—Capitulum central. Petal-blade small. Leaves rigid, lanceolate. Fruit small, compressed.—*Juan Fernandez.*

†† *Inflorescence a central panicle or spike.*

8. FERNSEEA.—Petals little longer than the sepals. Stigmas long, twisted. Leaves ensiform.—*Central Brazil.*

9. RONNBERGIA.—Petals much longer than the sepals, spreading only at the tip. Leaves petioled, oblong, without spines.—*New Granada.*

10. PORTEA.—Petals much longer than the mucronate sepals, spreading widely. Stigmas long, twisted. Leaves lorate or ensiform, spine-edged.—*Brazil.*

†† *Sepals free quite or nearly to the cyathiform apex of the ovary.*

\* *Stigmas short, not twisted.*

11. ANANAS.—Inflorescence terminal on a short peduncle, strobiliform. Fruits concrete with the bracts into a large fleshy syncarpium.—*Through Tropical America.*

12. ACANTHOSTACHYS.—Inflorescence spicate, strobiliform, lateral on a long stem. Fruits not concrete.—*Central Brazil.*

13. BROMELIA.—Inflorescence a dense panicle. Leaves numerous, ensiform. Fruits large, pulpy, distinct.—*Through Tropical America.*

14. RHODOSTACHYS.—Inflorescence a central capitulum. Fruits large, pulpy, distinct. Leaves numerous, ensiform.—*Subtemperate Chili & Argentina.*

15. AREOCOCCUS.—Inflorescence a lax panicle. Leaves few, lorate. Berry the size of a small pea.—*Guiana & Amazon Valley.*

\*\* *Stigmas long, twisted.*

16. STREPTOCALYX.—Inflorescence paniced. Sepals mucronate, much twisted. Petals much longer than the sepals, not scaled at the base.—*Brazil & Guiana.*

17. ÆCHMEA.—Inflorescence paniced or spicate. Sepals and flower-bracts usually coriaceous and mucronate. Petals usually not much longer than the sepals, scaled at the base.—*Through Tropical America.*

18. BILLBERGIA.—Inflorescence paniced or spicate. Sepals and flower-bracts not mucronate. Petals much longer than the sepals, scaled at the base, with filaments attached to their base.—*Tropical South America.*

19. QUESNELIA.—Inflorescence spicate, usually strobiliform. Sepals obtuse. Petals twice as long as the sepals, with stamens attached half-way up.—*Brazil & Guiana.*

Tribe II. PITCAIRNIEÆ.—Fruit a 3-valved capsule. Seeds not furnished with a funiculus that splits up into fine threads. Leaves with or without prickles.

\* *Capsule free only near the tip.*

20. BROCCINIA.—Petals not longer than the sepals. Leaves lorate, glabrous, entire.—*Guiana & Brazil.*

21. BAKERIA.—Petals much longer than the sepals. Leaves ensiform, acuminate, lepidote.—*Columbia.*

\*\* *Capsule free, except near the base.*

22. PITCAIRNIA.—Petals much longer than the sepals. Capsule septicidally 3-valved.—*Throughout Tropical America.*

\*\*\* *Capsule entirely superior.*

23. PUYA.—Capsule loculicidally 3-valved. Style long, entire.—*Chili & Andes of Peru & Columbia.*

*Capsule septicidally 3-valved. Styles short.*

24. COTTENDORFIA.—Flowers hermaphrodite. Leaves long, thin, entire.—*Brazil & Argentina.*

25. *DYCKIA*.—Flowers hermaphrodite. Leaves thick, rigid, margined with hooked pungent prickles.—*Brazil, Uruguay, Argentina*.

26. *HECHTIA*.—Flowers subdioicous. Leaves as in *Dyckia*.—*Mexico, Texas*.

Tribe III. *TILLANDSIEÆ*.—Fruit always a 3-valved entirely superior capsule. Seeds furnished with a long funiculus that breaks up into filiform threads. Leaves always without marginal prickles.

\* *Corolla gamopetalous*.

27. *SODIROA*.—Calyx with a long tube. Leaves spaced out.—*Ecuador, Columbia*.

28. *CARAGUATA*.—Calyx with a short tube. Leaves rosulate. Anthers free.—*West Indies, Guiana, Andes*.

29. *GUZMANIA*.—Calyx with a short tube. Leaves rosulate. Anthers syngenesious.—*Tropical America*.

\*\* *Corolla polypetalous*.

30. *CATOPSIS*.—Appendage of the seeds large and flattened; funiculus short.—*Tropical America*.

31. *TILLANDSIA*.—Appendage of the seeds a small mucro; funiculus long.—*Tropical & Subtropical America*.



# HANDBOOK OF BROMELIACEÆ.

## Tribe I.—BROMELIÆ.

### 1. KARATAS (*Plum.*) *Adans.*

*Sepals* free down to the ovary, lanceolate or oblong-lanceolate. *Petals* united in a distinct tube; segments lingulate or ovate, not scaled at the base. *Stamens* inserted in the corolla-tube, not reaching to the tip of the segments; filaments filiform, inserted near the base or at the middle of the back of the linear anthers. *Ovary* inferior, 3-celled; ovules numerous, horizontal; style long, filiform; stigmas adpressed, more or less twisted. *Fruit* baccate. *Seeds* globose, not appendiculate.—*Leaves* ensiform, lanceolate, or lorate from a dilated base, margined with large or small prickles. *Flowers* many, arranged in a dense globose usually sessile capitulum, each subtended by a bract and the shortened inner leaves that surround the capitulum usually bright-coloured. *Corolla* red, violet, or white.

Subgenus KARATAS PROPER.—Petals shortly united at the base. Filaments long, inserted at the back of the anther near its base. Leaves long, ensiform, with large pungent marginal spines.

Capitulum nearly sessile . . . . .	Sp. 1-4.
Capitulum distinctly peduncled . . . . .	Sp. 5-6.

Subgenus NIDULARIUM (*Lemaire*).—Tube of the petals usually as long as the sepals. Filaments short, inserted about the middle of the anther. Leaves shorter and less rigid, with smaller marginal teeth.

Leaves narrowed to the point; inner reduced leaves not bright red . . . . .	Sp. 7-12.
Leaves narrowed to the point; inner reduced leaves bright red . . . . .	Sp. 13-16.
Leaves lorate, obtuse; inner reduced leaves purple, red or brownish . . . . .	Sp. 17-22.
Leaves lorate, obtuse; inner reduced leaves bright red . . . . .	Sp. 23-29.
Leaves lorate, tipped with red . . . . .	Sp. 30-35.
Leaves lorate, tipped with brown . . . . .	Sp. 36.

1. *K. Plumieri* E. Morren in Belg. Hort. 1872, 181; Antoine Brom. 35, t. 21-22 (M.D.).\* *Bromelia Karatas* Linn. (Plum. Amer. Gen. t. 33); Jacq. Amer. Pict. t. 260, fig. 24; Hort. Vind. i. t. 32-33, iii. t. 74. *Nidularium Karatas* Lemaire.—Acaulescent. Leaves 30-40 in a dense rosette, rigid, spreading, ensiform, 4-8 ft. long, 1½-2 in. broad low down, narrowed gradually to the tip, green and glabrous on the face, persistently white-lepidote and finely lineate on the back, armed with large pungent hooked marginal prickles. Flowers about 50 in a dense sessile central capitulum, at first 3-4 in. finally 6-8 in. diam., surrounded by reduced ensiform inner leaves tinged red; flower-bracts scariose, oblanceolate, 2½-3 in. long. Ovary cylindrical-trigonus, 1½ in. long, clothed, like the bracts and sepals, with loose brown tomentum; sepals linear, permanently erect, an inch long. Petals reddish, glabrous, exerted ¼-⅓ in. beyond the tip of the sepals, united in a tube towards the base. Fruit 3-4 in. long, 1 in. diam., pale yellow, with an eatable white pulp, tapering from the middle to both ends. Seeds globose, dull brown, vertically compressed, ⅙ in. diam.

Hab. Tropical America, especially the West Indies. First noticed by Morison in 1680. There are two good figures in Plumier's unpublished series and a specimen from Jacquin at the British Museum. It is fully described by Hughes, in his 'Natural History of the Island of Barbados,' published in 1750, p. 232, under the name of "The Pen-gwyn. Latin Karatas." There are also two good figures in Plumier's Bot. Amer. inedit., vol. iii. t. 42-43 (1689-1697). Here belong also the Caraguata Acanga of Piso, Hist. Nat. Bras. 88 (1648), and Mexocotl seu Mangulei of Morison's Hist. Plant. sect. iv. t. 22 (1680), the two latter cited as synonyms under *Bromelia Acanga* by Linnæus. Mr. Jenman tells me it is called "Karwata" by the Indians of Demarara. Described mainly from a plant that flowered at Kew in the autumn of 1887. *K. Lagopus* E. Morren, inedit. (M.D.) seems to be a form of *K. Plumieri*.

1.\* *K. NIDUS-PUELLE* André.—Acaulescent. Leaves rigid, ensiform, 2½-3 ft. long, above an inch broad at the middle, nearly naked, green, the inner becoming bright red at the flowering-time, armed with distant, much-hooked spines. Inflorescence a flat-topped central capitulum; outer bracts broad ovate, red at the base, lilac upwards; inner rose-red, linear, as long as the flowers. Ovary tomentose, whitish, above 2 in. long including the pedicel. Sepals linear-lanceolate, 1½-2 in. long. Corolla with a short tube and lilac oblong segments tomentose at the tip, about as long as the calyx. Fruit 2 in. long, brown and eatable at maturity. Seeds brown, as large as a pea.

Hab. Slope of the western Andes of New Granada towards the Rio Magdalena, André 1836.

2. *K. LEGRELLE* E. Morren in Belg. Hort. 1872, 129, t. 11-13 (M.D.).—Acaulescent. Leaves 30-40 in a dense rosette, ensiform, rigid, spreading, reaching a length of 5-6 feet, 1½-2 in. broad low down, tapering gradually to the point, green on the face, finely albo-lepidote and striated on the back, armed with large hooked pungent marginal prickles. Flowers 100 or more in a dense sessile central capitulum 3-4 in. diam., overtopped by many bright red

\* M.D. means that there is an original drawing of the plant in the Morren collection, now at Kew.

reduced ensiform inner leaves; flower-bracts lanceolate, as long as the calyx. Ovary cylindrical-trigonus, glabrous, above an inch long; sepals lanceolate, as long as the ovary. Petals lilac, lingu- late, shortly united at the base, but little longer than the calyx. Filaments shorter than the linear anthers.

Hab. Amazon Valley; introduced from Para by Linden. Flowered at the Botanic Garden of Liege, in Oct., 1869, and by Madame Legrelle d'Hanis, after whom it is named, in Sept., 1871. Described from a young plant at Kew, and Morren's figure.

3. *K. AGAVÆFOLIA* Devans. in Rev. Hort. 1878, 190 (M.D.) *Bromelia agavæfolia* Brong.; K. Koch, Etud. Brom. 12.—Acaulescent. Leaves 30–40 in a dense rosette, moderately firm in texture, lanceolate, 2 ft. long, 2–3 in. broad at the middle, much narrowed to the base, bright green on the face, thinly lepidote and finely lineate on the back, armed with large pungent marginal prickles. Flowers in a nearly sessile central capitulum, overtopped by the bright red lanceolate reduced inner leaves; flower-bracts narrow, scariose. Ovary cylindrical-trigonus, ramentaceous,  $\frac{3}{4}$  in. long, sepals linear, erect, as long as the ovary. Petals white, half as long again as the sepals, shortly united at the base. Filaments about as long as the linear anthers.

Hab. Cayenne; sent by Leprieur to the Paris Garden in 1853. Described from a living plant at Kew, Morren's figure, and dried specimens from Dr. Karl Koch, and in the Paris collection. Regnell's 1258 from Caldas, has narrower leaves and pubescent outer bracts, and is probably a distinct species.

4. *K. HUMILIS* E. Morren in Belg. Hort. 1872, 131; Antoine Brom. 38, t. 22–23; Devans. in Rev. Hort. 1878, 190, with figure. *Bromelia humilis* Jacq. Ic. t. 60. *B. hemisphærica*, Lam., ex parte. *Madvigia humilis* Liebm. — Acaulescent, stoloniferous. Leaves about 50 in a dense rosette, ensiform, rigid, spreading, a foot long, an inch broad low down, narrowed gradually to the tip, bright green on the face, thinly lepidote and lineate on the back, armed with hooked pungent marginal prickles. Flowers about 30 in a nearly sessile capitulum 2–3 in. diam., overtopped by the bright red reduced ensiform inner leaves; flower-bracts lanceolate, scariose, reaching to the tip of the calyx. Ovary cylindrical-trigonus, an inch long, clothed with brown ramentum, as are the lanceolate sepals, which are nearly as long as the ovary. Petals reddish, shortly connate at the base, lingu- late, nearly twice as long as the calyx. Filaments shorter than the anthers.

Hab. Mexico and New Granada. It flowered in 1857 with Mathieu, at Berlin; with M. Antoine, at Vienna, in 1873; and in 1877 with M. Devansaye, at Fresne.

5. *K. REDOUTEI* Baker. *Bromelia Karatas*, var. *caulescens* Red. Lil. t. 457.—Acaulescent, stoloniferous. Leaves rigid, ensiform, 5–6 ft. long, 3–3½ in. broad low down, narrowed gradually to the tip, bright green and glabrous on the face, thinly albo-lepidote on the back, armed with large pungent hooked marginal prickles. Peduncle 2¼–3 ft. long; its leaves ensiform, arcuate, bright red, a foot or more long. Flowers in a dense globose capitulum, sur- rounded by several ovate scariose dull-coloured bract-leaves, with

short serrated tips; flower-bracts lanceolate, about as long as the calyx. Ovary cylindrical-trigonus, glabrous, an inch long; sepals lanceolate, nearly as long as the ovary. Petals violet, little longer than the sepals.

Hab. Country unknown. Figured by Redouté from a plant that flowered at Malmaison, in the summer of 1814. It may be a caulescent variety of *K. Legrelle*, but is evidently quite distinct from *K. Plumieri*.

6. *K. ALBO-ROSEA* Baker. *Nidularium albo-roseum* Griseb. in Gott. Nacht. 1864, 12.—Leaves ensiform, not very rigid in texture, 3–4 ft. long,  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. broad at the middle, narrowed gradually to the point and  $\frac{3}{4}$  in. above the base, the marginal prickles distant and small, except a few towards the base. Flowers in a dense capitulum surrounded by several greenish-brown ovate acuminate closely-serrated bract-leaves, the inner 2 in. long. Ovary glabrous, cylindrical-trigonus, an inch long; sepals lanceolate, erect, an inch long. Corolla whitish rose-coloured, with a tube as long as the sepals and segments half as long as the tube.

Hab. Venezuela, near Tovar, alt. 7500 ft., Fendler 1521! *Cryptanthus andicola* Moritz, Exsic. No. 1969, from the same district, is probably the same species. It is said to have a brown fruit, with an acid flavour, and a caudex sometimes 3–4 ft. long.

#### Subgenus NIDULARIUM.

7. *K. PURPUREA* Antoine Brom. 42, t. 25. *Nidularium purpureum* Beer, Brom. 75 (M.D.). *N. discolor* Beer, Brom. 74. *Tillandsia rubra* and *discolor* Hort.—Acaulescent. Leaves 10–15 in a short rosette, lanceolate, a foot or more long,  $1$ – $1\frac{1}{4}$  in. broad at the middle, spreading, dull green on the face, more or less flushed with purplish-brown or claret-brown, without any distinct bands or spots, paler and thinly lepidote beneath, narrowed to the point, the marginal prickles minute. Flowers in a dense central rosette, the reduced inner leaves scarcely changed in colour. Ovary oblong,  $\frac{1}{2}$  in. long; sepals lanceolate, acute,  $\frac{3}{4}$  in. long. Corolla-segments oblong, red,  $\frac{1}{2}$  in. long. Anthers  $\frac{1}{4}$  in. long, reaching nearly to the tip of the corolla-segments.

Hab. Brazil. Introduced into cultivation in the Louvain Garden before 1830. It has been for many years in the collection at Kew.

8. *K. DENTICULATA* Baker. *Nidularium denticulatum* Regel, Gartenfl. 1870, 268. *Bromelia denticulata* K. Koch, Wochen. ii. 151. *B. angustifolia* K. Koch. *B. pauciflora* K. Koch, Wochen. ix. 183. *Nidularium agavifolium* Hort.—Acaulescent. Leaves 10–15 in a short rosette, lanceolate, spreading, 6–8 in. long,  $\frac{1}{2}$  in. broad low down, green on the face without any distinct spots or bands, paler beneath, narrowed gradually to the point, the marginal prickles distant and minute. Flowers in a small head in the centre of the reduced inner leaves, which are not changed in colour. Ovary oblong,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; sepals lanceolate,  $\frac{1}{2}$  in. long. Corolla-segments dull violet, ovate, acute, nearly as long as the tube. Filaments short.

Hab. South Brazil. Introduced into cultivation about 1865. Gathered lately wild, by Dr. Wawra. Described from K. Koch's dried specimen and Morren's drawing.

9. *K. SARMENTOSA* Baker. *Nidularium sarmentosum* Regel, Gartenfl. 1870, 268. *Æchmea immersa* Hort.—Acaulescent, stoloniferous. Leaves about 10 in a rosette, lanceolate, 1–1½ ft. long, an inch broad at the middle, firm in texture for the genus, dark green on the face, more or less tinged with purple, thinly white-lepidote on the back, narrowed to the point, the marginal teeth minute. Flowers in a central head, 1 in. diam., the inner leaves not much reduced or changed in colour. Ovary oblong, white, ½ in. long; sepals lanceolate, green, much imbricated, ½ in. long. Petals white, oblong, acute, protruding nearly ½ in. beyond the tip of the sepals. Anthers white, 1–12th in. long; filament nearly as long as the anther.

Hab. Brazil. Introduced into cultivation about 1870. Described from a plant that flowered at Kew, March, 1878. A plant drawn by Morren, under the name of *Nidularium microps* (*N. verecundum* olim.), is apparently the same species.

10. *K. CYANEA* Baker. *Nidularium cyaneum* Linden & André, Ill. Hort. xx. 184. *N. elegans* Morren (M.D.).—Acaulescent. Leaves about a dozen in a short rosette, ensiform, erect-arcuate, 1½–2 ft. long, an inch broad at the middle, firm in texture, plain green, and channelled down the face, marked with distinct transverse bands of darker and paler green on the back, narrowed to the tip, the marginal prickles minute. Flowers in a small head in the centre of the rosette, the inner leaves not much reduced in size nor changed in colour. Ovary oblong, white; sepals lanceolate, ¾ in. long. Corolla with a tube as long as the sepals and ovate acute violet segments ½ in. long.

Hab. Probably Brazil. Described principally from Prof. Morren's drawing, made from a plant flowered by Linden, July, 1872.

11. *K. TRISTIS* Baker. *Nidularium triste* Regel, Gartenfl. xv. 356 (M.D.). *Bromelia tristis* Beer.—Leaves 10–12 in a short rosette, ensiform, 8–12 in. long, an inch broad at the middle, firm in texture, permanently erecto-patent, green on the face, mottled with brown spots, especially towards the base, the back obscurely lepidote, the marginal prickles minute. Ovary oblong, white, ½ in. long; sepals lanceolate, purplish-brown, ½ in. long. Corolla with a white tube as long as the sepals and violet oblong-lanceolate segments nearly as long as the tube. Anther whitish, ⅓ in. long, about as long as its filament. Fruit as in the other *Nidularia*, a white oblong berry ½ in. long.

Hab. South Brazil. Introduced into cultivation by Van Houtte, before 1857. Described from a plant that flowered at Kew in April, 1877. Gathered wild recently by Wawra and Binot. This also is sometimes called *N. marmoratum* in gardens.

12. *K. AMAZONICA* Baker in Gard. Chron. 1886, i. 814. *Nidularium amazonicum* Linden & Morren, Cat. 1873, 11 (M.D.).—Acaulescent, stoloniferous. Leaves 15–20 in a short rosette, lanceolate, 1–1½ ft. long, 2–3 in. broad at the middle, moderately firm in texture, narrowed to the point, brownish-green on the face without any spots or bands, a glossy uniform claret-brown all over the back, minutely serrated. Flowers in a dense head in the centre

of the reduced greenish-brown inner leaves ; flower-bracts lanceolate, much shorter than the calyx. Ovary oblong,  $\frac{1}{2}$  in. long ; sepals lanceolate, greenish,  $\frac{3}{4}$  in. long. Corolla with a greenish tube as long as the calyx and white segments  $\frac{1}{2}$  in. long.

Hab. Amazon Valley. Introduced into cultivation by Linden about 1870. Described from a plant that flowered at Kew in 1878, and one from Mr. Wm. Bull in June, 1886. Morren marks it on his drawing as received from Rio, from Binot.

13. K. FERDINANDO-COBURGI Baker. *Nidularium Ferdinando-Coburgi* Wawra, Itin. Prin. Cob. 138, t. 20, 36 C.—Leaves a dozen or more in a short rosette, lanceolate,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. broad at the middle, thin in texture, green above with a broad vertical central band, paler and obscurely lepidote beneath, distinctly minutely serrated. Flowers in a dense capitulum in the centre of many reduced bright scarlet ovate inner leaves. Ovary white, oblong,  $\frac{1}{2}$  in. long ; sepals lanceolate, greenish,  $\frac{3}{4}$  in. long. Petals violet, protruded  $\frac{1}{2}$  in. beyond the tip of the sepals.

Hab. South [Brazil, Burchell 2477! Wawra 101, 370; Glaziou 11693! First gathered by Burchell in 1826. Introduced into cultivation by Dr. Wawra in 1880.

14. K. ANTOINEANA Baker. *Nidularium Antoinceanum* Wawra, Itin. Prin. Cob. 139, t. 21, 35 C.—Leaves a dozen or more in a short rosette, ensiform,  $1\frac{1}{2}$ –2 ft. long, under an inch broad at the middle, moderately firm in texture, green on the face with an indistinct central band, paler green and slightly lepidote beneath, narrowed gradually to the point, minutely serrated. Flowers in a dense capitulum in the centre of several bright scarlet reduced serrated ovate inner leaves. Ovary oblong, white,  $\frac{1}{2}$  in. long ; sepals green, lanceolate,  $\frac{3}{4}$ –1 in. long. Petals violet, protruded  $\frac{1}{2}$  in. beyond the tip of the sepals.

Hab. South Brazil, Burchell 3314! Lhotsky! Wawra 321! Glaziou 13247! 15488! First gathered by Burchell in 1826. Introduced into cultivation by Dr. Wawra in 1880.

15. K. NEGLECTA Baker. *Nidularium Makoyanum* and *neglectum* Hort. (M.D.).—Leaves about ten in a long rosette, lanceolate, about a foot long,  $1\frac{1}{2}$  in. broad at the middle, narrowed gradually to the point, moderately firm in texture, bright green above, paler green beneath, without any spots or bands, the marginal teeth very inconspicuous. Flowers in a small capitulum in the centre of a few reduced brownish-green inner leaves. Corolla white.

Hab. Probably Brazil. Described from a plant that flowered at Kew, Feb. 1888, received from Prof. Morren. May be a variety of *N. Scheremetiewii*.

16. K. SCHEREMETIEWII Antoine, Brom. 46, t. 27. *Nidularium Scheremetiewii* Regel, Gartenfl. t. 224 ; Rev. Hort. 1875, 230, with figure (M.D.). *Caraguata serrata* Hort.—Leaves 10–15 in a short rosette, lanceolate, 1– $1\frac{1}{2}$  ft. long, an inch broad at the middle, narrowed towards the base and gradually to the point, moderately firm in texture, bright green on the face, pale green on the back, sharply serrated. Flowers in a small capitulum in the centre of the bright scarlet reduced sharply-toothed inner leaves ; flower-bracts lanceolate, falling short of the calyx. Ovary white,  $\frac{1}{2}$  in.

long; sepals lanceolate, greenish,  $\frac{3}{4}$  in. long. Petals violet, protruded  $\frac{1}{2}$  in. beyond the tip of the calyx. Filaments very short.

Hab. South Brazil, *Glaziou* 15849! Introduced to the St. Petersburg Botanic Garden in 1858. Described from plants that flowered at Kew in 1877 and 1885.

17. K. LEUCOPHŒA Baker. *Nidularium leucophœum* E. Morren (M.D.). *Andrea spectabilis* Hort. Gall.—Habit of a *Billbergia*. Leaves about a dozen in a rosette, lorate, 2 ft. long,  $2\frac{1}{2}$  in. broad at the middle, erecto-falcate, green on the face mottled with spots of darker green, entirely tinged with dark purple towards the base, whitish on the back, rounded to a cusp at the tip, the marginal prickles minute. Flowers in a dense central head hidden by the base of the leaves, the reduced inner leaves scarcely changed in colour. Sepals lanceolate, brown. Corolla-segments ovate, white, protruded  $\frac{1}{2}$  in. beyond the tip of the calyx.

Hab. Country unknown. Described from Professor Morren's drawing, made in Sept., 1885.

18. K. CHLOROSTICTA Baker. *Nidularium chlorostictum* E. Morren (M.D.). *Billbergia chlorosticta* Hort.—Habit of a *Billbergia*. Leaves 12–20 in a long utricular rosette, lorate, the blade exclusive of the large dilated base  $\frac{1}{2}$ –1 ft. long, an inch broad, firm in texture, reddish brown, with copious green spots, rounded to a cusp at the tip, the marginal prickles minute. Flowers few in a head at the top of the utriculus of leaves. Sepals tinged with red. Petals protruded  $\frac{1}{2}$  in. beyond the tip of the calyx.

Hab. Probably Brazil. Described from Prof. Morren's drawing, made in 1884, and a living plant at Kew, which has not yet flowered.

19. K. AMPULLACEA Baker. *Nidularium ampullaceum* E. Morren, Belg. Hort. 1880, 242 (M.D.); Regel, Gartenfl. 1886, 296, fig. 33.—Leaves about 8 in a rosette, their bases forming an oblong utriculus 2 in. long, from the top of which the lorate blade spreads to a length of 4–6 in., under an inch broad, firm in texture, green on the face, banded transversely with spots of reddish brown, especially on the back, rounded at the tip to a small cusp, the marginal prickles minute. Flowers few, arranged in a central head just emerging from the utriculus of leaves. Ovary  $\frac{1}{4}$  in. long; sepals green, lanceolate,  $\frac{1}{2}$  in. long. Petals violet, nearly twice as long as the sepals.

Hab. South Brazil, *Glaziou* 12231! Introduced into cultivation about 1880, by *Glaziou* and *Binot*. Very distinct.

20. K. LAURENTII Antoine, Brom. 48, t. 28. *Nidularium Laurentii* Regel, Gartenfl. t. 529 (M.D.). *Billbergia aurantiaca* Hort.—Leaves 10–12 in a short rosette, lorate, 1– $1\frac{1}{2}$  ft. long, 2– $2\frac{1}{2}$  in. broad at the middle, moderately firm in texture, plain green on both sides, thinly lepidote beneath, rounded to a cusp at the tip, the marginal prickles minute, black. Flowers in a globose head in the centre of the reduced inner leaves, which are sometimes, but not always, tinged with purple; flower-bracts narrow, green, scariose. Ovary white, half as long as the green lanceolate

sepals, which are  $\frac{3}{4}$  in. long. Petals violet, protruded  $\frac{1}{4}$ – $\frac{1}{3}$  in. beyond the tip of the calyx. Filaments shorter than the anthers.

Hab. South Brazil, *Burchell!* *Glaziou*-15495! Introduced into cultivation about 1867. Named after Dr. Laurentius, of Leipsic. Described from a plant at Kew, March, 1877. It may be *Bromelia concentrica* Beer, founded upon a rough figure in the 'Flora Fluminensis' (*Tillandsia concentrica*, vol. iii. t. 133).

21. *K. CORIACEA* Antoine, Brom. t. 30, fig. 1. *Nidularium coriaceum* Hort. Linden (M.D.).—Acaulescent. Leaves 12–15 in a short rosette, lorate, a foot long, 2–2 $\frac{1}{2}$  in. broad at the middle, moderately firm in texture, plain green on the face, with a few brown spots, thinly white-lepidote on the back, rounded to a cusp at the apex, all the marginal prickles minute. Flowers in a dense capitulum 2 in. diam. in the centre of the dark purple reduced inner leaves; flower-bracts narrow, green, nearly as long as the calyx. Ovary  $\frac{1}{2}$  in. long; sepals lanceolate-acuminate, green,  $\frac{3}{4}$  in. long. Petals violet, protruding  $\frac{1}{2}$  in. beyond the tip of the sepals. Filaments short.

Hab. South Brazil. Introduced into cultivation about 1870. Very near *K. acanthocrater*, from which it differs mainly by its minute marginal prickles.

22. *K. ACANTHOCRATER* Baker in Bot. Mag. t. 6904; Antoine, Brom. t. 29 and 30, fig. 2. *Nidularium acanthocrater* E. Morren in Belg. Hort. 1884, 140, t. 9 (M.D.).—Acaulescent. Leaves 20–30 in a short rosette, lorate, the outer 1 $\frac{1}{2}$  ft. long, 2–3 in. broad at the middle, moderately firm in texture, the face green, often spotted with dark brown, the back thinly white-lepidote, the tip rounded to a cusp, the marginal prickles large and brown. Flowers in a dense capitulum 2–3 in. diam. in the centre of the rosette, the reduced inner leaves dark or light purple, rarely unchanged in colour; flower-bracts lanceolate, scariose. Ovary cylindrical-trigonal, white,  $\frac{1}{2}$  in. long; sepals green, lanceolate-acuminate,  $\frac{3}{4}$ –1 in. long. Petals violet, protruded  $\frac{1}{4}$ – $\frac{1}{3}$  in. beyond the tip of the sepals. Filaments shorter than the anthers.

Hab. South Brazil, *Glaziou* 11687! Introduced into cultivation by Dr. Glaziou in 1877. Described from a plant that flowered at Kew in May, 1886. Vars. *Plutonis* and *Proserpinæ* of Morren differ in the colour of the reduced inner leaves. *Glaziou* 15494 (*K. macracantha* Baker), is probably an allied distinct species. It has close spreading brown prickles  $\frac{1}{4}$  in. and sepals 1 $\frac{1}{4}$  in. long.

23. *K. INNOCENTII* Antoine, Brom. 44, t. 26. *Nidularium Innocentii* Lemaire, Jard. Fleur. t. 329 (M.D.). *Gemellaria Innocentii* Pinel.—Acaulescent, stoloniferous. Leaves about 20 in a short rosette, lorate, under a foot long, 1 $\frac{1}{2}$  in. broad at the middle, thin but firm in texture, green more or less tinged with brown, especially on the back, neither spotted nor banded, deltoid-cuspidate at the tip, the marginal teeth close and minute. Flowers in a central capitulum and also a few in the axils of the 5–6 bright red ovate reduced inner leaves; flower-bracts scariose, linear, 2 in. long. Ovary  $\frac{1}{2}$  in. long; sepals lanceolate,  $\frac{3}{4}$  in. long. Corolla white, with a greenish tube, an inch longer than the calyx. Filaments very short.

Hab. South Brazil, *Glaziou* 13248! 15492! Introduced into cultivation by Pinel in 1854. Described from a plant seen in flower at Mr. J. T. Peacock's, March, 1874. Named in compliment to M. St. Innocent, of Autun.

24. *K. FULGENS* Antoine, Brom. 41, t. 24, *Nidularium fulgens* Lemaire, in Jard. Fleur. t. 411 (M.D.). *Guzmania picta* Hort. *N. pictum* Hort.—Acaulescent. Leaves 15–20 in a short dense rosette, lorate, spreading, the outer a foot long,  $1\frac{1}{2}$ –2 in. broad at the middle, not rigid in texture, bright green, usually copiously mottled with spots of darker green, paler and lepidote on the back, deltoid-cuspidate or rounded at the tip, sharply toothed on the edge. Flowers 30–40 in the centre and a few usually in the axils of the 6–10 brilliantly-scarlet reduced ovate inner leaves. Ovary white,  $\frac{1}{2}$  in. long; sepals lanceolate, acute,  $\frac{3}{4}$  in. long, tinged with red. Corolla violet,  $\frac{1}{4}$ – $1\frac{1}{2}$  in. long, the cylindrical white tube twice as long as the segments. Anthers linear,  $\frac{1}{4}$ – $\frac{1}{2}$  in. long; filaments very short.

Hab. South Brazil. Introduced into cultivation by Libon in 1849. Described from plants flowered at Kew in 1870 and 1877. It is the commonest and most showy of all the *Nidularia*. *N. Marichali* Hort., which I have not seen, is said to differ by its deeper-coloured inner leaves.

25. *K. CAROLINÆ* Antoine, Brom. 52, t. 31. *Bromelia Carolina* Beer; Regel. Gartenfl. t. 211. *Billbergia olens* Hook., in Bot. Mag. t. 5502. *Nidularium Carolina*, Lemaire. *N. Meyendorffii* Regel, in Gartenfl. 1859, 266, figs. 5–8; Ill. Hort. t. 245 (M.D.). *Billbergia Meyendorffii* Regel.—Acaulescent. Leaves about 20 in a short rosette, lorate, rather horny in texture, a foot long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. broad at the middle, plain bright green on both sides, deltoid-cuspidate at the tip, minutely toothed. Flowers in a dense capitulum in the centre of the reduced inner leaves, 3 or 4 of which are entirely bright red and as many more bright red at the base; flower-bracts oblong-lanceolate, entire. Ovary oblong-trigonous,  $\frac{1}{2}$  in. long; sepals lanceolate, greenish,  $\frac{3}{4}$  in. long. Corolla  $\frac{1}{2}$  in. longer than the calyx; lilac lanceolate segments half as long as the white cylindrical tube. Anthers  $\frac{1}{4}$  in. long; filaments very short.

Hab. South Brazil, *Glaziou* 15491! Sent alive by Dr. Regel to Kew in 1856. Described from plants that flowered at Kew in 1861, 1878 and 1887.

26. *K. RUTILANS* Baker. *Nidularium rutilans* E. Morren, in Belg. Hort. 1885, 81 (M.D.).—Leaves about 20 in a long utriculate rosette, lorate, above a foot long,  $1$ – $1\frac{1}{4}$  in. broad at the middle, plain green, minutely toothed, rounded to a cusp at the apex. Flowers in a small central capitulum, with a hidden peduncle 3–4 in. long, surrounded by 6–8 bright crimson ovate minutely-toothed reduced inner leaves. Corolla bright red,  $\frac{1}{2}$  in. longer than the calyx.

Hab. South Brazil. Introduced into cultivation by Dr. Glaziou in 1883. Described from Professor Morren's drawing.

27. *K. MORRENIANA* Antoine, Brom. t. 35. *Nidularium Morrenianum* Hort. Makoy (M.D.). *N. guyanense* A. Brong. inedit. *N. pulverulentum* E. Morren. — Rosette elongated, sometimes forked. Leaves about 20, lorate, a foot long, under an inch broad

at the middle, moderately firm in texture, plain green above, white-lepidote beneath, rounded to a small cusp at the tip, the marginal prickles small. Flowers in a capitulum in the centre of the bright crimson reduced inner leaves. Ovary oblong-trigonus, white,  $\frac{1}{2}$  in. long; sepals lanceolate, longer than the ovary. Corolla protruded  $\frac{1}{2}$  in. beyond the sepals; tube white; segments ovate-lanceolate, violet at the tip. Filaments shorter than the anthers.

Var. *PHYLLANTHIDEA* E. Morren (M.D.).—Leaves tinged with brown; inner more numerous, bright rose-red, many obtuse.

Hab. Guiana. Flowered by M. Jacob Makoy, of Liège in 1874, and the variety in 1879. Allied to *K. Caroline*.

28. *K. PRINCEPS* Baker. *Nidularium princeps* E. Morren (M.D.). *K. Meyendorffii* Antoine, Brom. t. 32. *N. spectabile* Hort. — Acaulescent. Leaves 15–20 in a short rosette, lorate, about a foot long,  $1\frac{1}{2}$ –2 in. broad at the middle, moderately firm in texture, a slightly glaucous green above, unspotted, pruinose beneath, rounded to a cusp at the tip, the marginal teeth small. Flowers in a globose capitulum in the centre of 6–10 ovate bright red reduced leaves; flower-bracts narrow, scarious. Sepals lanceolate, tinged with red,  $\frac{3}{4}$  in. long, exceeding the oblong white ovary. Corolla-tube as long as the calyx; segments violet, ovate-lanceolate, acute,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Filaments shorter than the linear anthers.

Hab. South Brazil. Introduced into cultivation about 1858. Two varieties are in cultivation at Kew, one with bright mauve and the other with dull crimson reduced inner leaves.

29. *K. REGNELLII* Baker. *Nidularium giganteum* Baker in Journ. Bot. 1880, 50.—Leaves in a long rosette; dilated ovate base half a foot long, 4 in. broad; blade lorate, 2 ft. long,  $1\frac{1}{2}$  in. broad at the middle, moderately rigid in texture, naked on the face, slightly lepidote on the back; apex deltoid; prickles deltoid-cuspidate, the lower nearly black,  $\frac{1}{8}$ – $\frac{1}{6}$  in. long. Flowers in a dense capitulum 2–3 in. diam. on a probably hidden peduncle 6–8 in. long, surrounded by a number of ovate, highly coloured (red?) inner leaves with large close brown deltoid marginal teeth; flower-bracts lanceolate, 2 in. long, reaching to the tip of the calyx. Ovary cylindrical-trigonus,  $\frac{3}{4}$  in. long; sepals lanceolate,  $1\frac{1}{4}$  in. long. Corolla but little longer than the calyx (colour not known).

Hab. Central Brazil, *Sello* 49! *Regnell* iii. 1259! *Glaziou* 11692! 13250! 13252! 14340! *Glaziou* 13251 is an allied species, with as large a leaf, but with a shorter peduncle, ovate reduced inner leaves entire, and sepals an inch long. Both these are known from dried specimens only. I have changed the specific name, which, when *Nidularium* is merged in *Karatas*, becomes inappropriate.

30. *K. CRUENTA* Baker. *Nidularium cruentum* Regel (M.D.). *Billbergia cruenta* Graham in Bot. Mag. t. 2892. *Bromelia cruenta* Graham.—Stem sheathed by leaf-bases reaching a foot in length. Leaves 20 or more to a rosette, lorate,  $1\frac{1}{2}$ –2 ft. long, 2–3 in. broad at the middle, ascending, moderately firm in texture, green on the face, pruinose with faint transverse bands on the back, spotted with blood-red at the obtuse cuspidate tip, the brown marginal prickles  $\frac{1}{2}$ –1 line long. Flowers in a dense central capitulum

2-3 in. diam.; inner reduced leaves not altered in colour; flower-bracts nearly as long as the calyx. Ovary  $\frac{1}{2}$  in. long; sepals lanceolate,  $\frac{1}{2}$  in. long. Corolla violet, with a tube as long as the calyx and ovate segments  $\frac{1}{2}$  in. long. Filaments very short.

Hab. South Brazil, *Burchell* 3291! *Glaziou* 8501b! Introduced into cultivation by Harris in 1829. *Bromelia rhodocincta* Brong. inedit.!, sent from Bahia by Porte, flowered by Morel in 1848, is a lorate-leaved species of *Nidularium*.

31. K. MARMORATA Baker. *Nidularium marmoratum* E. Morren, inedit. (M.D.).—Acaulescent. Leaves about a dozen in a rosette, spreading nearly from the base, lorate, about a foot long,  $1\frac{1}{2}$ -2 in. broad, pale green, copiously and conspicuously marbled both on the back and face with irregular confluent blotches of red-brown, deltoid-cuspidate at the tip, with a spot of bright red below the cusp, the marginal prickles small. Capitulum dense, central,  $1\frac{1}{2}$ -2 in. diam. Ovary white,  $\frac{1}{2}$  in. long; sepals green, lanceolate, very acute, longer than the ovary. Petals pale violet, but little longer than the sepals. Filaments very short.

Hab. Probably Brazil. Described from Professor Morren's drawing, made in April, 1878, and a plant that flowered at Kew in the autumn of 1887, received from Sir G. Macleay. There is in the Paris Herbarium a *Bromelia marmorata* Brong., inedit., flowered at Paris about 1850, which may be the same plant, but many of these *Nidularia* are too near one another to be identified from dried specimens.

32. K. JOHANNIS Baker. *Nidularium Johannis* Carriere in Rev. Hort. 1884, 432.—Habit of a *Billbergia*. Leaves few, arcuate, lorate,  $1\frac{1}{2}$ -2 ft. long, 3 in. broad, pale green, slightly marbled, rounded to a cusp and spotted with bright red at the tip, margined with small distant spines. Inflorescence a central capitulum; flower-bracts bright green, acute. Corolla pure white, small.

Hab. Probably Brazil. Flowered by M. Sallier, at Chateau du Val, near Paris, in 1884.

33. K. SPECTABILIS Antoine, Brom. t. 33. *Nidularium spectabile* T. Moore in Gard. Chron. 1873, 8; Hook. fil. in Bot. Mag. t. 6024 (M.D.). *N. eximium* Hort.—Acaulescent. Leaves 20-30 in a rosette with utricular bases, lorate, moderately firm in texture, the outer a foot or more long,  $1\frac{1}{2}$ -2 in. broad, green on the face tinged with brown, conspicuously marbled on the back with transverse bands of reddish brown, rounded to a small cusp and spotted with bright red at the tip; marginal prickles minute. Flowers 40-50 in a dense central capitulum; reduced inner leaves not altered in colour; flower-bracts reaching up to the tip of the calyx. Ovary oblong-trigonal, white,  $\frac{1}{2}$  in. long; sepals reddish, lanceolate,  $\frac{3}{4}$  in. long. Petals violet, cuspidate,  $\frac{1}{2}$  in. longer than the calyx, united in a tube as long as the sepals. Filaments very short.

Hab. Central Brazil. Introduced by Mr. W. Bull in 1872. Described from a plant that flowered at Kew in 1877. Now frequent in cultivation and often flowering.

34. K. MAKOYANA Baker. *Nidularium Makoyanum* Regel, Deser. 1887, 6.—Very near *K. spectabilis*, from which it differs by its leaves green on both sides, obscurely fasciate beneath, inner

reduced leaves green not purplish, and whitish petals free to the base, only slightly tinged with violet towards the acuminate tip.

Hab. Probably Brazil. Described by Dr. Regel, amongst the new plants of the Petersburg Garden, in 1887.

35. *K. BINOTI* Antoine, Brom. t. 34. *Nidularium Binoti* E. Morren (M.D.).—Acaulescent. Leaves 15–20 in a short rosette, lorate, not rigid, 9–12 in. long, 2–2½ in. broad at the middle, dark green with a few transverse bands of paler green, rounded suddenly to a small cusp and tipped with bright red at the apex, the marginal prickles very small. Flowers in a subsessile central capitulum, the reduced inner leaves resembling the outer in colour. Sepals green, lanceolate, longer than the ovary. Petals white, acute, not much longer than the sepals.

Hab. South Brazil. Introduced by Binot in 1877. A plant drawn by Morren under the name of *Nidularium sanguinarium* mainly differs from *N. Binoti* by its larger prickles.

36. *K. CARCHARODON* Baker. *Nidularium carcharodon* E. Morren (M.D.).—Acaulescent. Leaves 12–15 in a short rosette, lorate, 1½ ft. long, 3 in. broad at the middle, moderately firm in texture, dull pruinose green on the face, rounded to a cusp and furnished with a large distinct brown blotch at the tip, the marginal prickles large and distinct, like those of *K. acanthocrater*. Flowers in a dense head in the centre of the reduced inner leaves, which are not changed in colour. Sepals lanceolate, tinged with green, much longer than the ovary. Petals white, but little longer than the sepals.

Hab. Brazil. Described from Prof. Morren's drawing, made in 1882.

## 2. GREIGIA Regel.

*Sepals* lanceolate, free down to the ovary. *Petals* united in a long funnel-shaped tube; segments ovate. *Stamens* inserted at the throat of the corolla-tube; filaments filiform, rather shorter than the large linear-oblong basifixed anthers. *Ovary* inferior, 3-celled, clavate-triangular; ovules many in a cell; style filiform, reaching to the tip of the petals; stigmas short, flattened, not twisted. *Fruit* a large whitish rather pulpy berry narrowed to the base. *Seeds* oblong, brown.—*Leaves* very long, ensiform, firm in texture. *Flowers* in a dense head in the axil of the outer leaves. Differs from *Karatas* by its lateral heads, large basifixed anthers and exserted falcate untwisted stigmas. It is nearly hardy in England, whilst all the species of *Karatas* need tropical treatment.

1. *G. SPHACELATA* Regel, Gartenfl. 1865, 137, t. 474 (M.D.). *Bromelia sphacelata* Ruiz et Pav. Fl. Peruv. iii. 32. *Billbergia sphacelata* Schultes fil.—Acaulescent. Leaves 50 or more in a dense rosette, 3–4 ft. long, an inch broad above the dilated base, firm in texture, tapering gradually to the point, bright green on both surfaces, without any lepidote pubescence, the brown deltoid-cuspidate hooked marginal prickles about 1 line long and ½ in.

apart at the centre of the blade. Flowers in dense oblong lateral clusters 3-4 in. long, 2 in. diam., from the axils of some of the outer leaves of the rosette, each surrounded by many rigid ovate acuminate closely-serrated brown reduced leaves; flower-bracts scariosse, linear, or lanceolate. Ovary clavate-triquetrous, an inch long; sepals lanceolate,  $1\frac{1}{2}$  in. long. Corolla red,  $1\frac{1}{2}$ -2 in. long; segments oblong,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Anthers  $\frac{1}{3}$  in. long.

Hab. Chili. Common about Concepcion and Valdivia, extending south to latitude  $41^{\circ}$ , *Pavon!* *Philippi* 165! Native name "Chupon." I cannot distinguish *Bromelia crassa* Steud. in Lechler, Exsic. No. 677. The fruit is eaten for the sake of its sweet pulp. We have long grown it at Kew in the Cactus-house, where it first flowered October, 1866. *B. clandestina* Brong. inedit.! flowered at Paris in 1842, and supposed to be a Mexican species, belongs here.

2. *G. LANDBECKII* Philippi, Cat. Chil. 278. *Bromelia Landbeckii* Griseb.; Philippi in Linnæa, xxxiii. 246. — Leaves ensiform, 3-4 ft. long, glabrous on the face, obscurely pubescent on the back, much less rigid in texture than in *G. sphacelata*, the marginal prickles minute and inconspicuous. Flowers in dense lateral capitula, enclosed in many ovate dark brown reduced leaves  $1\frac{1}{2}$  in. long, which are not spinose on the margin. Ovary clavate-triquetrous, an inch long; sepals linear, rather shorter than the ovary. Corolla-lobes  $\frac{1}{2}$  in. long. Fruit 2 in. long.

Hab. Chili; shady damp woods in the Province of Valdivia, *Lechler* 3098! *Corral*, *Ochsenius!* *Pearce* 269! (labelled *Bromelia Pearcei*).

3. *G. VULCANICA* André.—Caudex stout, very short. Leaves ensiform, 2 ft. and more long, green and nearly naked above, finely striated and densely white-lepidote beneath, armed with distant rather ascending straight marginal spines. Inflorescence a laterally compressed capitulum 2-3 in. diam., subsessile amongst the radical leaves; outer bracts navicular,  $1\frac{1}{2}$  in. long, furfuraceous on the back, bright brownish red, inner linear-oblong. Flowers about as long as the outer bracts; ovary nearly naked, above  $\frac{1}{2}$  in. long; sepals lanceolate, a little longer than the ovary. Corolla with a white tube rather shorter than the calyx and red ovate spreading segments  $\frac{1}{3}$  in. long. Stamens reaching halfway up the corolla-lobes.

Hab. Southern Andes of New Granada, on the damp slopes of the Volcano of Azupal, alt. 12000 ft., *André* 2664. Native name "Pinuela."

### 3. DISTIACANTHUS *Hort.*

*Sepals* united in a short tube above the top of the ovary, linear-oblong, not mucronate. *Petals* lingulate, much longer than the sepals, but spreading only at the tip, not scaled, united at the base in a cylindrical tube. *Stamens* inserted at the throat of the corolla-tube, much shorter than the petals; filaments filiform; anthers linear, dorsifixed. *Ovary* inferior, 3-celled; ovules many in a cell; style filiform; stigmas linear, not twisted. *Fruit* oblong-cylindrical, baccate.—*Inflorescence* a central capitulum. *Leaves* oblong, petioled, spine-margined.

1. *D. SCARLATINUS* Hort. Linden. *Bromelia scarlatina* E. Morren in Belg. Hort. 1881, 164 (M.D.).—Acaulescent. Leaves 12–20 in a rosette, with a broad channelled petiole a foot long, armed with copious deflexed spines, and an oblong acute thin blade, a foot long, 3–4 in. broad, green on the face or tinged with brown, brown-lepidote on the back. Flowers in a dense sessile central capitulum, overtopped by the bright red much reduced inner leaves. Petals purplish red with a white margin, protruded about half an inch beyond the tip of the long calyx; tube as long as the sepals. Stamens reaching to the tip of the sepals.

Hab. Amazon valley. Introduced from Para by Linden in 1863. Described from a plant seen at Mr. J. T. Peacock's in 1879, one now at Kew received from the Botanic Garden at Liège and Prof. Morren's drawing.

2. *D. MORRENIANUS* Baker. *Cryptanthus Morrenianus* Regel, Gartenfl. 1888, 157. *Bromelia Moensis* E. Morren, inedit. (M.D.).—Acaulescent. Leaves about twenty in a rosette, with a broad channelled petiole 6–8 in. long, armed with copious spreading prickles and a thin oblong lanceolate acute blade a foot long, 2–3 in. broad, green or tinged with brown, glaucous beneath. Flowers in a dense sessile central capitulum, subtended by the lanceolate reduced inner leaves; flower-bracts shorter than the calyx. Ovary oblong; calyx-segments short, unequal. Corolla yellowish, with a cylindrical tube as long as the calyx-limb; segments yellowish, lingulate, spreading, as long as the tube. Stamens shorter than the corolla-segments.

Hab. Para. Introduced by Linden in 1873.

#### 4. *CRYPTANTHUS* *Otto & Dietr.*

(*Pholidophyllum* Vis.).

*Sepals* united in a campanulate tube above the ovary; segments ovate-lanceolate, imbricated, not tipped with a mucro. *Petals* 3–4-times as long as the calyx, obscurely united at the base, not scaled, spreading widely when expanded. *Stamens* inserted on the corolla, the three opposite the sepals at the base of the petals, the three others a little higher; filaments filiform; anthers small, oblong, versatile. *Ovary* inferior, oblong, 3-celled; ovules many in a cell; style filiform; stigmas linear, falcate, not contorted. *Fruit* dry. *Seeds* minute, subglobose.—*Leaves* many in a rosette, spreading, lanceolate or oblong-lanceolate, with stolons from the axils of the outer ones, minutely prickly on the edge, sessile or petioled. *Flowers* white, arranged in a capitulum in the axils of the inner leaves.

Leaves sessile, without cross-bands of lepidote scales or vertical vittæ . . . . .	Sp. 1–5.
Leaves sessile, without cross-bands, but with vertical vittæ . . . . .	Sp. 6–9.
Leaves sessile, decorated with cross-bands . . . . .	Sp. 10–11.
Leaves petioled, marbled all over white and green . . . . .	Sp. 12.

1. *C. UNDULATUS* Otto & Dietr. Allg. Gart. 1836, 299; Wawra, Reise, Max. 163, t. 87. *C. acaulis* Beer, Brom. 75. *Tillandsia acaulis* Lindl. in Bot. Reg. t. 1197. *Madrigia densiflora* Liebm. in Ann. Sc. Nat. ser. 4, ii. 373.—Leaves about a dozen in a short rosette, often overtopped by its stolons, oblong-lanceolate, 4–6 in. long,  $1\frac{1}{2}$  in. broad, comparatively thin in texture, much undulated, plain green on the face, thinly white-lepidote on the back, the marginal prickles close and minute. Calyx  $1\frac{1}{2}$  in. long above the ovary; segments ovate-lanceolate, about as long as the tube. Petals white, oblanceolate-unguiculate, an inch long. Filaments filiform,  $\frac{3}{4}$  in. long; anthers minute, oblong, versatile. Style reaching nearly to the tip of the petals.

Hab. South Brazil. Introduced by Mrs. Arnold Harrison, of Liverpool, in 1827. Vars. *ruber* Beer, and *purpureus* Baker in Saund. Ref. Bot. t. 287, are forms with the leaves more or less tinged with reddish-brown and sometimes a little lepidote on the lower part of the face. *C. testaceus* E. Morren (M.D.), is a form with brown ovate-lanceolate leaves 4–5 in. long, nearly 2 in. broad low down.

2. *C. BROMELIODES* Otto & Dietr. Allg. Gart. 1836, 298. *C. diversifolius* Beer, Brom. 76.—Leaves about 20 in a long copiously stoloniferous rosette, lanceolate, a foot long,  $1\frac{1}{2}$  in. broad at the middle, plain green on the face, not so firm in texture as in *C. discolor*, and not so white on the back. Flowers in the axils of several of the reduced inner leaves. Calyx-limb  $\frac{1}{2}$  in. long. Petals white, twice as long as the calyx-limb.

Hab. South Brazil. Introduced into cultivation by Sello in 1831. Scarcely more than a variety of *C. undulatus*. Of this also there is a form with reddish-brown leaves.

3. *C. DISCOLOR* Otto & Dietr. Allg. Gart. 1836, 299 (M.D.) *C. acaulis*, var. *argenteus* Beer. *C. acaulis*, var. *longifolius* Hort.—Leaves 20 or more, forming a rosette half a foot high, often overtopped by its stolons, lanceolate, a foot long, an inch broad, much firmer in texture than in *C. undulatus*, plain green on the face, persistently white-lepidote on the back, very acuminate, the marginal prickles close and minute. Flowers in the axils of several of the reduced inner leaves. Calyx including the ovary  $\frac{3}{4}$  in. long; segments ovate. Petals pure white,  $\frac{3}{4}$ –1 in. long.

Hab. South Brazil. First described from the Berlin Botanic Garden in 1836. Scarcely more than a variety of *C. undulatus*.

4. *C. SUAVEOLENS* E. Morren (M.D.).—Leaves 15–20 in a long rosette, above a foot long,  $1-1\frac{1}{2}$  in. broad, moderately firm in texture, often undulated, plain green on the face, white-lepidote on the back, narrowed gradually to the point, the marginal prickles close and minute. Flowers few in a head in the centre of the rosette. Perianth-blade white, oblong, acute, protruding nearly an inch from the calyx. Stamens reaching nearly to the tip of the petals.

Hab. Probably Brazil. Described from Prof. Morren's drawing made in Sept., 1831. Nearly allied to *C. discolor*.

5. *C. ANGUSTIFOLIUS* Baker.—Leaves a dozen or more in a very short rosette, ensiform, sessile, 6–9 in. long,  $\frac{1}{2}$ – $\frac{5}{8}$  in. broad, very

thin in texture, plain green on both surfaces, not perceptibly lepidote beneath, narrowed gradually to the point, the marginal prickles close, spreading, minute, deltoid. Flowers in a small head in the centre of the small ovate inner leaves; flower-bracts ovate, rather rigid, under an inch long. Capsule oblong-trigonal,  $\frac{1}{3}$  in. long, crowned by the withered calyx. Corolla not seen.

Hab. British Guiana; Marimi, *Appun* 1055! Gathered in 1864—5.

6. *C. BIVITTATUS* Regel; E. Morren, Cat. 1871, 2 (M.D.). *Billbergia bivittata* Hook in Bot. Mag. t. 5270. *Nidularium bivittatum* Lemaire. *Tillandsia vittata* and *bivittata* Hort.—Leaves about 20 in a short copiously stoloniferous rosette, oblong-lanceolate, sessile, 6–9 in. long,  $1\frac{1}{2}$ –2 in. broad, undulated, moderately firm in texture, with two distinct pale vertical bands, often tinged with reddish-brown, thinly white-lepidote on the back, narrowed gradually to the tip, the marginal prickles close and minute. Flowers in a tuft in the centre and a few also sometimes in the axils of the inner leaves. Ovary including the calyx  $\frac{1}{2}$  in. long; segments sub-orbicular. Petals oblanceolate, white, an inch long. Stamens and style falling considerably short of the petals.

Var. *LUDDERMANNII* Baker. — More robust than the type, leaves 2 in. broad, much tinged with brown, and the two vertical vittæ almost or quite confluent into a broad band occupying more than half of the centre of the face of the blade.

Hab. South Brazil. Introduced by Linden from Porto Seguro. We have had it in cultivation at Kew since 1859. It first flowered in 1861. The variety is described from a drawing of Professor Morren's.

7. *C. PRETEXTUS* E. Morren (M.D.).—Leaves 10–12 in a rosette 3 in. high, ensiform,  $\frac{1}{2}$  ft. long,  $\frac{1}{3}$ – $\frac{3}{4}$  in. broad, firm in texture, brown on the face with a single broad paler central vertical band, white-lepidote on the back, narrowed gradually to the point, much undulated on the edge, the marginal prickles close and minute. Flowers not seen.

Hab. Brazil. Described from Prof. Morren's drawing, made in Aug., 1885.

8. *C. MAKOYANUS* Baker (M.D.).—Leaves a dozen or more in a short rosette, sessile, oblanceolate-oblong, 6–9 in. long,  $1\frac{1}{2}$ –2 in. broad at the middle, narrowed gradually to a broad base, moderately firm in texture, furnished on the face with a paler vertical band on each side of the darker green centre, as in *C. bivittatus*, but less distinct, thinly white-lepidote on the back, acute, the marginal prickles small and distinct. Flowers in a small rosette in the centre of the reduced ovate inner leaves. Petal-blade oblong, white,  $\frac{1}{3}$  in. long.

Hab. Brazil. Described from Prof. Morren's drawing, made from a plant flowered by M. Jacob Makoy in Feb., 1886. Closely allied to *C. Lubbersianus*.

9. *C. LUBBERSIANUS* E. Morren (M.D.).—Leaves a dozen or more in a short rosette, oblanceolate-oblong, reaching above a foot in length,  $1\frac{1}{2}$ –2 in. broad at the middle, narrowed gradually to a base  $\frac{1}{2}$  in. broad, moderately firm in texture, green or tinged with brown on the face, with copious darker green blotches and two indistinct pale vertical bands, thinly white-lepidote on the back

acute, the marginal prickles close and small. Flowers in a small central rosette. Petals pure white, the oblanceolate blade protruding  $\frac{1}{2}$  in. from the calyx. Stamens reaching nearly to the tip of the petals.

Hab. Probably Brazil. Described from Prof. Morren's drawing, made in 1885.

10. *C. ZONATUS* Beer, Brom, 76 (M.D.). *Pholidophyllum zonatum* Visiani, Ind. Sem. Hort. Patav. 1847. *Tillandsia zonata* and *T. zebrina* Hort.—Leaves 10–15 in a short rosette, oblong-lanceolate, 6–9 in. long,  $1\frac{1}{2}$  in. broad at the middle, moderately firm in texture, dark green on the face with many wavy cross-bands  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad, of dirty white lepidote scales, thinly white-lepidote on the back, narrowed to the point, the marginal prickles small and close. Flowers in a small tuft in the centre of the rosette. Calyx  $\frac{1}{2}$  in. long above the ovary; segments about as long as the tube. Petals white, oblanceolate, an inch long. Stamens a little shorter than the petals.

Var. *FUSCUS* Visiani.—Leaves brown instead of green, with cross-bands as in the type.

Hab. Brazil. Now common in cultivation. Introduced by Quesnel from Pernambuco to the Paris Garden about 1842. It was collected there lately and brought alive to Kew by Mr. H. N. Ridley.

11. *C. COCHLEATUS* E. Morren (M.D.).—Leaves 12–15 in a short rosette, oblong-lanceolate, 4–6 in. long,  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. broad below the middle, moderately firm in texture, pale brown on the face with a few rather indistinct transverse bands of darker brown, thinly white-lepidote on the back, narrowed to an acute point, the marginal prickles close and minute. Flowers in a head in the centre of the reduced inner leaves. Petals white, oblanceolate, protruded  $\frac{1}{2}$  in. beyond the tip of the calyx. Stamens and style  $\frac{1}{4}$  in. shorter than the petals.

Hab. Brazil. Described from Prof. Morren's drawing, made in Aug., 1885.

12. *C. BEUCKERI* E. Morren in Belg. Hort. 1880, 241, 1881, 342, tab. 1 (M.D.).—Leaves 12–20 in a short rosette, the outer with an oblong acute blade 5–6 in. long, 2 in. broad below the middle, narrowed to a broad channelled minutely spine-edged petiole 2–3 in. long, moderately firm in texture, pale brownish or greenish on the face mottled with copious darker green spots, thinly white-lepidote on the back, the marginal prickles very minute. Flowers in a small head in the centre of the rosette of leaves; flower-bracts ovate-lanceolate, shorter than the calyx. Calyx-segments lanceolate, longer than the tube. Petals white, oblanceolate,  $\frac{1}{2}$  in. longer than the calyx.

Hab. South Brazil. Introduced into cultivation by M. Beucker, of Antwerp. We received it at Kew, from Linden, in 1884. I have not seen *C. Regeli*, which was exhibited by M. Jacob-Makoy and Co., at the Antwerp Exhibition of 1885, and is said to have leaves marbled with light and dark green. I am also unacquainted with *C. Grasli*, mentioned by name, Gard. Chron. 1883, 510.

5. DISTEGANTHUS *Lemaire*.

*Calyx* united in a distinct cylindrical tube above the ovary; segments small, ovate, not spine-pointed. *Petals* oblong-unguiculate, free to the base not scaled, much longer than the calyx, spreading widely when fully expanded. *Stamens* much shorter than the petals, 3 inserted at the base of the petals, 3 at the throat of the calyx-tube; filaments short, filiform; anthers oblong, dorsifixed. *Ovary* inferior, turbinate, 3-celled; ovules 3-4 in a cell, inserted near the top of the placenta; style filiform; stigmas linear, spirally twisted. *Fruit* oblong, baccate.—Nearest *Cryptanthus*, but readily known by its lateral inflorescence.

1. *D. BASILATERALIS* Lemaire in *Flore des Serres*, t. 227 (M.D.).—Rhizome wide-creeping. Leaves 6-10 in a sessile rosette; petiole 2-3 in. long, deeply channelled, armed with small spines; blade cordate-oblong, acute, 6-12 in. long, 2-3 in. broad, moderately firm in texture, plain green on the face, persistently white-lepidote on the back; marginal prickles minute. Flowers in several dense oblong spikes, 2-3 in. long, direct from the rhizome outside the rosette of leaves; outer bracts multiseriate, ovate, eroso-dentate,  $\frac{3}{4}$ -1 in. long, reddish, turning brown, closely imbricated. Calyx including the ovary cylindrical, pilose, above an inch long; segments lingulate,  $\frac{1}{2}$  in. long. Petals bright yellow, the oblong blade protruding  $\frac{1}{2}$  in. from the calyx.

Hab. French Guiana. Introduced into cultivation by Melinon in 1846. Described from plants that flowered at Kew in Feb., 1877, and with Mr. J. T. Peacock, in Nov., 1879; and a dried specimen from a plant sent by Leprieur flowered in the Paris Garden in July, 1849.

6. ORTGIESIA *Regel*.

*Sepals* lanceolate, narrowed gradually to a large cusp, united in a distinct cup above the apex of the ovary, *Petals* lingulate, scaled at the base, little longer than the sepals, spreading but little when expanded. *Stamens* 3, inserted at the throat of the calyx-tube, 3 at the base of the petals; filaments filiform, much shorter than the petals; anthers linear-oblong, dorsifixed. *Ovary* inferior, clavate or oblong 3-celled; ovules many in a cell; style filiform; stigmas linear, much twisted. *Fruit* small, indehiscent.—*Inflorescence* a dense spike or capitulum in the centre of rosette of ensiform leaves of rigid texture. *Flowers* bright red. Habit and leaves of *Rhodostachys*, from which it differs by its long twisted stigmas and lanceolate mucronate sepals, united in a distinct cup above the ovary. The two species are both like *Rhodostachys* and *Hechtia*, half-hardy.

1. *O. TILLANDSIODES* Regel, *Gartenfl.* 1867, 193, t. 547 (M.D.). *Æchmea Ortgiesii* Baker in *Journ. Bot.* 1879, 236.—Leaves about 30 in a sessile rosette, ensiform from an oblong base, a foot long,  $\frac{1}{2}$  in. broad at the middle, arcuate, moderately firm in texture, very acuminate, obscurely lepidote and channelled down the green face, thinly lepidote on the back, the marginal prickles minute. Flowers

in a dense head in the centre of the rosette; flower-bracts lanceolate-acuminate, spine ciliated, reddish,  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. long. Ovary oblong, glabrous,  $\frac{1}{2}$  in. long; calyx-limb nearly an inch long, the tube nearly as long as the oblong mucronate segments. Petals bright red, little longer than the calyx-segments.

Hab. Brazil and Uruguay. Introduced into cultivation about 1860. Described from a plant that flowered in the Cactus-house at Kew, Feb., 1875, sent by Dr. Regel. Var. *subexserta* Regel, is a form with a short peduncle to the spike.

2. O. LEGRELLEANA Baker. *Hohenbergia Legrelliana* Baker in Saund. Ref. Bot. t. 285.—*Echmea Legrelliana* Baker in Journ. Bot. 1879, 236. *O. palliolata* E. Morren, Cat. 1871, 2 (M.D.).—Leaves about 20 in a rosette, ensiform from an oblong base,  $1$ – $1\frac{1}{2}$  ft. long, an inch broad at the middle, firm in texture, arcuate, acuminate, plain green on the channelled face, thinly lepidote on the back, with small deltoid spreading marginal spines. Peduncle central,  $\frac{1}{2}$  ft. long, its leaves like those of the rosette, but smaller. Inflorescence a dense erect oblong spike 2–3 in. long; flower-bracts ascending, bright red, ovate or ovate-lanceolate, reaching to the top of the calyx. Ovary glabrous,  $\frac{1}{2}$  in. long; calyx-limb  $\frac{1}{2}$  in. long, the lanceolate mucronate segments three times as long as the tube. Petals lingulate, reddish purple,  $\frac{1}{4}$  in. longer than the calyx.

Hab. Uruguay, *Gilbert* 1414! Introduced into cultivation about 1856. Is in Herb. Reg. Berol. named by Klotzsch *Macrochordium recurvatum*. Described from plants that flowered with Mr. Wilson Saunders at Reigate about 1870, and Sir George Macleay at Pendell Court, in Feb., 1884.

### 7. OCHAGAVIA Philippi.

*Sepals* linear, united in a tube above the ovary. *Petals* oblanceolate-unguiculate, a little longer than the sepals, spreading only at the tip. *Stamens* inserted at the throat of the calyx-tube; filaments long, filiform; anthers linear, dorsifixed. *Ovary* inferior, ampullæform, laterally compressed, 3-celled; ovules many in a cell; style filiform, faintly 3-lobed at the top. *Fruit* large, coriaceous, indehiscent, compressed laterally. *Seeds* large, globose.

1. O. ELEGANS Philippi in Ann. Sc. Nat. ser. 4, vii. 107.—Leaves densely packed on a stem 6–8 in. long, lanceolate, rigidly coriaceous, spreading, 3–4 in. long,  $\frac{1}{2}$  in. broad at the base, green and glabrous on the face, white-lepidote beneath, armed on the edge with small deltoid spines. Flowers in a globose central terminal capitulum; outer bracts oblong, spine-edged,  $1\frac{1}{2}$  in. long. Ovary, including its neck, an inch long; segments  $\frac{3}{4}$  in. long. Petals rose-red, an inch longer than the calyx.

Hab. Juan Fernandez, *Philippi* 941! (Herb. Berol.).

### 8. FERNSEEA Baker.

*Sepals* linear-oblong, obtuse, not cuspidate, united in a short cup above the ovary. *Petals* lingulate, not scaled at the base, little longer than the sepals. *Stamens* inserted at the throat of the

calyx-tube, shorter than the petals; filaments linear; anthers linear-oblong, fixed by the back near the base. *Ovary* inferior, globose, trisulcate, 3-celled; ovules few in a cell, appendiculate at the apex; style filiform; stigmas long, linear, much twisted. *Fruit* small, globose, indehiscent. *Seeds* very few, sometimes solitary, the size of a grain of hemp-seed.—Differs from *Bromelia* by its inflorescence, bract-like stem-leaves, calyx cupular above the ovary and long much-contorted stigmas. Named after Baron Wawra von Fernsee, who has collected and carefully described and figured this and many other of the most interesting Brazilian *Bromeliaceæ*, and was engaged in writing a monograph of them at the time of his death.

1. *F. ITATIAIÆ* Baker. *Bromelia Itatiaia* Wawra, Itin. Prin. Sax. Cob. 141, t. 19.—Acaulescent. Leaves very numerous, linear from an ovate base, 6-8 in. long.  $\frac{1}{2}$ – $\frac{1}{3}$  in. broad at the middle, bright light green above, glaucous and lepidote beneath, firm in texture, arcuate, the marginal prickles close, small, spreading, deltoid. Peduncle central, a little longer than the leaves; stem-leaves erect, lanceolate, scarioso, entire, tinged with pink. Inflorescence a slightly compound moderately dense cylindrical raceme 3-4 in. long; flower-bracts lanceolate, scarioso,  $\frac{1}{2}$ –1 in. long; pedicels erecto-patent,  $\frac{1}{4}$ – $\frac{1}{2}$  in. long. Ovary subcylindrical, pubescent,  $\frac{1}{3}$  in. long; calyx as long as the ovary. Petals reddish,  $\frac{1}{2}$  in. long, spreading but little when fully expanded.

Hab. Central Brazil; on the Serra de Itatiaia, alt. 9000–10,000 ft. *Wawra* II. 442.

### 9. RONNBERGIA *E. Morren & André.*

*Sepals* united in a short campanulate tube above the ovary; segments small, ovate, not spine-pointed. *Petals* oblong-unguiculate, connivent in a tube above the calyx, spreading only at the tip. *Stamens* inserted at the throat of the calyx, much shorter than the petals; filaments filiform; anthers linear-oblong, small, basifixed. *Ovary* inferior, oblong, 3-celled, ovules many in a cell, appendiculate at the apex; style filiform; stigmas linear, contorted. *Fruit* small, globose, baccate.—Differs from *Billbergia* § *Libonia* by its sepals being united in a short tube above the ovary, and by its petioled oblong leaves, and from all the genera with inferior fruit by the leaves being entirely destitute of marginal prickles.

1. *R. MORRENIANA* Linden & André in Ill. Hort. n.s. t. 117 (M.D.).—Leaves about a dozen in a rosette, with a deeply channelled erecto-patent petiole 6-8 in. long, and an oblong acute blade above a foot long, not at all rigid in texture, light green on the face, much mottled with darker green, glaucous and less distinctly mottled on the back, both blade and petiole entirely destitute of marginal spines. Peduncle erect, about a foot long, with many ovate-lanceolate greenish-white bract-leaves. Flowers in a dense simple erect spike 3-4 in. long; bracts ovate, acute,

greenish, scariose, shorter than the flowers. Calyx including the ovary under an inch long; segments ovate. Petals twice as long as the tube, spreading only at the tip, violet.

Hab. New Granada. Introduced into cultivation by Linden in 1873. Described from a plant flowered by Mr. Wm. Bull about 1877.

#### 10. PORTEA K. Koch.

*Sepals* ovate, obtuse, strongly mucronate, united in a distinct cup above the apex of the ovary. *Petals* lingulate, much longer than the calyx, scaled at the base, spreading widely when fully expanded. *Stamens* attached 3 to the summit of the calyx-tube, 3 to the base of the petals; filaments long, filiform; anthers linear, dorsifixed, versatile. *Ovary* inferior, clavate-trigonal, 3-celled; ovules many in a cell, mucronate; style long, filiform; stigmas linear, much twisted. *Fruit* small, indehiscent.—Leaves as in *Billbergia*. *Inflorescence* an ample panicle; stem-leaves bract-like, bright coloured. Differs mainly from *Streptocalyx* by its ovate sepals united in a distinct cup above the ovary.

1. P. KERMESINA Brong.; K. Koch, Ind. Sem. Berol. 1856; Rev. Hort. 1870, 230, with figure; Antoine in Gartenfl. 1875, 129, t. 829 (M.D.). *Billbergia Brongniartii* Regel, Act. Hort. Petrop. iii. 283. *B. rubicunda* K. Koch.—Leaves 8–10 in a utricular rosette, lorate from an ovate base, above 2 ft. long, 1½ in. broad at the middle, moderately firm in texture, bright purple on the back, plain green or spotted with brown-purple on the face, deltoid at the tip, the marginal prickles small, deltoid, brown. Peduncle ½ ft. long; stem-leaves bract-like, oblong, acute, erect, glabrous, bright mauve-red. Inflorescence a dense oblong erect panicle 5–6 in. long; branch-bracts oblong, very convex, reddish, 2–3 in. long, hiding the branches; lower branches of 6–8 sessile much ascending flowers on a slender nearly straight rachis; flower-bracts oblanceolate, acute, greenish, scariose, nearly as long as the calyx. Ovary clavate, ½ in. long; calyx rather longer than the ovary; segments as long as the tube, ovate with a large cusp. Petals violet, twice as long as the calyx; stamens reaching the tip of the petals.

Hab. Brazil; province of Bahia, *Blanchet* 2997! Introduced into cultivation by M. Porte, after whom the genus is named, about 1855. Described from a plant that flowered at Kew in Jan., 1883.

2. P. GARDNERI Baker.—Leaves ensiform from a large ovate base, above a foot long, ¾–1 in. broad above the dilated base, narrowed gradually to the point, moderately firm in texture, armed with close conspicuous spreading dark brown deltoid-cuspidate marginal spines, the lower ⅙ in. long, the upper gradually smaller. Peduncle stout, flexuose, a foot long; bract-leaves spreading, lanceolate, scariose, tinged with red, 6–8 in. long, spinose towards the tip. Inflorescence a dense ovoid cernuous panicle 8–9 in. long, with a furfuraceous rachis; lower branches only subtended by large lanceolate red bracts; lower branches bearing 8–12 corymbose flowers on long ascending slender furfuraceous pedicels; ovary

clavate,  $\frac{1}{3}$  in. long; calyx as long as the ovary; segments as long as the tube, ovate, with a large mucro. Petals  $\frac{1}{2}$ – $\frac{3}{4}$  in. longer than the calyx.

Hab. Central Brazil; province of Minas Geraes on trees and the ground at San Caetano. *Gardner* 5234! Collected in Oct., 1840.

3. *P. GLAZIOVII* Baker.—Leaves lorate from an oblong base 9–12 in. long, 4–5 in. broad; blade above the base 2 ft. long, 2–2½ in. broad at the middle; texture moderately firm; upper surface naked; apex deltoid-cuspidate; marginal prickles small, close, dark brown, lanceolate, the lower  $\frac{1}{8}$ – $\frac{1}{6}$  in. long. Inflorescence a lax panicle above a foot long, 4–5 in. broad; branch-bracts small, lanceolate, the lower only 1½–2 in. long; lower branches compound; pedicels ascending, glabrous,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Ovary clavate, glabrous,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; calyx as long as the ovary; segments twice as long as the tube, ovate, with a large cusp. Petals protruded  $\frac{1}{2}$  in. from the calyx.

Hab. Brazil, *Glaziou* 12230! Received in Jan., 1881.

## 11. ANANAS *Adans.*

*Ananassa* Lindl.

*Sepals* ovate, acute, free down to the top of the ovary. *Petals* lingulate, free, scaled at the base, much longer than the sepals. *Stamens* much shorter than the petals, 3 epigynous, 3 attached to the base of the petals; filaments filiform; anthers linear, attached near the base. *Ovary* inferior, 3-celled; ovules many in a cell; style filiform; stigmas linear, scarcely twisted. *Fruits* fleshy, connate with the bracts into a large ovoid or subglobose syncarpium, which is usually crowned by a coma of leafy empty bracts. *Seeds* globose, horny, the size of a pea.—*Leaves* in a dense basal rosette, ensiform, firm in texture. *Peduncle* central, its leaves spine-edged and firm in texture, *Petals* violet or purplish. *Syncarpium* often proliferous from the base, bearing buds from which the plant can be propagated.

1. *A. SATIVUS* (*Ananassa sativa*) Lindl. in Bot. Reg. sub. t. 1068. *Bromelia Ananas* Linn. Sp. Plant. 408; Red. Lil. t. 455–6. *B. sylvestris* Vell. Fl. Flum. iii. t. 113, non Willd.—Leaves 30–50 in a dense rosette, ensiform, 3–5 ft. long, 1½–2 in. broad at the middle, firm in texture, green on the face and channelled, thinly white-lepidote and finely striated vertically on the back, narrowed gradually to the point, the teeth close, small, deltoid-cuspidate and hooked. *Peduncle* stiffly erect,  $\frac{1}{2}$ –1 ft. long, its leaves with long produced rigid serrated tips. Inflorescence an ovoid strobilus 3–6 in. long; bracts ovate, acute, rigid, serrated, adnate at the base to the ovary. Flower about an inch long; sepals ovate, half as long as the lingulate violet or purplish petals. *Stamens* a little shorter than the petals. *Syncarpium* ovoid,  $\frac{1}{2}$ –1 ft. long in the cultivated forms, crowned generally with a coma of 20–30 foliaceous empty bracts. Very variable, the principal cultivated forms

to which Latin names have been given being as follows, viz. :—  
 1. *A. pyramidalis* Miller Gard. Dict. No. 2 (Plumier, Bot. Amer. t. 31, 35, 36), with a large pyramidal syncarpium, with yellow flesh, to which belong the Sugar-loaf Pine-apple and many of the forms now most commonly cultivated. 2. *A. ovalis* Miller, Gard. Dict. No. 1; Plumier, Bot. Amer. iii. t. 38; Trew Ehret, t. 2; Sims in Bot. Mag. t. 1554, the Queen Pine-apple, with an ovoid syncarpium with white flesh. 3. *A. viridis* Miller, Gard. Dict. No. 6, the Montserrat Pine-apple, with a pyramidal greenish-yellow syncarpium. 4. *A. serotinus* Miller, Gard. Dict. No. 5, the St. Vincent's, or Green Olive Pine-apple, with a small late-maturing green syncarpium with sweet yellow flesh. 5. Var. *coccineus* E. Morren (Descourt. Fl. Med. Ant. v. 141, t. 341), with reddish flesh. 6. *A. variegatus* Bojer, leaves variegated with white, fruits rarely produced. 7 and 8. *A. Porteanus* K. Koch; E. Morren in Belg. Hort. 1872, 193, t. 16-19, and *A. penangensis* Hort., two decorative forms, with variegated leaves. 9. Var. *polycephalus* Hassk. Pl. Rar. Jav. 125 (*A. monstrosus* and *A. proliferus* Hort.), in which the lower drupes of the syncarpium are replaced by small clusters. 10. *A. microcephalus* Hort. Linden, a dwarf form with small drupes of unpalatable taste and small globose syncarpia, which perhaps represents the original wild form of the species, and 11. *A. bracamorensis* Hort. Linden, a giant form from Columbia, of which a full description will be found Illust. Gartenzeit. Wien, 1885, p. 272.

Var. A. **GLABER** Miller, Gard. Dict. No. 3. *A. semiserratus* Schult. fil. *Bromelia semiserrata* Willd., the Havannah Pine-apple.—Leaves with only a few small teeth towards the tip. *Bromelia subspinosa* Wendl., is a form with the inner leaves tinged with red.

Var. A. **LUCIDUS** Miller, Gard. Dict. No. 4 (Plumier, Amer. t. 60; Trew Ehret, t. 3; Dill. Hort. Elth. 25, t. 21, fig. 22), the King Pine-apple.—Leaves bright green, entire. Syncarpium bright yellowish green. Bracts often tinged with red. *A. Mordilona* Hort. Linden; E. Morren in Belg. Hort. 1879, 302, is a form with variegated leaves. Most of the pine-apples sold in the London shops belong to this variety, and are grown in the Azores.

Var. A. **DEBILIS** Lindl. in Bot. Reg. sub t. 1081 (Pomol. Mag. tab. 1).—Leaves weaker, spreading, with small reddish teeth. Syncarpium oblong, dull yellow.

Hab. Widely spread in Tropical America and now often naturalised in the tropical regions of the Old World. It was introduced into England by Lord Portland in 1690, and was first figured in Oviedo's 'History of the Indies,' in 1535. For a full bibliography see Beer's 'Bromeliaceæ,' pages 207—221, and for a synopsis of the cultivated varieties see Munro's paper in Trans. Hort. Soc., new series, vol. i. p. 1 (1830—1831), reprinted Gard. Chron. 1860, pp. 976, 999, 940, translated into German by Beer, Brom. p. 222, and into French in the 'Belgique Horticole,' 1878, p. 144—172. For an account of the fibre yielded by its leaves see Morris, in Kew Bulletin, 1887, No. 9.

2. A. **BRACTEATUS** (*Ananassa bracteata*) Lindl. in Bot. Reg. t. 1081; Hook. in Bot. Mag. t. 5025. *A. Sagenaria* Schult. fil. Syst. Veg. vii. 1286. *Bromelia Sagenaria* Arruda.—Leaves 30-50 in a rosette, ensiform, 4-5 ft. long, 1½ in. broad at the middle, firm in

texture, plain green on the face, thinly lepidote on the back, tapering to the point, the marginal prickles like those of *Karatas Plumieri*, much larger and more distant than in *A. sativus*. Peduncle 1–2 ft. long, its leaves usually bright red. Inflorescence a dense oblong strobilus 4–6 in. long; bracts ovate, rigid, bright red,  $1\frac{1}{2}$ –2 in. long, strongly serrated. Sepals ovate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Petals lingulate, violet, more than twice as long as the calyx. Syncarpium ovoid,  $\frac{1}{2}$  ft. long, with a large coma, pale yellow when fully ripe, the points of the bracts projecting beyond the drupes.

Hab. Widely spread in Brazil, especially near the coast, *Burchell* 5500! *Glaziou* 12235! 13264! Introduced into cultivation by Mr. Robert Barclay from Portugal in 1820. *A. muricatus* Schultes fil., which is known only from the description of Arruda da Camara, may be a variety of this species, with exaggerated spinose cusps to the bracts. They are described as  $3\frac{1}{2}$  in. long. In cultivated *bracteatus* they sometimes reach an inch.

3. *A. MACRODONTES* E. Morren in Belg. Hort. 1878, 140, t. 4–5 (M.D.). *Bromelia macrodosa* and *B. undulata* Hort.—Leaves 30–40 in a rosette, ensiform, 3–4 ft. long, 2– $2\frac{1}{2}$  in. broad at the middle, weaker in texture and more spreading than in *A. sativus*, much undulated, purplish-brown on the deeply-channelled face, thinly white-lepidote on the back, the deltoid-cuspidate hooked marginal prickles large and distant. Peduncle erect, a foot long, its leaves tinged with red. Inflorescence a dense strobilus 6–8 in. long; bracts ovate-cuspidate, reddish, spine-edged, the larger  $1\frac{1}{2}$ –2 in. long. Sepals ovate,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Petals purplish, more than twice as long as the sepals. Fruit an ovoid syncarpium 7–8 in. long, not crowned by a coma of leaves, the ascending cusps of the rigid brown bracts much longer than the drupes.

Hab. Brazil. First flowered by M. Rodembourg at Liège, in May, 1876. Described from Morren's drawings and living plants at Kew.

## 12. ACANTHOSTACHYS *Klotzsch*.

*Sepals* lanceolate-deltoid, acute, free down to the top of the ovary. *Petals* lingulate, scaled at the base, a little longer than the calyx. *Stamens* shorter than the petals, 3 epigynous, 3 attached to the base of the petals; filaments rather compressed; anthers attached by the back near the base. *Ovary* inferior, globose, flattened on the side next the axis; ovules 2 in a cell, collateral, pendulous; style filiform; stigmas short, cuneate, not twisted. *Fruits* pulpy, crowned by the persistent calyx, not concrete with each other and the bracts.—This is very different in stigma and non-concrete fruits from *Ananas*, with which Mr. Bentham has joined it.

1. *A. STROBILACEA* Link, *Klotzsch & Otto*, Ic. Pl. Rar. Hort. Berol. 21, t. 9 (M.D.). *Hohenbergia strobilacea* Schultes fil. Syst. Veg. vii. 1252. Tufts crowded on a slender creeping rhizome. Produced leaves 1–3, linear, the central one  $1\frac{1}{2}$ –2 ft. long,  $\frac{1}{4}$  in. broad, hemispherical on the back, channelled down the face, firm in texture, narrowed gradually to a point, dull green, obscurely

lepidote, the marginal prickles minute. Peduncle terete, 6 in. to 2 ft. or more long, bearing about the middle a dense spike 2-4 in. long, bracteated by one large reduced leaf and other small ones. Flower-bracts ovate, with a large cusp, rigid,  $\frac{1}{2}$  in. long, serrated. Ovary  $\frac{1}{4}$  in.; sepals  $\frac{1}{3}$  in. long. Petals  $\frac{1}{2}$  in. long, whitish. Fruit pulpy, containing 6 small seeds.

Hab. High campos of Central Brazil, *A. Cunningham!* (year 1815)! *Burchell* 5008! *Sello* 5215! *Regnell* 1260! *Claussen* 361! *Glaziou* 13249! Introduced into cultivation about 1840. Described from a plant that flowered at Kew, Feb., 1877.

2. *A. ANANASSOIDES* Baker. — Leaves rigid, linear, very acuminate, 3 ft. or more long, under an inch broad above the dilated base; prickles middle-sized, falcate. Peduncle  $1\frac{1}{2}$  ft. long. Inflorescence a dense oblong terminal central capitulum  $1\frac{1}{2}$  in. long, 1 in. diam.; flower-bracts ovate-lanceolate, acute, spine-edged,  $\frac{1}{2}$  in. long. Calyx with ovary shorter than the bract. Petals lingulate, shortly protruded.

Hab. Central Brazil; between Goyaz and Cujaba, collected by Weddell in 1844; *Caldas*, *Regnell* 1261! (Herb. Paris). Has entirely the habit of a small *Ananas*, but the bract is quite free from the ovary.

### 13. BROMELIA *Linn.*, ex parte.

(*Agallostachys* Beer).

*Sepals* free down to the top of the ovary, oblong, not mucronate. *Petals* free or obscurely connate at the base, not scaled. *Stamens* inserted at the base of the petals; filaments short; anthers linear, erect, almost basifixed. *Ovary* inferior, cylindrical-trigonous; ovules many in a cell; style filiform; stigmas short, scarcely twisted. *Fruit* a large yellowish berry. *Seeds* as large as a pea, with a thin testa.—*Leaves* in the typical species long, rigid, ensiform, armed with pungent hooked spines. *Inflorescence* a dense panicle, the lower branch-bracts with a serrated cusp and the crowded arcuate stem-leaves similar to the rosette leaves in texture, but shorter and often coloured bright red.

Petals but little longer than the sepals . . . Sp. 1-4.

Petals much longer than the sepals . . . Sp. 5-6.

1. *B. PINGVIN* Linn. Sp. Plant. 408 (Dill. Elth. t. 240, fig. 311; Trew Ehret. t. 51); Red. Lil. t. 396. *Agallostachys Pinguin* Beer. *Karatas Pinguin* Miller. *Ananas Pinguin* Gaert. *Karatas Plumieri* Devan. non Morren.—Acaulescent. Leaves 100 or more in a rosette, ensiform, stiffly erect in the lower half, reaching a length of 5-6 ft.,  $1\frac{1}{2}$ -2 in. broad at the middle, tapering gradually to the point, green and glabrous on the face, thinly white-lepidote on the back, armed with very large toothed pungent brown prickles. Peduncle stout, stiffly erect, about a foot long, its leaves often bright red. Panicle dense, stiffly erect, 1-2 ft. long; axis and branches densely mealy; branch-bracts oblong, pale, lower with a rigid spine-edged cusp; lower branches 3-4 in. long, bearing 6-8

sessile flowers; flower-bracts minute, ovate. Ovary cylindrical, very pubescent, about an inch long; sepals nearly as long, with a densely matted tip. Petals reddish, densely matted at the tip with white tomentum, about  $1\frac{1}{4}$  in. longer than the calyx. Berry ovoid, yellowish brown, 1 in. diam.

Hab. Widely spread in Tropical America, especially in the West Indies. *B. ignea* Beer, *B. Binoti* and *B. paraguayensis* Hort. (M.D.), are varieties with bright red inner leaves. A drawing of Miss North's (No. 31), and a woodcut in 'The Garden,' April 15, 1882, show the general habit excellently.

2. *B. SYLVESTRIS* Willd.; Sims in Bot. Mag. t. 2392. *Agallostachys sylvestris* Beer. — Acaulescent. Leaves ensiform, rigid, 3–4 ft. long,  $1\frac{1}{2}$  in. broad low down, narrowed gradually to the point, bright green on the face, thinly albo-lepidote on the back, armed with strong hooked prickles. Peduncle a foot or more long, its leaves reflexing, the upper bright red. Inflorescence a narrow panicle with short spaced-out corymbose branches, all subtended by bright red bracts, the lower with rigid spine-edged tips. Ovary pubescent, cylindrical-trigonous, about an inch long; sepals nearly as long as the ovary. Petals reddish, not matted at the tip, protruding  $\frac{1}{4}$  in. from the calyx.

Hab. Tropical America. Figured by Dr. Sims from a plant flowered by Anderson in the Chelsea garden in 1822 received from Berlin.

3. *B. LACINIOSA* Mart.; Schult. fil. Syst. Veg. vii. 1278; (M.D.). *Agallostachys lacinosus* K. Koch. *Karatas guianensis* Hort.—Acaulescent. Leaves rigid, ensiform, suberect in the lower half, reaching a length of 4–5 ft.,  $1\frac{1}{2}$  in. broad low down, tapering gradually to the point, bright green on the face, thinly lepidote on the back, armed with large pungent deltoid-cuspidate hooked prickles. Peduncle reaching a foot in length; its leaves ensiform, bright red. Panicle very dense, 2–3 in. diam.; branch-bracts pale, scariose, the lower with rigid red cusps; axis and branches densely canescent, the lower not more than  $1\frac{1}{2}$ –2 in. long. Ovary cylindrical-trigonous, densely pubescent,  $\frac{1}{2}$  in. long; sepals nearly as long as the ovary. Petals dull lilac, faintly tipped with tomentum,  $\frac{1}{4}$  in. longer than the sepals.

Hab. Caatingas of North Brazil, *Martius*. Flowered in cultivation at Liège in 1873. Intermediate between *B. Pinguin* and *B. fastuosa*. The same species, or a very close ally is in K. Koch's herbarium named *B. lanigera*.

4. *B. SERRA* Griseb. Symb. Fl. Argent. 329.—Habit of *B. Pinguin*. Leaves linear, a foot long,  $\frac{1}{3}$  in. broad at the middle, glabrous on the face, albedo-lepidote on the back, armed with small deltoid prickles. Panicle compact; branch-bracts rose-red; flower-bracts ovate-oblong, longer than the ovary. Ovary  $\frac{1}{2}$  in. long; sepals oblong, subobtuse,  $\frac{1}{2}$  in. long. Petals red-violet or white,  $\frac{1}{3}$  in. longer than the sepals.

Hab. Argentine territory; province of Oran, *Lorentz*. Vernacular name "Chaguar."

5. *B. FASTUOSA* Lindl. Collect. t. 1 (1821); Regel, Gartenfl. t. 493 (M.D.). *B. antiacantha* Bertol. Misc. iv. 6, t. 1; Antoine, Brom. t. 20 (M.D.). *B. Sceptrum* Fenzl.; Hart. Parad. t. 8. *B. Commeliniana* De Vriese, Descr. t. 4. *Agallostachys fastuosa*, anti-

*acantha* and *Commeliniana* Beer.—Acaulescent. Leaves 100 or more in a rosette 4–5 ft. diam., ensiform, 4–5 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, narrowed gradually to the point, rigid but recurving from low down, green on the face, thinly white-lepidote and lineate on the back, armed with copious, middle-sized hooked pungent yellowish prickles. Peduncle about a foot long; leaves crowded, arcuate, 1– $1\frac{1}{2}$  ft. long, often bright red. Panicle 1–2 ft. long, 4–6 in. diam., stiffly erect, with a stout densely pubescent axis; branch-bracts oblong, pale, scariose, lower with spine-edged cusps; lower branches flexuose, 2–3 in. long, bearing 6–8 erectopatent usually sessile flowers; flower-bracts minute, scariose. Ovary densely pubescent,  $\frac{3}{4}$  in. long; sepals oblong,  $\frac{1}{4}$  in. long. Petals red-violet, exserted  $\frac{1}{2}$  in. beyond the sepals. Berry yellow, ovoid,  $1\frac{1}{2}$ –2 in. long, 1 in. diam.

Hab. South and Central Brazil, *Burchell* 1520! *Gaudichaud* 129! *Tweedie* 793! *Glaziou* 12234. Paraguay, *Balansa* 608! Now the commonest species in cultivation. Lindley's plant was described from the collection of Mr. A. B. Lambert at Boyton. Bertoloni's was brought from Brazil to Bologna by Raddi.

6. *B. CHRYSANTHA* Jacq. Hort. Schoenb. i. t. 55. *Agallostachys chrysantha* Beer. — Acaulescent. Leaves ensiform, rigid, 2–3 ft. long,  $1\frac{1}{2}$  in. broad, low down, tapering gradually to the tip, bright green on the face, thinly lepidote and striated on the back, armed with large pungent hooked spines. Peduncle a foot long. Panicle comparatively lax, 1– $1\frac{1}{2}$  ft. long; rachis and branches pubescent; lower very flexuose, about 3 in. long, bearing about 6 sessile flowers, each subtended by a scariose ovate bract  $\frac{1}{2}$  in. long. Ovary cylindrical-trigonus, slightly pubescent,  $\frac{3}{4}$  in. long; sepals lingulate, subcoriaceous, nearly naked,  $\frac{1}{2}$ – $\frac{5}{8}$  in. long. Petals bright yellow,  $\frac{1}{2}$  in. longer than the sepals. Berry turbinate, yellow, very sweet.

Hab. Venezuela, *Fendler* 2574! Described and figured by Jacquin from the Schonbrun Garden in 1797.

#### 14. RHODOSTACHYS Phil.

(*Ruckia* Regel).

*Sepals* linear-oblong, not mucronate, free down to the cyathiform summit of the ovary. *Petals* oblong-unguiculate, little longer than the calyx, sometimes minutely scaled at the base, spreading only at the tip. *Stamens* as long as or a little longer than the petals, epigynous; filaments filiform; anthers dorsifixed, linear-oblong, versatile. *Ovary* inferior, oblong, 3-celled; ovules many in a cell; style long, filiform; stigmas short, scarcely twisted. *Fruit* ovoid-triquetrous, baccate.—*Leaves* many in a dense rosette, ensiform, firm in texture, armed on the margin with pungent spines. *Inflorescence* a dense sessile or shortly-peduncled central capitulum. *Flowers* red or violet. All the species are subtemperate, with leaves like those of *Hechtia* and *Dyckia*.

1. *R. BICOLOR* Benth. Gen. Plant. iii. 662. *Bromelia bicolor* Ruiz et Pav. Fl. Peruv. iii. 33; C. Gay, Fl. Chil. iii, 9, Atl. t. 68; E. Morren in Belg. Hort, 1873, t. 14.—Leaves 50–100 in a dense

rosette, ensiform, rigid, 1-1½ ft. long, 1½ in. broad at the dilated base, ½ in. at the middle, plain green on the face, thinly lepidote on the back, narrowed gradually to the point, the marginal prickles small and deltoid. Flowers in a head 2 in. diam. in the centre of the reduced red inner leaves, those just outside the capitulum ovate, with large spines; flower-bracts oblanceolate, rather shorter than the calyx. Ovary clavate, above an inch long; sepals shorter than the ovary, furfuraceous towards the tip. Petals violet, little longer than the sepals. Stamens not exerted. Fruit 1½ in. long.

Hab. Chili, about Valdivia, Concepcion, &c. Native name "Chupalla." Not known in cultivation.

2. *R. ALBO-BRACTEATA* Baker. *Bromelia albo-bracteata* Steud. in Phil. Pl. Chil. No. 204.—Leaves in a dense rosette, 1-1½ ft. long, ¼ in. broad at the middle, not so rigid in texture as in *R. bicolor*, sharply prickly on the margin. Flowers in a central head 2 in. diam.; outer bracts oblong-cuspidate, very furfuraceous, the innermost not overtopping the flowers. Ovary glabrous, subcylindrical, ½ in. long; sepals linear-oblong, furfuraceous, ⅓-½ in. long. Petals pale lilac, very little longer than the sepals. Stamens not exerted.

Hab. North Chili, on trees and rocks, *Philippi* 204! Gathered in 1852.

3. *R. PITCAIRNIÆFOLIA* Benth. Gen. Plant. iii. 662. *R. Joinvillei*, Benth. loc. cit. *Bromelia Joinvillei* E. Morren in Belg. Hort. 1876, 161, t. 10-11. *B. pitcairniæfolia* K. Koch, Wochen. 1868, 325 (M.D.). *Hechtia pitcairniæfolia* Verlot in Rev. Hort. 1868, 211, with figure. *Billbergia Joinvillei* Hort. Van Houtte. *Pouretia Joinvillei* Chantin.—Acaulescent. Leaves about 50, ensiform, 1½ ft. long, an inch or more broad at the dilated base, ½-¾ in. at the middle, dull green on the face, thinly white-lepidote on the back, tapering gradually to the point, less rigid in texture than in *R. bicolor*, the marginal prickles more slender and not so close. Flowers in a dense central head 1½-2 in. diam., reduced inner leaves bright red. Ovary clavate, an inch long; sepals nearly as long as the ovary. Petals bright violet, little protruded, minutely scaled at the base. Stamens a little shorter than the petals.

Hab. Probably Chili. Common in cultivation under a great variety of names. First flowered in 1866 by M. Lueddemann, at Paris. We have had it at Kew for many years, but I have never seen it in flower.

4. *R. ANDINA* Phil. in Linnæa, xxix. 57. *Bromelia longifolia* Lindl. in Paxt. Flow. Gard. t. 65; Lemaire, Jard. Fleur. t. 223, non Rudge. *B. carnea* Beer, Brom. 31. *Ruckia Elemæti* Regel, Gartenfl. 1868, 65, t. 571.—Leaves about 100 in a dense rosette, ensiform, 1-1½ ft. long, above an inch broad at the dilated base, ½-¾ in. at the middle, firm in texture, green and rather channelled down the face, naked when mature, persistently white-lepidote on the back, acuminate, the edge-prickles conspicuous and pungent. Flowers in a globose central head 2-3 in. diam., the inner ensiform leaves not turning red; the innermost ovate, as long as the flowers, eroso-dentate, slightly tinged with pink; flower-bracts oblanceolate, acute, rather shorter than the calyx. Ovary clavate-triangular, glabrous, ¾ in. long; sepals rather shorter than the ovary. Petals

oblanceolate, subacûte, bright red,  $\frac{1}{6}$  in. longer than the sepals. Filaments exerted; anthers linear-oblong,  $\frac{1}{6}$  in. long. Fruit ovoid,  $\frac{1}{2}$ – $\frac{5}{8}$  in. diam.

Hab. Cordilleras of Northern Chili, *Philippi* 938! *Germain*! Introduced into cultivation in England about 1850. Mainly described from a plant in the Cactus-house at Kew, Feb., 1875.

5. *R. LITTORALIS* Phil. in Linn. xxx. 201.—Leaves about 40 in a rosette, ensiform, under a foot long,  $\frac{3}{4}$  in. broad above the dilated base, tapering gradually to the acuminate point, rigid in texture but recurving, dull green and channelled down the face, persistently white-lepidote on the back, the marginal prickles conspicuous and pungent. Flowers in a central head  $1\frac{1}{2}$ –2 in. diam.; innermost leaves ovate, 2 in. long, rose-red; flower-bracts  $1\frac{1}{2}$  in. long, furfureous on both sides. Ovary clavate,  $\frac{3}{4}$  in. long; sepals nearly as long as the ovary. Petals rose-red, lingulate, an inch long. Filaments pink, as long as the petals; anthers linear-oblong,  $\frac{1}{3}$  in. long.

Hab. Chili; maritime region of the province of Colchagua. Described from a plant at Kew, Nov., 1887, and one flowered by Mr. W. Bull, Sept. 1873.

6. *R. GRANDIFLORA* Phil. in Linn. xxx. 202.—Leaves ensiform, albo-lepidote beneath, margined with pungent prickles; inner bright red, furfureous towards the base on both sides; innermost ovate-lanceolate, rather shorter than the flowers. Ovary clavate-trigonus; sepals above  $\frac{3}{4}$  in. long. Petals subobtuse, cuspidate, 14 lines long,  $\frac{1}{4}$  in. broad. Stamens as long as the petals; anthers linear,  $\frac{1}{3}$  in. long.

Hab. Chili; province of Colchagua, *Volckmann*. Known to me only from Dr. *Philippi*'s description.

7. *R. ARGENTINA* Baker.—Leaves 30–40 in a rosette, lorate-ensiform, above a foot long. 3 in. broad at the dilated base, 1– $1\frac{1}{4}$  in. at the middle, firm in texture, dull green, scarcely lepidote, deeply channelled down the face, thinly white-lepidote on the back, narrowed to deltoid tip with a small pungent brown cusp, the marginal prickles ascending, dark brown, pungent, the lower  $\frac{1}{3}$ – $\frac{1}{6}$  in. long. Peduncle very stout, finally 4 in. long. Inflorescence globose in the fruiting stage, 4 in. diam.; inner leaves ovate, shorter than the head. Sepals linear-oblong,  $\frac{3}{4}$  in. long. Fruit ovoid,  $\frac{3}{4}$  in. diam.

Hab. Argentine Republic; province of Gran Chaco. Described from living plants and dried specimens at Kew, received from Mr. F. E. Harman, Sept. 1884.

### 15. ARÆOCOCCUS *Brong.*

*Sepals* minute, ovate, free down to the ovary. *Petals* free, lingulate, 3–4 times the length of the sepals, not scaled at the base. *Stamens* epigynous; filaments filiform, shorter than the petals; anthers minute, ovate. *Ovary* inferior, oblong, 3-celled; ovules 2 in a cell, axile, pendulous; style filiform; stigmas short, not twisted. *Fruit* small, indehiscent.

1. *A. MICRANTHUS* Brong. in Ann. Sc. Nat. ser. 2, xv. 370. *Bromelia Acanga* Schult. fil. Syst. Veg. vii. 1281, non Linn.—Tufts from a slender rhizome. Leaves clasping each other in a cylindrical utriculus for 6–9 inches, only 1–2 produced, linear,  $1\frac{1}{2}$ –2 ft. long above the clasping base,  $\frac{1}{4}$ – $\frac{1}{2}$  in. broad, erect, moderately firm in texture, with minute marginal prickles. Peduncle slender, above a foot long; leaves small, scariosæ. Inflorescence a lax decomposed ovoid panicle 6–8 in. long, with very flexuose red rachises; flowers sessile, each subtended by a small ovate cuspidate bract. Ovary including sepals  $\frac{1}{8}$  in. long. Petals yellow, 1–12th in. long. Berry purple, globose,  $\frac{1}{8}$  in. diam.

Hab. Amazon valley, *Spruce*! French Guiana, *Martin*! *Poiteau*! *Melinon*! *Leschenault*! *Sagot*! Introduced into cultivation from Demerara by Sir Henry Barkly in 1859. *Bromelia Acanga* Linn., seems to be made up of two different plants, the description referring to *B. Pinguin*, but most of the synonyms to *Karatas Plumieri*.

## 16. STREPTOCALYX Beer.

*Sepals* free down to the ovary, ovate-lanceolate, much twisted, cartilaginous, distinctly mucronate. *Petals* oblong, with a long claw, free down to the base, without basal scales. *Stamens* shorter than the petals; filaments elongated; anthers linear, dorsifixed. *Ovary* inferior, oblong-trigonus; ovules many in a cell; style filiform; stigmas twisted. *Fruit* small, indehiscent.—*Leaves* densely rosulate, cartilaginous, spine-edged. *Inflorescence* an ample panicle; leaves of the peduncle small and bract-like. Petals violet. Differs only from *Achmea* by its very contorted sepals and more protruded scaleless petals, and scarcely worth separating generically.

1. *S. POEPPIGHI* Beer Brom. 141 (M.D.).—Acaulescent. Leaves 20 or more forming a utricular rosette, lorate,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, deltoid-cuspidate at the apex, dark glaucous green on the face, thinly white-lepidote on the back, with minute deltoid teeth. Peduncle about as long as the leaves; bract-leaves red, oblong-lanceolate, serrated. Panicle drooping, not so dense as in the other species, about a foot long; branch-bracts as long as the branches, oblong, bright red, serrated, the lower 2–3 in. long. Lower branches with about 6 sessile erecto-patent flowers; flower-bracts minute, membranous, round-cuspidate. Ovary oblong-trigonus, farinose,  $\frac{1}{8}$  in. long; sepals  $\frac{1}{2}$  in. long, tinged with red. Petal-blade oblong, violet, protruded  $\frac{1}{2}$  in. beyond the sepals.

Hab. Amazon valley; first discovered by Poeppig at Ega, and re-gathered by Dr. Spruce in Oct., 1849. Not known in cultivation.

2. *S. VALLERANDI* E. Morren in Belg. Hort. 1883, 13, t. 1—2. *Lamprococcus Vallerandi* Carriere in Rev. Hort. 1877, 129, with tab.—Acaulescent. Leaves about 40 in a dense rosette, with an ovate base 3–4 in. broad, the blade 3–4 ft. long,  $1\frac{1}{2}$  in. broad at the middle, narrowed gradually to the point, bright green and channelled down the face, grey and finely lineate on the back, the marginal prickles close, small and deltoid. Inflorescence including

panicle  $1\frac{1}{2}$ –2 ft. long; bract-leaves small, oblong, bright red. Panicle dense, erect, oblong-cylindrical,  $1$ – $1\frac{1}{2}$  ft. long; branch-bracts as long as the branches, oblong, acute, serrated, bright red, the lower 3–4 in. long; lower branches with 6–8 sessile erecto-patent flowers; flower-bracts minute, with a long cusp. Ovary subcylindrical, above  $\frac{1}{2}$  in. long; sepals longer than the ovary. Petal-blade oblong, violet, protruded  $\frac{1}{2}$  in. beyond the sepals.

Hab. Amazon valley; introduced by Baraquin in 1876. Flowered by M. Eugene Vallerand, head-gardener to M. Carcenac, at Bougival, near Paris, after whom it was named, in 1877; and by M. Chantin of Paris, in 1881.

3. *S. FUERSTENBERGII* E. Morren in Belg. Hort. 1883, 13 (M.D.). *Echmea Fuerstenbergii* E. Morren & Wittm. in Belg. Hort. 1879, 42, t. 2.—Acaulescent. Leaves 30–40 in a dense rosette, ensiform, arcuate, firm in texture, 2– $2\frac{1}{2}$  ft. long, 3 in. broad at the dilated base.  $1\frac{1}{2}$  in. at the middle, tapering gradually to the point, dull green and channelled down the face, finely vertically lineate on the back, margined with copious small hooked deltoid-cuspidate prickles. Panicle central, nearly sessile, oblong, strobiliform, 15–18 in. long, 3–4 in. diam.; branch-bracts as long as the branches, oblong, pink, serrated, the lower 3–4 in. long; lower branches with 6–8 sessile erecto-patent flowers; flower-bracts minute, ovate. Ovary greenish, mealy,  $\frac{1}{3}$  in. long; sepals twice as long as the ovary. Petal-blade small, oblong.

Hab. Brazil; province of Bahia. Described from a plant flowered by Mr. Wm. Bull in Oct., 1886. It was described from a plant that flowered with Prince Fuerstenberg, at Donausingen, in the Black Forest, in 1877.

4. *S. LONGIFOLIA* Baker. *Bromelia longifolia* Rudge, Guian. i. 31, t. 49.—Leaves rigid, ensiform, 3–4 ft. long, an inch broad above the dilated base, tapering gradually to the point, armed with close, middle-sized deltoid-cuspidate marginal prickles. Peduncle very short. Panicle oblong, strobiliform, half a foot long, 3–4 in. diam.; branch-bracts ovate, rigid, minutely eroso-ciliated, the lower 2 in., the upper an inch long; lower spikes 4–5 flowered, as long as their bracts. Ovary oblong-trigonous,  $\frac{1}{3}$  in. long; sepals lanceolate,  $\frac{3}{4}$  in. long, minutely cuspidate. Petals not seen.

Hab. French Guiana, *Martin*! The original specimen from which Rudge's figure was made is at the British Museum. The species is closely allied to *S. Fuerstenbergii*.

5. *S. ? POITEI* Baker. — Leaves ensiform, rigid in texture,  $2\frac{1}{2}$ –3 ft. long,  $1\frac{1}{2}$  in. broad at the middle, narrowed gradually to the pungent apex, margined with close hooked moderately large deltoid-cuspidate prickles. Panicle a foot long, about as dense as in *S. Poeppigii*; branch-bracts oblong, acute, red, serrated, the lower about 3 in. long; lower branches  $1\frac{1}{2}$ –2 in. long, bearing 4–6 erecto-patent sessile flowers; flower-bracts small, ovate, with a subpungent cusp. Mature ovary subglobose,  $\frac{1}{4}$  in. long; sepals lanceolate,  $\frac{1}{2}$  in. long, with a large subpungent cusp. Petals not seen.

Hab. Cayenne. Described from a plant from J. Gay's herbarium, received by him from Poiteau in 1824.

6. *S. LAXIFLORA* Baker. — Inflorescence a large lax panicle;

branches lax-flowered, reaching a foot in length, the lower compound; flower-bracts ascending, oblong, strongly ribbed, an inch long. Calyx with ovary  $1\frac{1}{4}$  in. long; sepals lanceolate, 2-3 times the length of the ovary, conspicuously mucronate.

Hab. Central Brazil; Bahia, *Blanchet* 2274! (Herb. Mus. Brit.).

7. *S. BLANCHETII* Baker.—Leaves lorate, rigid, naked,  $1\frac{1}{2}$  in. broad, deltoid at the apex; marginal teeth minute. Inflorescence a lax panicle  $1\frac{1}{2}$  ft. long; branches lax-flowered, the end one a foot long, the side one shorter, arcuate; flower-bracts ovate, acute, erecto-patent, an inch long. Calyx with ovary an inch long; sepals lanceolate,  $\frac{3}{4}$  in. long, free to the base, little twisted, distinctly cuspidate. Petals not seen.

Hab. Central Brazil; Bahia, *Blanchet*! (Herb. Mus. Brit.). Inflorescence like that of *Tillandsia flexuosa*.

8. *S. PODANTHA* Baker.—Leaves lorate from an oblong base 5-6 in. long,  $4-4\frac{1}{2}$  in. broad; blade 2 ft. long, 2 in. broad, moderately firm in texture, nearly glabrous; teeth close, brown, the lower  $\frac{1}{8}$  in. long. Peduncle stout; upper bract-leaves large, red, scariose. Inflorescence a lax, tripinnate panicle 2 ft. long; branches 3-5 in. long, only a few of the lowest compound; branch-bracts small, ovate; pedicels erecto-patent,  $\frac{1}{2}-\frac{3}{4}$  in. long, with a minute basal bract. Calyx with ovary  $\frac{3}{4}$  in. long; sepals ovate, minutely mucronate, shorter than the ovary. Petal-blade narrow,  $\frac{3}{4}$  in. long.

Hab. South Brazil *Glaziou*, 16417!

#### 17. *ÆCHMEA* Ruiz & Pavon.

*Sepals* lanceolate or ovate, free down to the top of the ovary, usually furnished with a spiny mucro. *Petals* free, lingulate, scaled at the base, two or three times the length of the sepals. *Stamens* shorter than the petals, 3 epigynous, 3 attached to the base of the petals; filaments filiform; anthers linear-oblong, dorsifixed. *Ovary* inferior, 3-celled; ovules mucronate, usually many, rarely only 3-4 in a cell; style filiform; stigmas flattened at the tip and spirally twisted. *Fruit* subcoriaceous or baccate. *Seeds* minute. *Leaves* densely rosulate, usually lorate, spine-margined. Leaves of the peduncle scariose, often bright red. *Inflorescence* very various, spicate, racemose or paniced, the ultimate branchlets multifarious or distichous, each flower usually subtended by a coriaceous spine-tipped bract. *Flowers* smaller than in *Bilbergia*, very various in colour.

Subgenus 1. *ÆCHMEA* PROPER.—Inflorescence a panicle with multifarious branches. Petals 3-4 times the length of the mucronate sepals, twisting as they fade. . . . Sp. 1-2.

Subgenus 2. *HOHENBERGIA* Schultes fil. (*Hoplophytum* Beer).—Inflorescence a panicle with multifarious not strobiliform branches. Ovary terete. Flower-bracts and sepals coriaceous, mucronate. Petals shortly protruded.

Panicle large, lax, tripinnate . . . . .	Sp. 3-9.
Panicle lax, spicate, bipinnate . . . . .	Sp. 10-16.
Panicle dense, cylindrical, bipinnate . . . . .	Sp. 17-26.
Panicle dense, deltoid, bipinnate . . . . .	Sp. 27-36.

Subgenus 3. *PIRONNEAVA* (Gaudich.).—Inflorescence paniced, with the flowers crowded into dense strobiliform spikes, so that the ovary is flattened on the side next the rachis.

Panicle bipinnate; spikes crowded on the . . . . .	
main axis . . . . .	Sp. 37-43.
Panicle bipinnate; spikes spaced out on . . . . .	
the main axis . . . . .	Sp. 44-54.
Panicle tripinnate . . . . .	Sp. 55-56.

Subgenus 4. *ANDROLEPIS* (Brong.).—Inflorescence a panicle with multifarious branches; rachis not brightly coloured. Ovary terete. Flower-bracts small or obsolete.

Flowers spicate . . . . .	Sp. 57-59.
Flowers racemose . . . . .	Sp. 60.
Flowers corymbose . . . . .	Sp. 61-66.

Subgenus 5. *LAMPROCOCCUS* (Beer) — Inflorescence a panicle with bright red axis and branches. Flower-bracts usually nearly obsolete. Sepals small, ovate, not mucronate.

Inflorescence a peduncled panicle . . . . .	Sp. 67-71.
Inflorescence a central capitulum . . . . .	Sp. 72.

Subgenus 6. *PLATYÆCHMEA* Baker.—Inflorescence a panicle with distichous branches.

Flower-bracts adnate to the rachis by their . . . . .	
edges at least halfway up . . . . .	Sp. 72-78.
Flower-bracts free from the rachis, with a . . . . .	
deep hollow in it opposite each flower . . . . .	Sp. 79-81.
Flower-bracts free from the non-excavated . . . . .	
rachis . . . . .	Sp. 82-86.

Subgenus 7. *PECTINARIA* Benth.—Inflorescence a dense simple, rarely 2-3-nate spike. Ovary terete. Flower-bracts ovate acuminate, pectinate . . . . . Sp. 87-90.

Subgenus 8. *POTHUAVA* (Gaudich.) — Inflorescence a simple spike. Ovary subterete. Sepals small, coriaceous, mucronate.

Spike very dense, globose . . . . .	Sp. 91-92.
Spike dense, oblong . . . . .	Sp. 93-102.
Spike dense, cylindrical . . . . .	Sp. 103-110.

Subgenus 9. CHEVALIERA (Gaudich.) — Inflorescencé a dense simple strobiliform spike, each flower subtended by a large ovate coriaceous bract. Ovary flattened on the side towards the axis.

Stem-leaves produced, ensiform, like those of

*Bromelia* . . . . . Sp. 111-112.

Stem-leaves scariose, erect, imbricated . . . Sp. 113-119.

Subgenus 10. MACROCHORDIUM (De Vriese). — Flowers densely spicate, imbedded in tomentum. Bracts and sepals ovate, not mucronate. Stigmas shorter than in the other subgenera, but finally a little twisted . . . . . Sp. 120-122.

Subgenus 11. CANISTRUM (E. Morren). — Flowers congested into a globose capitulum, surrounded by a whorl of ovate coloured outer bracts, as in *Nidularium*.

Outer bract-leaves bright red . . . Sp. 123-125.

Outer bract-leaves green . . . Sp. 126-127.

Outer bract-leaves white . . . Sp. 128.

#### Subgenus 1. ÆCHMEA PROPER.

1. Æ. PANICULATA Ruiz et Pav. Fl. Peruv. iii. 37, t. 264. — Leaves 20-30 in a lax rosette, lanceolate, above a foot long,  $1\frac{1}{2}$ -2 in. broad, narrowed gradually to the point, the close ascending horny marginal teeth  $\frac{1}{8}$ - $\frac{1}{4}$  in. long. "Peduncle lateral as regards the rosette." Inflorescence a lax ample panicle, the lower branches 6-9 in. long, subtended by a large lanceolate bract, the secondary racemes oblong-cylindrical, 3 in. diam., the upper peduncles bearing one, the lower 2-3 flowers, each clasped at the base by a round-cordate obtuse flower-bract  $\frac{1}{4}$  in. long, with a brown pungent mucro nearly as long as the lamina. Calyx, including ovary,  $\frac{3}{4}$ - $\frac{3}{4}$  in. long; sepals lanceolate, minutely cuspidate,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long. Petals about an inch long, greenish yellow, twisted after flowering.

Hab. Andes of Peru, *Pavon!* Described from Pavon's type-specimen at the British Museum. I doubt the peduncle being really external to the rosette of leaves, as it is drawn in the plate of the 'Flora Peruviana.' The specimen does not show that such is the case, and in all its allies the peduncle is central.

2. Æ. NOTTIGII Wawra, Itin. Prin. Sax. Cob. 147, t. 24 & 35 A. — Leaves numerous, ensiform from an ovate base,  $1\frac{1}{2}$  ft. long, above an inch broad at the base, very acute, pruinose on the back, the marginal teeth minute and black. Peduncle stout, reddish, shorter than the leaves. Inflorescence a lax, tripinnate panicle a foot long, with corymbose branches, large scariose pale branch-bracts, long arcuate pedicels and minute flower-bracts. Ovary with calyx  $\frac{3}{4}$  in. long, green, clavate; sepals as long as the ovary, imbricated, oblique, shortly mucronate. Petals pink, oblanceolate-unguiculate, above an inch long.

Hab. Woods of South Brazil; Entrerios, near Petropolis, *Wawra*, ii. 108.

## Subgenus 2. HOHENBERGIA (Schultes fil.).

(Hoplophytum Beer).

3. *Æ. PLATYNEMA* Baker in Journ. Bot. 1879, 166. *Pironneava platynema* Gaudich. Atlas, Bonité, t. 64. *Hohenbergia platynema* Baker in Ref. Bot. sub t. 284.—Whole plant reaching a height of from 6 to 10 ft. Leaves lorate from an ovate base, 2-3 ft. long, 5-6 in. broad at the middle, horny, glabrous on the face, thinly lepidote on the back, deltoid-cuspidate at the apex, the spreading horny teeth curved, middle-sized, the lower  $\frac{1}{8}$  in. long. Panicle ample, tripinnate, with shortly peduncled cylindrical branches, the lower a foot long, subtended by large red lanceolate branch-bracts; tertiary branches short, corymbose, each subtended by a rigid lanceolate bract; flower-bracts coriaceous, ovate, mucronate,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long. Ovary with calyx  $\frac{1}{3}$ - $\frac{1}{2}$  in. long; sepals ovate, with a large erecto-patent horny mucro. Petals pale, 2-3-times the length of the sepals.

Hab. Woods of South Brazil, *Weddell!* *Hombro!* *Gaudichaud* 371! *Burchell* 764! *Tweedie!* *Miers* 3211! *Glaziou* 5465! 8027! 15672! This is the giant of the genus and rivals *Tillandsia regina* in the breadth of its leaves.

4. *Æ. PYRAMIDALIS* Benth. Bot. Sulph. 173. *Hohenbergia pyramidalis* Baker in Ref. Bot. sub t. 284.—Leaves lanceolate, 2 ft. or more long, 2 in. broad at the middle, moderately firm in texture, thinly lepidote on the back, narrowed gradually to the point, the marginal prickles large, spreading, brown, the lower  $\frac{1}{4}$  in. long. Peduncle including the inflorescence 4 ft. long. Panicle tripinnate, 2 ft. long; main rachis very flexuose, red; main branches deflexed, oblong, copiously compound, subtended by large red lanceolate branch-bracts; tertiary branches very numerous, patent, spicate, 1-1 $\frac{1}{2}$  in. long; flower-bracts ovate, rigid, mucronate,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long. Ovary with calyx  $\frac{1}{3}$  in. long; sepals ovate, longer than the ovary, not mucronate. Petals pale, shortly protruded.

Hab. Guayaquil, *Cuming* 1178! *Sinclair!* Woods of Atacamas, *Barclay* 732! gathered in Dec., 1836. Western slope of Chimborazo, *André* 4053.

5. *Æ. MELINONII* Hook. in Bot. Mag. t. 5235 (M.D.); *Carrière* in Rev. Hort. 1880, 390, with fig. *Æ. Jenmani* Baker in Journ. Bot. 1882, 329. *Hohenbergia Melinonii* Baker in Ref. Bot. sub t. 284.—Leaves 20 or more in a utricular rosette, lorate from a large oblong base, 2-4 ft. long, 1 $\frac{1}{2}$ -2 in. broad at the middle, green on both sides, moderately firm in texture, deltoid-cuspidate at the tip, the teeth middle-sized, horny at the tip. Peduncle a foot long; bract-leaves pale. Inflorescence a dense tripinnate panicle about a foot long, 5-6 in. broad; branches short, erecto-patent, lower slightly compound, subtended by lanceolate branch-bracts; flowers spaced out, erecto-patent, all sessile; flower-bracts rigid, ovate, mucronate,  $\frac{1}{8}$  in. long. Calyx with ovary  $\frac{3}{4}$  in. long, bright red; sepals short, ovate, minutely mucronate. Petals red,  $\frac{1}{4}$ - $\frac{1}{3}$  in. longer than the sepals.

Hab. French Guiana. Introduced into cultivation by Melinon about 1840. British Guiana, on the banks of the Essequibo river, *Jenman* 903! Upper Demerara river, *Jenman* 4039! The imperfectly-known *Bromelia surinamensis*, *Miquel* in *Linnæa*, xviii. 378, from Dutch Guiana, seems to be nearly allied.

6. *Æ. RAMOSA* Mart.; Schultes fl. Syst. Veg. vii. 1272. *Pironneava ramosa* Wawra, Itin. Prin. Cob. 148.—Leaves few, lorate, spreading, 2–3 ft. long, above 2 in. broad, rigid, minutely toothed. Peduncle a foot long. Inflorescence a tripinnate panicle  $1\frac{1}{2}$ –2 ft. long, with a few long main branches subtended by large red lanceolate bracts; branchlets crowded, flexuose, very short, 2–4-flowered; flower-bracts ovate, cuspidate,  $\frac{1}{6}$ – $\frac{1}{5}$  in. long. Ovary globose,  $\frac{1}{8}$  in. long; sepals ovate, yellow, mucronate, just longer than the ovary. Petals yellow, more than twice as long as the sepals. Berry the size of a pea, at first yellow, finally black.

Hab. Brazil; Mariana, *Martius*; woods near Petropolis, *Wawra*, ii. 131.

7. *Æ. CYMOSO-PANICULATA* Baker in Journ. Bot. 1879, 165. *Æ. paniculigera* Griseb. in Gott. Nacht. 1864, 13, *ex parte*.—Leaves with a dilated oblong base half a foot long, 4–5 in. broad, and a lorate lamina 2 ft. long,  $2\frac{1}{2}$ –3 in. broad, with a deltoid-cuspidate tip and small close horny deltoid brown teeth. Peduncle sheathed by large lanceolate adpressed imbricated bract-leaves. Inflorescence an ample deltoid tripinnate panicle, the lower branches nearly a foot long, spreading, peduncled, subtended by large lanceolate branch-bracts; secondary branches 2–3 in. broad; tertiary laxly cymose, each flower with a stiff ascending pedicel  $\frac{1}{2}$ – $\frac{5}{8}$  in. long, with a minute ovate-cuspidate bract at its base and another similar one subtending the ovary. Ovary including the calyx  $\frac{3}{8}$  in. long; sepals small, deltoid, with a minute erecto-patent cusp. Petals violet, shortly protruded.

Hab. Venezuela, *Moritz* 1231! *Fendler* 2453! The true *paniculigera* has a bipinnate panicle and the flowers are sessile. This is in the Berlin Herbarium as *Bromelia latifolia* Willd., and *Æchmea latifolia* Klotzsch.

8. *Æ. SCHIEDEANA* Schlecht. in Linnæa, xviii. 437. *Æ. macracantha* Brong. inedit.; Le Bele in Ill. Hort. 1880, 59 (M.D.).—Leaves about 20 in a rosette, lorate from an ovate base, 2–3 ft. long, 2–3 in. broad at the middle, rigid in texture, plain green on the channelled face, thinly white-lepidote, not banded on the back, deltoid-cuspidate at the tip, the marginal teeth deltoid-cuspidate, large and spreading. Peduncle 2 ft. long; upper bract-leaves large, erect, bright red. Inflorescence a tripinnate panicle  $1\frac{1}{2}$  ft. long; rachises pubescent; lower branches remote, patent, 4–5 in. long, subtended by large red lanceolate branch-bracts; branchlets spicate; flower-bracts ovate acuminate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Calyx with ovary nearly as long as the flower-bract; sepals ovate, acute; ovary globose, yellow. Petals pale yellow, shortly protruded. Berry green, finally black, the size of a pea.

Hab. Mountains of Central Mexico, *Schiede & Deppe*, *Liebmann* 26–30, *Karwinski*. Described mainly from *Morren's* drawing made from a plant flowered by Dr. Le Bele at Mans in 1880, and a specimen at Paris dried by Brogniart in 1870.

9. *Æ. SERVITENSIS* André, Enum. 3.—Leaves linear from an ovate base,  $2\frac{1}{2}$ –3 ft. long, an inch broad at the middle, lepidote on both surfaces; marginal teeth small. Inflorescence a tripinnate panicle  $1\frac{1}{2}$  ft. long, 3–4 in. broad, lax in the lower, denser in the upper half; upper branches simple, lower bearing 3–5 laxly 5–6-

flowered branchlets; branch-bracts rose-red, lower large, ovate-lanceolate; flower-bracts rose-red, obscurely mucronate, 1-5th in. long. Ovary with calyx  $\frac{1}{2}$  in. long; sepals obtuse, longer than the ovary. Petals reddish white.

Hab. Eastern slope of the Bogotan Andes at Servita, alt. 1500-2000 ft. *André* 1197.

10. *Æ. ODORA* Baker in Journ. Bot. 1879, 226. *Billbergia odora* Miquel in Linnæa, xviii. 377. *Hohenbergia odora* Baker in Ref. Bot. sub t. 284.—Leaves 10-12 in a utricular rosette, lorate from an ovate base, 2-3 ft. long, 2-3 in. broad at the middle, plain green and slightly lepidote on the face, more lepidote on the back, moderately firm in texture, deltoid-cuspidate at the tip, the marginal teeth minute. Peduncle  $1\frac{1}{2}$  ft. long; bract-leaves erect, adpressed. Inflorescence a lax, bipinnate panicle 1- $1\frac{1}{2}$  ft. long, with a few arcuate spicate shortly peduncled branches 6-9 in. long, subtended by large branch-bracts; flowers sessile, spreading; flower-bracts rigid, lanceolate-acuminate,  $\frac{1}{4}$  in. long. Ovary with calyx  $\frac{3}{8}$  in. long; sepals ovate, shorter than the ovary, with a large erecto-patent cusp. Petals pale yellow,  $\frac{1}{4}$  in. longer than the sepals.

Hab. West Indies (seen from Trinidad, Martinique, St. Lucia, St. Thomas, and Tobago); Surinam, *Herb. Vaillant!* Focke 809! Cayenne, *Poiteau!* Perottet! Pernambuco, *Ridley & Ramage!* Cultivated long ago by Sir Wm. Hooker at Glasgow, and again lately at Kew, but it is not a showy, though a very distinct, species.

11. *Æ. POEPPIGII* Baker.—Leaves lanceolate,  $1\frac{1}{2}$  ft. long, with small black marginal prickles. Inflorescence a bipinnate panicle with short lax spicate branches; flower-bracts oblong,  $\frac{1}{2}$  in. long. Calyx with ovary as long as the bract; sepals as long as the ovary.

Hab. Amazon valley at Ega, *Poeppig!* Near *Æ. odora*.

12. *Æ. LAXIFLORA* Benth. Bot. Sulph. 173. *Hohenbergia laxiflora* Baker in Ref. Bot. sub t. 284. *Aloe americana arboribus innascens*, &c., Rel. Houst. edit. Banks, t. 16. *Bromelia bracteata* Schultes fil. Syst. Veg. vii. 1280, *ex parte*.—Leaves ensiform, above 2 ft. long,  $1\frac{1}{2}$ -2 in. broad at the middle, moderately firm in texture, glabrous on the face, thinly lepidote on the back, narrowed gradually to the point, the marginal teeth large and hooked. Peduncle above a foot long. Inflorescence a dense panicle 1- $1\frac{1}{2}$  ft. long, 5-6 in. broad, with very numerous drooping laxly spicate branches subtended by red lanceolate bracts, the upper all simple, the lowest sometimes forked; flower-bracts ovate, cuspidate,  $\frac{1}{8}$  in. long. Ovary with calyx above  $\frac{1}{4}$  in. long; sepals ovate, minutely cuspidate. Petals pale,  $\frac{1}{8}$  in. longer than the sepals.

Hab. Vera Cruz, *Houston!* Mosquito shore, *Capt. Miller!* Yucatan, *Schott* 891! Acapulco, *Sinclair!* Houston's specimen was gathered in 1731, *Capt. Miller's* in 1774. Both are at the British Museum.

13. *Æ. BRACHYCLADA* Baker.—Leaves rigid, ensiform, above a foot long,  $1\frac{1}{2}$  in. broad above the dilated base; marginal teeth middle-sized, crowded. Peduncle as long as the leaf. Inflorescence a dense cylindrical bipinnate panicle 8-9 in. long, with

copious spreading laxly spicate slender flexuose branches under an inch long; flower-bracts ovate-cuspidate, minute. Calyx with ovary  $\frac{1}{4}$  in. long; sepals ovate, as long as the ovary.

Hab. Andes of Bolivia, *Weddell!* (Herb. Paris). Very near *Æ. laxiflora* Benth.

14. *Æ. PATENTISSIMA* Baker in Journ. Bot. 1879, 227. *Billbergia? patentissima* Mart.; Schultes fil. Syst. Veg. vii. 1270. —Whole plant reaching a height of 4–6 ft. Leaves lorate-ensiform, 3–4 ft. long, 1–1 $\frac{1}{4}$  in. broad, glabrous above, thinly lepidote beneath, with minute marginal teeth. Peduncle 3 ft. long; bract-leaves lanceolate. Panicle 1–3 ft. long, with short spreading closely-flowered spicate branches, at most 4–5 in. long; flower-bracts ovate, with a brown cusp,  $\frac{1}{8}$ – $\frac{1}{2}$  in. long. Sepals ovate,  $\frac{1}{8}$  in. long, with a large pungent mucro. Petals above  $\frac{1}{4}$  in. long, pale lilac or reddish, not scaled at the base.

Hab. Brazil, *Martius*.

15. *Æ. EDMONSTONEI* Baker.—Leaves ensiform, from an ovate base, 1 $\frac{1}{2}$ –2 ft. long, comparatively thin in texture, glabrous on the face, thinly lepidote on the back, narrowed to the point, the marginal prickles small, brown, spreading, the lowest  $\frac{1}{8}$ – $\frac{1}{6}$  in. long. Peduncle slender, erect, a foot long; bract-leaves small, adpressed. Inflorescence a lax deltoid panicle 4 in. long; upper branches patent, simple; lower deflexed with 2–4 spicate branchlets; flower-bracts ovate, cuspidate,  $\frac{1}{4}$  in. long. Ovary with calyx  $\frac{1}{4}$  in. long; sepals ovate-lanceolate, longer than the ovary. Petals shortly protruded.

Hab. Ecuador, *Edmonstone!* (Voyage of the 'Herald,' just before his death by a sad accident). Allied to *Æ. laxiflora* and *Barleei*.

16. *Æ. BARLEEI* Baker in Gard. Chron. 1883, i. 102. —Leaves 8–10 in a utricular rosette, lanceolate from an ovate base, 2–3 ft. long, 1 $\frac{1}{2}$ –2 in. broad at the middle, horny in texture, pale green on the channelled face, thinly white-lepidote without bands on the back, narrowed gradually to the point, the lower marginal spines  $\frac{1}{4}$  in. long. Peduncle erect, 1–1 $\frac{1}{2}$  ft. long; upper bract-leaves red, lanceolate, spreading. Inflorescence a lax panicle  $\frac{1}{2}$  ft. long, 2 $\frac{1}{2}$ –3 in. broad; rachis stiff, white-pubescent; branches all simple, laxly 6–8-flowered; flower-bracts ovate, greenish,  $\frac{1}{4}$  in. long. Sepals lanceolate, not mucronate; ovary globose, black, with a little white tomentum. Petals primrose-yellow, exerted  $\frac{1}{8}$  in.

Hab. British Honduras. Introduced to Kew by Governor Barlee in 1877.

17. *Æ. BILLBERGIOIDES* Baker. *Hohenbergia? billbergioides* Schultes fil. Syst. Veg. vii. 1253.—Leaves about 8 in a utricular rosette, ensiform, 1–1 $\frac{1}{2}$  ft. long, an inch broad; marginal teeth small. Peduncle under a foot long. Inflorescence a subspicate panicle 1 $\frac{1}{2}$  in. long; lower branches very short, 2–3-flowered; branch-bracts ovate-lanceolate, acuminate, spinoso-serrate, 1 $\frac{1}{2}$ –2 in. long; flower-bracts ovate-acuminate,  $\frac{1}{2}$  in. long. Ovary with calyx under  $\frac{1}{2}$  in. long; sepals lanceolate, acute, longer than the ovary. Berry the size of a small pea.

Hab. Brazil; province of Bahia, near Almada, *Martius*.

18. *Æ. LEUCOSTACHYS* Baker.—Leaves 30 or more in a utricular rosette, ensiform from an ovate base, 2 ft. long,  $2\frac{1}{2}$  in. broad above the base, horny, bright green on the face, obscurely lepidote on the back, narrowed gradually to the point, the marginal teeth small, deltoid-cuspidate, not brown. Peduncle  $1\frac{1}{2}$  ft. long; bract-leaves adpressed, pale. Inflorescence a moderately dense cylindrical panicle 8–9 in. long, 2 in. diam.; upper flowers solitary; lower 3–4 to a branch; branch-bracts linear; flower-bracts minute, lanceolate. Ovary globose, white-lepidote,  $\frac{1}{2}$  in. long and broad; sepals ovate, cuspidate,  $\frac{1}{2}$  in. long. Petals waxy yellow,  $\frac{1}{2}$  in. long.

Hab. Country unknown. Described from a plant that flowered at Kew, Jan., 1883. Intermediate between *Æ. paniculigera* and *Skinneri*.

19. *Æ. PRIEUREANA* Baker. *Echinostachys Priureana* Brong. inedit.—Leaves rigid, ensiform, with an ovate base a foot long, 6–7 in. broad; blade 2–3 ft. long, 3 in. broad low down; marginal prickles very large, black, the lower  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Inflorescence a dense bipinnate panicle 1–2 ft. long, 3 in. diam.; branchlets slender, zigzag; lowest flower-bracts orbicular, coriaceous,  $\frac{1}{2}$  in. broad, with a black cusp  $\frac{1}{2}$  in. long; middle bracts ovate; upper reduced to a mere spine. Ovary with calyx  $\frac{3}{4}$  in. long; sepals much twisted, longer than the ovary, not mucronate. Petals not seen.

Hab. French Guiana, *Leprieur*! Sent to the Jardin des Plantes in 1856, but was dead when it arrived (Mus. Paris, two specimens). A very distinct and curious species.

20. *Æ. CASTELNAVII* Baker.—Leaves rigid, ensiform, obscurely lepidote, 3 ft. long,  $2\frac{1}{2}$ –3 in. broad; marginal spines small, close. Peduncle  $1\frac{1}{2}$ –2 ft. long, with 8–10 large red scarioso lanceolate bract-leaves. Inflorescence a bipinnate oblong-cylindrical panicle  $1\frac{1}{2}$  ft. long, 3 in. diam.; flower-bracts small, ovate. Calyx with ovary  $\frac{1}{2}$  in. long; sepals ovate, conspicuously mucronate. Petal-blade small, oblong.

Hab. Andes of Bolivia: Santa Cruz, *Castelnau*! (Herb. Paris). Near *Æ. tocantina* and *paniculigera*.

21. *Æ. COLUMNARIS* André in Ill. Hort. 1878, Misc. 51, with woodcut.—Leaves lorate from a dilated base, horny, channelled down the face, green in shade, tinged with red or violet when exposed, 3–6 ft. long, 4–5 in. broad at the middle; marginal teeth distant, straight, weak. Stem with panicle  $7\frac{1}{2}$ –8 ft. long. Inflorescence a long cylindrical bipinnate panicle; branches spreading horizontally, flexuose, bearing 6–7 laxly-disposed flowers; lower branches often 2–3-nate, spaced out; flower-bracts minute, ovate; branch-bracts linear, deflexed. Ovary cylindrical,  $\frac{1}{2}$  in. long; sepals ovate-lanceolate, rather shorter than the ovary, conspicuously cuspidate. Petals grey, half as long again as the sepals. Berry yellow.

Hab. Columbia; on the banks of the Rio Honda, alt. 5000 ft., *André* 1753. Near *Æ. paniculigera*.

22. *Æ. TOCANTINA* Baker.—Leaves not seen. Peduncle above 2 ft. long; upper bract-leaves large, red, lanceolate. Inflorescence a

moderately dense oblong-cylindrical bipinnate panicle a foot long, 3 in. diam; branches spreading, 1-1½ in. long; flower-bracts small, ovate-cuspidate. Calyx with ovary ⅓ in. long; sepals lanceolate, minutely mucronate. Petal-blade small.

Hab. Central Brazil; prov. Tocantins, *Weddell!* (Herb. Paris). Near *Æ. paniculigera*.

23. *Æ. PANICULIGERA* Griseb. Flor. Brit. West. Ind. 592. *Bromelia paniculigera* Swartz. Prodr. 56. *Hohenbergia paniculigera* Baker in Ref. Bot. sub t. 284, excl. syn.—Leaves 12-20 in a utricular rosette, lorate from an ovate base, 2-3 ft. long, 2-3 in. broad at the middle, horny in texture, bright green on both sides, deltoid-cuspidate at the tip, the spreading deltoid teeth small or middle-sized. Peduncle 1-1½ ft. long; upper bract-leaves large, spreading, bright red. Inflorescence a dense or sub-lax cylindrical panicle 1-1½ ft. long, 2-3 in. diam.; branches few-flowered, spicate, very flexuose, the lower geminate; flower-bracts small, ovate, cuspidate. Calyx with ovary ½-¾ in. long; sepals ovate-lanceolate, obtuse, with a large brown cusp. Petals red-purple, twice as long as the sepals.

Hab. Jamaica, *Wright!* *Purdie!* Venezuela, *Fendler 2454!* *Moritz 299!* Para, *Spruce!* Described from a plant flowered at Kew, Dec., 1887. The Amazon valley plant has a much laxer panicle than the West Indian and broader-toothed upper bract-leaves, and may be a distinct species.

24. *Æ. SPICATA* Mart.; Schultes fil. Syst. Veg. vii. 1275. *Æ. angustifolia* Popp. & Endlich. Nov. Gen. t. 159. *Hoplophytum spicatum* and *angustifolium* Beer, Brom. 132, 134. *Hohenbergia angustifolia* and *Martii* Baker in Ref. Bot. sub t. 284. *Bromelia thyrsoides* Willd.; Schult. fil. Syst. vii. 1282.—Leaves about 20 in a utricular rosette, lanceolate from a very large ovate base, 1-1½ ft. long, 1-2 in. broad at the base of the blade, narrowed gradually to the apex, the marginal teeth horny and spreading, the lowest sometimes ¼ in. long. Peduncle about a foot long, with several large spreading bright red lanceolate bract-leaves aggregated near its apex. Inflorescence a dense cylindrical panicle 2-6 in. long; branches dense-flowered, short, spicate, secund; flower-bracts coriaceous, orbicular, with a large brown mucro, ¼ in. long. Calyx with ovary ⅓-½ in. long; sepals ovate-lanceolate, with a large brown mucro. Petals yellow, twice as long as the sepals.

Hab. Trinidad, *Fendler 842!* *843!* French Guiana, *Perottet!* *Poiteau!* *Sagot 569!* British Guiana, *Appun 249!* *Im Thurn!* *Jenman 853!* *3814!* Surinam, *Coulon!* Maynas, *Poppig!* Amazon valley, *Burchell!* *Spruce!* Pernambuco, *Ridley & Ramage!* There is a specimen from Gronovius at the British Museum, gathered in Surinam in 1736.

25. *Æ. SETIGERA* Mart.; Schultes fil. Syst. Veg. vii. 1274.—Leaves with a dilated base 4-5 in. long and a lorate cuspidate lamina 2-3 ft. long, 1¼-1½ in. broad, the marginal teeth large, those near the base of the leaf ¼ in. long. Peduncle much shorter than the leaves; upper bract-leaves 6-8 in. long, purple-tinted and spine-margined. Panicle cylindrical, with a tomentose rachis and spreading 2-3-fid 2-3-flowered branches not more than an inch

long; flower-bracts coriaceous, with a large black mucro. Calyx pale yellowish green, floccose. Corolla pale rose.

Hab. Banks of Rio Negro, *Martius*.

26. *Æ. MERTENSII* Schultes fil. Syst. Veg. vii. 1274; Hook. in Bot. Mag. t. 3186. *Bromelia Mertensii* Meyer, Esseq. 144. *Billbergia Mertensii* Miquel in Linnæa xviii. 376. *Hoplophytum Mertensii* Beer, Brom. 134. *Hohenbergia Mertensii* Baker in Ref. Bot. t. 284.—Leaves 12–20 in a utricular rosette, lanceolate from an ovate base, above 2 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, glabrous on the face, obscurely lepidote on the back, narrowed gradually to the point, the marginal teeth small, brown, spreading. Peduncle  $1-1\frac{1}{2}$  ft. long; upper bract-leaves large, spreading, lanceolate, bright red. Inflorescence a dense cylindrical panicle 6–9 in. long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. diam.; branches short, erecto-patent, densely spicate; flower-bracts  $\frac{1}{8}$  in. long, orbicular, green, mucronate. Calyx with ovary nearly  $\frac{1}{2}$  in. long; sepals ovate-lanceolate, mucronate. Petals rose-pink, twice as long as the sepals.

Hab. Dutch and British Guiana; first described by G. F. Meyer, in 1818. Introduced into cultivation in 1832, by Mr. C. S. Parker, to the Liverpool Botanic Garden.

27. *Æ. CÆLESTIS* E. Morren in Flores des Serres, t. 2146. *Hohenbergia caelestis* Baker in Ref. Bot. t. 284. *Hoplophytum caelestis* K. Koch; E. Morren, Belg. Hort. 1862, 97, with figure (M.D.).—Leaves 12–20 in a utricular rosette, lorate from an ovate base,  $1-1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, moderately firm in texture, plain green on the face, obscurely transversely banded on the back, deltoid-cuspidate at the tip, the marginal teeth minute. Peduncle  $1-1\frac{1}{2}$  ft. long, floccose; upper bract-leaves adpressed, bright red. Inflorescence a dense bipinnate panicle 4–6 in. long, 3 in. broad, with a stout straight floccose rachis; branches numerous, patent, spicate, the lowest 4–6-flowered; flower-bracts ovate-acuminate,  $\frac{1}{4}$  in. long. Calyx with ovary white,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; sepals ovate with a large mucro. Petals blue, shortly protruded. Berry black.

Hab. Brazil. Described from a plant flowered by Mr. Wilson Saunders at Reigate, about 1870; and one at Kew in 1888, received under the name of *Billbergia Celeriana*. It may be identical with *Billbergia paniculata* Mart.; Schultes fil. Syst. Veg. vii. 1268, a native of the Upper Amazon.

28. *Æ. CANDIDA* E. Morren, inedit. (M.D.).—Leaves 10–12 in a utricular rosette, lorate from an ovate base, 12–15 in. long,  $1\frac{1}{2}$  in. broad, plain green on the face, distinctly white-lepidote on the back, rounded to a cusp at the tip, the marginal teeth minute. Peduncle slender, floccose, under a foot long; bract-leaves small, adpressed, lanceolate, pale. Inflorescence a moderately dense deltoid bipinnate panicle 4–6 in. long; branches few, spicate, patent,  $1-1\frac{1}{2}$  in. long, 4–6-flowered, subtended by small lanceolate bracts; flower-bracts  $\frac{1}{4}$  in. long, ovate, with a large cusp, reddish. Ovary with calyx white,  $\frac{1}{2}$  in. long; sepals ovate, with an erecto-patent brown mucro. Petals shortly protruded. Berry snow-white,  $\frac{1}{4}$  in. diam.

Hab. Probably Brazil. Described from two drawings of Professor Morren's made from plants flowered at Liège in 1883 and 1885. Closely allied to *Æ. celestis*. Introduced by Devansaye in 1881.

29. *Æ. REGULARIS* Baker in Journ. Bot. 1879, 229.—Leaves with a dilated utricular base and a lorate horny cuspidate lamina  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, with copious spreading horny prickles  $\frac{1}{8}$ – $\frac{1}{6}$  in. long. Peduncle above a foot long; upper bract-leaves large, bright red. Inflorescence a dense oblong bipinnate panicle 6–8 in. long; branches numerous, spreading, spicate, 1– $1\frac{1}{2}$  in. long, 6–8-flowered, the lower subtended by large red lanceolate branch-bracts; flower-bracts coriaceous, ovate-cuspidate,  $\frac{1}{4}$  in. long. Calyx with ovary  $\frac{1}{3}$  in. long; sepals ovate, not distinctly mucronate, much shorter than the ovary. Petals twice as long as the sepals.

Hab. South Brazil. Collected by Weir. Described from a plant flowered by Mr. Wilson Saunders at Reigate, in Sept., 1871. Allied to *Æ. suaveolens*.

30. *Æ. FLORIBUNDA* Mart.; Schultes fil. Syst. Veg. vii. 1272. *Æ. organensis* Wawra, Itin. Prin. Sax. Cob. 146, t. 23. *Hoplophytum luteum* E. Morren, inedit. (M.D.). *H. Platzmanni* E. Morren in Belg. Hort. 1875, 362 (name).—Leaves lorate from an oblong base,  $1\frac{1}{2}$ – $2\frac{1}{2}$  ft. long, 2– $2\frac{1}{2}$  in. broad at the middle, thin in texture for the genus, green on both sides, rounded to a small cusp at the tip, the marginal teeth very minute. Peduncle  $1\frac{1}{2}$  ft. long; bract-leaves small, pale, lanceolate, erect. Inflorescence a dense bipinnate panicle, 6–8 in. long; branches many, patent, spicate, laxly 6–8-flowered, with a slender flexuose rachis; flower-bracts ovate, with a very large cusp  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Calyx with ovary reddish,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; sepals ovate, with a large cusp. Petals pale yellow, shortly exerted.

Hab. South Brazil, *Martius*, *Burchell* 3291! *Wawra* 317; *Sello* 229! *Glaziou* 16413! 16414! *Platzmann*. Nearly allied to *Æ. suaveolens*.

31. *Æ. SUAVEOLENS* Knowles & Westc. Floral Cab. iii. 177, t. 184. *Billbergia purpureo-rosea* Hook. in Bot. Mag. t. 3304. *Hoplophytum suaveolens* and *purpureo-roseum* Beer, Brom. 135. *Bromelia albo-rosea* Lemaire, Ill. Hort. Misc. 64. *Æ. rosea* Hort.—Leaves few in a long utricular rosette, outer linear, inner lanceolate,  $1\frac{1}{2}$ –2 ft. long, 1– $1\frac{1}{2}$  in. broad at the middle, horny in texture, plain green on both sides, narrowed gradually to the point, the marginal prickles middle-sized, ascending, pungent. Peduncle slender,  $1\frac{1}{2}$  ft. long; bract-leaves inconspicuous, adpressed. Inflorescence a moderately dense oblong bipinnate panicle 6–8 in. long; branches numerous, erecto-patent,  $1\frac{1}{2}$ –2 in. long, laxly 6–8-flowered, with a very flexuose rachis; flower-bracts ovate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long, with an erecto-patent brown mucro. Ovary with calyx  $\frac{3}{8}$ – $\frac{1}{2}$  in. long; sepals ovate, mucronate. Petals red-purple,  $\frac{1}{2}$  in. long.

Hab. Central and Southern Brazil. First gathered by Bowie and Cunningham in 1815. Introduced into cultivation in 1831, when it was flowered by Mr. Shepherd, of the Liverpool Botanic Garden.

32. *Æ. PENDULIFLORA* André, Enum. 3.—Leaves unknown. Stem slender, slightly furfuraceous; leaf-bracts small, lanceolate.

Inflorescence a moderately dense drooping bipinnate panicle 4 in. long; branches flexuose, laxly 5-7-flowered, lower  $1\frac{1}{2}$  in. long; branch-bracts small, deltoid, denticulate; flower-bracts very small, deltoid. Calyx with ovary  $\frac{1}{3}$  in. long; ovary subglobose; sepals broad, rather longer than the ovary, emarginate or obscurely mucronate. Petals mucronate, more than half as long again as the sepals.

Hab. Columbia; on the banks of the Rio Magdalena, near Isla brava. *André* 378.

33. *Æ. CUMINGII* Baker in Journ. Bot. 1879, 227. — Leaves unknown. Peduncle slender; upper bract-leaves large, lanceolate, adpressed, toothed. Inflorescence a dense bipinnate panicle 6-8 in. long, with about 10-12 subpatent spicate 10-12-flowered branches  $1\frac{1}{2}$ -2 in. long, the lower overtopped by their red lanceolate branch-bracts; flower-bracts ovate-lanceolate,  $\frac{1}{4}$  in. long. Calyx including ovary  $\frac{1}{2}$  in. long; sepals oblong-lanceolate,  $\frac{1}{4}$  in. long, with an erecto-patent brown mucro. Petals twice as long as the sepals.

Hab. Ecuador, *Cuming* 1178, *ex parte*! (Herb. Kew); *André* 1036.

34. *Æ. SUBINERMIS* Baker in Journ. Bot. 1879, 228. — Leaves about 20 in a utricular rosette, lanceolate from a dilated oblong base,  $1\frac{1}{2}$ -2 ft. long,  $\frac{3}{4}$ -1 in. broad at the middle, thin in texture for the genus, narrowed gradually to the point, with only a few minute prickles towards the base. Peduncle about a foot long, with several red ascending lanceolate bract-leaves about 2 in. long. Inflorescence a dense oblong-thyrsoid bipinnate panicle about 3 in. long; central branches longest,  $1-1\frac{1}{2}$  in. long, 5-6-flowered; flower-bracts orbicular, not cuspidate,  $\frac{1}{8}$ - $\frac{1}{2}$  in. long and broad. Ovary with calyx,  $\frac{1}{3}$  in. long; sepals ovate, not mucronate,  $\frac{1}{8}$  in. long. Petals not seen.

Hab. South Brazil, *Glaziou* 9326!

35. *Æ. CÆSIA* E. Morren, inedit. (M.D.). — Leaves about a dozen in a utricular rosette, lorate from an ovate base, 12-15 in. long,  $1\frac{1}{2}$  in. broad at the middle, plain green on the face, thinly white-lepidote, not banded on the back, rounded to a cusp at the tip, the marginal teeth middle-sized, deltoid-cuspidate, black, hooked. Peduncle slender, a foot long; bract-leaves lanceolate, adpressed, pale. Inflorescence a dense deltoid bipinnate panicle 2 in. long; branches few, dense, erecto-patent, densely spicate, at most an inch long, subtended by small ovate pink branch-bracts; flower-bracts ovate, acute, pink, serrated,  $\frac{1}{3}$  in. long. Ovary with calyx as long as the flower-bract. Petals reddish lilac, exerted  $\frac{1}{4}$ - $\frac{1}{3}$  in.

Hab. Probably South Brazil. Described from a drawing of Prof. Morren's made Dec., 1885.

36. *Æ. LEUCOCARPA* André, Enum. 3. — Leaves lorate from a dilated base, 12-16 in. long, above 2 in. broad, slightly lepidote beneath; marginal teeth large. Peduncle slender, purplish, furfuraceous; leaf-bracts lanceolate, deflexed. Inflorescence a dense erect ovoid bipinnate panicle 5-6 in. long, 3 in. broad at the middle; branches 6-10-flowered; lower branch-bracts lanceolate,

2-3 in. long, upper small, ovate; flower-bracts ovate-cuspidate, green, tinged with reddish brown, turning brown. Ovary with calyx  $\frac{1}{3}$  in. long; ovary globose, green, finally white; sepals shortly mucronate, yellow turning purple. Petals linear, pale yellow, protruded  $\frac{1}{8}$  in.

Hab. Columbia; western base of Mt. Quindio, alt. 3000 ft., *André* 2425.

### 3. Subgenus *PIRONNEAVA* (*Gaudich.*)

37. *Æ. EXSUDANS* Baker. *Bromelia exsudans* Lodd. Bot. Cab. t. 801. *B. paniculigera* Reich. Icon. Exot. t. 239-240. *Tillandsia exsudans* Desf. *Hohenbergia exsudans* E. Morren in Belg. Hort. 1879, 352, t. 18. *Æ. capitata* Baker in Journ. Bot. 1879, 167. *H. capitata* Schultes fil. Syst. Veg. vii. 1252.—Leaves about 20 in a utricular rosette, lorate from an ovate base, 2-3 ft. long,  $1\frac{1}{2}$  in. broad, plain green on the channelled face, thinly white-lepidote on the back, rounded to a cusp at the tip, the marginal prickles small, horny, deltoid. Peduncle erect,  $1\frac{1}{2}$  ft. long; bract-leaves lanceolate, adpressed, upper bright red. Flowers in a dense globose terminal capitulum 3-4 in. diam.; flower-bracts ovate-acuminate, green,  $\frac{3}{4}$ -1 in. long. Calyx with ovary as long as the bract; sepals lanceolate, 7-8 lines long. Petals bright yellow,  $\frac{1}{4}$  in. longer than the calyx.

Hab. Brazil; province of Bahia, *Martius*. Introduced into cultivation by Loddiges in 1824. Figured by Morren from a plant that flowered with M. Schlumberger of Rouen in 1878.

38. *Æ. CHRYSOCOMA* Baker. *Hohenbergia chrysocoma* E. Morren, inedit.—Leaves about 20 in a utricular rosette, lorate from an ovate base, the outer above 2 ft. long, much recurved, the inner suberect,  $1\frac{1}{2}$  in. broad at the middle, plain green on the face, thinly white-lepidote on the back, rounded to a cusp at the apex, the marginal teeth middle-sized, brown, deltoid-cuspidate. Peduncle slender, erect,  $1\frac{1}{2}$  ft. long; lower bract-leaves adpressed, imbricated; 2-3 upper erecto-patent bright red. Inflorescence a capitulum composed of about 3 oblong or subglobose dense strobiliform spikes  $1\frac{1}{2}$  in. long; flower-bracts oblong-acuminate, bright yellow, an inch long. Calyx with ovary as long as the bracts; sepals ovate-lanceolate. Petals bright yellow, protruded  $\frac{1}{3}$ - $\frac{1}{2}$  in.

Hab. Nearly allied to *Æ. exsudans*. Introduced into cultivation by Devansaye in 1881. Pernambuco, *Ridley & Ramage!*

39. *Æ. PYCNANTHA* Baker. *Pothuava pycnantha* Hort. (M.D.).—Leaves a dozen or more in a utricular rosette, lorate from an ovate base, 2 ft. long, 3 in. broad at the middle, horny, plain green on the deeply concave face, thinly lepidote and obscurely transversely banded on the back, rounded to a cusp at the tip, the marginal teeth small, ascending, deltoid, concolorous. Peduncle stout, a foot long; bract-leaves imbricated, lanceolate, erect; upper not brightly coloured. Inflorescence a dense oblong panicle 3 in. long, 2 in. diam., composed of about 30 sessile ovoid erecto-patent spikes  $\frac{3}{4}$ -1 in. long; flower-bracts broad ovate, acute,  $\frac{1}{2}$  in. long.

Ovary with calyx as long as the bract. Petals white, protruding  $\frac{1}{8}$  in.

Hab. Country unknown. Described from Prof. Morren's drawing, made from a plant that flowered in the Botanic Garden of Liège, Aug. 1869.

40. *Æ. GIGANTEA* Baker. *Hoplophytum giganteum* E. Morren, inedit. (M.D.). *Billbergia gigantea* Hort.—Leaves 12–20 in a utricular rosette, lorate from an ovate base, 3–4 ft. long, 3 in. broad at the middle, stiffly suberect, green on both surfaces, rounded to a cusp at the apex, the marginal prickles small, ascending, deltoid, concolorous. Peduncle stout, about a foot long, hidden by the connivent bases of the leaves; upper bract-leaves large, lanceolate, erecto-patent, greenish red. Inflorescence a dense bipinnate panicle 4–5 in. long, with many sessile erecto-patent branches, subtended by large pale lanceolate bracts; flower-bracts ovate-acuminate, pale, rigid,  $\frac{3}{4}$  in. long. Ovary with calyx shorter than the bract. Petals whitish, protruded about half an inch.

Hab. Country unknown. Described from Prof. Morren's drawing, made from a plant flowered in the Botanic Garden of Brussels, May, 1876. Habit of *Æ. lingulata*, with long flower-bracts like *exsudans* and *aquilega*. We have had it at Kew for some time, but it has not yet flowered.

41. *Æ. VIRENS* Brong. inedit.—Leaves not seen. Inflorescence a narrow panicle consisting of 15–20 oblong multifarious heads about an inch long,  $\frac{3}{4}$  in. diam., the upper sessile, the lower on short spreading peduncles; branch-bracts lanceolate, the lowest an inch long; flower-bracts ovate, cuspidate,  $\frac{1}{6}$  in. long. Ovary with calyx  $\frac{1}{4}$  inch long; sepals ovate, as long as the ovary, conspicuously mucronate. Petal-blade oblong,  $\frac{1}{6}$  in. long.

Hab. French Guiana. Described from a cultivated specimen in the Paris Herbarium, received from Quesnel in 1848. Near *Æ. lingulata*.

42. *Æ. LINGULATA* Baker in Journ. Bot. 1879, 164. *Æ. Plumieri* E. Morren. *Bromelia lingulata* Linn. Sp. Plant. 409. *Hoplophytum lingulatum* Beer, Brom. 139. *Chevalliera lingulata* Griseb. Fl. Brit. West. Ind. 591.—Leaves with a large oblong base 4–5 in. broad and a lorate lamina 3 ft. long. 3–4 in. broad at the middle, horny in texture, glabrous on the face, thinly white-lepidote on the back, rounded to a deltoid-cuspidate apex, the marginal teeth minute. Peduncle stout, erect, much shorter than the leaves. Inflorescence a dense or lax ovoid panicle a foot long, consisting of 20–40 oblong spikes, the upper sessile, the lower shortly peduncled, subtended by lanceolate bracts  $1\frac{1}{2}$ –2 in. long; flower-bracts broad ovate, mucronate, coriaceous,  $\frac{3}{4}$  in. long. Ovary with calyx  $\frac{1}{2}$ – $\frac{3}{8}$  in. long, much compressed; sepals ovate, minutely mucronate. Petals pale, shortly protruded.

Hab. Jamaica, *Robins!* Porto Rico, *Sinten* 92 b. 2000! 6888. Also according to Grisebach, Antigua, Guadeloupe and Guiana. Mentioned by Miller as a garden plant in 1771, and has been grown lately at Berlin and Paris. It is in Plumier's drawings made in 1689–1697 (vol. v. tab. 65–66) under the name of “*Caraguata clavata et spicata foliis serratis.*”

43. *Æ. POLYCEPHALA* Baker in Journ. Bot. 1879, 164.—Leaves not seen. Inflorescence a panicle about a foot long, composed of 30–40 subglobose dense sessile strobiliform heads under an inch

long, the branch-bracts of the lower exceeding, of the upper as long as, the heads; flower-bracts broad-ovate, coriaceous, minutely cuspidate,  $\frac{1}{2}$  in. long and broad. Ovary with calyx rather shorter than the bract; sepals ovate, not mucronate, as long as the ovary. Petals not seen.

Hab. Jamaica, *Dr. Wright!* (Herb. Mus. Brit.). Nearly allied to *Æ. lingulata*.

44. *Æ. AQUILEGA* Griseb. Flora Brit. West Ind. 592. *Bromelia aquilega* Salisb. Parad. t. 40. *Æ. Meyeri* Baker in Journ. Bot. 1880, 16.—Leaves about 20 in a utricular rosette, lanceolate from a large ovate base, 2–3 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, horny in texture, plain green on the face, thinly lepidote beneath, narrowed gradually to the point, the marginal prickles middle-sized, deltoid-cuspidate, horny, brown, the lower  $\frac{1}{8}$ – $\frac{1}{6}$  in. long. Peduncle stout,  $1\frac{1}{2}$ –2 ft. long, the upper bract-leaves large, bright red. Panicle  $\frac{1}{2}$ –1 ft. long, the upper clusters crowded, sessile, the lower shortly peduncled, subtended by large oblong-lanceolate, red branch-bracts; outer bracts of the clusters ovate, coriaceous, mucronate, an inch long. Ovary with calyx  $\frac{3}{4}$  in. long, flattened on the face; sepals lanceolate, mucronate,  $\frac{1}{3}$  in. long. Petals yellow, shortly exerted.

Hab. Jamaica, *Salisbury*; Trinidad, *Fendler 841!* Tobago, *Meyer!* British Guiana, *Jenman 3826!* French Guiana, *Coulon 76*. Introduced into England in 1806, but I have not seen it alive.

45. *Æ. BRASSICOIDES* Baker in Journ. Bot. 1882, 329. — Leaves lorate from a large oblong base,  $1\frac{1}{2}$ –2 ft. long,  $2\frac{1}{2}$ –3 in. broad at the middle, very horny, obscurely lepidote on the back, deltoid-cuspidate at the tip, the marginal teeth small, deltoid. Peduncle stout, erect,  $1\frac{1}{2}$  ft. long, in the specimen seen piercing through the top of a reduced red-tinted inner leaf; upper bract-leaves large, lanceolate, erecto-patent. Inflorescence a panicle half a foot long, composed of many dense globose or oblong clusters of flowers, the upper clusters close, sessile, the lower spaced out, the lowest shortly peduncled, subtended by large lanceolate bracts; flower-bracts floccose, rigid, ovate, with a long cusp,  $\frac{3}{4}$ –1 in. long. Ovary with calyx  $\frac{1}{2}$  in. long; sepals twice as long as the ovary, obtuse, with a small mucro. Petals protruded  $\frac{1}{3}$ – $\frac{1}{2}$  in., yellow.

Hab. British Guiana; Kaieteur Savannah, *Jenman 957!* Allied to *Æ. aquilega*.

46. *Æ. DISTANS* Griseb. Fl. Brit. West Ind. 592. *Hohenbergia distans* Baker in Ref. Bot. sub t. 284.—Leaves lorate, 2–3 ft. long, 3 in. broad at the middle, thin in texture for the genus, thinly lepidote on the back, rounded to a cusp at the apex, the marginal teeth few and very indistinct. Peduncle slender, cernuous,  $1\frac{1}{2}$ –2 ft. long; bract-leaves large, lanceolate, erect. Inflorescence a very lax drooping panicle  $1\frac{1}{2}$  ft. long, nearly a foot broad, bearing 20–30 dense strobiliferous spikes an inch long at the end of long spreading peduncles subtended by large linear scarioso bracts; flower-bracts ovate-cuspidate,  $\frac{1}{2}$  in. long. Calyx with ovary rather shorter than the bract; sepals lanceolate, with a large horny mucro. Petals white, shortly protruded.

Hab. Jamaica; on trees near the Dolphin, *Purdie*! Gathered in 1844. An allied plant, in a very young state, has been gathered by Baron Eggers in Dominica.

47. *Æ. PHANEROPHLEBIA* Baker.—Leaves lorate,  $2\frac{1}{2}$  ft. long, 4 in. broad at the dilated base, 2 in. at the middle, rigidly coriaceous, subglabrous, narrowed to the point, teeth very minute. Inflorescence a bipinnate or tripinnate panicle; ultimate clusters strobili-form, few-flowered,  $\frac{1}{2}$  in. diam., sessile; flower-bracts ovate, naked, prominently ribbed,  $\frac{1}{2}$  in. long, with a large mucro. Calyx with ovary  $\frac{1}{2}$  in. long; sepals longer than the ovary, obtuse, with a large mucro. Petal-blade oblong,  $\frac{1}{4}$  in. long.

Hab. South Brazil, *Glaziov* 16412! Near *Æ. distans*.

48. *Æ. RIDLEYI* Baker.—Whole plant 4–5 ft. high. Leaves lorate, thinly lepidote, 2 ft. long, 2 in. broad at the middle, armed with small black slender spreading teeth. Inflorescence a narrow panicle above a foot long, the lower branches consisting of 5–6 glomerate spikes at most an inch long, clustered at the end of a short peduncle; flower-bracts ovate-cuspidate, furfuraceous,  $\frac{1}{3}$  in. long. Calyx with ovary shorter than the flower-bract. Petal-blade purple,  $\frac{1}{4}$  in. long.

Hab. Pernambuco, *Ridley & Ramage*! (Herb. Mus. Brit.). Near *Æ. angusta*.

49. *Æ. ERIANTHA* Brong. inedit.—Leaves rigid, lorate, 2–3 ft. long, nearly naked on both surfaces,  $1\frac{1}{2}$  in. broad at the middle, 3 in. at the dilated base; marginal spines minute. Inflorescence a panicle of numerous subglobose heads  $\frac{1}{2}$  in. diam., with 6–8 flowers in each; flower-bracts ovate-cuspidate, thinly white-lepidote on the back,  $\frac{1}{8}$ – $\frac{1}{4}$  in. long. Ovary with calyx  $\frac{1}{4}$  in. long; sepals ovate, mucronate. Petal-blade minute.

Hab. Pernambuco. Described from a specimen from the Paris Garden, dried by Brogniart in Oct., 1851. Near *Æ. angusta*.

50. *Æ. AUGUSTA* Baker in Journ. Bot. 1879, 162. *Tillandsia augusta* Vell. Fl. Flum. iii. t. 135. *Hoplophytum augustum* Beer, Brom. 136. *Hohenbergia augusta* E. Morren, Cat. 1873, 9 (M.D.). *Pironneava glomerata* Gaudich. Atlas Bonité, t. 63. *H. ferruginea* Carriere in Rev. Hort. 1881, 437, fig. 104. *Nidularium fragrans* and *Guzmania maculata* Hort.—Leaves 12–20 in a utricular rosette, lorate from an ovate base, 2–3 ft. long,  $2\frac{1}{2}$ –3 in. broad at the middle, plain green, slightly mottled on the face, obscurely lepidote, not banded on the back, rounded to a cusp at the tip, horny in texture, all the marginal teeth minute. Peduncle  $1\frac{1}{2}$  ft. long; bract-leaves lanceolate, adpressed, pale. Inflorescence lax, 9–12 in. long, the clusters globose, 1– $1\frac{1}{2}$  in. diam., all sessile on the main rachis or the lower peduncled; flower-bracts ovate, acute, greenish,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Calyx including ovary  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; sepals ovate, minutely mucronate. Petals whitish, twice as long as the sepals.

Hab. South Brazil; Santa Catherina, *Gaudich.* 128! Flowered at Liège in 1870. It is closely allied to *Æ. glomerata*, but the flower-bracts are much smaller, and not brightly coloured. It is the plant on which Gaudichaud's genus *Pironneava* was founded.

51. *Æ. GLOMERATA* Hook. in Bot. Mag. t. 5668. *Hohenbergia stellata* Schultes fil. Syst. Veg. vii. 1251. *H. erythrostachys* Brong. in Journ. Imp. Soc. Hort. July, 1864, with fig.; Carriere in Rev. Hort. 1869, 217, fig. 53 (M.D.). *Pironneava roseo-cærulea* K. Koch. *P. Morreniana* Regel, Gartenfl. t. 805.—Leaves 12–20 in a utricular rosette, lorate from an ovate base,  $1\frac{1}{2}$ –2 ft. long, 2–3 in. broad at the middle, moderately horny in texture, plain green on both sides, obscurely mottled with darker green when young, deltoid-cuspidate at the tip, the marginal prickles minute, brown, deltoid. Peduncle  $1-1\frac{1}{2}$  ft. long; bract-leaves pale, adpressed. Inflorescence a narrow panicle a foot long; clusters of flowers globose,  $1-1\frac{1}{4}$  in. diam., the upper close and sessile, the lower remote and peduncled; flower-bracts ovate-acuminate, bright red,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Calyx with ovary  $\frac{1}{2}$ – $\frac{5}{8}$  in. long; sepals deltoid-cuspidate. Petals reddish lilac, twice as long as the sepals.

Var. *PALLIDA* Baker.—Flower-bracts greenish white and ovary the same colour.

Hab. Brazil! province of Bahia. First gathered by Martius 2211. Introduced into cultivation by M. Porte about 1860, and now one of the commonest species of the genus.

52. *Æ. OLIGOSPHÆRA* Baker.—Leaves lorate, moderately thin, 2 in. broad, rounded to a cusp at the apex; marginal prickles small, deflexed. Inflorescence a panicle with shortly peduncled globose heads  $2\frac{1}{2}$ –3 in. diam.; branch-bracts large, ovate-lanceolate; flower-bracts ovate-acuminate, an inch long. Sepals lanceolate-acuminate,  $\frac{1}{3}$  in. long. Petals not seen.

Hab. Caracas, *Gollmer!* (Herb. Reg. Berol.). Collected in 1853. This no doubt is the Venezuelan plant referred by Dr. Karl Koch to *Æ. glomerata*.

53. *Æ. WRIGHTII* Baker in Journ. Bot. 1879, 163. *Æ. distans* Griseb. Pl. Cub. 253.—Leaves lorate from an oblong base,  $1\frac{1}{2}$ –2 ft. long, 3–4 in. broad at the middle, horny in texture, thinly lepidote on the back, rounded to a cusp at the apex, the marginal teeth close, deltoid, minute, brown, horny. Peduncle very slender, above 2 ft. long; bract-leaves small, distant, lanceolate, adpressed. Panicle  $\frac{1}{2}$ –1 ft. long, composed of distant oblong strobiliferous spikes  $1-1\frac{1}{2}$  in. long on short spreading peduncles, subtended by lanceolate branch-bracts 1–2 in. long; flower-bracts coriaceous, broad ovate, mucronate,  $\frac{1}{3}$  in. long. Calyx with ovary finally longer than the bract; sepals ovate, with a small cusp, much shorter than the ovary. Petals pale, twice as long as the sepals.

Hab. Eastern Cuba, near Monte Verde, *C. Wright 1525! Guthnick!* (Mus. Brit.). There is a specimen in the Paris Herbarium from a plant grown by Quesnel at Havre in 1843, received by him from Havana. Sintenis 1321, from Porto Rico, has narrower leaves than the Cuban plant and may be distinct.

54. *Æ. LONGISEPALA* Baker.—Habit of *Æ. glomerata*. Leaves not seen. Inflorescence a long panicle, the lower branches formed of 8–10 densely glomerate spikes forming a globose cluster 3–4 in. diam., on a short spreading peduncle. Flower-bracts ovate-cuspidate, coriaceous,  $\frac{3}{4}$ –1 in. long. Calyx with ovary  $\frac{3}{4}$  in. long; sepals lanceolate-acuminate.

Hab. Bahia, *Blanchet 241* (Herb. Mus. Brit.).

55. *Æ. SALZMANNI* Baker. *Hohenbergia Salzmanni* E. Morren inedit. (M.D.).—Leaf 2 ft. long, 4–6 in. broad at the middle, narrowed gradually to a pungent cuspidate tip; marginal teeth distant, middle-sized, patent, deltoid-cuspidate. Peduncle with inflorescence 5 ft. long, the latter a lax deltoid panicle a foot long, composed of 20–30 ovoid or oblong dense strobiliform spikes 1–1½ in. long, only the uppermost sessile on the main axis, the rest aggregated or the lower spaced out, sessile on distant erecto-patent branches, subtended by small ovate or ovate-lanceolate branch-bracts; flower-bracts broad ovate, ⅓–½ in. long, not distinctly cuspidate. Ovary with calyx as long as the flower-bract; sepals ovate, not mucronate. Petals bright violet, shortly protruded.

Hab. Brazil; in the province of Bahia, *Salzmann* 540! *Sello* 67! (Herb. Mus. Paris). Nearly allied to *Æ. Blanchetii*, *distans*, and *Wrightii*.

56. *Æ. BLANCHETII* Baker. *Hohenbergia Blanchetii* E. Morren inedit. (M.D.).—Leaf lorate, nearly 2 in. broad at the middle, deltoid at the tip with a small cusp, the marginal teeth distant, middle-sized, ascending, deltoid cuspidate. Inflorescence a lax panicle a foot long, composed of about 30 subglobose strobiliform spikes ½–¾ in. long, the uppermost sessile on the main axis, those below single and shortly peduncled, the rest sessile spaced out on erecto-patent branches; branch-bracts small, lanceolate; flower-bracts ⅓ in. long, broad ovate, with a small cusp. Calyx with ovary as long as the flower-bract. Petal-blade very small.

Hab. Brazil; province of Bahia, near Ilheos, *Blanchet* 2996! Heads and flower-bracts like those of *Æ. Wrightii* and *distans*.

#### Subgenus 4. ANDROLEPIS (*Brongn.*).

57. *Æ. CHANTINI* Baker. *Billbergia*? *Chantini* Carriere in Rev. Hort. 1878, 112, fig. 22, 1880, 272, figs. 54–56. Leaves 10–12 in a utricular rosette, lorate, a foot long, 1½–2 in broad, firm in texture, marked with very broad transverse zones of green and white, rounded to a cusp at the tip, the marginal teeth close, minute. Peduncle as long as the leaves; upper bract-leaves large, lanceolate, bright red. Inflorescence a dense ovoid bipinnate panicle 4–6 in. long; branches erecto-patent, lower 1½–2 in. long; flower-bracts ovate, ⅓ in. long, not mucronate. Calyx with ovary ¾ in. long, red-yellow; sepals oblong-lanceolate, not mucronate. Petal-blade small.

Hab. Amazon valley. Introduced into French gardens by M. Baraquin in 1877.

58. *Æ. SKINNERI* Baker. *Androlepis Skinneri* Brong. inedit.; E. Morren, Cat. 1871. 1 (M.D.). *Pothuava Skinneri* K. Koch. *Billbergia Skinneri* Hort. Linden.—Leaves about 20 in a utricular rosette, lanceolate from an ovate base, 2–2½ ft. long, 2½–3 in. broad at the middle, plain green on the face, thinly white-lepidote not banded on the back, narrowed gradually from the middle to the point, the marginal teeth close, minute, deltoid. Peduncle stout, erect, 1½ ft. long; bract-leaves lanceolate, pale, adpressed. Inflorescence a subcylindrical panicle a foot long, 2–3 in. diam., with a stout stiff

green rachis; branches short, the lower 1-1½ in. long, densely 5-6-flowered; branch-bracts small; flower-bracts obsolete. Ovary with calyx ovoid, green, ½-⅝ in. long; sepals deltoid, short, not mucronate. Petals yellow, shortly protruded.

Hab. Guatemala. Introduced into cultivation by Linden in 1850. Described mainly from a drawing of Prof. Morren's, from a plant that flowered at Liège, March, 1870.

59. *Æ. PLUMIERI* Baker. *Lamprococcus ramosus* Beer, Brom. 106.—Leaves lorate, rigid, 2-3 ft. long, 2-3 in. broad, channelled down the face, deltoid at the apex, the teeth close, middle-sized, ascending, deltoid-cuspidate. Inflorescence a panicle a foot long, consisting of 8-9 densely-flowered shortly peduncled spikes 3-4 in. long, subtended by large lanceolate branch-bracts. Ovary with calyx sessile round-ovoid, ⅓ in. long.

Hab. West Indies. Known only from Plumier's figure, vol. v. tabs. 67-68, called "Bromelia ramosa et racemosa, foliis arundinaceis serratis."

60. *Æ. PARVIFLORA* Baker in Journ. Bot. 1879, 67. *Billbergia parviflora* Mart.; Schultes fil. Syst. Veg. vii. 1270. *Lamprococcus chlorocarpus* Wawra, Reise, Maxim. 162. t. 28.—Leaves 6-10 in a rosette, lanceolate from an ovate base, a foot long, ½-¾ in. broad at the middle, narrowed to the point, entire. Peduncle a foot long, with many adpressed pale lanceolate bract-leaves. Inflorescence a lax rhomboid panicle 4-6 in. long, with erecto-patent 9-12-flowered racemose branches, the lowest sometimes forked; pedicels spreading, ⅓-⅓ in. long, subtended by a minute ovate bract. Calyx including ovary ½ in. long; sepals deltoid, minutely cuspidate. Petals lingulate, blue, ⅓-⅓ in. long, not scaled at the base. Berry olive-green, the size of a grain of hemp-seed.

Hab. Brazil; woods of the province of Bahia, Martius, Wawra & Maly 232. Connects *Æchmea* and *Aræococcus*.

61. *Æ. CÆRULESCENS* Baker in Journ. Bot. 1879, 227. *Æ. cærulea* E. Morren, Cat. 1871, 1 (M.D.). *Lamprococcus cærulescens* Regel, Gartenfl. t. 694. *Hoplophytum cærulescens* E. Morren. Cat. 1873, 9. *Æ. Luddemanniana* Brong. inedit. *Pironneara Luddemanniana* K. Koch Wochen. 1866, 182.—Leaves about 20 in a utricular rosette, lorate from an ovate base, 15-18 in. long, 1½-2 in. broad at the middle, moderately firm in texture, green on the face, obscurely lepidote on the back, deltoid-cuspidate at the apex, the marginal teeth minute. Peduncle about a foot long; bract-leaves pale, adpressed. Inflorescence a moderately dense bipinnate panicle 6-9 in. long; branches short, erecto-patent or the upper spreading; pedicels ¼-⅓ in. long; branch-bracts and flower-bracts both almost obsolete. Ovary with calyx green, ⅓ in. long; sepals ovate, with a small cusp, much shorter than the ovary. Petals red, shortly protruded.

Hab. Country unknown. Introduced into cultivation about 1866, by M. Luddemann, of Paris.

62. *Æ. MEXICANA* Baker in Journ. Bot. 1879, 165; Gard. Chron. 1887, i. 8 (M.D.). *Guzmania grandis* Hort. Linden. *Hoplophytum grande* E. Morren, inedit.—Leaves 20-30 in a utricular rosette, lorate

from an ovate base, above 2 ft. long, 3 in. broad at the middle, moderately firm in texture, green on the face, mottled with darker green, obscurely lepidote on the back, deltoid-cuspidate at the apex, the marginal teeth minute. Peduncle stout, erect, furfuraceous, a foot long; bract-leaves lanceolate, adpressed, pale. Inflorescence a lax tripinnate panicle 1-1½ ft. long, all the rachises furfuraceous; lower branches deltoid, 4-6 in. long; final pedicels  $\frac{1}{4}$ - $\frac{1}{3}$  in. long; bracts obsolete or very minute. Calyx with oblong green ovary  $\frac{1}{2}$  in. long; sepals short, ovate, minutely cuspidate. Petals bright crimson, protruding  $\frac{1}{3}$ - $\frac{1}{2}$  in. beyond the sepals.

Hab. Central Mexico; province of Orizaba, *Bourgeau* 3106! *Liebmann* 78, 79. Described from a plant that flowered at Kew, Dec., 1886. A very distinct species, introduced into cultivation by M. Omer de Malzine.

63. *Æ. GALEOTTEI* Baker. — Leaves thin, lorate, 1 ft. long, 1-2 in. broad; marginal spines minute. Peduncle slender, a foot long. Inflorescence a lax bipinnate panicle 4-6 in. long; branches an inch long; pedicels erecto-patent,  $\frac{1}{3}$ - $\frac{1}{6}$  in. long; flower-bracts obsolete. Calyx with ovary  $\frac{1}{4}$ - $\frac{1}{3}$  in. long; sepals ovate, minutely mucronate, as long as the ovary. Petal-blade small, white, oblong.

Hab. Mountains of Central Mexico; Oaxaca, Cordova, &c., *Galeotti* 4918! *Bourgeau* 1776 bis! *Hahn*!

64. *Æ. SPECTABILIS* Brong.; Houlet in Rev. Hort. 1876, 311, with figure (M.D.). *Æ. flexuosa* Baker in Gard. Chron. 1887, i. 8. *Pironneava spectabilis* K. Koch; E. Morren, Cat. 1873, 13. *Guzmania spectabilis* Hort. — Leaves 20-30 in a dense utricular rosette, lanceolate from an ovate base, 2-3 ft. long, 2-3 in. broad at the middle, green on both sides with scarcely any lepidote pubescence on the back, narrowed gradually to the point, the marginal prickles small, pale, deltoid. Peduncle stout, 1-1½ ft. long; bracts pale, lanceolate, adpressed. Inflorescence a lax rhomboid tripinnate panicle 1½-2 ft. long; lower branches 4-6 in. long; branchlets subcorymbose; pedicels  $\frac{1}{4}$ - $\frac{1}{2}$  in. long, minutely bracteate at the base. Calyx with ovary  $\frac{1}{2}$ - $\frac{3}{8}$  in. long, pale pink, glabrous; sepals lanceolate-deltoid, rather longer than the globose ovary, with a small brown erecto-patent cusp. Petals pink, exserted  $\frac{1}{2}$  in. beyond the sepals.

Hab. Guatemala. Described from a plant that flowered at Kew, Dec., 1886, received from Linden.

65. *Æ. PETROPOLITANA* Wawra, Itin. Prin. Sax. Cob. 146, fig. 34 A (M.D.). — Leaves about 30 in a dense utricular rosette, lanceolate from an ovate base, 2-3 ft. long, 2-3 in. broad, narrowed gradually to the point, green on both sides, moderately firm in texture, the marginal teeth minute. Peduncle 1-1½ ft. long; bract-leaves lanceolate, adpressed, not brightly coloured. Inflorescence a lax tripinnate panicle 2 ft. long; longest branches 4-5 in. long; pedicels  $\frac{1}{3}$ - $\frac{1}{2}$  in. long, subtended by a minute ovate-lanceolate bract. Ovary with calyx an inch long, pink, glabrous; sepals about as long as the ovary, minutely mucronate. Petals reddish, protruded  $\frac{1}{2}$  in. beyond the sepals.

Hab. Woods of South Brazil, near Petropolis, *Wawra* 63. Closely allied to *Æ. spectabilis*.

66. *Æ. HOKELI*, Regel, *Descr.* 1887, 5; *Munich Illust. Monat.* viii. 142, with figure.—Leaves lorate from an ovate base, 2–2½ ft. long, 3–4 in. broad at the middle, plain green on the face, thinly white-lepidote on the back, the spreading deltoid marginal teeth 1–12th in. long. Peduncle stout, floccose, 1½ ft. long. Inflorescence a deltoid tripinnate panicle 1½ ft. long; lower branches patent, 5–6 in. long; branchlets 1–5-flowered; lower flowers shortly pedicellate; flower-bracts minute (½ line) mucronate. Ovary and calyx pale red; sepals ovate, ½ in. long, minutely mucronate. Petals dark purple, shortly protruded.

Hab. Country unknown. Flowered in the Petersburg Botanic Garden in 1887. Allied to *Æ. spectabilis*.

#### Subgenus 5. LAMPROCOCCUS (*Beer*).

67. *Æ. FULGENS* Brong. in *Ann. Sc. Nat.* ser. 2, xv. 371; *Flore des Serres*, ii. 38, with figure; *Paxt. Mag.* x. 173, with figure. *Lamprococcus fulgens* Beer, *Brom.* 103.—Leaves about 20 in a utricular rosette, lorate from an ovate base, 1–1½ ft. long, 2–2½ in. broad, plain green on the face, slightly glaucous, not banded on the back, not horny, rounded to a cusp at the apex, the marginal teeth minute. Peduncle a foot long, glabrous, bright red; bract-leaves few, lanceolate, pale, scariosæ. Inflorescence a lax deltoid panicle ½ ft. long; rachises bright red; only 1–2 lowest branches subtended by small pale lanceolate bracts; branches 4–6-flowered, lowest forked; flower-bracts very minute or obsolete. Ovary with calyx oblong, ½ in. long, the former bright red, the sepals ovate, purplish towards the tip. Petals pale lilac, exserted ¼–½ in.

Var. *DISCOLOR* Brong. *Echmea discolor* Hook. in *Bot. Mag.* t. 4293; *Ann. Gand* 1869, t. 65; *Moore in Gard. Mag. Bot.* 1850, t. 121.—Leaf bright claret-brown all over the lower surface, often with obscure farinose bands above.

Hab. French Guiana. First gathered by Melinon about 1840. Bahia, *Blanchet* 2371! Var. *discolor* was introduced by Quesnel from Pernambuco about 1842.

68. *Æ. CORALLINA* Brong. *inedit.* *Lamprococcus corallinus* Beer, *Brom.* 106; *K. Koch, Wochen.* iii. 76 (M.D.).—Leaves about a dozen in a utricular rosette, lorate from an ovate base, 1–1½ ft. long, 1½ in. broad, plain green on both sides, the marginal teeth minute. Peduncle under a foot long. Inflorescence a dense deltoid panicle 3–4 in. long and broad; rachises dirty ochreous yellow. Calyx with ovary ½ in. long, both bright coral-red. Petals white, exserted ⅓ in. beyond the sepals.

Hab. Brazil; probably Bahia. Introduced into cultivation by M. Morel, of Paris, about 1850. Described principally from Prof. Morren's drawing, made from a plant that flowered in the Botanic Garden at Liège, in Sept., 1865. Very near *Æ. fulgens*.

69. *Æ. CONGLOMERATA* Hort. *Berol.* *Lamprococcus glomeratus* Beer, *Brom.* 105.—Leaves 12–20 in a rosette, lorate from an ovate

base, 1-1½ ft. long, 1¼-1½ in. broad at the middle, plain green on both surfaces. Peduncle under a foot long. Inflorescence a dense rhomboid panicle 2-3 in. long: rachis bright red; lower branches erecto-patent, forked, subtended by small scariosse bracts. Ovary with calyx oblong, ½ in. long, bright red. Petals lilac, ⅓ in. long.

Var. *FARINOSA* Baker. *Lamprococcus farinosus* Regel in Ind. Sem. Hort. Petrop. 1868, App. 79.—Leaves white-farinose, especially beneath.

Var. *DISCOLOR* Beer.—Leaves claret-brown beneath.

Hab. Probably Brazil. Described from a plant at Kew; specimens in the herbarium of Dr. Karl Koch, and one from the Paris Garden dried in Jan., 1854, and Prof. Morren's drawing. Very near *Æ. fulgens*.

70. *Æ. MINIATA* Hort. *Lamprococcus miniatus* Beer, Brom. 104; K. Koch, Wochen. iii. 75.—Leaves a dozen or more in a utricular rosette, lorate from an ovate base, 1-1½ ft. long, plain green on both sides, the marginal teeth minute. Peduncle under a foot long; bract-leaves pale, scariosse, adpressed. Inflorescence a moderately dense panicle 4-5 in. long, with red rachises; lower branches forked. Calyx with ovary oblong, bright red, ¼-½ in. long. Petals lilac, protruded ½ in.

Var. *DISCOLOR* Beer (M.D.).—Leaves bright claret-brown beneath.

Hab. Bahia, *Blanchet!* *Wawra & Maly* 259. Seen also in Dr. Karl Koch's herbarium. Very near *Æ. conglomerata*, with which it is combined specifically in Morren's catalogue of 1873.

71. *Æ. WEILBACHII* F. Didr.; Liebm. in Ann. Sc. Nat. ser. 4, ii. 373. *Lamprococcus Weilbachii* E. Morren in Belg. Hort. 1861, 305, with figure; Regel, Gartenfl. t. 539; Baker in Bot. Mag. t. 6435. *L. Laurentianus* K. Koch, Wochen. iii. 73.—Leaves 12-20 in a rosette, lorate from an ovate base, 1-1½ ft. long, 1½ in. broad at the middle, very pliable in texture, deltoid-cuspidate at the apex, both sides bright green, the marginal teeth minute. Peduncle 1-1½ ft. long, glabrous, dull red; bract-leaves adpressed, imbricated. Inflorescence a lax bipinnate panicle 4-6 in. long with a bright rachis; branches 4-6, 3-4-flowered, clasped by large oblong-lanceolate acute navicular bracts; flower-bracts round-navicular, ⅓-¼ in. long. Ovary with the calyx oblong, ½ in. long, the former bright red, globose; sepals ovate, bright lilac. Petals exerted ⅓ in., lilac, soon turning brown-black.

Hab. Woods of South Brazil! Corcovado, &c., *Miers* 3579! *Glaziou* 9326! Introduced to the Copenhagen Botanic Garden in 1854. Described from plants that flowered at Kew in 1877 and Paris in 1868.

72. *Æ. BRACHYCAULIS* Baker. *Lamprococcus brachycaulis* E. Morren, inedit. (M.D.).—Produced leaves 8-10 in a rosette, ensiform from an ovate base, 1½ ft. long, an inch broad at the middle, thin in texture, plain dark green on the face, uniform claret-brown all over the back, the marginal teeth minute. Flowers in an oblong capitulum placed at the top of the utriculus of the rosette. Ovary with calyx bright red. Petals whitish, exerted ⅓-½ in.

Hab. Probably Brazil. Described from Professor Morren's drawing made in 1883, from a plant received from M. Jacob Makoy and Co.

Subgenus 6. *PLATYÆCHMEA* Baker.

73. *Æ. DISTICHANTHA* Lemaire in Jard. Fleur. t. 269; Hook in Bot. Mag. t. 5447 (M.D.). *Billbergia polystachya* Paxt. Flow. Gard. iii. t. 80. *Hoplophytum distichanthum* Beer, Brom. 136. *Hohenbergia distichantha* Baker in Saund. Ref. Bot. sub t. 284.—Leaves 15–20 in a utricular rosette, with an ovate base 4–5 in. long and an ensiform blade 2–2½ ft. long, an inch broad at the middle, firm in texture, plain green on the face, thinly white-lepidote not banded on the back, narrowed to the point, the edge-prickles middle-sized, hooked, horny, black. Peduncle erect, 1½–2 ft. long; bract-leaves imbricated, all adpressed. Inflorescence a dense oblong panicle 4–5 in. long, with crowded erecto-patent densely-flowered distichous branches 1–1½ in. long, subtended by small ovate bracts; flower-bracts round-cuspidate, ¼ in. long, adnate by the edges to the rachis. Calyx with ovary ½ in. long, both red; sepals oblong or oblong-lanceolate, cuspidate. Petals red-purple, ¼ in. longer than the calyx.

Hab. Paraguay, *Balansa* 610! Introduced into cultivation about 1852, and needing only cool treatment.

74. *Æ. BRASILIENSIS* Regel Gartenfl. 1885, 258, t. 1202 (M.D.). *Chevalliera grandiceps* Griseb. Symb. Argent. 329.—Leaves about 20 in a utricular rosette, lanceolate from a long ovate base, above 2 ft. long, 1½ in. broad at the middle, horny in texture, plain green on the channelled face, thinly white-lepidote not banded on the back, narrowed gradually to an acute point, the marginal prickles close, middle-sized, deltoid-cuspidate, with a large black tip. Peduncle erect, 1½ ft. long; bract-leaves imbricated, adpressed. Inflorescence a dense oblong panicle 4–6 in. long, with numerous erecto-patent or spreading dense-flowered distichous branches 1½–2 in. long, subtended by small ovate red branch-bracts; flower-bracts ¼ in. long, orbicular, mucronate, with margins adnate to the axis. Calyx with ovary ½ in. long, bright red; sepals oblong-cuspidate, imbricated. Petals lilac, ⅓ in. longer than the calyx.

Hab. Central and South Brazil. *Burchell* 4556! 4654! *Regnell* 437! *Glaziou* 11691! 13245! *Argentaria*; Oran, *Lorentz & Hieronymus*! Introduced to the St. Petersburg Garden by Dr. Glaziou in 1885. I doubt this being more than a variety of *Æ. distichantha*. It is probable that *Hoplophytum polystachyum* Beer, Brom. 137, founded on a very rough drawing in the Flora Fluminensis (*Tillandsia polystachya*, vol. iii. t. 138) belongs here.

75. *Æ. GLAZIOVII* Baker in Journ. Bot. 1879, 133; E. Morren in Belg. Hort. 1880, 240, 1881, 271, t. 13 (M.D.).—Leaves 20 in a rosette, lorate from a short ovate base, 1½ ft. long, 2 in. broad at the middle, horny in texture, plain green on the channelled face, thinly white-lepidote, not banded on the back, deltoid-cuspidate at the tip, the marginal prickles small, black-pointed. Peduncle a foot or more long; bract-leaves much imbricated. Inflorescence a dense oblong panicle 3–4 in. long, with many short dense-flowered erecto-patent distichous branches, subtended by small ovate bracts; flower-bracts ¼ in. long, round-navicular with a distinct mucro, adnate by their sides to the rachis. Calyx with ovary ½ in. long;

sepals lanceolate, minutely mucronate. Petals red-purple, half as long again as the sepals.

Hab. South Brazil, *Glaziou* 8986! 11695! Introduced into cultivation by Dr. Glaziou to Liège, in 1880. It was grown at Berlin in the days of Kunth. I cannot separate specifically, a plant draw by Professor Morren under the name of *Æ. pulchella*, one form of which has the leaves vertically striped with lines of brown on the back towards the base. Closely allied to *Æ. distichantha*. A living plant, sent to Kew in 1888, had leaves 7—8 feet long.

76. *Æ. EXCAVATA* Baker in Journ. Bot. 1879, 134. — Leaves lorate from an ovate base, 2—3 ft. long,  $1\frac{1}{2}$ —2 in. broad at the middle, pale green, the curved marginal prickles 1-12th in. long. Peduncle 3—4 ft. long; bract-leaves sheathing. Inflorescence a dense oblong panicle 8—10 in. long, with about 20 erecto-patent densely-flowered distichous branches  $1\frac{1}{2}$ —2 in. long; flower-bracts minutely cuspidate,  $\frac{1}{3}$  in. long, with sides entirely adnate to the rachis. Calyx with ovary  $\frac{3}{4}$  in. long; sepals lanceolate, cuspidate, longer than the globose ovary. Petals red-lilac, exserted  $\frac{1}{4}$  in.

Hab. Paraguay, near Assomption, *Gibert!* *Calot!* Bolivia; Corrientes, *D'Orbigny* 113! Chiquitos, *Weddell!*

77. *Æ. MYRIOPHYLLA* E. Morren, inedit. (M.D.); Baker in Bot. Mag. t. 6939. — Leaves 30—40 in a utricular rosette, ensiform from an ovate base, 2—2 $\frac{1}{2}$  ft. long, an inch broad at the middle, dull green on the face, thinly white-lepidote not banded on the back, firm in texture, tapering gradually to a long point, with middle-sized horny marginal prickles. Peduncle erect,  $1\frac{1}{2}$  ft. long; bract-leaves imbricated, all adpressed. Inflorescence a lax bipinnate panicle  $\frac{1}{2}$  ft. long, with short spreading densely-flowered distichous branches 1—1 $\frac{1}{2}$  in. long, subtended by small ovate-cuspidate bracts; rachises straight, pubescent; flower-bracts red, broad-ovate, cuspidate,  $\frac{1}{4}$  in. long, adnate by their edge to the rachis more than half way up. Calyx with ovary  $\frac{1}{2}$  in. long; sepals oblong lanceolate, cuspidate. Petals  $\frac{3}{8}$  in. longer than the calyx, at first pink, then lilac-purple.

Hab. South Brazil. Introduced by Glaziou in 1886. Described from a plant that flowered at Kew, Oct. 1886. Nearly allied to *Æ. distichantha*.

78. *Æ. JUCUNDA* E. Morren, inedit. (M.D.). — Leaves 10—12 in a utricular rosette, lorate, a foot long,  $\frac{3}{4}$ —1 in. broad at the middle, plain green on the face, white-lepidote on the back, with a few irregular transverse bands, deltoid-cuspidate at the tip, the marginal prickles minute. Peduncle slender, much overtopping the leaves; bract-leaves adpressed, imbricated, not brightly coloured. Inflorescence a dense rhomboid bipinnate panicle 3 in. long, with short erecto-patent densely-flowered distichous branches; flower-bracts round-cuspidate, red,  $\frac{1}{4}$  in. long. Calyx with ovary  $\frac{1}{2}$  in. long, both red; sepals oblong-lanceolate, cuspidate, Petals lilac, shortly exserted.

Hab. South Brazil. Introduced by Glaziou in 1884. Described from Prof. Morren's drawing, made Jan., 1886. Allied to *Æ. distichantha*.

79. *Æ. BRACTEATA* Griseb. Fl. Brit. West. Ind. 592. *Bromelia bracteata* Swartz, Prodr. Fl. Ind. Occ. 56. *Hohenbergia bracteata* Baker in Ref. Bot. sub t. 284. Leaves 12—20 in a utricular

rosette, lorate from an oblong base, 2 in. broad at the middle, not horny, plain green on both sides, deltoid-cuspidate at the tip, the marginal teeth middle-sized, with a brown-black tip. Peduncle about a foot long; bract-leaves large, lanceolate; upper more or less spreading, bright red. Inflorescence a dense panicle 6-9 in. long, with numerous erecto-patent densely-flowered distichous branches 2-3 in. long, subtended by lanceolate bracts; rachis excavated so as to form a cup opposite each flower, which is subtended by an ovate-navicular cuspidate entire bract  $\frac{1}{2}$  in. long. Ovary globose; sepals lanceolate,  $\frac{1}{2}$  in. long, with a small erecto-patent mucro. Petals yellow, shortly protruded.

Hab. West Indies. Jamaica, *Swartz*! St. Lucia, *Anderson*! *H. B. Murray*! St. Vincent's, *Guilding*! Trinidad, *Prestoe*! This is now in cultivation at Kew, and flowered in 1885.

80. *Æ. MARTINICENSIS* Baker in Journ. Bot. 1879, 132.—Leaves with a very large entire oblong base; blade not seen. Peduncle erect, a foot long; bract-leaves imbricated, adpressed, the upper serrated. Inflorescence a dense oblong panicle 3-4 in. long, with numerous densely-flowered erecto-patent distichous branches 1-1 $\frac{1}{2}$  in. long, the lower subtended by ovate-lanceolate rigid sharply-toothed bracts; rachis excavated into a winged pocket opposite each flower, which is subtended by an ovate navicular bract  $\frac{1}{2}$  in. long, with a large cusp. Calyx including ovary  $\frac{1}{2}$ - $\frac{5}{8}$  in. long; sepals lanceolate, twice as long as the ovary, with a large erecto-patent cusp. Petals shortly protruded.

Hab. Martinique, *Belanger* 467! *Hahn* 522! 581! Closely allied to *Æ. bracteata*, from which it differs by its broader conspicuously toothed branch-bracts.

81. *Æ. DICHLAMYDEA* Baker in Journ. Bot. 1879, 133; 1880, 15.—Leaves not seen. Peduncle shorter than the leaves; upper bract-leaves lanceolate, erecto-patent, bright red. Inflorescence an ovate panicle above a foot long, consisting of 12-20 ovate densely-flowered distichous spikes 1-1 $\frac{1}{2}$  in. long, at the end of erecto-patent peduncles, of which the lower are 3-4 in. long, subtended by small red spreading or deflexed lanceolate bracts; rachis deeply excavated opposite each flower, which is subtended by an ovate-navicular bract  $\frac{1}{2}$  in. long, with a small horny mucro. Calyx with ovary  $\frac{1}{2}$ - $\frac{3}{8}$  in. long; sepals lanceolate, longer than the ovary, minutely mucronate. Petals narrow,  $\frac{1}{4}$  in. longer than the calyx.

Hab. Tobago. Originally described from an old specimen at the British Museum. It was specially sought for at my request and re-gathered in Feb., 1879, by Mr. Louis C. Meyer, formerly of Kew.

82. *Æ. TILLANDSIODES* Baker in Journ. Bot. 1879, 134 (M.D.). *Æ. vriesioides* Baker. *Billbergia tillandsioides* Mart.; Schultes fil. Syst. vii. 1269. *B. gracilis* Poeppig.—Leaves about a dozen in a utricular rosette, lanceolate from an ovate base, 1-1 $\frac{1}{2}$  ft. long 1 $\frac{1}{2}$  in. broad at the middle, plain green on the face, obscurely lepidote, not banded on the back, narrowed gradually to the point, the marginal prickles middle-sized, deltoid-cuspidate, horny. Peduncle a foot long; upper bracts oblong-lanceolate, bright red, serrated. Panicle rhomboid, 4-5 in. long, consisting of 4-8 erecto-patent, sessile,

densely-flowered distichous spikes 1-2 in. long; flower-bracts oblong, acute,  $\frac{1}{2}$ - $\frac{5}{8}$  in. long, quite hiding the calyx. Ovary with calyx as long as the flower-bract; sepals ovate, shortly mucronate,  $\frac{1}{4}$  in. long. Petals twice as long as the sepals. Berry bright blue.

Hab. Amazon valley, *Martius*, *Poppig* 2716. Demerara, Appun, *Jenman* 2042! 4116! Drawn by Morren from a plant flowered at Liège in 1882.

83. *Æ. CHIRIQUENSIS* Baker in Journ. Bot. 1886, 243.—Leaves 5-6 in a utricular rosette, lanceolate from an oblong base, above a foot long,  $\frac{3}{4}$ -1 in. broad at the middle, moderately firm in texture, obscurely lepidote on the back, narrowed gradually to the point, the marginal prickles deltoid-cuspidate, spreading horizontally, the largest 1-12th in. long. Peduncle slender, under a foot long, with 3-4 spreading lanceolate bright red toothed bract-leaves crowded near its apex. Panicle of 2 erecto-patent laxly 8-10-flowered distichous spikes  $1\frac{1}{2}$ -2 in. long; flower-bracts oblong-navicular, acute, ascending,  $\frac{1}{2}$  in. long. Ovary with calyx reaching to the tip of the bract; sepals ovate-lanceolate, with a small horny mucro. Petals protruded  $\frac{3}{8}$  in.

Hab. Chiriqui Lagoon, *Hart* 173! Collected on an expedition in 1886. It is probable that a plant at the British Museum from the Mosquito shore, gathered by Captain Miller in 1774, belongs here. It is closely allied to *Æ. tillandsioides*.

84. *Æ. PUBESCENS* Baker in Journ. Bot. 1879, 135.—Leaves with a dilated entire oblong base and lanceolate blade above a foot long,  $1-1\frac{1}{2}$  in. broad at the middle, moderately firm in texture, thinly lepidote beneath, narrowed gradually to the point, the lower prickles decurved, horny,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long. Peduncle a foot long, with many scarioso bract-leaves, the upper bright red, all erect. Inflorescence a panicle  $\frac{1}{2}$ -1 ft. long, the lower branches lax and compound, the upper simple, the flowering portion distichous, 1-2 in. long; rachis laxly pubescent; flower-bracts ovate-cuspidate, coriaceous,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long, with entirely free sides. Calyx with ovary  $\frac{1}{3}$ - $\frac{1}{2}$  in. long, pubescent; sepals ovate-lanceolate, minutely mucronate. Petals pale, exserted  $\frac{1}{8}$  in.

Hab. Porto-bello, *Bergius*! (Herb. Linn.). Nicaragua, *Ralph Tate* 416! Chagres, *Fendler* 449! Panama, *Seeman* 609! Not known in cultivation.

85. *Æ. DACTYLINA* Baker in Journ. Bot. 1879, 135.—Leaves with a dilated ovate base 5-6 in. long and an ensiform lamina 2 ft. long,  $1\frac{1}{2}$ -2 in. broad, moderately firm in texture, thinly lepidote on the back, narrowed gradually to a brown horny pungent point, the lower marginal spines lanceolate, horny,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long. Peduncle a foot long, with scarioso imbricated adpressed bract-leaves. Panicle lax, deltoid, above a foot long, the branches subtended by large red lanceolate bracts, the lower half a foot long, bearing near the end 3-4 spikes; upper spikes single; spikes distichous, densely flowered, 3-4 in. long; flower-bracts ovate,  $\frac{1}{2}$  in. long, minutely cuspidate, acutely keeled, free at the sides. Calyx with ovary as long as the bract; sepals lanceolate, as long as the globose ovary, minutely cuspidate. Petal-blade  $\frac{1}{8}$  in. long.

Hab. Chagres, Panama, *Fendler* 450! Gathered in March, 1850. A very distinct species.

86. *Æ. MULTICEPS* Baker in Journ. Bot 1880, 49.—Leaves with a lorate lamina, 3–4 ft. long,  $2\frac{1}{2}$ –3 in. broad at the middle, moderately firm in texture, plain green on the face, thinly white-lepidote not banded on the back, deltoid-cuspidate at the tip, the marginal prickles very minute. Inflorescence a bipinnate panicle with a stout loosely pubescent flexuose rachis, the lower branches spreading horizontally, subtended by short scariose adpressed lanceolate bract-leaves, the flowers of each branch clustered into 10–12 globose distichous sessile heads  $\frac{1}{2}$ – $\frac{5}{8}$  in. diam., containing each 6–8 flowers, the upper heads of the branch aggregated, the lower with a space between them; flower-bracts cordate-orbicular, coriaceous, minutely cuspidate,  $\frac{1}{4}$  in. long. Calyx with ovary  $\frac{1}{4}$  in. long; sepals deltoid, shorter than the ovary, minutely cuspidate. Petals protruded 1–12th in., spirally twisted.

Hab. South Brazil, *Glaziou* 11681! A very distinct species.

#### Subgenus 7. PECTINARIA *Benth.*

87. *Æ. FASCIATA* Baker in Journ. Bot. 1879, 231. *Billbergia fasciata* Lindl. in Bot. Reg. t. 1130. *Hoplophytum fasciatum* Beer, Brom. 129. *Hohenbergia fasciata* Schultes fil. Syst. Veg. vii. 1253. *Æchmea Leopoldii* Hort. *Billbergia rhodocyanea* Lemaire in Flore des Serres, t. 207; Hook. in Bot. Mag. t. 4883 (M.D.).—Leaves about 20 in a rosette, lorate from an ovate base,  $1\frac{1}{2}$ –2 ft. long, 2– $2\frac{1}{2}$  in. broad at the middle, green with abundant white spots and a few transverse bands of white on the back, deltoid-cuspidate at the tip, the marginal prickles small, brown-tipped. Peduncle erect, floccose, a foot long, the upper bract-leaves bright red, sharply serrated. Inflorescence a dense erect simple rarely 2–3-nate oblong capitulum 2–4 in. long; flower-bracts bright pink, ascending, imbricated, ovate-lanceolate with a pungent tip, conspicuously toothed, the lower  $1\frac{1}{2}$  in. long, the upper much shorter. Ovary with calyx  $\frac{1}{2}$ – $\frac{5}{8}$  in. long; sepals ovate, as long as the ovary, obtuse. Petals red, fading to blue,  $\frac{3}{4}$ –1 in. long.

Hab. Woods of South Brazil, *Sello* 94! *Miers* 1759! *Glaziou* 11686! Introduced into cultivation in 1826. Described from plants that flowered at Kew, Oct., 1878 and June, 1886. I find it was labelled *Æchmea fasciata* by Brongniart in the Paris Herbarium in 1864. *Tillandsia bracteata* Vell. Fl. Flum. iii. t. 125, is probably a synonym.

88. *Æ. DEALBATA* E. Morren in herb. Kew. *Hoplophytum dealbatum* E. Morren, inedit. (M.D.).—Stoloniferous. Leaves few in a utricular rosette, lorate, above 2 ft. long,  $1\frac{1}{2}$ –2 in. broad, horny in texture, plain green and channelled down the face, tinged with brown and copiously banded with white on the back, deltoid-cuspidate at the tip, the marginal prickles minute. Peduncle slender, erect, above a foot long; bract-leaves adpressed, lanceolate, imbricated, farinose, the upper serrated. Inflorescence a dense simple or 2–3-nate erect oblong spike 3–4 in. long; flower-bracts ascending, ovate-lanceolate, acuminate, serrated, brownish, persistently white-farinose, 1– $1\frac{1}{2}$  in. long. Calyx with ovary  $\frac{1}{2}$  in.

long; sepals ovate, obtuse. Petals pink, three times as long as the sepals.

Hab. Woods of South Brazil, *Glaziou* 11677! 16410! Drawn by Prof. Morren from a plant flowered in cultivation Sept., 1879. A close ally of *Æ. fasciata*.

89. *Æ. PECTINATA* Baker in Journ. Bot. 1879, 233. — Leaves lorate from a large oblong base, 3 ft. long, 3–4 in. broad at the middle, moderately firm in texture, thinly white-lepidote on the back, deltoid-cuspidate at the apex, the marginal spines minute, spreading, brown-tipped. Peduncle  $1\frac{1}{2}$  ft. long; bract-leaves adpressed, much imbricated, conspicuously toothed. Inflorescence a dense simple ovoid capitulum 2–3 in. long, 2 in. diam.; flower-bracts ovate-acuminate, coriaceous, ascending,  $\frac{3}{4}$ –1 in. long, margined with large close deltoid horny brown teeth. Calyx with ovary  $\frac{3}{4}$  in. long; sepals ovate, acute, longer than the ovary. Petals not seen.

Hab. Woods of South Brazil, *Burchell* 3594! *Glaziou* 15484! First gathered by Burchell in 1826, in the province of St. Paulo.

90. *Æ. BURCHELLII* Baker in Journ. Bot. 1879, 231. — Leaves densely rosulate, under a foot long, lorate from an ovate base, 2 in. broad at the middle, moderately firm in texture, thinly lepidote on the back, narrowed suddenly to a deltoid-cuspidate apex, the marginal teeth minute. Peduncle 3 in. long; bract-leaves imbricated. Inflorescence a globose capitulum 2 in. long; flower-bracts ovate-acuminate, not rigid, furnished with deltoid teeth on the margin, the lower  $\frac{3}{4}$  in., the upper  $\frac{1}{2}$  in. long. Calyx with ovary  $\frac{1}{2}$  in. long; sepals lanceolate, longer than the ovary, tipped with a minute horny brown mucro. Petals not seen.

Hab. South Brazil; woods of the province of St. Paulo near Cubatao, *Burchell* 3487! Gathered in 1826.

#### Subgenus 8. POTHUAVA (Gaudich.).

91. *Æ. CALYCVLATA* Baker in Journ. Bot. 1879, 232. *Hohenbergia calyculata* Baker in Saund. Ref. Bot. t. 286. *Hoplophytum calyculatum* E. Morren in Belg. Hort. 1865, 162, t. 11 (M.D.). *Macrochordium luteum* Regel in Gartenfl. 1867, 164, t. 544. *M. nudiusculum* K. Koch, Wochen. 1864, 176. — Leaves 10–12 in. a utricular rosette, lorate from an ovate base,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. broad at the middle, not so rigid in texture as in its allies, plain green on the face, obscurely fasciated on the back, rounded to a small cusp at the apex, the marginal prickles minute. Peduncle a foot long; bract-leaves pale, scarioso, imbricated. Inflorescence a dense globose rarely pyramidal head  $1\frac{1}{2}$  in. diam.; flower-bracts coriaceous, ovate-acuminate,  $\frac{1}{4}$  in. long. Calyx including ovary  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; sepals ovate, reddish with a mucro as long as the blade. Petals lingulate, bright lemon-yellow,  $\frac{1}{3}$  in. long, fading brown.

Hab. South Brazil. Introduced into cultivation about 1862. Described from plants flowered by Mr. Wilson Saunders at Reigate, in 1868, and at Kew in Feb., 1875 and Dec., 1887. One of the specimens drawn by Prof. Morren has a pyramidal head of flowers 4 in. long, compound at the base.

92. *Æ. SELLOANA* Baker.—Leaves thin, lorate, 2 ft. long,  $1\frac{1}{4}$  in. broad at the middle, rounded at the apex to a small cusp; marginal prickles nearly obsolete. Peduncle slender, much shorter than the leaves. Inflorescence a very dense subglobose head  $1\frac{1}{2}$  in. long; flower-bracts broad ovate, spine-pointed,  $\frac{1}{4}$  in. long; ovary with calyx  $\frac{1}{4}$  in. long; sepals ovate, scarcely cuspidate.

Hab. South Brazil, *Sello* 4008! (Herb. Reg. Berol.). Habit of *Æ. calyculata*, but the sepals not mucronate.

93. *Æ. LONGICUSPIS* Baker.—Leaves rigid, ensiform, 2–3 in. broad, narrowed to the point; prickles large, brown, deltoid-cuspidate. Inflorescence a dense oblong-cylindrical spike 4–6 in. long, 2–2 $\frac{1}{2}$  in. diam.; flower-bracts orbicular, coriaceous, glabrous,  $\frac{1}{2}$  in. long and broad, with a rigid black cusp as long as the blade. Calyx with ovary  $\frac{3}{4}$  in. long; sepals lanceolate. Petals not seen.

Hab. Andes of New Granada at Chamba, *Goudot*! (Herb. Paris).

94. *Æ. ORNATA* Baker in Journ. Bot. 1879, 162. *Chevaliera ornata* Gaudich. Atlas Bonité, t. 62.—Leaves rigid, ensiform from an oblong base, 3–4 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, narrowed gradually to the point, minutely serrated. Peduncle stiffly erect, much shorter than the leaves. Inflorescence a dense oblong spike 5–6 in. long, 2–3 in. diam.; bracts obovate-cuneate,  $\frac{1}{2}$  in. long and broad with a mucro  $\frac{1}{2}$  in. long. Mature ovary tetragonal,  $\frac{1}{2}$ – $\frac{5}{8}$  in. long,  $\frac{1}{4}$  in. diam.; sepals lanceolate-deltoid,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long, with a minute mucro. Petals not seen.

Hab. South Brazil; island of Santa Catherina, *Gaudichaud* 129! 371! Gathered in the year 1835.

95. *Æ. PINELIANA* Baker in Journ. Bot. 1879, 232. *Echinostachys Pineliana* A. Brong.; Planch. in Hort. Donat. 25; Hook. in Bot Mag. t. 5321 (M.D.). *E. rosea* Beer, Brom. 149. *Macrochordium Pinelianum* Lemaire in Ill. Hort. ix. Misc. 62.—Leaves 12–15 in. a utricular rosette, lorate from an ovate base, 1–1 $\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, moderately firm in texture, plain green on the face, thinly white-lepidote on the back without spots or bands, deltoid at the apex, the marginal spines brown-pointed, the lower patent,  $\frac{1}{8}$ – $\frac{1}{6}$  in. long. Peduncle 1–1 $\frac{1}{2}$  ft. long; bract-leaves lanceolate, adpressed, imbricated, bright red. Flowers in a dense simple spike 2–3 in. long; flower-bracts rigid, ascending, with a small ovate base and a large pungent stramineous mucro. Ovary with calyx  $\frac{1}{2}$  in. long; sepals ovate, with a large cusp. Petals bright yellow,  $\frac{1}{2}$  in. long, turning brown when they fade. Ovules 3–4 in a cell.

Hab. Woods of South Brazil, *Glaziov* 13244! 15487! Introduced into cultivation by Morel about 1851. Described from a plant that flowered at Kew, Dec., 1877.

96. *Æ. MARIE-REGINÆ* H. Wendl. in Hamb. Gartenzeit, ix. 32; Regel, Gartenfl. 1864, 152; Floral Mag. n.s., t. 8 (M.D.).—Leaves 15–20 in. a short rosette, lorate from an ovate base, 2–3 ft. long, 2–3 in. broad at the middle, moderately firm in texture, plain green, thinly white-lepidote on both sides, lanceolate-deltoid at the tip, the marginal prickles deltoid-cuspidate,  $\frac{1}{2}$ –1 line long.

Peduncle about a foot long, stout, stiffly erect, clothed with white tomentum, its numerous bright crimson reflecting lanceolate bract-leaves 3-5 in. long, serrated on the margin. Inflorescence a dense oblong spike 3-6 in. long; bracts red, minute, subulate from a deltoid base, entire. Calyx with ovary  $\frac{1}{2}$  in. long; sepals very mealy, imbricated, obtuse, with a large mucro. Petals half as long again as the sepals, violet at the tip.

Hab. Costa Rica. Introduced into cultivation about 1863. Described from a plant flowered by Mr. B. M. Williams in April, 1879. "Flor de Santa Maria" is the native name.

97. Æ. LALINDEI Linden & Rodigas in Ill. Hort. n.s., t. 481. *Æ. gigas* E. Morren (M.D.).—Leaves about 30 in a short rosette, lorate from an ovate base, 3-4 ft. long, 3-4 in. broad at the middle, plain green, channelled down the face, deltoid-cuspidate at the apex, the marginal prickles small. Peduncle very stout,  $1\frac{1}{2}$  ft. long, with many oblong-lanceolate bright red scariose reflexing bract-leaves in its upper half. Inflorescence a dense oblong spike 6-8 in. long, 3-4 in. diam.; flower-bracts small. Ovary with calyx  $\frac{3}{4}$ -1 in. long, greenish white; sepals ovate, with a small erecto-patent mucro. Petals greenish, shortly protruded.

Hab. New Granada. Introduced into cultivation by M. Lalinde in 1867. Closely allied to *Æ. Maria-regina*, but much larger in all its parts. Prof. Morren's plant was received from Glaziou and supposed to be Brazilian.

98. Æ. LINDENI K. Koch, Wochen, 1865, 398; Baker in Bot. Mag. t. 6565. *Hoplophytum Lindeni* E. Morren in Belg. Hort. 1873, 81, t. 5 (M.D.).—Leaves about 20 in a rosette, lorate from an oblong base, 2-4 ft. long,  $1\frac{1}{2}$ -2 in. broad at the middle, moderately firm in texture, green on the channelled face, thinly white-lepidote, not transversely banded on the back, rounded to a small cusp at the tip, the marginal teeth minute. Peduncle 1- $1\frac{1}{2}$  ft. long; bract-leaves small, scariose, lanceolate or the upper ovate, not brightly coloured. Inflorescence a dense oblong spike 2-4 in. long; flower-bracts ovate, acute, membranous, reddish,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Ovary with calyx  $\frac{1}{2}$  in. long; sepals ovate, obliquely cuspidate, as long as the ovary. Petals lemon-yellow, twice as long as the sepals.

Hab. South Brazil; province of Santa Catherina, *D'Urville!* Introduced into cultivation by Libon in 1864. Described from a plant that flowered at Kew in Feb., 1879, presented by Mr. J. T. Peacock.

99. Æ. FRASERI Baker.—Leaves unknown. Peduncle slender, under a foot long; bract-leaves numerous, imbricated, lanceolate, ascending, spine-edged, the lower 2 in. long. Inflorescence a dense oblong spike 2 in. long; flower-bracts small. Calyx  $\frac{1}{2}$  in. long; sepals oblong, with a horny erecto-patent cusp. Petal-blade lanceolate, yellowish,  $\frac{1}{2}$  in. long. Stamens rather shorter than the petals.

Hab. Andes of Ecuador, *Fraser!* (Herb. Mus. Brit.).

100. Æ. HYSTRIX E. Morren in Belg. Hort. 1880, 243, t. 13 (M.D.).—Leaves about 20 in a utricular rosette, ensiform, above 2 ft. long,  $1\frac{1}{2}$ -2 in. broad at the middle, firm in texture, channelled down the plain green face, thinly white-lepidote, not banded on the

convex back, narrowed gradually from the middle to the point, the marginal teeth minute. Peduncle stiffly erect,  $1\frac{1}{2}$  ft. long; bract-leaves many, scariose, ascending, imbricated, bright red. Inflorescence a dense oblong capitulum 3 in. long, with the flowers, as in *Macrochordium*, immersed in cottony tomentum; flower-bracts minute, with a very long subulate point. Ovary with calyx greenish,  $\frac{1}{2}$  in. long; sepals ovate, obtuse, with a large mucro. Petals purple, shortly protruded.

Hab. French Guiana. Described from Prof. Morren's drawing, made from a plant that flowered in the Liège Botanic Garden in 1880. Allied to *Æ. calyculata* and *Pineliana*.

101. *Æ. MUCRONIFLORA* Hook. in Bot. Mag. t. 4832. *Hoplophytum mucroniflorum* Beer, Brom. 131. *Hohenbergia mucroniflora* Baker in Ref. Bot. sub t. 284.—Leaves about a dozen in a rosette, lorate from an ovate base,  $1-1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad, firm in texture, green on the channelled face, not banded beneath, rounded to a cusp at the apex, the marginal teeth spreading, horny, the lower  $\frac{1}{3}-\frac{1}{6}$  in. long. Peduncle under a foot long; several upper leaves oblong-lanceolate, erecto-patent, bright red. Inflorescence a dense oblong spike 3-4 in. long, simple or slightly compound at the base; flower-bracts small, broad, coriaceous, with a large cusp. Ovary with calyx  $\frac{1}{3}-\frac{1}{2}$  in. long; sepals ovate, imbricated, with a large oblique cusp. Petals bright yellow, cuspidate,  $\frac{1}{2}$  in. long. Berry bright blue.

Hab. Demerara; Kaeiteur Fall, *Appun!* Introduced into cultivation by Sir H. Barkly, when Governor of Demerara, in 1855.

102. *Æ. CONTRACTA* Baker in Journ. Bot. 1879, 234. *Billbergia contracta* Mart.; Schultes fil. Syst. Veg. vii. 1263.—Leaves with a dilated utricular base and a lanceolate blade  $1-1\frac{1}{2}$  ft. long,  $1-1\frac{1}{4}$  in. broad, the lower edge-spines  $\frac{1}{3}-\frac{1}{6}$  in. long. Peduncle  $1\frac{1}{2}-2$  ft. long; bract-leaves bright red, toothed, the upper 3-4 in. long. Inflorescence an oblong spike 3-4 in. long, with a flexuose tomentose rachis; flower-bracts ovate-acuminate, entire.  $\frac{1}{3}-\frac{1}{2}$  in. long. Sepals lanceolate-deltoid,  $\frac{1}{3}$  in. long, not cuspidate. Petals orange-yellow,  $\frac{3}{4}$  in. long.

Hab. Brazil; Valley of the Upper Amazon, *Martius*.

103. *Æ. NUDICAULIS* Griseb. Fl. Brit. West Ind. 593; Baker in Journ. Bot. 1879, 234. *Bromelia nudicaulis* Linn. Sp. Plant. 409; Hook. Exot. Flora. t. 143. *Billbergia nudicaulis* Lindl. in Bot. Reg. sub t. 1068. *Hohenbergia nudicaulis* Baker in Ref. Bot. sub t. 284. *Bromelia lutea* Meyer Esseq. 145. *Billbergia lutea* Schultes fil. *B. quadricolor* Hort. *B. pyramidata* Beer. *Hoplophytum nudicaule* K. Koch (M.D.). *H. lanuginosum* Beer. *Pothuava spicata* Gaudich. Atlas Bonité, t. 117. *Hoplophytum spicatum* and *unispicatum* Beer.—Leaves about a dozen in a utricular rosette, lorate from an oblong base, 2-3 ft. long, 2-3 in. broad at the middle, horny in texture, plain green on the face, not banded on back, rounded to a small cusp at the tip, the marginal prickles usually small, deltoid-cuspidate, brown-black. Peduncle  $1\frac{1}{2}-2$  ft. long, with many scariose lanceolate bright red ascending bract-

leaves. Inflorescence a lax simple usually drooping spike 3–6 in. long,  $1\frac{1}{2}$  in. diam.; flower-bracts very minute, ovate-cuspidate. Calyx with ovary greenish,  $\frac{1}{2}$  in. long; sepals shorter than the ovary, ovate with a minute cusp. Petals pale lemon-yellow, protruded  $\frac{1}{8}$ – $\frac{1}{4}$  in.

Hab. Spread throughout Tropical America, Mazatlan, Mexico, *Hahn*! Cuba, *C. Wright* 673! 1524! Trinidad, *Schacht*! *Fendler* 834! 835! St. Domingo, *Eggers*, 2374! Porto Rico, *Sintenis* 2133! 6040! Columbia, *Cuming*! Guiana, *Parker*! *Appun*! *Jenman* 611! Brazil, as far south as Santa Catherina, *Commerson*! *Burchell* 3150! 3288! *Gaudichaud* 131! *Blanchet* 2282! *Glaziou* 7501! 15482! Var. *distans* Wittm. in Berl. Gartenzeit, 1884. figs. 1, 2, is a form with a lax spike and short broad leaves. *Æ. Cornui* Carriere in Rev. Hort. 1885, 36, with coloured figure, is a form with a short dense oblong spike.

104. *Æ. AUREO-ROSEA* Baker. *Hoplophytum aureo-roseum* Antoine in Wien. Gartenzeit, 1881, t. 1 (M.D.). *Billbergia aureo-rosea* Hort. Linden. —Leaves few in a utricular rosette, connivent in the lower half foot, lorate from an oblong base,  $1\frac{1}{2}$  ft. long, 1– $1\frac{1}{2}$  in. broad at the middle, plain green on the face, thinly white-lepidote not banded on the back, deltoid-cuspidate at the tip, the marginal prickles small. Peduncle a foot long, erect, farinose; upper bract-leaves several, erecto-patent, bright crimson. Flowers in a rather lax erect spike 3–4 in. long; rachis straight, farinose; flower-bracts minute. Calyx with ovary,  $\frac{1}{2}$  in. long, bright red; sepals ovate, as long as the ovary, with a minute oblique cusp. Petals reddish yellow, oblong, shortly protruded.

Hab. Brazil. Introduced into cultivation by Linden in 1863. Probably a mere variety of *nudicaulis*.

105. *Æ. XIPHOPHYLLA* Baker.—Leaves ensiform, not rigid,  $1\frac{1}{2}$  ft. long, under an inch broad at the middle, tapering gradually to a long point; marginal prickles small, close. Peduncle 5–6 in. long; bract-leaves elongated; upper short, lanceolate, erect. Inflorescence a moderately dense oblong spike 2–3 in. long, 1 in. diam.; flower-bracts ovate,  $\frac{1}{3}$  in. long. Ovary with sepals as long as the bract; sepals lanceolate, as long as the ovary, with a small mucro. Petal-blade oblong-lanceolate,  $1\frac{1}{4}$  in. long.

Hab. Probably South Brazil. Described from a plant grown in the Berlin Garden in 1839, under the name of *Tillandsia* or *Billbergia coccinea*.

106. *Æ. COMATA* Baker in Journ. Bot. 1879, 234. *Pothuava comata* Gaudich. Atlas Bonité, t. 116. *Hoplophytum comatum* Beer, Brom., 140.—Leaves lorate, 2–3 ft. long, 3–4 in. broad at the middle, horny, thinly lepidote on the back, deltoid-cuspidate at the tip, the marginal teeth middle-sized, deltoid-cuspidate, black-tipped. Peduncle a foot long, with scarioso imbricated bract-leaves. Inflorescence a dense oblong-cylindrical spike 4–5 in. long. 2 in. diam.; flower-bracts coriaceous, ovate with a pungent brown cusp, the lower an inch long. Calyx with ovary farinose,  $\frac{3}{4}$  in. long; sepals twisted, ovate-lanceolate with a small brown cusp. Petals shortly protruded.

Hab. Woods of South Brazil, *Gaudichaud*, *Glaziou* 14337! 15485! Allied to *Æ. nudicaulis*.

107. *Æ. SQUARROSA* Baker.—Leaves ensiform, 3 ft. long, 2 in.

broad at the middle, very rigid, thinly lepidote on the back, narrowed gradually to a pungent point, the marginal teeth middle-sized, horny-tipped, the lower  $\frac{1}{8}$ – $\frac{1}{6}$  in. long. Peduncle  $1\frac{1}{2}$  ft. long, with many lanceolate ascending bright red bract-leaves. Inflorescence a dense drooping cylindrical spike 9–10 in. long, 2 in. diam.; flowers all deflexed; flower-bracts ovate, with a large brown cusp, rigid, shorter than the calyx. Ovary with calyx  $\frac{3}{4}$  in. long; sepals ovate, twisted, with a spreading brown mucro 1–12th in. long. Petals shortly protruded.

Hab. Woods of South Brazil, *Glaziou* 15486! Differs from *Æ. comata* by its deflexed flowers and smaller bracts.

108. *Æ. STENOPHYLLA* Baker.—Leaves linear, above a foot long,  $\frac{1}{3}$  in. broad at the middle, moderately firm in texture; marginal teeth minute. Peduncle above a foot long; lower bract-leaves with produced points. Inflorescence a moderately dense cylindrical raceme 4–5 in. long, with a furfuraceous rachis; pedicels ascending, lower  $\frac{1}{4}$  in. long; flower-bracts thin, lanceolate,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Ovary oblong,  $\frac{1}{3}$  in. long; sepals lingulate, not spine-tipped, rather shorter than the ovary. Petals very shortly protruded.

Hab. Rio Janeiro, *Glaziou* 5464! (Herb. Reg. Berol.).

109. *Æ. DRAKEANA* André in Rev. Hort. 1888, 401.—Leaves about a dozen in a rosette, lorate,  $1\frac{1}{2}$ –2 ft. long, 2 in. broad, chartaceous, arcuate, tinged with violet, thinly lepidote, rounded to an apical cusp, the marginal teeth small and distant. Peduncle tomentose, a foot long; bract-leaves pale lanceolate. Inflorescence a lax simple cylindrical spike  $\frac{1}{2}$  ft. long; flower-bracts linear-subulate. Calyx with ovary nearly an inch long, bright red; sepals obtuse, mucronate. Petals sky-blue,  $1\frac{1}{2}$  in. long, pale towards the base.

Hab. Andes of Ecuador, near Zaraguro, *Poortman* 134.

110. *Æ. INVOLUCRATA* André Enum. 4, — Leaves unknown. Stem with inflorescence 3– $3\frac{1}{2}$  ft. long; upper bract-leaves crowded, lanceolate, enveloping the base of the spike. Spike nearly a foot long, 3– $3\frac{1}{2}$  in. diam.; flower-bracts ovate-cuspidate,  $\frac{1}{3}$  the length of the calyx. Ovary with calyx an inch long; ovary subglobose; sepals oblong, twisted, with a large oblique mucro. Petals rose-lilac, linear,  $1\frac{1}{2}$  in. long.

Hab. Andes of Central Ecuador, between Riobamba and Loja, *André* 4296.

#### Subgenus 9. CHEVALIERA (Gaudich.).

111. *Æ. FERNANDÆ* Baker. *Bromelia Fernandæ* E. Morren in Ill. Hort. n. s., t. 65 (M.D.). *Ananas Mensdorffianus* Hort. *Chevaliera Fernandæ* Hort.—Leaves 40 or more in a lax rosette, ensiform, reaching a length of 4–5 ft. rigid in texture, bright green on the face, thinly white-lepidote on the back, narrowed to the point, armed with copious pungent middle-sized hooked marginal spines. Peduncle short, erect, with many ascending rigid ensiform leaves. Inflorescence a dense globose capitulum 4–5 in. diam.;

bract-leaves rigid, ovate, acute, squarrose, bright red, copiously serrated, the lower  $1\frac{1}{2}$ –2 in. long. Flowers much shorter than the bracts. Ovary oblong-trigonus,  $\frac{1}{2}$  in. long; sepals lanceolate-acuminate, glabrous, an inch long. Petals yellowish white, a little longer than the calyx.

Hab. Amazon valley; San Carlos, *Spruce* 3113! Introduced into cultivation by Wallis in 1866, and flowered by Linden in 1870.

112. Æ. SPHÆROCEPHALA Baker in Journ. Bot. 1879, 162. *Chevaliera sphaerocephala* Gaudich. Atlas Bonité, t. 61.—Leaves ensiform,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$  in. broad, rigid, narrowed gradually to the point, closely minutely serrated. Peduncle stiffly erect, much shorter than the leaves, furnished with several large ascending ensiform leaves. Inflorescence a dense globose capitulum finally 5–6 in. diam.; bracts broad ovate, acute, an inch long. Ovary ovoid,  $\frac{3}{4}$  in. long,  $\frac{1}{2}$  in. diam.; sepals deltoid-cuspidate,  $\frac{1}{2}$  in. long, united a little at the base above the top of the ovary. Petals not seen.

Hab. South Brazil; Rio Janeiro, *Gaudichaud* 369!

113. Æ. GIGANTEA Baker.—*Chevaliera gigantea* Maury in Le Jardin, 1888, 8, with woodcut.—Leaves densely rosulate, ensiform, 6–8 ft. long, 6–8 in. broad at the base, 4–6 in. at the middle, firm in texture, tapering gradually to the point, armed with stout black marginal spines. Peduncle stout, stiffly erect, 2 ft. long; upper bract-leaves large, lanceolate, spreading, bright red. Inflorescence a dense spike 4–5 in. diam., at first globose, finally oblong,  $1\frac{1}{2}$ –2 ft. long; flower-bracts obovate-cuneate with a large cusp, green, shorter than the flowers. Ovary with calyx  $1\frac{1}{2}$  in. long; sepals oblong-cuspidate, as long as the ovary, greenish white. Petal-blade oblong, reddish blue, half as long again as the sepals. Stamens shorter than the petals.

Hab. South Brazil. Introduced lately by Dr. Glaziou to the Jardin des Plantes at Paris.

114. Æ. CROCOPHYLLA Baker. *Chevaliera crocophylla* E. Morren in Belg. Hort. 1885, 81.—Leaves about 20 in a short rosette, lorate,  $1\frac{1}{2}$ –2 ft. long, 3 in. broad at the middle, moderately firm in texture, narrowed to a deltoid-cuspidate tip, green on the face, thinly white lepidote on the back with a few darker green spots on both surfaces, minutely serrated. Peduncle stiffly erect, 6–8 in. long; bract-leaves adpressed, much imbricated. Inflorescence a dense globose head, 2–2½ in. diam.; bracts ovate, acute, rigid, ascending, greenish, serrated, under an inch long. Calyx including the ovary as long as the bract; sepals ovate, very short, minutely mucronate. Petals shortly protruded from the calyx.

Hab. Brazil. Introduced in 1883. Described from Professor Morren's drawing.

115. Æ. MAGDALENÆ André. *Chevaliera Magdalenæ* André, Enum. 3—Habit of *Ananas sativus*. Leaves ensiform, acuminate, 3–3½ ft. long, 2 in. broad low down, flat, glabrous, armed with small distant black ascending marginal spines. Peduncle erect, robust; upper bract-leaves large, lanceolate, bright red. Inflores-

cence a globose capitulum 5 in. diam.; flower-bracts ovate, acute, bright red, coriaceous, recurved, spine-margined, the upper empty, the central subtending one, the lower three flowers. Ovary including calyx  $1\frac{1}{2}$  in. long; sepals ovate, mucronate, as long as the ovary. Petals and stamens not seen.

Hab. New Granada; virgin forests of the Rio Magdalena, between Tenerife and Canalotal, *André* 692. M. André is not quite certain that the leaves described really belong to the inflorescence.

116. *Æ. VEITCHII* Baker in Bot. Mag. t. 6329. *Chevaliera Veitchii* E. Morren in Belg. Hort. 1878, 177. t. 5; Rev. Hort. 1880, 450, with figure; Garden, June 25, 1881, with figure (M.D.).—Leaves 12–15 in a short rosette, lorate from an ovate base,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, moderately firm in texture, suberect, plain green on the face, obscurely lepidote on the back, deltoid at the tip, the marginal teeth very minute. Peduncle erect, above a foot long; bract-leaves lanceolate, green, adpressed, imbricated. Inflorescence a dense oblong spike, 3–4 in. long, 2 in. diam.; flower-bracts ovate, rigid, bright red, squarrose, serrated, the lower an inch long. Calyx with ovary  $\frac{5}{8}$ – $\frac{3}{4}$  in. long, glabrous, the latter flattened on the side next the axis; sepals ovate-lanceolate, a little longer than the ovary. Petals pale yellow, twice as long as the sepals.

Hab. New Granada. Sent by Wallis in 1874 to Messrs. Veitch. Described from a plant that flowered at Kew in Jan., 1878.

117. *Æ. GERMINYANA* Baker. *Chevaliera Germinyana* Carriere in Rev. Hort. 1881, 230, with figure. *Bromelia duquensis* Hort.—Leaves 20–30 in a short rosette, lorate from an ovate base, 2–2 $\frac{1}{2}$  ft. long, 3 in. broad at the middle, weak, bending over from the middle, plain bright green on the face, deltoid-cuspidate at the tip, the marginal prickles minute. Peduncle half as long as the leaves, erect, with many imbricated greenish adpressed leaves. Inflorescence a dense spike 6–8 in. long, 2 in. diam.; bracts ovate, bright red, squarrose, conspicuously serrated, the lower an inch long. Sepals lanceolate,  $\frac{1}{2}$  in. long. Petals reddish white, nearly twice as long as the sepals. Berry globose,  $\frac{1}{3}$  in. diam., crowned by the persistent calyx.

Hab. New Granada; Andes of Popayan, *Hartweg!* *Lehmann* 2947! First flowered in cultivation by Count Alfred de Germiny, of the Chateau de Gouville, near Rouen, after whom it is named. Very near *Æ. Veitchii*, from which it differs by its larger bracts and broader weaker leaves. It may be a variety only.

118. *Æ. ? SCHOMBURGKII* Baker. *Bromelia longifolia* Schomb. Reise, iii. 903 (name only), non Rudge.—Radical leaves densely rosulate, linear,  $1\frac{1}{2}$  ft. long;  $\frac{1}{3}$  in. broad, tapering to the point, armed with small ascending marginal teeth. Peduncle stout,  $\frac{1}{2}$  ft. long; bract-leaves crowded, lanceolate, spreading, scarious, 4–5 in. long. Inflorescence a dense globose capitulum 4–5 in. diam., each flower subtended by an ovate acute red serrated bract about  $1\frac{1}{2}$  in. long. Flowers whitish, shorter than the bracts.

Hab. British Guiana, in the Essequibo district, *Sir R. Schomburgk*. Known to me only from a drawing at the British Museum. It has no dissections, so the genus is doubtful. It may be a *Karatas*. In general habit it most resembles *Æ. Fernanda*.

119. *Æ. STEPHANOPHORA* E. Morren, inedit. (M.D.).—Leaves 20 or more in a short rosette, lanceolate from an ovate base, 3 ft. long, 3–4 in. broad low down, green on the face, thinly white-lepidote not banded on the back, narrowed to a deltoid-cuspidate apex, the marginal prickles small, deltoid, ascending. Peduncle stout, erect,  $\frac{1}{2}$  ft. long; bract-leaves pale, scarioso, ascending, those at the base of the spike ovate. Inflorescence a dense oblong capitulum  $\frac{1}{2}$  ft. long, 3 in. diam.; flower-bracts ovate-cuspidate, entire, greenish brown, ascending, an inch long. Ovary with calyx a little longer than the bract; sepals ovate, distinctly mucronate. Petals  $\frac{1}{2}$  in. longer than the calyx, violet-blue, spreading only at the tip.

Hab. Pernambuco, *Ridley & Ramage!* Introduced into cultivation by Glaziou in 1880.

#### Subgenus 10. MACROCHORDIUM (De Vriese).

120. *Æ. BROMELIÆFOLIA* Baker in Benth. et Hook. fil. Gen. Plant. iii. 664. *Tillandsia bromeliæfolia* Rudge, Guian. 32, t. 50. *T. vestita* Willd.; Schultes fil. Syst. vii. 1228. *Bromelia tinctoria* Mart. Reise, Bras. ii. 554. *B. melanantha* Ker in Bot. Reg. t. 766. *Billbergia clavata* Lindl. in Bot. Reg. sub t. 1068. *B. tinctoria* Mart.; Schultes fil. Syst. vii. 1256; Ann. Gand. iii. t. 56. *Macrochordium tinctorium*, *melananthum*, *bromeliæfolium*, *pulchrum*, and *strictum* Beer, Brom. 145–148.—Leaves 12–20 in a utricular rosette, lorate from a large ovate base, 2–3 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, moderately firm in texture, plain green on the face, white-lepidote not banded on the back, narrowed to the point, the marginal prickles sometimes small and deltoid, sometimes larger and black. Peduncle 1–2 ft. long, erect, with many lanceolate ascending scarioso bract-leaves, which are sometimes bright red, sometimes pale and greenish white. Inflorescence a very dense oblong or oblong-cylindrical spike 2–6 in. long,  $1-1\frac{1}{2}$  in. diam.; flowers imbedded in white cottony tomentum; flower-bracts orbicular, uncoloured,  $\frac{1}{3}$  in. long, not at all mucronate, at first quite hidden in the tomentum. Ovary with calyx  $\frac{1}{3}-\frac{1}{2}$  in. long; sepals as long as the ovary, ovate, connivent, obtuse. Petals lingulate, under  $\frac{1}{2}$  in. long, at first lemon-yellow, soon turning brownish black. Stamens a little longer than the sepals; anthers oblong,  $\frac{1}{8}$  in. long. Style-branches very short. Berry the size of a pea, containing 12–15 seeds.

Hab. Trinidad, *Fendler 837!* *Prestoe!* Venezuela, *Fendler 1252!* *Moritz 450!* French Guiana, *Poiteau!* British Guiana, *Rudge, Richd. Schomburgk 1025!* *Im Thurn!* *Jenman 4056!* Para, *Hoffmannsegg.* Bahia and Minas Geraes, *Burchell 4404!* *4765!* *Glaziou 14341!* *Blanchet 1525!* *2276!* *Regnell 1726!* *M. Lamarckii*, M.D., is a form with narrower leaves, smaller prickles and larger flowers than the type; *M. Renaudi*, M.D., a robust form, with broad leaves, large black prickles and pale bract-leaves. The species has long been known in cultivation.

121. *Æ. CONSPICUARMATA* Baker. *Macrochordium macracanthum* Regel in Gartenfl. 1886, 297, fig. 37; Descr. Pl. Nov. fasc. x. 29.—Leaves about 20 in a utricular rosette, lanceolate from a large ovate base, 2 ft. long, 2 in. broad at the middle, plain green on the

face, thinly white-lepidote on the back, narrowed gradually to the point, the marginal prickles close, large, blackish, ascending. Peduncle stout, stiffly erect, floccose,  $\frac{1}{3}$  in. diam. at the top; lower bract-leaves green, upper red. Head of flowers globose, under an inch in diam.; axis densely cottony; flower-bracts small, rigid, ovate, emarginate. Flowers under an inch long. Ovary globose; sepals ovate, minutely mucronate. Petals shortly protruded, bright yellow, soon changing to brown-black.

Hab. South Brazil. Introduced into cultivation lately by Dr. Glaziou. Flowered by Dr. Regel at St. Petersburg in 1886. May be an extreme form of *Æ. bromeliæfolia*.

122. *Æ. MACRONEOTIA* Baker.—Leaves not seen. Peduncle 2-3 ft. long, with many large, scariose bract-leaves. Inflorescence a dense oblong spike 4-5 in. long,  $1\frac{1}{2}$  in. diam.; flower-bracts white-lepidote, forming a globose nest  $\frac{1}{3}$  in. broad and deep. Ovary globose; sepals obtuse, not mucronate,  $\frac{1}{2}$  in. long. Petals not seen.

Hab. Central Brazil; between Goyaz and Cuyaba, *Weddell!* (Herb. Paris).

#### Subgenus 11. CANISTRUM (E. Morren).

123. *Æ. AURANTIACA* Baker in Journ. Bot. 1879, 235. *Canistrum aurantiacum* E. Morren in Belg. Hort. 1873, 257, t. 15 (M.D.). *Cryptanthus clavatus* Hort.—Leaves about 20 in a short rosette, recurving from low down, lorate from an ovate base,  $1\frac{1}{2}$ -2 ft. long, 2-2 $\frac{1}{2}$  in. broad at the middle, moderately firm in texture, green on both surfaces, faintly spotted with darker green when young, rounded to a cusp at the apex, the marginal teeth close and small, lanceolate, 1-12th in. long towards the base of the blade. Peduncle erect, above a foot long, hidden by the adpressed imbricated greenish scariose bract-leaves. Flowers 50-100 in a dense globose capitulum 2 in. diam., surrounded but not overtopped by ovate acute entire erect adpressed bract-leaves, which are about 2 in. long, the outer greenish, the inner bright red. Flower  $1\frac{3}{4}$ -2 in. long; sepals oblong, obtuse, cuspidate, as long as the ovary. Petals lingulate, orange-yellow,  $\frac{1}{2}$  in. longer than the calyx.

Hab. Pernambuco, *Ridley & Ramage!* Flowered by Professor Morren at Liège in July, 1867. Described from a plant at Kew and the drawings of Prof. Morren and Mr. Ramage. Introduced into cultivation by Porte.

124. *Æ. ROSEA* Baker. *Canistrum roseum* E. Morren in Belg. Hort. 1879, 301, 1883, 195. t. 14, 15 (M.D.).—Leaves about 20 in a short open rosette, lorate from an ovate base,  $1\frac{1}{2}$ -2 ft. long, 2 $\frac{1}{2}$ -3 in. broad at the middle, moderately firm in texture, plain green mottled with darker green, deltoid-cuspidate at the tip, the marginal teeth minute. Peduncle erect, 6-8 in. long; bract-leaves scariose, pink. Inflorescence a globose capitulum 2-3 in. diam., surrounded and overtopped by a whorl of ovate pink falcate serrated bract-leaves 3-4 in. long. Flower  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. long. Sepals oblong-lanceolate, acute, as long as the clavate ovary, both white and farinose. Petals pale green, shortly protruded.

Hab. South Brazil. First flowered by Count Germiny in Dec., 1879. Before flowering, both this and *E. eburnea* much resemble *Karatas fulgens*.

125. *Æ. PURPUREA* Baker. *Canistrum purpureum* E. Morren in Belg. Hort. 1883, 195, name (M.D.).—Leaves 12–20 in a utricular rosette, suberect, lanceolate from a dilated base, 2 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, plain green, neither mottled nor banded on the back, narrowed to the point, the marginal teeth minute. Peduncle above a foot long; bract-leaves large, lanceolate, tinged with red. Flower-bracts a dozen or more, ovate, acute, serrated, squarrose, bright red, 2–3 in. long, the flowers placed not only in a cluster in the centre, but also in the axils of several of the outer bracts. Flowers about an inch long.

Hab. South Brazil. Introduced by Mr. Sander of St. Alban's. Described from Prof. Morren's drawings, made from a plant that flowered Oct., 1882. Leaves and bracts like those of *Karatas Scheremetiewii*.

126. *Æ. FUSCA* Baker. *Canistrum fuscum* E. Morren in Belg. Hort. 1883, 195, name (M.D.).—Leaves about 20 in a short rosette, lorate from an ovate base, 2 ft. long, 2–3 in. broad at the middle, suberect, plain green on the face, not mottled, obscurely fasciated with white on the back, deltoid-cuspidate at the tip, the marginal teeth minute, deltoid. Peduncle erect, a foot long; bract-leaves greenish, adpressed, imbricated. Flowers in a central globose capitulum 2–3 in. diam., surrounded and overtopped by the ovate acute green squarrose serrated bract-leaves, which are 3–4 in. long. Flowers much shorter than the bracts. Petals green, shortly protruded.

Hab. South Brazil. Introduced by Glaziou in 1879. Described from Prof. Morren's drawing, made from a plant that flowered Sept., 1880.

127. *Æ. VIRIDIS* Baker in Journ. Bot. 1879, 235. *Canistrum viride* E. Morren in Belg. Hort. 1874, 376, t. 16 (M.D.) *Billbergia canephora* and *Nidularium latifolium* Hort.—Leaves 12–15 in a rosette, spreading from low down, lorate from an ovate base, 2 ft. or more long, 2 in. broad at the middle, moderately firm in texture, pale green mottled with darker green, not banded on the back, obtuse, the marginal teeth minute. Peduncle stiffly erect, a foot long; bract-leaves imbricated, closely sheathing. Flowers in a globose capitulum 2 in. diam., surrounded and overtopped by the ovate acute greenish squarrose serrated bract-leaves, which are 2–3 in. long. Ovary clavate,  $\frac{1}{2}$  in. long; sepals as long as the ovary. Petals green, lingulate, shortly protruded.

Hab. Brazil; province of Santa Catherina, on an island in the bay of Paranagua. Introduced into cultivation by Platzmann. First flowered Sept., 1870. *Tillandsia cyathiformis* Vell. Fl. Flum. iii. t. 144 (*Hohenbergia* Beer) is, no doubt, a rough drawing of one of these species of *Canistrum*.

128. *Æ. EBURNEA* Baker. *Canistrum eburneum* E. Morren in Belg. Hort. 1879, 168, t. 13 (M.D.). *Guzmania fragrans* Hort. Linden. *Nidularium Lindenii* Regel in Ind. Sem. Hort. Petrop. 1868, 78; Gartenfl. 1869, 167.—Leaves about 20 in a short open rosette, lorate from an ovate base, 2–3 ft. long, 3 in. broad at the middle, pale green on the face copiously spotted with darker green,

deltoid-cuspidate at the apex, the marginal teeth minute. Flowers in a globose capitulum 2-3 in. diam., sessile in the centre of the rosette of leaves just like a *Nidularium*, overtopped by a large number of ovate serrated acute ivory-white or greenish-white bract-leaves. Calyx white, an inch long; sepals oblong, acute, as long as the ovary. Petals greenish, shortly protruded.

Hab. South Brazil. Introduced into cultivation by Linden. Described mainly from Prof. Morren's drawing, made from a plant that flowered May, 1878.

### 18. BILLBERGIA *Thunb.*

*Sepals* linear-oblong, not mucronate, free down nearly or quite to the cyathiform apex of the ovary. *Petals* lingulate, much longer than the sepals, scaled at the base, usually spreading widely when expanded. *Stamens* nearly as long as the petals, 3 epigynous, 3 attached to the base of the petals between the scales; filaments long, filiform; anthers linear, dorsifixed, versatile. *Ovary* oblong, inferior, 3-celled; ovules many in a cell; style long, filiform; stigmas linear, adpressed, contorted. *Fruit* indehiscent, usually about the size of an olive. *Seeds* small, brown, clavate. *Leaves* few, arranged in a rosette with a long utricular base, moderately firm in texture, usually lorate, spine-margined. *Leaves* of the peduncle bract-like, scariose, the upper often bright red and spreading. *Inflorescence* a dense or lax spike or raceme or little-branched panicle; flower-bracts small, scariose, not spine-pointed, often obsolete. *Flowers* the most showy of any of the genera of *Bromeliææ*.

Subgenus BILLBERGIA PROPER.—Sepals usually longer than the ovary. Petals spreading widely when expanded, not curling up spirally.

Inflorescencè a dense erect spike (*Jonghea* Lemaire).

Sp. 1-2.

Inflorescence lax, erect or suberect.

Sepals  $\frac{1}{4}$ - $\frac{1}{2}$  in. long . . . . . Sp. 3-6.

Sepals  $\frac{3}{4}$ -1 in. long . . . . . Sp. 7-12.

Inflorescence lax, drooping.

Petals entirely green . . . . . Sp. 13-14.

Petals tipped with violet-blue.

Leaves narrowed gradually to the point . . . . . Sp. 15-21.

Leaves narrowed suddenly to the point . . . . . Sp. 22-25.

Colour of petals not known . . . . . Sp. 26-27.

Subgenus LIBONIA (*Lemaire*).—Sepals very short, slightly connate at the base. Petals convolute in a tube, spreading only at the tip . . . . . Sp. 28.

Subgenus HELICODEA (*Lemaire*).—Petals usually green, rolling up spirally to the base. Rachis and ovary mealy, the latter deeply sulcate. Inflorescence drooping.

Petals green . . . . . Sp. 29-34.

Petals violet . . . . . Sp. 35-36.

## Subgenus 1. BILLBERGIA PROPER.

1. *B. PYRAMIDALIS* Lindl. in Bot. Reg. sub t. 1068; Schnitz. Ic. i. t. 65; E. Morren in Belg. Hort. 1873, 289, t. 16. *Bromelia pyramidalis* Sims in Bot. Mag. t. 1732.—Leaves 10–12 in a short rosette, lorate from an ovate base,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$  in. broad at the middle, thin in texture, plain dull green on the face, thinly white-lepidote and obscurely fasciated on the back, narrowed to a deltoid-cuspidate tip, the marginal teeth minute but distinct. Peduncle erect, about a foot long; upper bract-leaves lanceolate, bright red, 3–4 in. long, hiding the lower half of the spike. Flowers 20–30 in a dense erect spike 3–4 in. long. Ovary oblong-cylindrical, thinly white-mealy,  $\frac{1}{2}$ – $\frac{5}{8}$  in. long; sepals linear-oblong, as long as the ovary. Petals mauve-scarlet, 2 in. long, violet at the tip, spreading in the upper half inch. Stamens and style nearly as long as the petals.

Var. *BICOLOR* Lindl. in Bot. Reg. t. 1181. *B. bicolor* Lodd. Bot. Cab. t. 1819. *B. Loddigesii* Steud.—Flowers with the two colours, violet and red, not so much blended as in the type. Leaves more distinctly fasciated on the back.

Var. *ZONATA* De Vriese in Tuinbow Flora, 1855, 353, t. 8.—Leaves broader and more obtuse than in the type, more distinctly fasciated on the back with white.

Var. *B. FARINOSA* K. Koch, herb. !—A stunted form, with a few-flowered slightly drooping spike and plain dull grey-green leaves.

Var. *B. CROYIANA* De Jonghe; Lemaire, Jard. Fleur. t. 413. *B. setosa* Hort. *Æchmea setigera* Hort.—Leaves erect, with the dorsal zones conspicuous. Peduncle longer than in the type. Flowers more numerous; petals acute, red edged with violet.

Hab. South Brazil, *Brackenridge!* *Boog!* *Glaziou* 11690! Introduced into cultivation in 1815, and at present one of the commonest species, under many forms.

2. *B. THYRSOIDEA* Mart.; Schultes fil. Syst. Veg. vii. 1260; Hook. in Bot. Mag. t. 4756; Lindl. in Paxt. Flow. Gard. iii. t. 74; Lemaire, Jard. Fleur. t. 267; E. Morren in Belg. Hort. 1873, 295, t. 17. *B. fastuosa* Beer, Brom. 110. *Pitcairnia fastuosa* Morren, Ann. Gand iii. t. 112.—Leaves 12–15 in a utricular rosette, lorate from an ovate base, 1– $1\frac{1}{2}$  ft. long, 2 in. broad at the middle, not rigid, obscurely lepidote on the plain green face, not transversely banded on the back, deltoid-cuspidate at the tip, the marginal prickles minute. Peduncle a foot long; bract-leaves bright red, the upper ascending and nearly hiding the flowers. Flowers 30–40 in a dense spike, the lowest with large bracts. Ovary oblong-cylindrical, thinly white-mealy,  $\frac{1}{2}$  in. long; sepals linear-oblong, as long as the ovary. Petals lingulate, 2 in. long, bright red with a violet-purple tip. Stamens nearly as long as the petals; anthers linear, yellow,  $\frac{1}{4}$  in. long. Stigma overtopping the anthers.

Var. *B. SPLENDIDA* Lemaire in Jard. Fleur. t. 181–182.—More robust than the type, with more numerous bright-coloured flowers and broader bracts.

Var. *B. LONGIFOLIA* K. Koch & Bouché Ind. Sem. Berol. 1851;

Otto Gartenzeit. 1857, t. 2.—Leaves longer than in the type and narrowed more gradually towards the apex.

Hab. Southern Brazil, *Burchell* 2281! *Miers* 3873! *Glaziou* 1729! 16421! 16425! Now common in cultivation under various forms, to which besides those already cited belong *B. Paxtoni* Beer, *B. Schultesiana* Lem., *B. rhodocyanea*, *Lemoinei*, and *miniato-rosea* Hort. It was first flowered at Kew in Nov., 1858, from plants received from Messrs. Henderson. It is scarcely more than a variety of *pyramidalis* in a broad sense, *longifolia* and *zonata* being intermediate between the two types. For an account of the varieties see André in Rev. Hort. 1883, 300, 1885, 332.

3. *B. MITIS* Mart.; Schult. fil. Syst. Veg. vii. 1267.—Produced leaves about 3, lanceolate from a dilated base, moderately firm in texture, a foot long,  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. broad, obscurely serrulate towards the base. Peduncle slender, much shorter than the leaves; bract-leaves bright red; upper  $1\frac{1}{4}$  in. long. Inflorescence a few-flowered spike  $1\frac{1}{2}$  in. long. Sepals  $\frac{1}{3}$  in. long. Petals  $\frac{3}{4}$  in. long. Stamens a little shorter than the petals.

Hab. Brazil, *Martius*.

4. *B. CORYMBOSA* Mart.; Schultes fil. Syst. Veg. vii. 1258.—Leaves lanceolate from a dilated base, a foot or more long, above an inch broad, the brown spreading marginal spines  $\frac{1}{12}$  in. long towards the base of the blade. Peduncle a foot long, tomentose upwards, loosely sheathed by the bract-leaves, of which the upper are  $1\frac{1}{2}$ –2 in. long. Inflorescence a short corymbose panicle with a tomentose rachis: lower branches 3–4-flowered, subtended by large scariose bracts. Flowers about an inch long, subtended by ovate bracts  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Sepals oblong,  $\frac{1}{3}$  in. long. Petals obtuse,  $\frac{3}{4}$  in. long. Stamens rather shorter than the petals. Berry the size of a pea.

Hab. Woods of the Rio Negro, *Martius*. I have not seen either this or the last. They may belong to *Quesnelia*.

5. *B. LINEARIFOLIA* Baker.—Leaves about 10 in a rosette, not connivent at the base, linear, a foot long,  $\frac{1}{4}$  in. broad low down, tapering gradually to an acuminate point, moderately firm in texture, green on both surfaces, channelled down the face, the marginal prickles distant and minute. Peduncle slender, shorter than the leaves, its bract-leaves lanceolate-acuminate, all pale, scariose and adpressed. Inflorescence a raceme with three flowers, the lowest with a long ascending pedicel. Mature ovary green, globose, glabrous,  $\frac{1}{3}$ – $\frac{1}{2}$  in. diam.; sepals lanceolate, glabrous,  $\frac{1}{2}$ – $\frac{5}{8}$  in. long. Petals twice as long as the sepals.

Hab. Paraguay; forests in the east of the Cordillera of Villa-rica, *Balsans* 612! Gathered in Sept., 1874.

6. *B. HORRIDA* Regel Gartenfl. 1859, 321, t. 272; K. Koch in Berl. Gartenzeit. 1858, 345, t. 8; E. Morren in Belg. Hort. 1876, 336, t. 22 (M.D.).—Leaves about 10 in a utricular rosette, connivent for the lower 6–9 inches, lorate from an ovate base, 1– $1\frac{1}{2}$  ft. long, 2– $2\frac{1}{2}$  in. broad at the middle, rigid in texture, plain green on the face, thinly white-lepidote, without distinct bands on the back, deltoid-cuspidate at the tip, the marginal prickles more conspicuous

than in any other *Billbergia*, ascending, brown-black, lanceolate,  $\frac{1}{5}$ – $\frac{1}{4}$  in. long. Peduncle a foot long, its bract-leaves all adpressed, pale and inconspicuous. Inflorescence a simple erect spike 3–4 in. long; flower-bracts all minute. Ovary green, glabrous, clavate-cylindrical,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; sepals linear-oblong, as long as the ovary. Petals lingulate, pale green with a violet tip,  $1\frac{1}{2}$  in. long, falcate from the top of the calyx. Style reaching to the tip of the petals.

Var. *TIGRINA* Hort. (M.D.).—Leaves brown, copiously banded with white on the back. Petals narrow, 2 in. long.

Hab. Brazil. Introduced into cultivation by Riedel to the St. Petersburg Garden, where it first flowered in 1856. We have had it at Kew for many years, but it does not flower freely.

7. *B. SPECIOSA* Thunb. in Holm Decad. Pl. Bras. iii. 30, with figure. *B. amena* Lindl. in Bot. Reg. sub t. 1068; E. Morren in Belg. Hort. 1875, 19, t. 1—4 (M.D.); Wittm. in Berl. Gartenzeit. 1884, 294, fig. 97. *B. discolor* and *pallida* Beer Brom. 121. *B. variegata* Schultes fil. Syst. Veg. vii. 122. *Bromelia variegata* Arruda de Camara. *B. pallida* Ker in Bot. Reg. t. 344. *Tillandsia amena* Lodd. Bot. Cab. t. 76. *Pitcairnia discolor* Loisel. in Herb. Gen. Amat. t. 345. *Pourretia magnispatha* Colla Hort. Ripul. App. 334, t. 19.—Leaves 10–12 in a utricular rosette, connivent in the lower foot, lorate,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, firm in texture, deltoid-cuspidate at the tip, green on the face, thinly white-lepidote, not distinctly banded on the back, the marginal prickles minute, deltoid. Peduncle 1– $1\frac{1}{2}$  ft. long, pale, with many bright red lanceolate ascending or deflexed scarioso bract-leaves 3–4 in. long. Inflorescence suberect, lax, ovate, 4–6 in. long, the upper flowers single, sessile, the lower on short 2–4-flowered branches often subtended by large red bracts. Ovary oblong-cylindrical, greenish, shallowly sulcate,  $\frac{1}{2}$  in. long; sepals an inch long, pale green tipped with violet-blue. Petals 2 in. long, green with a violet tip. Stamens nearly and style quite as long as the petals. Berry the size of an olive.

Hab. Common in the woods of Brazil, about Pernambuco and Rio Janeiro. A common species in cultivation, under many forms. *B. chlorocyanea* De Vriese, *B. Wiotiana* De Jonghe, *B. pallescens*, K. Koch, *B. elegans* Mart., and *B. Thunbergiana* Hort., are forms of this species, which is the original plant on which the genus *Billbergia* was founded. *Tillandsia distacata*, Vell. Fl. Flum. iii. t. 141, should probably be referred here.

8. *B. TWEEDIEANA* Baker.—Leaves lorate, 3 ft. long, 4–5 in. broad at the dilated base,  $2\frac{1}{2}$ –3 in. at the middle, firm in texture, thinly lepidote on the back, rounded to an apical cusp, the close spreading deltoid-cuspidate marginal spines  $\frac{1}{2}$  in. long. Peduncle slender,  $1\frac{1}{2}$  ft. long; bract-leaves large, adpressed, imbricated, scarioso. Inflorescence a very lax corymbose panicle 6–12 in. long and broad: lower branches subtended by large lanceolate bracts. Ovary cylindrical, thinly white-lepidote, finely sulcate,  $\frac{1}{2}$  in. long; sepals linear-oblong, as long as the ovary. Petals lingulate,  $1\frac{1}{2}$  in. long, green tipped with violet-blue. Stamens nearly as long as the petals; anthers linear, stramineous,  $\frac{1}{4}$  in. long.

Hab. Brazil; woods about Rio Janeiro, *Tweedie* 1313! *Miers* 3122! *Glaziou* 15476! First gathered by *Tweedie* in 1837.

9. *B. LIBONIANA* De Jonghe in Journ. Hort. Prat. Mch. 1851, with fig.; *Lemaire* Jard. Fleur. t. 197; *Flore des Serres* t. 1048; *Hook.* in Bot. Mag. t. 5090; *E. Morren* in Belg. Hort. 1877, 57, t. 34 (M.D.).—Leaves 5–6 in a rosette, connivent in the lower half foot, ensiform from an ovate base,  $1\frac{1}{2}$ –2 ft. long,  $1$ – $1\frac{1}{2}$  in. broad at the middle, firm in texture, plain green on the face, thinly white-lepidote without distinct bands on the back, narrowed gradually to the point, the marginal spines very minute. Peduncle slender, a foot long, all its bract-leaves small, adpressed, pale and inconspicuous. Inflorescence a lax erect or cernuous simple 6–10-flowered spike; flower-bracts minute, ovate. Ovary oblong-cylindrical, bright red, shallowly sulcate,  $\frac{1}{3}$  in. long; sepals linear-oblong, bright red, an inch long. Petals 2 in. long, green with a violet-blue tip. Stamens reaching nearly to the tip of the petals; anthers linear-oblong,  $\frac{1}{4}$  in. long.

Hab. Woods of Brazil, about Bahia and Rio Janeiro, *Wetherill*! *Prof. Cunningham*! *Glaziou* 9324! 9325! *Wawra* 221. Introduced into cultivation by *M. Libon*, about 1850.

10. *B. ENSIFOLIA* Baker.—Leaves few, ensiform from an oblong-base, 12–15 in. long,  $\frac{3}{4}$ –1 in. broad, at the middle, narrowed to the point, sharply minutely serrated. Peduncle as long as the leaves; upper bract-leaves with erecto-patent lanceolate points. Inflorescence a lax 6–8-flowered suberect spike, with a slender straight rachis; flower-bracts minute. Ovary naked, subcylindrical,  $\frac{1}{2}$  in. long. Sepals linear-oblong, obtuse, an inch long. Petals linear, 2 in. long, tipped with violet. Stamens shorter than the petals.

Hab. South Brazil, *Glaziou* 16437! Allied to *B. Liboniana*.

11. *B. MORRENIANA* Baker. *B. Reichardti* Hort. *Morren* non *Wawra* (M.D.).—Leaves 8–10 in a utricular rosette, connivent only in the lower 3–4 in., ensiform, above a foot long, an inch broad, thin in texture, plain green on the face, whitish on the back without any bands, narrowed gradually to the point, the marginal prickles minute, deltoid. Peduncle much shorter than the leaves, with several bright red ascending lanceolate bract-leaves. Inflorescence a lax suberect spike, 3–4 in. long with a red flexuose rachis; several lower flowers with large ascending bright red bracts. Ovary oblong-cylindrical, bright red, shallowly sulcate; sepals longer than the ovary, red tipped with violet. Petals an inch longer than the calyx, green, tipped with violet-blue. Style reaching to the tip of the petals. Stamens a little shorter; anthers linear-oblong, yellow.

Hab. Origin unknown. Described from a plant that belonged to *Prof. Morren*, that flowered at Kew, Dec., 1887. May be a hybrid between *B. Liboniana* and *iridifolia*.

12. *B. TILLANDSIODES* Baker.—Habit of a *Tillandsia*. Leaves 20–30 in a dense rosette, with a dilated ovate base an inch broad, narrowed suddenly to a linear blade 5–6 in. long,  $\frac{1}{4}$ – $\frac{1}{6}$  in. broad low down, tapering gradually to a long point, moderately firm in

texture, channelled down the face, thinly lepidote on the back, without any marginal prickles. Peduncle not more than half as long as the leaves. Inflorescence a lax 3-4-flowered spike; flowers all sessile, the lower with a lanceolate bract  $\frac{1}{3}$  in. long. Ovary oblong-cylindrical, glabrous,  $\frac{1}{3}$  in. long; sepals naked, linear-oblong,  $\frac{5}{8}$  in. long. Petals narrow, twice as long as the calyx, falcate from its top. Stamens nearly as long as the petals; anthers linear, yellow,  $\frac{1}{4}$  in. long.

Hab. Brazil, *Glaziou* 13259! Received in 1882. Very distinct.

13. *B. BAKERI* E. Morren in Belg. Hort. 1880, 166, t. 8 (M.D.); Wittm. Gartenzeit. 1885, fig. 23. *B. pallescens* Baker in Bot. Mag. t. 6342, non K. Koch. — Leaves 8-10 in a utricular rosette, connivent in the lower half foot, ensiform from an ovate base,  $1\frac{1}{2}$ -2 ft. long,  $1\frac{1}{2}$ -2 in. broad at the middle, moderately firm in texture, plain green on the face, thinly white lepidote on the back without distinct transverse bands, the marginal prickles minute. Peduncle a foot long, the upper bract-leaves lanceolate, pink, scariose, 3-4 in. long. Flowers 6-12 in a short cernuous spike, all subsessile, with very minute bracts. Ovary oblong, green, glabrous,  $\frac{1}{2}$  in. long, deeply sulcate; sepals linear-oblong,  $\frac{3}{4}$  in. long, green tipped with violet-blue. Petals 2 in. long, usually pale green to the very tip, rarely obscurely tipped with violet-blue. Stamens reaching to the tip of the petals.

Hab. Brazil. Described from a plant that flowered at Kew, Dec., 1877. Var. *oxysepala* Regel. Descr. x. 25, is a form with more acute sepals sent lately from Rio Janeiro by M. Lietz. Comes near the drooping forms of *B. speciosa*.

14. *B. VIRIDIFLORA* Wendl. in Otto et Dietr. Gartenzeit. xxii. 154; Flore des Serres t. 1019-1020; E. Morren in Belg. Hort. 1874, t. 1-2, 1876, 324, t. 20-21.—Leaves 12-15 in a utricular rosette, connivent for the lower foot, ensiform from an ovate base,  $1\frac{1}{2}$ -2 $\frac{1}{2}$  ft. long,  $1\frac{1}{2}$ -2 in. broad at the middle, plain green on the face, thinly white-lepidote on the back, sometimes tinged with purple and obscurely fasciated, narrowed gradually to the point, the marginal prickles very minute. Peduncle 1-1 $\frac{1}{2}$  ft. long, with several large lanceolate, bright red ascending scariose bract-leaves. Inflorescence a lax ascending or cernuous raceme  $\frac{1}{2}$ -1 ft. long; pedicels slender, 1-2 in. long; bracts minute, scariose. Ovary oblong  $\frac{1}{2}$  in. long, green, glabrous, not at all sulcate; sepals lanceolate, acute, green, an inch long. Stamens and style a little longer than the petals.

Hab. Brazil. First flowered in 1854, at the Herrenhausen Botanic Garden. A very distinct species, still rare in cultivation.

15. *B. NUTANS* Wendl. in Regel Gartenfl. t. 617, E. Morren in Belg. Hort. 1876, 220, t. 15; Baker in Bot. Mag. t. 6423. *B. Bonplandiana* Gaudich.—Leaves 12-15 in a utricular rosette, linear, 1-1 $\frac{1}{2}$  ft. long,  $\frac{1}{2}$  in. broad at the middle, not rigid in texture, channelled down the green face, thinly lepidote on the back without transverse bands, tapering to a long point, the marginal teeth very obscure. Peduncle a foot long; bract-leaves imbricated, the upper ascending, lanceolate, bright red. Inflorescence a lax, few-flowered

drooping spike; rachis very slender, flexuose; flower-bracts minute. Ovary oblong, green, glabrous,  $\frac{1}{3}$  in. long, not sulcate; sepals lanceolate, glabrous,  $\frac{1}{2}$  in. long. Petals lingulate,  $1\frac{1}{2}$  in. long, green with a sudden distinct blue edge. Stamens as long as the petals.

Hab. Brazil, *Glaziou* 11678! 16436! *Sello* 4001! Corrientes, *Boupland* 1110! Described from a plant that flowered at Kew, Jan., 1878. First flowered at Herrenhausen in 1869.

16. *B. BURCHELLII* Baker.—Produced leaves 5-6 in a utricular rosette, connivent in the lower half foot, ensiform,  $1\frac{1}{2}$ -2 ft. long,  $\frac{3}{4}$ -1 in. broad at the middle, green on the face, thinly white-lepidote on the back, moderately firm in texture, narrowed gradually to the point, the marginal prickles distinct, spreading, deltoid. Peduncle slender, a foot long; all the bract-leaves erect. Flowers 6-12 in a lax cernuous spike, with a slender very flexuose naked rachis, all subsessile and only minutely bracteate. Ovary oblong-cylindrical, naked, shallowly sulcate,  $\frac{1}{3}$  in. long; sepals linear-oblong, obtuse,  $\frac{5}{8}$ - $\frac{3}{4}$  in. long. Petals  $1\frac{3}{4}$  in. long, greenish with a blue tip. Stamens a little shorter than the petals.

Hab. Woods of South Brazil, *Burchell*, 4860! *Glaziou* 12227! *Sello* 61! 182! First gathered by Burchell in Aug., 1827. Intermediate between *B. Liboniana* and *B. nutans*.

17. *B. IRIDIFOLIA* Lindl. in Bot. Reg. t. 1068; Knowles and Westc. Floral Cab. t. 105; Reich. Fl. Exot. t. 262; E. Morren in Belg. Hort. 1874, 193, t. 8, 9. *Bromelia iridifolia* Nees & Mart. Nova Acta xi. 16.—Produced leaves 5-6 in a utricular rosette, ensiform, 1- $1\frac{1}{2}$  ft. long, 1- $1\frac{1}{4}$  in. broad at the middle, not at all rigid in texture, bright green on the face, thinly white-lepidote without any transverse bands on the back, narrowed to the point, the marginal prickles distant and very minute. Peduncle a foot long; upper bract-leaves bright red, lanceolate, ascending, 3-4 in. long. Inflorescence a very lax drooping spike 4-6 in. long, with a slender glabrous flexuose red rachis; flowers solitary, nearly all subtended by large bright red scarioso clasping bracts. Ovary oblong, glabrous,  $\frac{1}{3}$  in. long; sepals linear-oblong, obtuse,  $\frac{3}{4}$  in. long, reddish tipped with blue. Petals  $1\frac{1}{2}$ -2 in. long, greenish tipped with blue. Stamens and style as long as the petals; anthers linear-oblong, pale yellow,  $\frac{1}{4}$  in. long.

Hab. Woods of Southern Brazil, *Blanchet* 2277! *Glaziou* 12228! 16432! 15475! Described from a plant that flowered at Kew, March, 1877. It was first gathered by Prince Maximilian of Neuwied, in 1817.

18. *B. LIETZEI* E. Morren in Belg. Hort. 1881, 97, t. 5-7 (M.D.).—Leaves 6-10 in a utricular rosette, ensiform, 1- $1\frac{1}{2}$  ft. long, 1- $1\frac{1}{4}$  in. broad at the middle, moderately firm in texture, plain green on the face, thinly white-lepidote, without distinct bands on the back, narrowed gradually to the tip, the marginal prickles very minute. Peduncle under a foot long; upper bract-leaves pink. Inflorescence a lax drooping raceme with a flexuose pink rachis, nearly all the flowers subtended by large clasping pink lanceolate bracts, the lower with short pedicels. Ovary pink, oblong,  $\frac{1}{3}$  in. long; sepals pink, lanceolate,  $\frac{3}{4}$  in. long. Petals

twice as long as the sepals, green tipped with violet. Style longer than the petals.

Hab. Woods of Southern Brazil. Introduced into cultivation by M. Lietze, of Rio Janeiro, in 1878. Described from a plant that flowered at Kew, Dec., 1883. Scarcely more than a variety of *B. iridifolia*. Var. *chlorantha* Morren, is a form with petals entirely green.

19. *B. MORELI* Brong. in Portef. Hort. ii. 97, with figure; E. Morren in Belg. Hort. 1860, 161, t. 11, 12, 1873, 17, t. 1, 2, non *B. Moreliana* Lindl. et Lemaire (M.D.). *B. Glymiana* De Vriese in Linnæa, xxvi. 756; E. Morren in Belg. Hort. 1866, 134, t. 11. *B. Wetherilli* Hook. in Bot. Mag. t. 4835.—Produced leaves 6–12 in a utricular rosette, connivent in the lower half foot, ensiform,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, horny in texture, bright green on the face, obscurely white-lepidote on the back without distinct transverse white bands, narrowed gradually to the point, the marginal prickles minute. Peduncle a foot long; bract-leaves bright red, several aggregated near the base of the spike, erecto-patent, 3–4 in. long. Inflorescence a lax drooping ovate spike 6–8 in. long, with a red mealy rachis, many of the lower flowers overtopped by the bright red bracts. Ovary turbinate, rather mealy,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; sepals linear-oblong, obtuse, reddish, farinaceous,  $\frac{3}{4}$  in. long. Petals an inch longer than the sepals, lilac in the upper half inch, greenish lower down. Stamens nearly as long as the petals; anthers linear,  $\frac{1}{4}$  in. long.

Hab. Brazil; province of Bahia. Imported to Europe by M. Porte in 1847, and first flowered by M. Morel, of Paris, after whom it is named. It was sent by Mr. Wetherill to Kew, and first flowered in 1858. Its copious brilliant red bracts make it one of the most showy of all the Billbergias.

20. *B. EUPHEMIE* E. Morren in Belg. Hort. 1872, 1, t. 1, 2; Baker in Bot. Mag. t. 6632 (M.D.).—Rootstock wide-creeping. Produced leaves 5–6 in a utricular rosette, connivent in the lower half-foot, lanceolate,  $1$ – $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, moderately firm in texture, plain green on the face, thinly white-lepidote and obscurely banded on the back, narrowed to a deltoid apex, the marginal prickles minute. Peduncle a foot long, reddish, thinly mealy; bract-leaves pale pink, several aggregated towards the top of the peduncle, ascending, 3–4 in. long. Inflorescence a lax simple drooping spike 3–4 in. long, with a flexuose mealy rachis, only the lowest flowers subtended by large pinkish-white bracts. Ovary turbinate, mealy,  $\frac{1}{4}$  in. long; sepals linear-oblong, pale pink,  $\frac{3}{4}$  in. long. Petals  $1\frac{1}{2}$ –2 in. long, green, with a large dark violet tip. Stamens shorter than the petals.

Hab. South Brazil. First flowered by Prof. Morren at Liège, in April, 1868. Described from plants that flowered at Kew in Feb., 1882, and with Sir Geo. Macleay, March, 1888. Intermediate between *B. iridifolia* and *B. vittata*, but the bracts much less highly coloured. Named after Madame Morren.

21. *B. MACROCALYX* Hook. in Bot. Mag. t. 5114; E. Morren in Belg. Hort. 1860, t. 19; Wittm. in Berl. Gartenzeit. 1885, 67, fig. 17.—Produced leaves only 3–4 in a rosette, connivent for the lower foot, lanceolate,  $1\frac{1}{2}$ –2 ft. long, 2 in. broad at the middle, horny in texture, bright green on the face with a few pale spots,

white-lepidote on the back with a few transverse bands, narrowed suddenly to a deltoid apex, the marginal prickles small, ascending, tipped with brown. Peduncle mealy, a foot long, with 5-6 ascending bright red bract-leaves aggregated near its apex. Inflorescence a drooping raceme 3-4 in. long with a stout straight mealy rachis, none of the flowers or only the lowest subtended by a large red bract; pedicels short. Ovary clavate, mealy,  $\frac{1}{3}$  in. long; sepals linear-oblong, mealy, nearly an inch long. Petals an inch longer than the calyx, green with a violet-blue tip. Stamens nearly as long as the petals; anther linear, pale yellow,  $\frac{1}{4}$  in. long.

Hab. Brazil; province of Bahia. Sent to Kew by Mr. Wetherill in 1859. Described from a plant that flowered at Kew in April, 1878.

22. *B. VITTATA* Brong.; Morel Portef. Hort. ii. 353, with figure; E. Morren in Belg. Hort. 1871, 193, t. 14, 15. *B. amabilis* Beer Brom. 118 (E. Morren in Belg. Hort. 1874, 19, t. 1, 2). *B. Leopoldi* K. Koch non E. Morren. *B. pulcherrima* K. Koch. *B. zonata* Hort. *B. Rohaniana* De Vriese in Linnæa xxvi. 756; Tuinbow Flora, ii. t. 3. *B. Moreliana* Lemaire in Jard. Fleur. t. 138; Lindl. in Paxt. Flow. Gard. t. 77. *Tillandsia Moreliana* Henfrey in Gard. Mag. Bot. iii. t. 53. *Bromelia Rohaniana* Walp. Ann. vi. 71.—Leaves 8-10 in a utricular rosette, connivent in the lower foot, lorate, 2-3 feet long, 2 in. broad at the middle, horny in texture, green on the face, conspicuously and copiously banded on the back with white, rounded to a cusp at the apex, the marginal prickles blackish, ascending, small but conspicuous. Peduncle  $1\frac{1}{2}$ -2 ft. long, with many ascending lanceolate bright red bracts 5-6 in. long aggregated towards its apex. Inflorescence a drooping panicle  $\frac{1}{2}$ -1 ft. long, the short lower branches often 3-4-flowered, many subtended by large bright red bracts. Ovary cylindrical, mealy,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long; sepals linear-oblong, cuspidate,  $\frac{3}{4}$ -1 in. long, reddish, tipped with violet. Petals an inch longer than the sepals, the exposed part violet, the rest greenish. Stamens nearly as long as the petals; anthers linear, bright orange-yellow.

Hab. Woods of Southern Brazil, *Glaziov* 8983! 14339! 16429! One of the finest of all the cultivated Bromeliads, and now widely spread. It was first sent from Bahia by Porte to M. Morel, of Paris, about 1847.

23. *B. SAUNDERSII* Hort. Bull.; Floral Mag. n.s. t. 106; E. Morren in Belg. Hort. 1878, t. 1, 2. *B. chlorosticta* Hort. Saunders; Gard. Chron. 1871, 1425. *B. quintutiana* Hort. Makoy (M.D.).—Produced leaves 5-6 in a utricular tuft, connivent in the lower half foot, lorate,  $1\frac{1}{2}$ -2 ft. long,  $1\frac{1}{2}$  in. broad at the middle, horny, plain green or brownish-green on the face, thinly white-lepidote beneath with copious white spots and white transverse bands, the marginal prickles close, small, bright brown. Peduncle a foot long, with several ascending bright red bracts aggregated towards its apex. Inflorescence a lax drooping raceme with a flexuose reddish farinose rachis, the spreading flowers all only minutely bracteated; lower pedicels  $\frac{1}{2}$  in. long. Ovary turbinate,  $\frac{1}{4}$  in. long; sepals linear-oblong, red, nearly an inch long. Petals

twice as long as the sepals, bright lilac in the upper half inch. Stamens rather shorter than the petals; anthers orange-yellow.

Hab. Brazil: Bahia. Imported by Mr. Wilson Saunders about 1869. Nearly allied to *B. vittata*.

24. *B. SANDERIANA* E. Morren in Belg. Hort 1884, t. 1, 2 (M.D.).—Leaves about 20 in a utricular rosette, connivent in the lower half foot, lorate from an ovate base, 1-1½ ft. long, 1½-2 in. broad at the middle, moderately firm in texture, bright green on both sides, rounded to a small cusp at the tip, the marginal prickles like those of *B. horrida*, ascending, nearly black, ⅓-½ in. long. Peduncle a foot long; upper bract-leaves pink. Inflorescence a lax drooping raceme ½-1 ft. long with slender naked rachis, many of the lower flowers clasped and overtopped by large pink scariose bracts. Ovary cylindrical, farinaceous, ½ in. long; sepals linear-oblong, ¾ in. long, tipped with blue. Petals 2 in. long, green tipped with violet-blue. Stamens quite as long as the petals and style shortly exerted.

Hab. South Brazil; woods of the Organ Mountains, *A. Cunningham!* Gardner 693! *Glaziou* 15477! This fine species was gathered by Allan Cunningham in 1816, but has only been lately introduced into cultivation by Dr. Glaziou through Messrs. Sander & Co., of St. Alban's. It flowered at Kew for the first time, Dec., 1887.

25. *B. REICHARDTI* Wawra Itin. Prin. Sax. Cob. 148, t. 22.—Produced leaves 4-6 in a utricular rosette, connivent for half a foot, lorate, 1½-2 feet long, at most an inch broad, obtuse and emarginate at the apex, banded with white on the back. Peduncle very slender, a foot long, furnished with small distant adpressed red bract-leaves. Flowers 6-10 in a very lax drooping raceme, the lower 3-4 subtended by large red scariose bracts. Ovary clavate, nearly an inch long; sepals lanceolate, above an inch long. Petals half as long as the calyx, violet-blue at the tip. Stamens shorter than the petals.

Hab. South Brazil; St. Juiz de fora, *Wawra*, ii. 197. Allied to *B. vittata* Brong.

26. *B. FILICAULIS* Griseb. in Gott. Nacht. 1864, 13.—Leaves few in a rosette, lorate, 2-2½ ft. long, 1-1½ in. broad at the middle, rounded to a cusp at the apex, entire. Peduncle very slender, cernuous, 3 ft. long below the panicle; bract-leaves distant, small, lanceolate, adpressed. Inflorescence a very lax drooping panicle 1½ ft. long, with distant few-flowered corymbose spreading branches; central pedicels 1-1¼ in. long; flower-bracts small, membranous, oblong-lanceolate. Ovary subglobose, ⅓ in. long; sepals lanceolate, ¾ in. long. Developed petals not known.

Hab. Mountains of Venezuela near Valencia, alt. 5000 ft., *Fendler* 2452. Described mainly from a sketch kindly sent by Dr. Withnack. Very distinct.

27. *B. SCHIMPERIANA* Wittm.—Leaves about 14 in a rosette, linear, 2½ ft. long, ⅓ in. broad, acuminate, green and channelled down the face, slightly furfuraceous on the back, entire. Peduncle with inflorescence shorter than the leaves, cernuous; flower-bracts remote, lanceolate, 5-6 in. long. Inflorescence a lax spike;

flower-bracts minute. Sepals lanceolate,  $\frac{3}{4}$ – $\frac{7}{8}$  in. long, equalling the cylindrical ovary. Petals twice as long as the sepals. Style just exceeding the petals.

Hab. South Brazil, near San Bento, *Schimper* 270.

### Subgenus 2. LIBONIA (*Lemaire*).

28. *B. MARMORATA* Lemaire in Ill. Hort. t. 48 (M.D.). — Leaves 8–10 in a utricular rosette, lorate,  $1\frac{1}{2}$ –2 ft. long, 2 in. broad, firm in texture, suberect, connivent for the lower foot, copiously mottled with darker green and brown spots all over the thinly lepidote back and faintly mottled on the green face, rounded to a cusp at the tip, the marginal spines minute and inconspicuous. Peduncle a foot long, nearly hidden by the connivent bases of the leaves, with a few small bright red spreading bract-leaves aggregated near its apex. Flowers 8–12 in a short erect spike, all sessile, erectopatent, minutely bracteated. Ovary oblong, green,  $\frac{1}{2}$  in. long; sepals oblong, violet, shorter than the ovary, connate at the base. Petals an inch long, bright violet-blue, white downwards, spreading only at the tip.

Hab. Central Brazil, *Glaziou* 12233! Sent by M. Libon in 1853 to De Jonghe.

### Subgenus 3. HELICODEA (*Lemaire*).

29. *B. PALLIDIFLORA* Liebm. Ind. Sem. Hort. Hafn. 1854; Ann. Sc. Nat. ser. 4, ii. 373 (M.D.). — Leaves about 10 in a utricular rosette, connivent in the lower half foot, lorate from an ovate base,  $1\frac{1}{2}$ –2 ft. long, 1– $1\frac{1}{2}$  in. broad at the middle, firm in texture, plain green on the face, thinly lepidote and furnished with many indistinct white transverse bands on the back, deltoid-cuspidate at the tip, with minute deltoid marginal prickles. Peduncle a foot long; bract-leaves scariose, ascending, lanceolate, greenish-white. Inflorescence a lax erect simple spike 4–6 in. long; flowers all sessile, ascending, not bracteated. Ovary oblong, whitish-green, deeply sulcate,  $\frac{1}{2}$  in. long; sepals oblong, shorter than the ovary. Petals narrow, entirely green, 2 in. long. Style reaching the tip of the petals.

Hab. Nicaragua. Introduced to Copenhagen in 1854 by Dr. Oersted. Described principally from Prof. Morren's drawing, made from a plant that flowered in the Botanic Garden of Liège, in April, 1872.

30. *B. ZEBRINA* Lindl. in Bot. Reg. sub t. 1068; Lodd. Bot. Cab. t. 1912; E. Morren in Belg. Hort. 1872, 65, t. 4, 5. *Bromelia zebrina* Herb. in Bot. Mag. t. 2686. *Helicodea zebrina* Lemaire. *Billbergia farinosa* Hort. — Produced leaves 5–6 in a rosette, connivent for the lower foot, lorate from an oblong base, 2–3 ft. long, 2–3 in. broad at the middle, very horny in texture, stiffly arcuate, dull green, often tinged with brown, with copious white spots and white transverse bands on both sides, the lower marginal prickles sometimes  $\frac{1}{8}$ – $\frac{1}{6}$  in. long. Peduncle very cernuous, 1– $1\frac{1}{2}$  ft. long, with 6–8 pink lanceolate bracts 3–4 in. long, aggregated towards its

apex. Spike dense, drooping,  $\frac{1}{2}$ –1 ft. long: rachis densely white-mealy. Ovary white, oblong, deeply sulcate,  $\frac{1}{2}$  in. long; sepals oblong, obtuse, as long as the ovary. Petals green, 2 in. long. Filaments  $1\frac{1}{2}$  in. long; anthers linear,  $\frac{1}{2}$  in. long. Fruit subglobose,  $\frac{3}{4}$  in. long, with numerous prominent ribs. Seeds brown, clavate,  $\frac{1}{8}$  in. long.

Hab. Central and Southern Brazil, *Burchell* 862! 995! *Claussen!* *Weddell* 2518! *Gaudichaud* 363! *Regnell* 1258! *Glaziou* 2729! Introduced into cultivation in 1826. *B. commixta* K. Koch, and *B. anisodora* Schott, appear to be forms of this species.

31. *B. BOLIVIENSIS* Baker.—Leaves few in a rosette, lanceolate, acute,  $1\frac{1}{2}$ –2 ft. long, above an inch broad at the middle, thinly lepidote; marginal teeth minute. Peduncle  $1\frac{1}{2}$  ft. long; upper bract-leaves spreading, bright red. Inflorescence a moderately dense spike  $\frac{1}{2}$  ft. long; flower-bracts minute. Ovary oblong, thinly white-lepidote, finely sulcate,  $\frac{1}{4}$  in. long; sepals oblong, obtuse, twice as long as the ovary. Petals oblanceolate-unguiculate,  $1\frac{1}{2}$  in. long, greenish, rolling up spirally. Genitalia longer than the petals.

Hab. Bolivian Andes; Unduavi, alt. 8000 ft., *Rusby*, 2853! A *Billbergia* which I have not seen is said to grow high up on the east side of Pichincha.

32. *B. DECORA* Poepp. et Endl. Nov. Gen. 42, t. 157; E. Morren in Belg. Hort. 1875, 221, t. 13, 14; Baker in Bot. Mag. t. 6937. *B. Baraquiniana* Lemaire in Ill. Hort. t. 421. *Helicodea Baraquiniana* Lemaire. *B. granulosa* Brong.—Leaves 8–10 in a utricular rosette, the bases connivent for 5–6 in., lorate,  $1\frac{1}{2}$ –2 ft. long, 2 in. broad at the middle, moderately firm in texture, thinly lepidote on the face and furnished with irregular transverse white mealy bands on the back, the brown marginal prickles minute. Peduncle cernuous, a foot long; 8–9 pink lanceolate bract-leaves, 3–6 in. long, aggregated towards its apex. Spike dense, 3–4 in. long, half hidden by the bract-leaves; rachis mealy. Ovary oblong, sulcate, thinly white-mealy,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; sepals ovate, obtuse, mealy, greenish,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Petals pale green, 2–2 $\frac{1}{2}$  in. long. Anthers linear, yellow,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long.

Hab. Yurimaguas, Peru, *Poeppig* 2432. New Granada, *Linden* in Hort. Paris 1851. Introduced into cultivation by Baraquin, from Para, in 1864. Described from a plant flowered by Sir G. Macleay in Jan., 1887.

33. *B. PORTEANA* Brong.; Beer Brom. 115; E. Morren in Belg. Hort. 1876, 9, t. 1, 3; Baker in Bot. Mag. t. 6670. *B. rosea* Beer Brom. 128.—Leaves 6–8 in a utricular rosette, connivent for the lower foot, lorate from an ovate base, 3–4 ft. long, 2–2 $\frac{1}{2}$  in. broad at the middle, very horny in texture, the channelled face plain dull green, the back furnished with copious transverse white mealy bands, sometimes tinged with brown towards the base, the apex deltoid-cuspidate, the marginal prickles close, lanceolate, curved, ascending, brown, the lower a line long. Peduncle 2 ft. long, with many bright red scariose bract-leaves 4–6 in. long, the upper spreading. Spike lax, drooping, sometimes a foot long; rachis white-farinoso. Ovary oblong, densely mealy, shallowly sulcate,  $\frac{1}{2}$  in. long; sepals oblong, shorter than the ovary. Petals green,

2-2½ in. long, rolling up to the base. Filaments violet, as long as the petals; anthers linear, ¾ in. long.

Hab. Brazil; province of Bahia. Introduced into cultivation by M. Porte, after whom it is named, in 1849. Described from plants that flowered at Kew in June, 1878 and 1882, and with Mr. J. T. Peacock in Aug., 1885. One of the most showy of all the species.

34. B. VIOLACEA Beer Brom. 116. *B. stipulata* and *macrostachya* Brong. inedit.—Leaves lorate, 3 ft. long, 1½-2 in. broad, moderately firm in texture, light green on the face, slightly lepidote on the back, the marginal prickles minute, deltoid. Peduncle 1½-2 ft. long, with several bright red lanceolate bract-leaves 4-6 in. long aggregated towards its apex. Spike simple, lax, drooping, a foot long; rachis slender, mealy. Ovary oblong, mealy, deeply sulcate, under ½ in. long; sepals as long as the ovary. Petals very narrow, green, 2½ in. long, rolling up to the base. Stamens nearly as long as the petals.

Hab. French Guiana, *Martin! Poiteau! Melinon!* British Guiana, *Appun.* Introduced into cultivation about 1857, but I have not seen it alive in England.

35. B. LEOPOLDI E. Morren in Belg. Hort. 1871, 1, t. 1-4, non K. Koch (M.D.). *B. nuptialis* and *ianthina* Hort. *Helicodea Leopoldi* Lemaire in Ill. Hort. sub t. 421, with figure.—Leaves 8-10 in a utricular rosette, connivent in the lower foot, lorate from an ovate base, 3-3½ ft. long, 2-2½ in. broad at the middle, horny in texture, channelled down the face, plain green on the face, copiously transversely fasciated with white on the back, the apex deltoid with a cusp, the marginal prickles small, ascending, deltoid. Peduncle cernuous, 1½ ft. long; upper 6-8 leaves erecto-patent, bright red, lanceolate, 3-4 in. long. Inflorescence a dense oblong spike, 6-9 in. long. Ovary oblong, white-mealy, ⅓-½ in. long; sepals linear-oblong, also mealy, ½ in. long. Petals violet, 2 in. long. Style longer than the petals. Berry turbinate, ¾ in. diam.

Hab. Brazil; island of Santa Catherina. Discovered by M. Devos. Introduced into cultivation by Verschaffelt in 1847. Described from a plant that flowered at Kew in the summer of 1877. *B. nuptialis* is said to have been introduced from Bahia and first flowered by De Smet in Ghent. Easily distinguished from all the other eastern *Helicodeas* by its violet petals.

36. B. INCARNATA Schultes fil. Syst. Veg. vii. 1261. *Bromelia incarnata* Ruiz et Pav. Fl. Peruv. iii. 32, t. 255.—Leaves lorate from an ovate base, 2-3 ft. long, 2-3 in. broad at the middle, moderately firm in texture, green on the face, thinly white-lepidote on the back, deltoid-cuspidate at the apex, the ascending dark-brown marginal prickles ⅓-½ in. long. Peduncle much shorter than the leaves, with several lanceolate bright red bract-leaves aggregated towards the top. Spike lax, a foot long, ½ ft. broad, each flower furnished with a small ovate scarious bract. Ovary oblong-cylindrical, ¾ in. long, farinose; sepals as long as the ovary. Petals purplish-violet. Stamens as long as the petals. Style-arms ½ in. long.

Hab. Peru; Andes of Pozuzo, *Pavon!* Described from Pavon's type-specimen at the British Museum.

Of late years many of the species have been hybridised and several fine new garden types have been raised, belonging principally to the

group with lax drooping spikes and large bright red upper bract-leaves. The following are the principal named hybridforms, viz:—

37. *B. VITTATO-BAKERI*. *B. Breauteana* André in Rev. Hort. 1885, 300, with figure. *B. Cappei* E. Morren (M.D.).—Leaves 10–12 in a rosette, lorate, obtuse, horny, 2 ft. or more long, 2–2½ in. broad at the middle, copiously banded with white on the back, the marginal prickles minute. Peduncle above a foot long, with several large bright red bracts towards the top. Inflorescence a lax drooping panicle, the lower branches 3–4-flowered, subtended by large red bracts, Ovary cylindrical, pale green, deeply sulcate, ¾ in. long; sepals linear-oblong, an inch long, pinkish-white tipped with violet. Petals twice as long as the sepals, bright violet-blue.

This cross, which was made by M. André in France, has been distributed by M. Bruant, of Poitiers, and I think also by some one in Belgium. Described from a plant that flowered at Kew, Dec., 1886. *B. Collevii*, *Oberthuri*, *Joliboisii* and *rhodonensis*, are similar hybrids between *speciosa* and *vittata*, raised by Van Geert (see Devos in Belg. Hort. 1882, 334), and *B. Herbaultii* Hort., another raised by Maron.

38. *B. VITTATO-NUTANS* Hort. Makoy (M.D.).—Leaves a dozen or more in a rosette, lanceolate, 1½–2 ft. long, recurving from low down, narrowed gradually to the point, the marginal prickles minute. Peduncle 1½ ft. long, with many large, bright red ascending bract-leaves. Inflorescence a few-flowered lax drooping spike. Ovary oblong-cylindrical, greenish, ½ in. long; sepals lanceolate, an inch long, pink, tipped with violet. Petals twice as long as the calyx, bright violet-blue.

There are two forms of this cross among Prof. Morren's drawings, the other with shorter stiffer leaves than above described. It was flowered at Kew, March, 1888.

39. *B. DECORO-NUTANS*. *B. Baraquiniano-nutans* and *B. Windii* Hort. (M.D.).—Leaves about 20 in a rosette, lanceolate, not at all horny, narrowed gradually to the point, not banded on the back, the marginal prickles minute. Peduncle bright red, 1½ ft. long, with many large bright red bract-leaves. Inflorescence a lax drooping spike half a foot long. Ovary oblong, green, deeply sulcate, ½ in. long; sepals lanceolate, ¾ in. long. Petals 2 in. long, entirely green, rolling up spirally to the base. Stamens and style longer than the petals.

Raised by M. Jacob-Makoy, of Liège. Mentioned Belg. Hort. 1882, 233. Described from Prof. Morren's drawing.

40. *B. NUTANTO-MORELI*. *B. Worleyana* Wittmack in Hort. Kramer (M.D.) Leaves 10–12 in a rosette, lanceolate 1–1½ ft. long, ½–1½ in. broad at the middle, narrowed to the point, not horny, green on both sides, not banded on the back. Peduncle above a foot long, with many large bright red bracts upwards. Inflorescence a lax drooping spike. Ovary pale green, ½ in. long; sepals lanceolate, ¾ in. long, red with a violet tip. Petals twice as long as the calyx, bright violet.

Described from a plant that flowered at Kew, Dec., 1887. It was raised at Hamburg by Herr Kramer in 1885.

41. *B. Euphemia-speciosa* = *B. Euphemia-amœna* Hort. Makoy, mentioned Belg. Hort. 1882, 238.

42. *B. Jenischiana* Wittmack, a cross between *pyramidalis* and *Moreli*, raised by Kramer of Hamburg.

43. *B. Gireoudiana* Kramer and Wittmack, a cross between *Saundersii* and *thyrsoidea*, obtained by Kramer.

44. *B. Rancougnei* Rev. Hort. 1884, 524, is a hybrid between *Liboniana* and some other species, obtained by M. Maron, gardener to the Marquis of Rancougne.

45. *B. BLIREIANA* André in Rev. Hort. 1889, p. 139, a cross between *iridifolia* and *nutans* raised by M. André at Lacroix (France).

46. *B. VEXILLARIA* André, a most splendid hybrid, according to M. André, who raised it quite recently from a cross between *Moreliana* and *thyrsoidea splendida*.

### 19. QUESNELIA Gaudich.

(*Lievena* Regel).

*Sepals* linear-oblong, not mucronate, free down nearly or quite to the top of the ovary. *Petals* free, lingulate-unguiculate, scaled at the base, usually about twice as long as the sepals. *Stamens* 3 inserted at the top of the ovary, 3 at the top of the claw of the petals; filaments filiform; anthers linear-oblong, attached on the back near the base. *Ovary* oblong, inferior, 3-celled; ovules many in a cell; style filiform; stigmas linear, much contorted. *Fruit* small, baccate.—Habit of *Billbergia*, from which it differs by its usually spicate inflorescence, shorter less spreading petals and alternate stamens attached to the top of the claw of the petals.

Inflorescence simple.

Bracts and flowers ascending.

Bracts obtuse . . . . . Sp. 1-3.

Bracts acute . . . . . Sp. 4-9.

Bracts and flowers spreading . . . . . Sp. 10.

Inflorescence compound . . . . . Sp. 11-12.

1. *Q. RUFA* Gaudich. Atl. Bonite, t. 54; *Q. roseo-marginata* Carrière in Rev. Hort. 1880, 70, with figure; E. Morren in Belg. Hort. 1881, 82, t. 4 (M.D.). *Q. Skinneri* Hort. *Bromelia arvensis* Vell. Fl. Flum. iii. t. 114. *Billbergia roseo-marginata* K. Koch Wochen. 1867, 141. *Lievena princeps* Regel Gartenfl. t. 1024.—Acaulescent. Leaves about 20 in a short utricular rosette, lorate from an ovate base, 1½-2 ft. long, 1½-2 in. broad at the middle, moderately firm in texture, plain green on the face, thinly lepidote with copious transverse bands on the back, deltoid-cuspidate at the tip, the marginal spines small, close, horny, ascending. Peduncle erect, a foot long; stem-leaves oblong, acute, scariose, pale, adpressed, much imbricated. Inflorescence a dense oblong erect strobiliform spike 4-8 in. long; flower-bracts oblong, subobtuse, bright red, 1-1½ in. long, broadly crisped and scariose at the edge. Ovary oblong, ½ in. long; sepals linear-oblong, much imbricated,

as long as the ovary. Petals violet or white, turning brown-black, twice as long as the sepals. Stamens  $\frac{1}{4}$  in. shorter than the petals.

Hab. South Brazil; in the neighbourhood of Rio Janeiro, *Gaudichaud* 370! *Hombroul* *Burchell* 3151! *Tweedie*! *Miers* 3847! *Glaziov* 4262! 15840! Introduced into cultivation about 1867. Described from a plant flowered by Sir G. Macleay, Feb., 1888.

2. *Q. CAYENNENSIS* Baker. *Q. rufa* E. Morren in Belg. Hort. 1882, 115, tab. 4-6 (M.D.) non Gaudich. *Billbergia Quesneliana* Brong. in Ann. Sc. Nat. ser. 2, xv. 372; Planch. in Flore des Serres t. 1028; Regel Gartenfl. 1875, 195, t. 834, 836.—Leafy stem much produced, reaching sometimes a length of 6-8 ft., simple or forked. Leaves lanceolate from an ovate base, 2-3 ft. long,  $1\frac{1}{2}$ -2 in. broad at the middle, moderately firm in texture, plain green on the concave face, banded transversely with white on the back, narrowed gradually to the point, armed with close erectopate lanceolate marginal spines  $\frac{1}{8}$ - $\frac{1}{6}$  in. long. Peduncle erect, much shorter than the leaves; stem-leaves pale, scariose, adpressed, much imbricated. Inflorescence a dense strobiliform spike 6-8 in. long, 2 in. diam.; flower-bracts oblong, obtuse, bright red, with a pale plicate scariose margin, the lower  $1\frac{1}{2}$ -2 in. long. Ovary oblong,  $\frac{1}{2}$  in. long; sepals linear-oblong, obtuse, tinged with red,  $\frac{1}{2}$  in. long. Petals blue-violet, twice as long as the sepals. Stamens rather shorter than the petals.

Hab. French Guiana. Introduced into cultivation by Quesnel in 1841. Described mainly from Brongniart's type-specimen in the Paris Herbarium. Very near *Q. rufa*.

3. *Q. LAMARCKII* Baker.—Leaves unknown. Inflorescence a dense oblong-cylindrical strobiliform spike a foot long, 4 in. diam.; flower-bracts oblong, obtuse, 2-3 in. long. Mature ovary clavate-trigonal, 1- $1\frac{1}{2}$  in. long; sepals linear-oblong, obtuse,  $\frac{3}{4}$ -1 in. long, free down to the ovary. Petals not seen.

Hab. Probably Guiana. Described from a specimen from Lamarck, in the Smithian Herbarium at the Linnean Society, marked "*Bromelia*, No. 41." Allied to *Q. rufa* and *cayennensis*.

4. *Q. BAKERI* André Enum. 4.—Leaves and peduncle unknown. Inflorescence a dense cylindrical spike 5-6 in. long,  $2\frac{1}{2}$  in. diam.; bracts acute, dark violet, 2 in. long, 1 in. broad, transversely plicate, covered, like the calyx, with dense ferruginous tomentum; flowers sessile in their axils. Ovary  $\frac{1}{2}$  in. long; sepals ovate, emarginate at the tip, three times the length of the ovary. Petals orange-red, obtuse, glabrescent, 3 in. long,  $\frac{1}{2}$  in. broad. Alternate stamens inserted near the base of the petals: anthers linear,  $\frac{1}{2}$  in. long.

Hab. Damp virgin forests of the western declivity of the Andes of Southern Columbia, near San Pablo, alt. 4000 ft., *André* 3391, bis.

5. *Q. VAN HOUTTEANA* E. Morren in Belg. Hort. 1881, t. 18 (M.D.). *Echinostachys Van Houtteana* Van Houtte Cat. 1878.—Leaves about 30 in a short rosette, lorate from an ovate base, 2 ft. long,  $1\frac{1}{2}$ -2 in. broad at the middle, 3-4 in. at the dilated base, firm in texture, green on both sides, not transversely banded on the back, deltoid-cuspidate at the tip, the close ascending brown

marginal spines  $\frac{1}{3}$ – $\frac{1}{6}$  in. long. Peduncle erect, 1–1½ ft. long; stem-leaves oblong, acute, adpressed, scariose, pale, much imbricated. Inflorescence a strobiliform oblong spike 5–6 in. long; flower-bracts ovate, acute, red towards the tip, pale at the base, 1–1½ in. long. Ovary oblong,  $\frac{1}{2}$  in. long; sepals linear-oblong, as long as the ovary. Petals violet,  $\frac{1}{3}$  in. longer than the sepals. Stamens a little shorter than the petals.

Hab. South Brazil; in the neighbourhood of Rio Janeiro, *Glaziou* 12223! Introduced into cultivation by Van Houtte in 1878.

6. *Q. STROBILISPICA* Wawra Itin. Prin. Sax. Cob. 149, t. 25. *Billbergia Glaziovii* Regel Gartenfl. 1885, 260, t. 1203. — Produced leaves 5–6 in a rosette, ensiform, erect, 2 ft. long, 1½–2 in. broad at the middle, firm in texture, green on the face, obscurely banded with white on the back, narrowed gradually to a pungent point without any perceptible marginal prickles. Peduncle slender, erect, central, 1½ ft. long; stem-leaves few, scariose, lanceolate, rolled round the stem, not imbricated. Inflorescence a dense erect oblong spike 2–3 in. long; flower-bracts ovate, acute, tinged with red, the lower an inch long. Ovary clavate,  $\frac{1}{3}$  in. long; sepals linear-oblong, a little longer than the ovary. Petals violet, more than twice as long as the sepals, Stamens  $\frac{1}{2}$  in. shorter than the petals.

Hab. South Brazil, about Rio Janeiro, *Wawra* ii. 273, *Glaziou* 15483! 16451! Introduced to St. Petersburg by Glaziou in 1885.

7. *Q. ENDERI* Gravis & Wittm. in Gartenfl. 1888, 195. t. 41–43. *Q. centralis* and *lateralis* Wawra Itin. Prin. Sax. Cob. t. 26, 27. *Billbergia Enderi* Regel Gartenfl. t. 1217. — Leaves 8–10 in a rosette, lorate, 2 ft. long, 2 in. broad at the middle, moderately firm in texture, plain green on the face, thinly lepidote but not transversely banded on the back, rounded to a cusp at the apex, the marginal prickles small, brown, deltoid-cuspidate, hooked. Peduncle slender, above a foot long; stem-leaves adpressed, scariose, contiguous. Inflorescence a dense oblong few-flowered spike; flower-bracts ovate, acute, tinged with red, the lower above an inch long. Ovary oblong,  $\frac{1}{3}$  in. long; sepals linear-oblong, as long as the ovary. Petals violet, twice as long as the sepals. Stamens a little shorter than the petals.

Hab. South Brazil, high up the Organ Mountains, *Gardner* 694! *Wawra* ii. 315, 376, *Glaziou* 14336! I do not think *Q. lateralis* is more than an abnormal form of the species.

8. *Q. WITTMACKIANA* Regel Gartenfl. 1888, 497, t. 1281, fig. 2. — Acaulescent, stoloniferous. Leaves ensiform, rigid, suberect, 40–50 in. long, 1¼–1½ in. broad, green on the face, distinctly fasciated with white on the back, the marginal teeth minute. Peduncle central, much shorter than the leaves; bract-leaves small, scariose, adpressed. Inflorescence a dense few-flowered raceme; flower-bracts very small. Calyx with ovary red,  $\frac{1}{2}$  in. long. Petal-blade small, blue. Stamens shorter than the petals.

Hab. Probably Southern Brazil.

9. *Q. COLUMBIANA* Baker. *Ronnbergia columbiana* E. Morren in Belg. Hort. 1885, 82. Leaves about a dozen in a rosette, their bases connivent for 6–8 inches, lorate, arcuate,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, firm in texture, plain green on the face, brown on the back, deltoid-cuspidate at the tip, the marginal prickles close and minute. Peduncle under a foot long, hidden by the connivent bases of the leaves. Spike few-flowered, lax, simple, erect, 2–3 in. long; flower-bracts small, ovate. Calyx including the ovary  $\frac{3}{4}$  in. long; segments short, ovate. Petals violet, twice as long as the calyx, spreading only at the tip. Stamens inserted high up the petals.

Hab. Columbia. Introduced by Mr. W. Bull, who first flowered it Mar., 1882.

10. *Q. AUGUSTO-COBURGI* Wawra Itin. Prin. Sax. Cob. 158, t. 28, 35 B.—Produced leaves only 3–4 in a rosette, lorate, 2 ft. long,  $2$ – $2\frac{1}{2}$  in. broad at the middle, moderately firm in texture, plain green on the face, thinly white-lepidote on the back, not transversely banded, deltoid-cuspidate at the tip, the marginal spines minute. Peduncle very slender, longer than the leaves; bract-leaves lanceolate, erect, pale, scariose. Inflorescence a dense spike a span long; flowers spreading horizontally, sessile, each subtended at the base by a lanceolate acuminate scariose bract nearly as long as the calyx. Ovary small, green, subglobose; sepals lanceolate-acuminate, bright red, above an inch long. Petals oblanceolate-unguiculate, bright violet, half as long again as the sepals. Stamens a little shorter than the petals, 3 attached to the top of the claw. Style reaching to the tip of the petals.

Hab. South Brazil; woods of Juiz de fora, *Wawra* ii. 185, 196. This does not agree well with *Quesnelia* or any other recognised genus.

11. *Q. SELLOANA* Baker.—Leaves linear, entire, moderately firm in texture, 12–15 in. long,  $\frac{1}{2}$  in. broad at the middle, naked on the face, slightly brown-furfuraceous on the back, especially towards the base. Peduncle much shorter than leaves; bract-leaves lanceolate, similar to the proper leaves in texture. Inflorescence a dense compound globose capitulum  $1$ – $1\frac{1}{2}$  in. diam.; branch-bracts ovate, chartaceous, entire, the upper  $\frac{1}{2}$  in., the lower  $1$ – $1\frac{1}{2}$  in. long, subtending each a few crowded flowers; final bracts ovate, scariose,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Calyx with ovary  $\frac{3}{4}$  in. long; ovary small, oblong, naked; sepals lanceolate, acute. Petals violet, half as long again as the sepals. Stamens much shorter than the petals.

Hab. South Brazil, *Sello* 1414! (Hort. Berol.).

12. *Q. GLAZIOVII* Baker.—Leaves with a dilated oblong base 3–4 in. long, 2 in. broad; blade thin, lorate, subglabrous, narrowed to the point, a foot long, an inch broad, with only a few prickles towards the base. Peduncle a foot long; bract-leaves many, scariose, adpressed, imbricated. Inflorescence a moderately dense panicle 2–3 in. long; branches few-flowered, lower an inch long; branch-bracts ovate, lower an inch long; flower-bracts small, scariose, obtuse. Calyx with ovary  $\frac{1}{3}$  in. long; sepals ovate, as long as the ovary. Petal-blade oblong,  $\frac{1}{3}$  in. long. Stamens shorter than the petals.

Hab. South Brazil, *Glaziou* 16418!

## Tribe II.—PITCAIRNIEÆ.

20. BROCCINIA, *Schultes fil.*

*Perianth* inserted above the middle of the ovary; sepals obovate-oblong; petals not longer than the sepals, orbicular with a short claw. *Stamens* a little shorter than the perianth-segments; filaments slightly flattened; anthers small, globose, dorsifixed. *Ovary* half-inferior, clavate-trigonus, 3-celled; ovules many, superposed; style short; stigmas short, not twisted. *Capsule* dry, small, clavate-trigonus, septically 3-valved at the apex. *Seeds* flat, with a small oblong nucleus, with a horny border and a lanceolate horny appendage at each end.—*Trunk* woody, like that of a *Yucca*. *Leaves* densely rosulate, with a large entire lorate lamina. *Inflorescence* a large lax decomposed panicle. Flowers small, whitish. Very distinct as a genus, both in structure and habit.

1. *B. PANICULATA* Schultes fil. Syst. Veg. vii. 1250.—Caulесcent, with a woody trunk 6 ft. high. Leaves lorate, 2 ft. long, 3 in. broad at the middle. Panicle pyramidal, 2 ft. long, 1½ ft. broad; flowers spreading and subdistichous; pedicels under a line long; flower-bracts ovate, acute, 2-3 times the length of the pedicels. Sepals obtuse, under ¼ in. long. Capsule ½-⅔ in. long.

Hab. Amazon valley; Mount Araracoara, *Martius*.

2. *B. CORDYLINOIDES* Baker in Journ. Bot. 1882, 330. *B. demerarensis* and *Andreana* Hort. *Cordyline micrantha* Baker in Gard. Chron. 1880, ii. 243, t. 47.—Caulесcent, with a woody trunk reaching a height of 12-15 ft. and a diameter of 6-8 in. Leaves in a dense rosette at the top, lorate from an ovate base, 3-4 ft. long, 6-7 in. broad at the middle, moderately firm in texture, entire, deltoid at the apex, green and glabrous on both sides. Peduncles shorter than the leaves; bract-leaves many, ovate, green, erecto-patent. Inflorescence a lax decomposed panicle 6-8 ft. long; lower-branches 1½-2 ft. long; final branches 4-6 in. long, laxly racemose; pedicels very short; bracts ovate, acute, longer than the pedicels. Flower whitish, under ¼ in. long. Capsule ¼-½ in. long.

Hab. British Guiana, covering acres on the Kaieteur savannah and ascending to 5500 ft. on Mount Roraima, *Appun! Im Thurn! Jenman 1196!* See *Im Thurn* in Trans. Linn. Soc. 2 ser. Bot. ii. 256, 269. There is a specimen at the British Museum, gathered by Appun in 1872. It was introduced into cultivation in 1882, and a fine plant may now be seen in the Cactus-house at Kew. It flowered for the first time in the autumn of 1888.

3. *B. REDUCTA* Baker in Journ. Bot. 1882, 331.—Terrestrial, acaulescent. Leaves very few, forming a subcylindrical rosette, lorate, erect, obtuse, 1½ ft. long, 2 in. broad at the middle. Peduncle 2 ft. long; bract-leaves small, distant, adpressed. Panicle lax, rhomboid, 8-12 in. long; branches subspicate, simple, rarely forked, at most 6-8 in. long; flower-bracts very small, ovate. Flower not more than ⅓ in. long. Sepals oblong, about as long as the pilose ovary.

Hab. British Guiana; wet parts of the Kaieteur savannah, *Jenman 873!*

## 21. BAKERIA, Ed. André.

*Perianth* inserted above the middle of the ovary; sepals small, ovate; petals oblong, much longer than the sepals. *Stamens* as long as the petals; filaments linear; anthers small, oblong, versatile. *Ovary* more than half inferior, clavate-trigonous, 3-celled; ovules many, superposed; style and stigmas very short, not twisted. *Capsule* dry, small, clavate-trigonous, septically 3-valved at the apex. *Seeds* not seen.—Intermediate between *Brocchinia* and *Cottendorfia*.

1. B. TILLANDSIOIDES André in Rev. Hort. 1889, 84, with coloured figure.—Acaulescent. Leaves densely rosulate, spreading, ensiform, acuminate, 6–8 in. long,  $\frac{1}{2}$  in. broad low down, convolute in the upper half, moderately firm in texture, entire, white-lepidote on both surfaces. Peduncle slender, about as long as the leaves. Inflorescence a lax panicle a foot long, with several ascending or spreading racemose branches 2–3 in. long; branch-bracts small, ovate, scariose; flower-bracts minute, lanceolate; pedicels spreading,  $\frac{1}{8}$  in. long. Inferior portion of ovary  $\frac{1}{4}$  in. long; sepals scariose, as long as the ovary; petals oblong, obtuse,  $\frac{1}{3}$  in. long, tinged with purple, with 5–7 distinct lax brownish vertical nerves. Rachises and ovary naked.

Hab. Probably Brazil. Described from a plant flowered at Le Fresne, May, 1888, by M. A. de la Devansaye. We have had it at Kew for many years, but it did not flower till Sept. 1888.

## 22. PITCAIRNIA L'Herit.

*Calyx* generally with a short tube adnate to the base of the ovary; segments long, lanceolate or oblong-lanceolate. *Petals* free, much longer than the calyx, with a narrow limb and a long claw, usually minutely scaled at the base. *Stamens* inserted with the petals at the summit of the calyx-tube; filaments long, filiform or slightly flattened; anthers linear, almost basifixed. *Ovary* generally free except at the base, ampullæform, 3-celled; ovules many, superposed; style long, filiform; stigmas linear, contorted. *Capsule* with 3 septical valves. *Seeds* numerous, minute, flattened, generally tailed at both ends, in subgenera 5–8 not tailed but furnished with a broad horny border.—*Habit* and *leaves* very variable, the latter linear, lanceolate, rarely oblong, sometimes distinctly petioled, usually thin in texture for the order. *Peduncle* central; racemes simple or paniced; bracts small or large. *Flowers* usually bright red, sometimes white, yellow or blue. One section has entirely the habit of *Puya*, differing only by the septical dehiscence of the capsule.

Subgenus PITCAIRNIA PROPER.—Flowers generally bright red, racemose. Leaves chartaceous. Seeds tailed at each end.

Group of *P. bromeliæfolia*. — Leaves linear, spine-margined, furfureaceous beneath. Flowers bright red.

Flowers bright red.

Leaves very narrow ( $\frac{1}{4}$ - $\frac{1}{2}$ in. broad)	Sp. 1-5.
Leaves broader; pedicels short	Sp. 6-13.
Leaves broader; pedicels $\frac{1}{2}$ -1 in. long	Sp. 14-16.
Flowers white	Sp. 17.

Group of *P. integrifolia*.—Leaves linear, entire, furfuraceous beneath.

Flowers white or yellow	Sp. 18-21.
Flowers bright red	Sp. 22-31.

Group of *P. suaveolens*.—Leaves linear, green and naked on both sides.

Flowers white	Sp. 32-33.
Flowers red. Leaves entire	Sp. 34-47.
Flowers red. Leaves spine-edged towards the base	Sp. 48-49.

Group of *P. australis*.—Leaves broader, ensiform.

Leaves green on both sides.	
Flowers red	Sp. 50-58.
Flowers yellow	Sp. 59.
Leaves white-furfuraceous beneath.	
Flowers red	Sp. 60-69.
Flowers yellow	Sp. 70-72.
Flowers white	Sp. 73-75.

Subgenus 2. CEPHALOPITCAIRNIA.—Flowers bright red, arranged in a bright red sessile central capitulum. Leaves chartaceous. Sp. 76-77.

Subgenus 3. PHLOMOSTACHYS (Beer).—Seeds with a long tail at each end. Leaves chartaceous, petioled, not spine-edged. Inflorescence a simple subspicate raceme, with flower-bracts as long as the calyx. Sp. 78-83.

Subgenus 4. NEUMANNIA (Brong.).—Only differs from *Phlomostachys* by its denser spike and rather larger flower-bracts.

Flower whitish.

Leaves green and glabrous beneath.	
Flower-bracts bright red	Sp. 84-87.
Flower-bracts reddish-brown	Sp. 88-90.
Flower-bracts greenish	Sp. 91-92.
Leaves white-furfuraceous beneath	Sp. 93.
Flowers purplish-black or purplish-red	Sp. 94-95.
Flowers yellowish-red	Sp. 96.

Subgenus 5. SCHWEIDELERIA (E. Morren inedit.)—Flowers bright red, but leaves oblong and petioled and seeds with a horny border and no tail. Sp. 97-98.

Subgenus 6. PEPINIA Brong. — Flowers bright red. Leaves linear, chartaceous. Seeds with a horny border and no tail. Caulescent . . . . . Sp. 99-100.

Section 7. MELINONIA (Brong.). — Habit and leaves of *Eupitcairnia*, but seeds with a horny border and no tail. Sp. 101-107.

Section 8. PUYOPSIS. — Habit of *Puya*, but the capsule septidial. Flowers white or blue. Caudex generally produced and woody. Leaves ensiform, firm in texture, armed with spreading pungent spines.

Inflorescence a simple subspicate raceme . . . . . Sp. 108-110.

Inflorescence paniced . . . . . Sp. 111-130.

### Subgenus 1. PITCAIRNIA PROPER.

#### Group of *P. bromeliaefolia*.

1. *P. CARICIFOLIA* Mart. in Roem. et Schultes Syst. Veg. vii. 1242. — Leaves linear, 1-1½ ft. long, ¼-⅓ in. broad, glabrous on the face, furfuraceous on the back, minutely denticulate towards the tip, and furnished with horny teeth towards the base. Peduncle under a foot long, floccose. Raceme lax, simple, 4-5 in. long; rachis floccose; pedicels ascending, ⅓ in. long; bracts lanceolate, ¼-½ in. long. Sepals lanceolate, ⅕ in. long. Petals bright red, 1½ in. long, scaled at the base. Stamens as long as the petals.

Hab. Woods of the Amazon Valley, *Martius*.

2. *P. ANGUSTIFOLIA* Soland. in Ait. Hort. Kew, i. 401; Gawl. in Bot. Mag. t. 1547; Red. Lil. t. 76. *P. Redouteana* Schultes Syst. Veg. vii. 1243. — Acaulescent. Leaves linear, not petioled, 2 ft. long, ¼-⅓ in. broad at the middle, chartaceous, green and glabrous above, white-furfuraceous beneath, armed throughout with distinct spreading horny spines. Peduncle slender, 1½-2 ft. long. Racemes 1-3, lax, the end one 6-9 in. long; rachis slightly floccose; pedicels erecto-patent, ¼-½ in. long; bracts lanceolate, a little longer than the pedicels. Sepals lanceolate, ½-⅔ in. long. Petals bright red, 18-21 lines long, scaled at the base. Stamens nearly as long as the petals.

Hab. West Indies; island of Santa Cruz, *Ryan*! Porto Rico, *Eggers* 973! Water Island near St. Thomas, *Eggers* 476! *P. Glymiana* K. Koch-Wochen. 1868, 89 (*Hechtia Glymiana* Hort.) is said to be a near ally. I have seen old garden specimens in herbaria of Sir J. E. Smith and Bishop Goodenough.

3. *P. IRIDIFLORA* Beer Brom. 51. — Leaves linear, 2-3 ft. long, ⅓ in. broad at the middle, spine-margined. Peduncle short. Raceme dense, simple, half a foot long; pedicels short; bracts lanceolate, 1-1½ in. long. Calyx with ovary 1½ in. long. Petals bright red, 2 in. long, not scaled at the base. Stamens as long as the petals.

Hab. Country unknown. Described by Beer in 1857 from a plant that flowered in the Schönbrunn Garden. Appears to be near to *P. bracteata*.

4. *P. VALLISOLETANA* Lex. et La Llave Nov. Veg. Descr. i. 19.—Leaves linear, very narrow, spine-margined, the inner furfuraceous. Peduncle a foot long. Inflorescence simple; bracts ovate, smooth, reddish. Petals red, twice as long as the calyx, not scaled at the base.

Hab. Mexico; on the Vallisoletan Mountains. Known to me only from a brief description.

5. *P. GLAZIOVII* Baker.—Acaulescent. Rootstock thick; outer rudimentary leaves copiously spine-edged. Produced leaves linear,  $\frac{1}{2}$  ft. long,  $\frac{1}{4}$  in. broad, furfuraceous beneath. Peduncle slender,  $\frac{1}{2}$  ft. long. Inflorescence a lax simple raceme. Calyx an inch long; sepals acuminate, united at the very base. Petals bright red, less than twice as long as the sepals.

Hab. Rio Janeiro, *Glaziou* 17232!

6. *P. CARNEA* Beer in *Æster. Bot. Wochen*, 1858, 182 (M.D.).—Acaulescent. Leaves linear, not distinctly petioled, 2 ft. or more long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the middle, chartaceous, green and glabrous above, white-furfuraceous beneath, spine-edged towards the base. Peduncle  $1\frac{1}{2}$  ft. long; lower bract-leaves with long points. Raceme lax, simple, nearly a foot long; pedicels ascending, lower  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; bracts lanceolate, lower an inch long. Sepals lanceolate, reddish yellow,  $1\frac{1}{2}$  in. long. Petals bright red, an inch longer than the sepals. Stamens as long as the petals.

Hab. Central America. Discovered by Warszewicz. First flowered at Vienna in 1858.

7. *P. LATIFOLIA* Soland. in *Ait. Hort. Kew.* i. 401; *Bot. Mag.* t. 856; *Andr. Bot. Rep.* t. 322. *P. furfuracea* Beer ex parte.—Acaulescent. Leaves linear, not distinctly petioled, 2–3 ft. long,  $\frac{3}{4}$ –1 in. broad at the middle, chartaceous, green on the face, white-furfuraceous on the back, with only a few small spines towards the base and sometimes also towards the tip. Peduncle  $1\frac{1}{2}$ –2 ft. long; lower bract-leaves with long points. Raceme simple or slightly compound, moderately dense, 6–9 in. long; rachis slightly floccose; lower pedicels  $\frac{1}{4}$ – $\frac{1}{2}$  in. long; bracts lanceolate, about as long as the pedicels. Sepals lanceolate, nearly naked, greenish-red,  $\frac{3}{4}$ –1 in. long. Petals bright red, lingulate, 2 in. long, scaled at the base. Stamens as long as the petals. Capsule shorter than the calyx, adhering to it only at the very base. Seeds with a long tail at each end.

Var. *P. FURFURACEA* Jacq. *Eclog.* 117, t. 79; Sims in *Bot. Mag.* t. 2657. *P. ramosa* Jacq. *Eclog.* 154 (M.D.).—More robust, with a peduncle 2–3 ft. long and 3–5 denser racemes.

Hab. Cuba, *Wright* 689! Martinique, *Hahn!* *Plée!* St. Eustace, *Masson!* St. Domingo, *Schomburgk!* North Brazil, *Burchell* 8116! There is a type-specimen at the British Museum dried from Kew Gardens in 1786, and an old specimen from Martinique in the Paris Herbarium, called "*Hepetis pyramidata* Richard."

8. *P. ALBUCÆFOLIA* Schrad. *Comment. Blumenb.* 24, t. 3; Wittm. in *Berl. Gartenzeit.* 1884, 481, fig. 142. *P. affinis* K. Koch *Monogr.* 5. *P. angustifolia* Hort. non Ait. (M.D.).—Acaulescent. Leaves linear, not distinctly petioled,  $1\frac{1}{2}$ –2 ft. long, an inch broad

at the middle, chartaceous, green and glabrous on the face, white-furfuraceous on the back, spine-margined towards the base. Peduncle 2 ft. or more long; lower bract-leaves with long points. Raceme dense, 4-9 in. long, nearly always simple; pedicels ascending,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long; bracts green, lanceolate, an inch or more long. Sepals lanceolate, greenish-red,  $\frac{3}{4}$ - $\frac{7}{8}$  in. long. Petals bright red, 2 in. long, scaled at the base. Stamens as long as the petals.

Hab. Martinique, *Hahn!* Columbia, *Karsten!* Intermediate between *P. latifolia* and *P. bracteata*. To this belong *P. angustifolia* of the Morren drawings and *P. affinis* and *angustifolia* of K. Koch's herbarium. Cultivated at Berlin in 1837.

9. *P. BRACTEATA* Dryand. in Ait. Hort. Kew. edit. 2, ii. 202; Hook. in Bot. Mag. t. 2813 (M.D.). *P. latifolia* Red. Lil. t. 74, non Ait. *P. Gireoudiana* Dietr. in Allg. Gartenzeit. xxi. 105. *P. commutata*, Regel Gartenfl. t. 557.—Acaulescent. Leaves many in a tuft, linear,  $1\frac{1}{2}$ -2 ft. long,  $\frac{3}{4}$ -1 in. broad at the middle, not petioled, chartaceous, green and glabrous above, white-furfuraceous beneath, entire or prickly towards the base. Peduncle  $\frac{1}{2}$ -1 ft. long, stout, floccose. Raceme dense, simple, 4-12 in. long; rachis floccose; pedicels very short, ascending; bracts lanceolate, 1- $1\frac{1}{2}$  in. long. Sepals lanceolate, slightly pubescent,  $\frac{3}{4}$ -1 in. long. Petals lingulate, bright red, scaled at the base, twice as long as the sepals. Stamens as long as the petals.

Var. *P. SULPHUREA* Andr. Bot. Rep. t. 249. *P. bracteata* var. *sulphurea* Gawl. in Bot. Mag. t. 1416.—Flowers yellow.

Hab. West Indies; St. Vincent's, *Anderson!* *Guilding!* Introduced into cultivation about 1800. *Billbergia bifrons* Lindl. in Journ. Hort. Soc. viii. 54, may perhaps belong here.

10. *P. UAUPENSIS* Baker.—Shortly caulescent. Leaves with a channelled petiole  $\frac{1}{2}$  ft. long with a few black spines and a linear entire chartaceous blade  $1\frac{1}{2}$  ft. long,  $\frac{1}{2}$  in. broad at the middle, green and glabrous above, obscurely furfuraceous beneath. Flowers only seen detached. Sepals lanceolate,  $1\frac{1}{4}$  in. long. Petals bright red, nearly twice as long as the sepals.

Hab. Amazon valley; banks of the Rio Uaupes, *Spruce* 2667! Allied to *P. subpetiolata*.

11. *P. ODONTOPODA* Baker.—Acaulescent. Leaves with a channelled petiole a foot long armed with copious toothed black spines and an ensiform chartaceous entire blade  $1\frac{1}{2}$ -2 ft. long,  $\frac{3}{4}$  in. broad at the middle, green and glabrous above, deciduously white-furfuraceous beneath. Peduncle 2 ft. or more long. Racemes lax, the end one 3-4 in. long, with 2-3 short ones beneath it; rachis furfuraceous; pedicels ascending, the lower  $\frac{1}{3}$ - $\frac{1}{2}$  in. long; bracts as long as the pedicels. Sepals lanceolate,  $\frac{5}{8}$ - $\frac{3}{4}$  in. long. Petals bright red.

Hab. Andes of Peru below Corvico, alt. 4000-6000 ft., with *P. Pearcei*, *Pearce!* Collected in 1866.

12. *P. DEVANSAYANA* André.—Leaves linear, acuminate, 2 ft. long, above  $\frac{1}{2}$  in. broad at the middle, nearly glabrous, convolute when dry, spiny towards the base. Stem with panicle 6-7 ft.

long. Panicle ample; lower branches nearly a foot long, sometimes compound; pedicels ascending,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; bracts shorter than the pedicels. Sepals lanceolate,  $\frac{1}{2}$  in. long. Petals scarlet, scaled at the base,  $1\frac{1}{2}$  in. long. Stamens as long as the petals.

Hab. Central Andes of Ecuador, on the slope of Mt. Chimborazo, alt. 6000–7000 ft., *André* 4700. Near *P. alta* Hassk.

13. *P. ALTA* Hassk. Retz. ii. 5; Baker in Bot. Mag. t. 6606 (M.D.). *P. ramosa* K. Koch Monogr. 5, non Jacq. *P. Skinneri* and *intermedia* Hort.—Acaulescent. Leaves 12–20 to a stem, linear, 2–3 ft. long,  $\frac{3}{4}$ –1 in. broad at the middle, very acuminate, thin in texture, green and glabrous above, white-furfuraceous beneath. Peduncle 2–3 ft. long below the inflorescence; lower bract-leaves with long points. Racemes many, very lax, forming a deltoid panicle; lower pedicels  $\frac{1}{2}$ – $\frac{1}{3}$  in. long, ascending or spreading; bracts lanceolate, not longer than the pedicels. Sepals lanceolate, reddish,  $\frac{3}{4}$ – $\frac{7}{8}$  in. long. Petals bright red, 2 in. long, minutely scaled at the base. Stamens as long as the petals.

Hab. West Indies; Porto Rico, *Eggers* 617! *Sintenis* 475! 1586!; *Dominica*, *Imray*! *Ramage*!; *Trinidad*, *Fendler* 839! Described from a plant that flowered at Kew, July, 1881. Very near *P. bromeliæfolia*, from which it differs by its more compound inflorescence and shorter pedicels. Frequent in cultivation.

14. *P. JACKSONI* Hook. in Bot. Mag. t. 4540. *Lamproconus Jacksoni* Lemaire Jard. Fleur. t. 127.—Acaulescent. Leaves in a dense tuft, linear, sessile, a foot or more long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the middle, spine-margined, green and glabrous above, white-furfuraceous beneath. Peduncle short; raceme lax, simple, 6–9 in. long; rachis floccose; lower pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; bracts minute. Sepals reddish, lanceolate,  $\frac{1}{2}$ – $\frac{5}{8}$  in. long. Petals bright red, three times as long as the sepals, scaled at the base. Stamens as long as the petals.

Hab. Mountains of Guatemala. Introduced into cultivation by Mr. Jackson of Kingston, about 1850. *P. humilis* Tenore, judging from the description, may be a narrow-leaved form of this species.

15. *P. SUBPETIOLATA* Baker in Journ. Bot. 1881, 267.—Acaulescent. Leaves densely tufted, furnished with a channelled petiole about a foot long with a few spines towards the base and a linear entire chartaceous blade 2–3 ft. long,  $\frac{1}{2}$  in. broad at the middle, green and naked above, white-furfuraceous beneath. Peduncle above 3 ft. long; lower bract-leaves elongated. Raceme simple, very lax, a foot long; pedicels erecto-patent, the lower  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; bracts small, ovate-cuspidate. Sepals lanceolate, glabrescent,  $\frac{3}{4}$ – $\frac{7}{8}$  in. long. Petals bright red, less than twice as long as the sepals.

Hab. Andes of Eastern Peru near Tarapoto, *Spruce*!

16. *P. BROMELIÆFOLIA* L'Herit. Sert. 7, t. 11; Swartz Fl. Ind. Occ. 1971, t. 12; Bot. Mag. t. 834; Red. Lil. t. 75; Lindl. in Bot. Reg. t. 1011.—Acaulescent. Leaves in a dense tuft, linear, not petioled, 2–3 ft. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the middle, weak in texture, green and glabrous above, white-furfuraceous beneath, spine-margined towards the base. Peduncle about a foot long; lower bract-leaves produced. Raceme very lax, simple or slightly com-

pound; rachis slightly floccose; lower pedicels  $\frac{3}{4}$ -1 in. long; bracts lanceolate, about as long as the pedicels. Sepals lanceolate, reddish, nearly glabrous,  $\frac{3}{4}$ - $\frac{5}{8}$  in. long. Petals bright red, 2 in. long, scaled at the base. Stamens as long as the petals.

Hab. West Indies, especially Jamaica. This is the original species, on which the genus *Pitcairnia* was founded by L'Héritier in 1784. *P. platyphylla* Schrad., is apparently a robust form, with broad leaves.

17. *P. STENOPHYLLA* André Enum. 4.—Rudimentary leaves pectinate,  $\frac{1}{2}$  in. broad. Produced leaves linear, sessile,  $2\frac{1}{2}$ -3 ft. long, spinescent on the edge towards the face, furnished beneath with spreading glanduliform scales. Stem slender, reaching with the inflorescence a length of 4-4 $\frac{1}{2}$  ft.; bract-leaves many. Raceme simple, very lax, a foot long; rachis slightly furfuraceous; bracts lanceolate, the lower reaching nearly to the tip of the calyx; pedicels very short. Sepals lanceolate, an inch long. Petals whitish, scaled at the base, half as long again as the sepals. Stamens as long as the petals.

Hab. Columbia, on the banks of the Rio Magdalena, André 1876.

#### Group of *P. integrifolia*.

18. *P. INERMIS* Meyer in Rel. Haenk. ii. 123, t. 23. *Orthopetalum inerme* Beer Brom. 72.—Acaulescent. Leaves linear, a foot long, under  $\frac{1}{2}$  in. broad, firm in texture for the genus, acuminate, not petioled, destitute of marginal spines, green and glabrous above, white-furfuraceous beneath. Peduncle  $\frac{1}{2}$ -1 ft. long, glabrous; lower bract-leaves long, upper rudimentary. Panicle a foot long, made up of a longer end-raceme and several short ascending branches; pedicels ascending,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long; flower-bracts small, lanceolate. Sepals lanceolate, reddish, glabrous,  $\frac{1}{2}$ - $\frac{5}{8}$  in. long. Petals white, more than twice as long as the sepals, Stamens and style shorter than the petals.

Hab. Andes of Peru, ascending to 6000 ft., Haenke, Mathews 2088! Pearce!

19. *P. SCHIEDEANA* Baker.—Stem-base sheathed by many large ovate brown scarioso entire rudimentary leaves. Produced leaves linear, entire, subpetiolate, white-furfuraceous beneath. Peduncle a foot long; bract-leaves long-pointed, erect. Inflorescence a simple lax raceme nearly a foot long; pedicels ascending, lower  $\frac{1}{2}$ - $\frac{3}{4}$  in. long; bracts lanceolate, upper  $\frac{1}{2}$  in., lower long-pointed,  $1\frac{1}{2}$ -2 in. long. Sepals lanceolate,  $\frac{3}{4}$  in. long. Petals white, twice as long as the sepals.

Hab. Central Mexico; Hacienda de la Laguna Schiede & Deppe! (Herb. Mus. Brit.).

20. *P. MICROCALYX* Baker in Journ. Bot. 1881, 228.—Acaulescent. Leaves linear, indistinctly petioled, 2 ft. long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad at the middle, without marginal spines, green and slightly furfuraceous on the face, thinly white-furfuraceous all over the back. Peduncle a foot long; bract-leaves several, long-pointed. Flowers in a dense simple raceme, 4-5 in. long, 3 in. broad; pedicels erectopatent, the lower  $\frac{1}{4}$ - $\frac{1}{3}$  in. long; bracts lanceolate-acuminate,

equalling or rather exceeding the pedicels. Sepals lanceolate, thinly floccose,  $\frac{1}{2}$  in. long. Petals orange-yellow,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long. Stamens reaching to the tip of the petals.

Hab. Venezuela, *Funck & Schlim* 145! 482! labelled "*P. aurantiaca*" (Herb. Paris).

21. *P. CAMPTOCALYX* André Enum. 4.—Rudimentary leaves pectinate. Produced leaves linear,  $1\frac{1}{2}$  ft. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad, furfuraceous beneath. Stem with inflorescence 2 ft. long; bract-leaves many, lower elongated. Raceme lax, simple, 6–8 in. long; rachis furfuraceous; bracts lanceolate, the lowest an inch long; pedicels ascending, nearly as long as the bracts. Sepals lanceolate,  $1\frac{1}{2}$  in. long. Petals white, scaled at the base, 2– $2\frac{1}{2}$  in. long. Stamens shorter than the petals.

Hab. Western Andes of Columbia, in the valley of the Rio Dagua, *André* 1934. Var. *robusta* André, from the foot of Mount Quindio, differs by its more robust habit, and var. *lutea* André, by its yellow flowers.

22. *P. KEGELIANA* K. Koch inedit.; Baker in Journ. Bot. 1881, 230.—Lower leaves linear, acuminate, entire, about a foot long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad, green and naked above, white-furfuraceous beneath, overtopping the raceme. Peduncle slender,  $\frac{1}{2}$  ft. long, with several long bract-leaves. Raceme simple, moderately dense, about 3 in. long, with a flexuose cottony rachis; pedicels ascending, the lower  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; bracts lanceolate-acuminate, the lower  $\frac{3}{4}$ –1 in. long, the upper much smaller. Sepals lanceolate,  $\frac{3}{8}$ – $\frac{1}{2}$  in. long. Petals bright red, twice as long as the sepals. Stamens not longer than the petals.

Hab. Dutch Guiana. Described from a cultivated specimen in the herbarium of Dr. Karl Koch. Habit of *P. muscosa*. Introduced by Van Houtte in 1853.

23. *P. muscosa* Mart. in Roem et Schultes Syst. Veg. vii. 1240; Hook. in Bot. Mag. t. 4770 (M.D.). *P. Beycalema* Beer Brom. 63. *P. leiotelema* Hort.—Acaulescent. Whole plant not more than a foot high. Leaves 12–20 to a stem, linear, sessile, 6–9 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad, very acuminate, much recurved, green and glabrous on the face, white-furfuraceous on the back, entire. Peduncle 6–9 in. long, slender, densely floccose; lower bract-leaves with long points. Raceme lax, simple, 3–6 in. long; rachis floccose; pedicels ascending, the lower  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; bracts lanceolate,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Sepals lanceolate, glabrous, greenish-red,  $\frac{5}{8}$ – $\frac{3}{4}$  in. long. Petals lingulate, bright red, 2 in. long, not scaled at the base. Stamens as long as the petals.

Hab. Mountains of Central Brazil; first gathered by Martius. Introduced into cultivation at Berlin in 1838. Described from a plant that flowered at Kew, Feb., 1877.

24. *P. PAUCIFLORA* Baker in Journ. Bot. 1881, 230.—Acaulescent. Leaves 6–10 to a stem, with an indistinct petiole and a linear blade 1– $1\frac{1}{2}$  ft. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad at the middle, quite destitute of spines, grass-like in texture, green and glabrous above, furfuraceous beneath. Peduncle slender, above a foot long, with several long-pointed bract-leaves. Raceme simple, very lax,  $\frac{1}{2}$  ft. long, with only 6–9 flowers; rachis slender, cottony; pedicels ascending, the

lower  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; bracts lanceolate, a little longer than the pedicels. Calyx about an inch long, with an oblong tube adnate to the ovary nearly to its tip and not much shorter than the linear segments. Petals bright red, an inch longer than the sepals. Stamens reaching to the tip of the petals.

Hab. British Guiana; banks of the River Quitara, *Schomburgk* 585! Remarkable for its much-adnate calyx. May belong to section *Melinonia* near *P. subjuncta*, but not known in fruit.

25. *P. STAMINEA* Loddiges Bot. Cab. t. 773; Sims in Bot. Mag. t. 2411; Ill. Hort. n. s. t. 205 (M.D.). *Orthopetalum stamineum* Beer Brom. 70.—Acaulescent. Leaves 20–30 to a stem, indistinctly petioled, linear,  $1\frac{1}{2}$ –2 ft. long,  $\frac{1}{4}$ – $\frac{1}{2}$  in. broad, entirely destitute of marginal spines, green and glabrous above, thinly white-furfuraceous beneath. Peduncle slender,  $1\frac{1}{2}$ –2 ft. long; lower bract-leaves long, upper rudimentary. Inflorescence a lax simple raceme 1– $1\frac{1}{2}$  ft. long,  $\frac{1}{2}$  ft. broad when fully expanded; pedicels deflexed, reddish, the lower an inch or more long; bracts green, lanceolate,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Sepals greenish, lanceolate, glabrous,  $\frac{3}{4}$ – $\frac{7}{8}$  in. long. Petals bright red, 2 in. long, rolling up spirally. Stamens and style red, longer than the petals.

Hab. South Brazil; forests about Rio Janeiro, &c., *Burchell*, 2934! *Gardner* 846! *Sello*! *Collie*! Introduced into cultivation about 1820. The alleged locality of New Granada is doubtless a mistake.

26. *P. INTEGRIFOLIA* Ker in Bot. Mag. t. 1462. *P. decora* Dietr. in Allg. Gartenzeit. xv. 352. *P. graminifolia* Hort.—Acaulescent. Leaves linear, not distinctly petioled, 2–3 ft. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the middle, chartaceous, destitute of spines, green and glabrous above, white-furfuraceous beneath. Peduncle slender, above a foot long; lower leaves with long points. Racemes 1–5, very lax, the end one 9–12 in. long; rachises cottony; pedicels ascending,  $\frac{1}{4}$ – $\frac{1}{2}$  in. long; bracts small, lanceolate; sepals lanceolate, nearly naked,  $\frac{1}{2}$ – $\frac{3}{8}$  in. long. Petals an inch longer than the calyx, bright red, scaled at the base. Stamens and style as long as the petals.

Var. MAJOR Regel in Ind. Sem. Hort. Petrop. 1869, 24.—Leaves 3 ft. long, an inch broad. Raceme 2 ft. long.

Hab. St. Lucia, *Anderson*! St. Domingo, *Mayerhoff* 133! Andes of New Granada, *Funck* 58! Columbia, *Moritz* 451! Introduced into cultivation by Lady Amelia Hume about 1810. *P. meridensis* Klotzsch (Merida, *Moritz* 1233!) differs from the type by its broader subpetiolate leaves and longer pedicels.

27. *P. TURCKHEIMI* Donnell Smith in Amer. Bot. Gaz. 1888, 190, t. 24.—Base of the stem swollen, surrounded by ovate brown rigid rudimentary leaves with a pectinate linear tip. Proper leaves few, linear, entire, 6–8 in. long, under  $\frac{1}{2}$  in. broad at the middle, cano-floccose beneath. Peduncle a foot long; bract-leaves with linear free tips. Raceme very lax, simple,  $\frac{1}{2}$  ft. long; pedicels erecto-patent, lower  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; bracts ovate, lower  $\frac{1}{2}$  in. long. Calyx an inch long; sepals lanceolate. Petals narrow, bright red, 3 in. long. Stamens just protruded.

Hab. Guatemala, *Turckheim* 1298.

28. *P. PUNGENS* H.B.K. Nov. Gen. i. 294; Hook. in Bot. Mag. t. 5356.—Acaulescent. Tufts bulb-like at the base, the outer coria-

ceous rudimentary leaves furnished with a rigid linear pectinate point, as in *P. heterophylla*. Produced leaves 6–10, sessile, linear, chartaceous, entire, 1–1½ ft. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad, naked on the face, loosely furfuraceous on the back. Peduncle  $\frac{1}{2}$ –1 ft. long; bract-leaves all small. Raceme dense, simple, 4–8 in. long; pedicels very short, ascending; bracts lanceolate,  $\frac{1}{2}$ –1 in. long. Sepals lanceolate, rather cottony,  $\frac{3}{4}$ – $\frac{7}{8}$  in. long. Petals lingulate, bright red, scaled at the base, 2 in. long. Stamens reaching to the tip of the petals.

Hab. High Andes of Ecuador and New Granada, 9000–11000 ft. Introduced into cultivation by the late I. Anderson Henry, Esq., of Edinburgh, from seeds sent by Professor Jameson.

29. *P. MORITZIANA* K. Koch & Bouché Ind. Sem. Hort. Berol. 1856, App. 4. — Acaulescent. Leaves 20 or more to a stem, not distinctly petioled, linear, entire, 1–1½ ft. long,  $\frac{3}{4}$ –1 in. broad at the middle, chartaceous, green and glabrous above, white-furfuraceous beneath. Peduncle slender, 6–15 in. long. Raceme lax, simple,  $\frac{1}{2}$ –1 ft. long; axis thinly cottony; pedicels ascending, the lower  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; bracts lanceolate,  $\frac{1}{2}$ –1 in. long. Sepals lanceolate, glabrous,  $\frac{3}{4}$  in. long. Petals lingulate, pale red with a yellow tip, 2–2½ in. long, not scaled at the base. Stamens as long as the petals. Style a little exerted.

Hab. Mountains of Venezuela, *Moritz*. Described mainly from a plant flowered by Messrs. Veitch in March, 1874.

30. *P. ARANEOSA* Baker in Journ. Bot. 1882, 231.—Produced leaves with a channelled petiole half a foot long and a linear chartaceous blade 2–3 ft. long,  $\frac{3}{4}$ –1 in. broad at the middle, green and glabrous above, white-furfuraceous beneath, both destitute of spines. Peduncle 2 ft. or more long, conspicuously furfuraceous. Flowers in a rather dense raceme a foot long and two short side ones; rachises densely white-cottony; pedicels ascending,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; bracts lanceolate, rather longer than the pedicels. Sepals lanceolate-acuminate, an inch long, densely cottony towards the base. Petals bright red, half as long again as the sepals. Stamens as long as the petals.

Hab. New Granada; province of Ocana, *Schlim* 139!

31. *P. MEGASEPALA* Baker in Journ. Bot. 1881, 229. — Acaulescent. Leaves with a distinct channelled petiole a foot long and a linear chartaceous blade 2–3 ft. long, nearly an inch broad, green on the upper surface, white-furfuraceous beneath, destitute of teeth except at the dilated base of the petiole. Peduncle 2–3 ft. long; lower bract-leaves long-pointed. Raceme simple, or with a short fork, a foot long, dense in the upper half; rachis very cottony; pedicels ascending, the lower  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; bracts lanceolate,  $\frac{3}{4}$ –1 in. long. Sepals lanceolate-acuminate, very cottony,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long. Petals bright red, an inch longer than the sepals. Stamens shorter than the petals.

Hab. Andes of New Granada; La Paila, *Holton* 153! Ocana, alt. 5000 ft., *Kalbrejer* 661!

Group of *P. SUAVEOLENS*.

32. *P. SUAVEOLENS* Lindl. in Bot. Reg. t. 1069. *P. micrantha* Lindl. in Bot. Reg. xxix. Misc. 44. *P. laevis* Beer Brom. 60? (*Tillandsia laevis* Vellozo Fl. Flum. iii. t. 126).—Acaulescent. Leaves linear, chartaceous,  $1\frac{1}{2}$  ft. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the middle, without teeth, green and glabrous on both surfaces. Peduncle a foot long, glabrous; bract-leaves with produced tips. Inflorescence a simple moderately dense raceme 6–9 in. long; rachis glabrous; pedicels ascending,  $\frac{1}{4}$ – $\frac{1}{2}$  in. long; bracts lanceolate, glabrous, the lower an inch or more long. Sepals lanceolate, glabrous, an inch long. Petals lingulate, white, twice as long as the sepals, scaled at the base. Stamens shorter than the petals.

Hab. Mountains of South Brazil, *Gardner* 5895! Introduced into cultivation in 1826.

33. *P. ALBIFLOS* Herb. in Bot. Mag. t. 2642 (M.D.). *P. odorata* Regel Gartenfl. t. 114. *Tillandsia Schuchii* Fenzl in Otto & Dietr. Allg. Gartenzeit. xiv. 266. *Cochliopetalum albiflos* and *Schuchii* Beer Brom. 68–69.—Acaulescent or shortly caulescent. Leaves many to a tuft, obscurely petioled, linear, chartaceous, entire,  $1\frac{1}{2}$ –2 ft. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the middle, green and glabrous on both surfaces. Peduncle slender, erect, glabrous,  $1\frac{1}{2}$ –2 ft. long; lower bract-leaves with produced tips. Raceme simple, lax, 6–12 in. long; rachis slightly pilose; pedicels spreading or deflexed,  $\frac{1}{2}$ –1 in. long; bracts small, lanceolate. Sepals lanceolate, green, glabrous,  $\frac{3}{4}$  in. long. Petals white, 2 in. long, rolling up spirally. Stamens as long as the petals. Style exerted.

Hab. Mountains of S. Brazil, *Glaziou* 8022! 8023! *Miers*! Introduced into cultivation about 1826. *P. elata* Liebm. Ind. Sem. Hort. Hafn. 1849, 14, agrees with this, judging from the description, but is said to come from East Mexico.

34. *P. CANALICULATA* Baker.—Leaves linear, entire, complicate, 4–8 in. long,  $\frac{1}{8}$  in. broad low down, green beneath. Peduncle slender, under a foot long. Inflorescence a simple very lax few-flowered raceme; pedicels erecto-patent  $\frac{3}{4}$ – $1\frac{1}{2}$  in. long; flower-bracts lanceolate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Sepals linear,  $\frac{3}{4}$  in. long. Petals bright red, 2 in. long.

Hab. Southern Brazil, *Sello* 53! (Herb. Paris) 942! (Herb. Mus. Brit.).

35. *P. JALISCANA* S. Wats. in Proc. Amer. Acad. xxii. 456; Garden and Forest i. t. 35.—Acaulescent. Leaves 8–10 to a stem, linear,  $\frac{1}{2}$  ft. long,  $\frac{1}{8}$  in. broad low down, tapering to the point, green on both surfaces, without marginal spines, but bordered with small rather stiff hairs. Peduncle  $\frac{1}{2}$  ft. long; bract-leaves small, adpressed. Flowers 8–10 in a simple raceme 3–4 in. long; pedicels short; lower bracts an inch long. Sepals lanceolate, bright red,  $\frac{7}{8}$  in. long. Petals bright red, twice as long as the sepals. Style exerted beyond the tip of the petals.

Hab. North Mexico; province of Jalisco, on the banks of the Rio Blanco, *Palmer* 348! Discovered in 1886.

36. *P. PALMERI* S. Wats. in Proc. Amer. Acad. xxii. 456.—Acaulescent. Leaves linear, chartaceous, green on both surfaces,

$\frac{1}{2}$  ft. long,  $\frac{1}{4}$  in. broad, without any marginal prickles; outer rudimentary leaves with a few spines. Peduncle very short. Raceme simple, secund; pedicels  $\frac{1}{4}$  in. long; bracts small. Sepals lanceolate,  $\frac{5}{8}$ – $\frac{3}{4}$  in. long. Petals bright red, twice as long as the sepals.

Hab. North Mexico; province of Jalisco, on the banks of the Rio Blanco, *Palmer* 16! Discovered in 1886.

37. *P. CONCOLOR* Baker in Journ. Bot. 1881, 269.—Acaulescent. Outer rudimentary leaves with a rigid pectinate tip. Produced leaves linear, not petioled, above a foot long,  $\frac{3}{4}$ –1 in. broad at the middle, chartaceous, entire, green and glabrous on both surfaces. Peduncle about a foot long, floccose; all the leaves small and bract-like. Raceme lax, simple, 3–6 in. long; rachis densely floccose; pedicels ascending, the lower  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; bracts lanceolate, floccose, the lower  $\frac{3}{4}$ –1 in. long. Sepals lanceolate acuminate, floccose, an inch long. Petals bright red, twice as long as the sepals. Stamens and style shorter than the petals.

Hab. Andes of Peru at Canta, *Maclean*! Allied to *P. australis*, with pectinate rudimentary leaves as in *P. pungens*.

38. *P. CALDASIANA* Baker.—Leaves thin, linear, entire, not lepidote beneath, 2 ft. long,  $\frac{1}{2}$  in. broad at the middle. Peduncle as long as the leaves. Inflorescence a very lax simple raceme a foot long; pedicels erecto-patent, lower  $\frac{1}{2}$  in. long; lower bracts lanceolate,  $\frac{1}{2}$  in. long, upper ovate. Sepals lanceolate, an inch long. Petals bright red, above 3 in. long.

Hab. Central Brazil; Caldas, *Regnell* 1253!

39. *P. SCHLIMI* Baker.—Leaves thin, linear, entire, indistinctly petioled, 2–3 ft. long,  $\frac{3}{4}$ –1 in. broad at the middle, not furfuraceous beneath. Peduncle 1–1 $\frac{1}{2}$  ft. long; bract-leaves small. Inflorescence a dense simple raceme 3–4 in. long; pedicels ascending, lower  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; bracts small, lanceolate. Sepals lanceolate,  $\frac{1}{2}$  in. long. Petals bright red,  $\frac{3}{4}$ –1 in. longer than the sepals.

Hab. Venezuela, *Funck & Schlim* 144!

40. *P. SELLOANA* Baker.—Leaves linear, 2 $\frac{1}{2}$ –3 ft. long, sessile, entire,  $\frac{1}{2}$  in. broad at the middle, not furfuraceous beneath. Peduncle 2 ft. long; bract-leaves with long free points. Inflorescence a dense raceme,  $\frac{1}{2}$  ft. long; pedicels floccose, ascending, the lower  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; bracts lanceolate, the lower an inch long. Sepals lanceolate,  $\frac{1}{2}$  in. long. Petals bright red, an inch longer than the sepals. Stamens shorter than the petals.

Hab. South Brazil, *Sello* 1317! 5346! (Herb. Berol.). Near *P. suaveolens*.

41. *P. CORCOVADENSIS* Wawra Bot. Ergeb. 160, t. 27.—Acaulescent. Leaves 10–12 to a stem, with a short channelled petiole half a foot long and a linear chartaceous blade 2–3 ft. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the middle, green and glabrous on both surfaces, entirely free from prickles. Peduncle slender, 1–1 $\frac{1}{2}$  ft. long; lower bract-leaves with long points. Raceme lax, simple; pedicels ascending,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; bracts small, lanceolate. Sepals lanceolate, glabrous,

$\frac{3}{4}$ – $\frac{7}{8}$  in. long. Petals bright red,  $2\frac{1}{2}$  in. long, scaled at the base. Stamens nearly as long as the petals.

Hab. Mountains of South Brazil; Corcovado, &c., Wawra 3, Glaziou 12237! Guillemin 769!

42. *P. CINNABARINA* A. Dietr. in Allg. Gartenzeit. xviii. 202.—Acaulescent. Leaves linear, not petioled,  $1\frac{1}{2}$  ft. long,  $\frac{5}{8}$ – $\frac{3}{4}$  in. broad at the middle, without marginal spines, chartaceous, green on both sides, glabrous above, with only a few scattered lepidote brown spots beneath. Peduncle a foot long, naked; bract-leaves small. Raceme dense, simple,  $\frac{1}{2}$  ft. long; rachis dotted with lepidote scales, not floccose; pedicels ascending, the lower  $\frac{3}{4}$ –1 in. long; bracts lanceolate, as long as the pedicels. Sepals lanceolate, naked,  $\frac{3}{4}$ – $\frac{7}{8}$  in. long. Petals lingulate, bright red, 2 in. long, not scaled at the base. Stamens as long as the petals.

Hab. Brazil. Described from dried specimens in the herbarium of the late Dr. Karl Koch.

43. *P. SPLENDENS* Warsz. in Otto & Dietr. Allg. Gartenzeit. xix. 176.—Acaulescent. Leaves linear, not distinctly petioled, 2 ft. long,  $\frac{1}{2}$  in. broad at the middle, green and glabrous on both surfaces, entire. Peduncle much shorter than the leaves; bract-leaves small, scariose, imbricated. Inflorescence a dense simple oblong spike  $\frac{1}{2}$  ft. long, 2 in. diam.; flower-bracts ovate, acute, the lower  $1\frac{1}{2}$  in. long; rachis densely pubescent; pedicels obsolete. Sepals linear, pubescent, above  $1\frac{1}{2}$  in. long. Petals bright red, an inch longer than the calyx. Stamens longer than the petals.

Hab. Central America. Described from a specimen dried from the Berlin Garden in May, 1851.

44. *P. KARWINSKIANA* Schultes fil. Syst. Veg. vii. 1239 (M.D.). *P. ringens* Klotzsch in. Ic. Rar. Berol. 63, t. 23; Regel Gartenfl. t. 53. *P. Warszewicziana*, *montalbensis* and *fulgens* Hort.—Acaulescent, with a swollen base. Leaves linear, not distinctly petioled,  $1\frac{1}{2}$ –2 ft., long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the middle, chartaceous, green and glabrous on both surfaces, usually destitute of marginal teeth. Peduncle  $1$ – $1\frac{1}{2}$  ft. long, slightly floccose; bract-leaves small, adpressed. Raceme simple, lax or moderately dense, 6–12 in. long; rachis floccose; pedicels ascending,  $\frac{1}{4}$ – $\frac{1}{2}$  in. long; bracts lanceolate, twice as long as the pedicels. Sepals lanceolate, naked, reddish,  $\frac{3}{4}$ –1 in. long. Petals bright red, 2– $2\frac{1}{2}$  in. long, scaled at the base. Stamens as long as the petals. Style finally exerted.

Hab. Central Mexico, Karwinski, Botteri 911! Finck! Uhde 154! Described from a plant flowered by Messrs. Veitch, June, 1877.

45. *P. LAXISSIMA* Baker. — Leaves with a slender unarmed petiole half a foot long and a chartaceous linear acuminate blade 2–3 ft. long, under an inch broad at the middle, green and glabrous on both surfaces. Peduncle simple, a foot or more long. Inflorescence a very lax simple raceme a foot long; rachis slender, glabrous; pedicels ascending, the lower 2 in. long; bracts very small. Calyx scarcely at all adnate to the ovary; sepals  $1\frac{3}{4}$  in.

long. Petals bright red, an inch longer than the sepals. Stamens not longer than the petals.

Hab. Andes of Popayan, Ecuador, *Lehmann*!

46. *P. ALBORUBRA* Baker.—Leaves with a non-spinose channelled petiole a foot long and a chartaceous entire acuminate linear blade 2 ft. long, under an inch broad at the middle, green and nearly glabrous both above and beneath when mature. Peduncle slender, simple, 1-1½ ft. long. Raceme very lax, simple, half a foot long; pedicels arcuate-ascending, the lower an inch long; bracts very small, ovate. Ovary adherent to a campanulate calyx-tube  $\frac{1}{4}$ - $\frac{1}{3}$  in. long; sepals oblong-lanceolate, obtuse,  $\frac{3}{4}$  in. long. Petals more than twice as long as the sepals, red at the base, white towards the tip. Stamens not protruded.

Hab. New Granada; province of Antioquia, alt. 6000 ft., *Kalbreyer* 1640!

47. *P. LECHLERI* Baker in *Journ. Bot.* 1881, 269.—Whole plant about 4 ft. high. Outer rudimentary leaves with a pectinate rigid tip as in *P. pungens*. Produced leaves linear, entire, not distinctly petioled, 1½-2 ft. long,  $\frac{3}{4}$ -1 in. broad at the middle, green and glabrous on both surfaces. Peduncle 2 ft. long; bract-leaves all small, the lower spine-edged. Racemes several, arranged in a lax panicle; end one dense in the upper half, 8-10 in. long; rachis not at all floccose; pedicels very short; bracts lanceolate, the lower  $\frac{3}{4}$ -1 in. long. Sepals lanceolate, glabrous,  $\frac{1}{2}$  in. long. Petals bright red, half as long again as the sepals. Stamens as long as the petals.

Hab. Eastern declivity of the Peruvian Andes at Sachapata, *Lechler* 3132!

48. *P. SPATHACEA* Griseb. *Sym. Fl. Argent.* 1878, 329.—Leaves linear, sessile, 2-3 ft. long, an inch broad at the middle, spine-margined towards the base, slightly furfuraceous on the upper surface, glabrescent beneath. Racemes several, 6-8 in. long, forming a lax panicle; pedicels very short; bracts lanceolate,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Sepals lanceolate, very acuminate, an inch long. Petals  $\frac{1}{4}$  in. longer than the calyx, not scaled at the base.

Hab. Argentine Republic; banks of the Rio Primero, *Lorentz*.

49. *P. TARAPOTENSIS* Baker.—Acaulescent. Outer rudimentary leaves pectinate. Leaves indistinctly petioled, linear, 2 ft. long,  $\frac{1}{2}$  in. broad at the middle, chartaceous, green and glabrous on both sides, armed with hooked black spines towards the base. Peduncle slender, a foot long. Racemes several, very lax, not more than 3-4 in. long, forming a rhomboid panicle; pedicels ascending,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long; bracts minute. Sepals lanceolate,  $\frac{1}{2}$  in. long. Petals bright red, 1¼ in. long.

Hab. Andes of North-Eastern Peru at Tarapoto, *Spruce*!

#### Group of *P. AUSTRALIS*.

50. *P. GUARITERMÆ* André *Enum.* 4.—Rudimentary leaves not spine-edged. Produced leaves linear-lanceolate, 2½ ft. long, above an inch broad at the middle, spineless, glabrous. Stem robust,

with the inflorescence 2 ft. long; flower-bracts imbricated. Raceme simple, very dense,  $\frac{1}{2}$  ft. long; rachis white-cottony; pedicels very short; bracts linear, the lower  $\frac{1}{2}$  in. long. Sepals lanceolate, nearly an inch long. Petals scarlet, half as long again as the calyx, scaled at the base. Stamens a little shorter than the petals.

Hab. Eastern Andes of Columbia, on metamorphic rocks near Guariterma, *André* 1209.

51. *P. POORTMANI* *André* Enum. 4.—Leaves lanceolate, 2–2 $\frac{1}{2}$  ft. long, above an inch broad, spine-edged towards the base, glabrous beneath. Stem with inflorescence 4–5 ft. long. Panicle lax, deltoid, a foot long; branches short, bearing at the tip a lax raceme of 5–6 flowers; pedicels ascending,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; bracts lanceolate, as long as the pedicels. Sepals lanceolate, an inch long. Petals red, scaled at the base, half as long again as the sepals. Stamens rather shorter than the petals.

Hab. New Granada, in the Cauca valley, *André* 2937 bis. Ecuador, *Poortman*.

52. *P. CARACASANA* Baker.—Leaves ensiform, not distinctly petioled, above 2 ft. long, 1 $\frac{1}{4}$  in. broad at the middle, green on both surfaces, entirely destitute of marginal spines. Peduncle stout, shorter than the leaves; bract-leaves small, scariose. Inflorescence a moderately dense simple raceme 6–9 in. long; bracts small, lanceolate, the lower  $\frac{1}{2}$  in. long; pedicels ascending,  $\frac{1}{3}$ – $\frac{1}{4}$  in. long. Sepals  $\frac{1}{2}$ – $\frac{3}{8}$  in. long. Petals bright red, an inch longer than the calyx.

Hab. Caracas, *Gollmer* 268! (Herb. Reg. Berol.).

53. *P. MORELII* Lemaire in Hort. Univ. vii. 231, tab. 289. *P. australis* and *rubicunda* K. Koch.—Stem bulbiform at the base. Leaves few in a rosette, not distinctly petioled, lanceolate, 1 $\frac{1}{2}$ –2 ft. long, 1–1 $\frac{1}{4}$  in. broad at the middle, quite destitute of spines, green and glabrous on both surfaces. Peduncle 1–1 $\frac{1}{2}$  ft. long; lower bract-leaves with produced foliaceous tips. Inflorescence a dense simple raceme 6–9 in. long; pedicels ascending, lower  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; bracts lanceolate, green, 1–1 $\frac{1}{2}$  in. long. Calyx bright red, glabrous, an inch long; sepals acute. Petals bright red, more than twice as long as the calyx. Stamens as long as the petals.

Hab. South and Central Brazil, *Claussen*! *Miers* 4078! *Glaziou* 12238! 13256! Described from a plant that flowered at Kew, Dec., 1878.

54. *P. NUBIGENA* Planch. in Flore des Serres, t. 847.—Acaulescent. Leaves with a distinct petiole and a lanceolate chartaceous blade 3 ft. long, 1–1 $\frac{1}{4}$  in. broad at the middle, green and glabrous on both sides; spines none. Peduncle 2–3 ft. long. Raceme simple, moderately dense, 6–8 in. long; pedicels arcuate or erectopatent,  $\frac{1}{2}$ –1 in. long; bracts small, lanceolate. Sepals lanceolate, bright red, an inch long. Petals bright red, scaled at the base, more than twice as long as the calyx. Stamens shorter than the petals.

Hab. Venezuela; Mountains of Merida, *Funck & Schlim* 1213! 1214! *Moritz* 1233, ex parte! Allied to *P. Moreli*.

55. P. LEHMANNI Baker in Journ. Bot. 1881, 273. *P. orgyalis* Baker *loc. cit.*—Leaves lanceolate, not distinctly petioled, 2–3 ft. long,  $1\frac{1}{2}$  in. broad at the middle, firm in texture for the genus, very acuminate, green and glabrous on both surfaces, margined with small spines towards the base. Peduncle with inflorescence 5–6 ft. long; lower stem-leaves above a foot long. Racemes many, dense, peduncled, ascending, forming a lax panicle, the end one 6–9 in. long; rachises glabrous, bright red; lower pedicels  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; bracts very small, lanceolate. Calyx glabrous  $\frac{5}{8}$  in. long. Petals bright red, more than twice as long as the calyx. Stamens shorter than the petals.

Hab. Andes of Ecuador; Montana de Canelos, *Spruce* 5399! *André* 4700. New Granada; Pasto, *Lehmann*! Andes of Bolivia, *Weddell* 3637!

56. P. DENDROIDEA *André* Enum. 4.—Leaves lanceolate, 3–3½ ft. long, nearly 2 in. broad at the middle, naked beneath. Peduncle with inflorescence 6–7 ft. long. Panicle very lax; branches spreading, bearing a dense raceme towards the tip. Sepals red, Petals not seen.

Hab. Andes of South Columbia, on the banks of the Rio Nambi, *André* 3361.

57. P. KALBREYERI Baker in Journ. Bot. 1881, 273. — Leaves with a distinct channelled petiole a foot long, margined with a few spines and a lanceolate entire chartaceous blade 2–3 ft. long,  $2\frac{1}{2}$  in. broad at the middle, green and glabrous on both surfaces. Peduncle 3–4 ft. long; bract-leaves small, distant, adpressed. Raceme lax, simple, a foot long; lower flowers deflexed; lower pedicels  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; bracts about as long as the pedicels. Calyx green, glabrous, an inch long; sepals lanceolate. Petals bright red, above 2 in. long. Stamens as long as the petals.

Hab. New Granada; Mountains of Ocana, alt. 4500–5000 ft., *Kalbreyer* 1103! Leaves like those of a *Neumannia*, with the ordinary flowers of *Eupitcairnia*.

58. P. MACROBOTRYS *André* Enum. 4.—Caulescent, with a stem 3–4 ft. long. Leaves lanceolate,  $2\frac{1}{2}$ –3 ft. long, nearly 3 in. broad at the middle, minutely spiny towards the base, glabrous beneath. Stem stout, slightly furfuraceous, 3–3½ ft. long, inflorescence included; upper leaf-bracts oblong, acute. Inflorescence a simple moderately dense raceme  $1\frac{1}{2}$  ft. long; bracts lanceolate, reddish-green at the base, the lower above an inch long; pedicels erecto-patent,  $\frac{1}{2}$  in. long. Sepals lanceolate, nearly an inch long. Petals scarlet, bordered with a white line, above 2 in. long.

Hab. Andes of South Columbia; steep cliffs of the Rio Juanambu, *André* 2892.

59. P. LUTEA Hort. Linden.—Leaves thin, entire, lanceolate, sessile, 2–3 ft. long,  $1\frac{1}{4}$  in. broad at the middle, not furfuraceous beneath. Inflorescence a simple dense raceme, 3–4 in. long; pedicels short, erecto-patent; bracts lanceolate, lower an inch long. Sepals lanceolate, an inch long. Petals yellow, twice as long as the sepals.

Hab. Country unknown. Described from a specimen grown at the Jardin des Plantes in 1853. Near *P. bracteata sulphurea*.

60. *P. ANDREANA* Linden Cat. 1873; Ill. Hort. n. s. t. 139; Baker in Bot. Mag. t. 6480 (M.D.). *P. lepidota* Regel in Act. Hort. Petrop. ii. 435.—Whole plant under a foot high. Leaves 5–6 to a stem, not distinctly petioled, lanceolate, chartaceous, drooping, 16–20 in. long, 1–1½ in. broad at the middle, narrowed to a long point and ⅓ in. above the base, white all over beneath, green with copious scattered lepidote spots above. Peduncle 4–6 in. long, leafy up to the top. Raceme simple, erect, moderately dense, 4–6 in. long; pedicels ascending, the lower ¼–⅓ in. long; flower-bracts small, green, lanceolate. Sepals green, lepidote, lanceolate, under an inch long. Petals 2½–2¾ in. long, narrow, bright red with a yellow tip. Stamens as long as the petals.

Hab. Venezuela and New Granada. Introduced into cultivation by Roezl about 1872. Described from a plant that flowered at Kew, July, 1879.

61. *P. FULGENS* Dcne. in Cat. Linden, 1850, 18; Dietr. in Allgem. Garten. xix. 26. *P. Decaisnei* K. Koch Monogr. 5. *P. L'Herminieri* Hort.—Leaves with a channelled petiole a foot long, sometimes but not always margined with small spines and a lanceolate chartaceous blade 2–3 ft. long, 1–1¼ in. broad at the middle, green above, persistently white-furfuraceous beneath. Peduncle 2–2½ ft. long, slightly floccose; lower bract-leaves long and distinctly petioled. Raceme dense, simple, erect, a foot long; pedicels ascending; lower ¾–1 in. long; bracts lanceolate-acuminate; lower 1–1½ in. long. Sepals lanceolate, nearly an inch long. Petals bright red, 2–2½ in. long, scaled at the base. Stamens not longer than the petals.

Hab. Guadeloupe, *L'Herminier*. Introduced into cultivation by Linden in 1850. Described from a specimen in the herbarium of Dr. Karl Koch. The plant called *P. fulgens* in the Morren drawings has deflexed pedicels and small bracts.

62. *P. BRACHYSPERMA* André Enum. 4.—Rudimentary leaves ovate, not spine-margined. Produced leaves lanceolate, 2–2½ ft. long, 2 in. broad at the middle, subpetiolate, white-furfuraceous beneath. Stem with inflorescence 2–2½ in. long, slightly floccose; upper bract-leaves short, adpressed. Raceme short, simple, moderately dense; pedicels ⅓ in. long; lower bracts nearly an inch long. Sepals lanceolate, an inch long. Petals scarlet, scaled at the base, half as long again as the sepals. Stamens shortly exerted. Seeds shortly tailed at each end.

Hab. Eastern Andes of Columbia, near the Cascade of Chirajara, *André* 1088.

63. *P. REFLEXIFLORA* André Enum. 4.—Leaves linear-lanceolate, not spine-margined, 2½–3 ft. long, an inch or more broad at the middle, white-furfuraceous beneath. Stem with inflorescence 2½–3 ft. long, slightly cottony; bract-leaves numerous; lower very long. Raceme dense, simple, 4–6 in. long; rachis cottony; flowers at first spreading, finally reflexed; bracts linear-lanceolate, ½–¾ in. long; pedicels very short. Sepals oblong-lanceolate, ⅓–½ in. long. Petals

bright red, an inch long, not scaled at the base. Stamens as long as the petals.

Hab. Central Andes of Ecuador, south of Riobamba, *André* 4334.

64. *P. FLAMMEA* Lindl. in Bot. Reg. t. 1092 (M.D.). *P. Olfersii* Link in Verhand. Ver. Bef. Gartenb. vii. 363, t. 3. — Acaulescent. Leaves lanceolate, 2–3 ft. long, 1–1½ in. broad at the middle, weak, flaccid, not distinctly petioled, without spines, bright green above, furfuraceous beneath. Peduncle 1½–2 ft. long; lower leaves with long points. Raceme simple, moderately dense, ½–1 ft. long; rachis thinly furfuraceous; pedicels ascending, ¼–½ in. long; bracts lanceolate, green, the lower 1–1½ in. long. Sepals lanceolate, red, nearly an inch long. Petals bright red, more than twice as long as the sepals, scaled at the base. Stamens about as long as the petals.

Hab. Woods of South Brazil; Organ Mountains, &c., *Gardner* 5896! *Glaziou* 8021! Introduced into cultivation by Mr. Harrison, of Aigburth, in 1826.

65. *P. ROEZLI* E. Morren in Belg. Hort. xxxv. 285, t. 18, 19 (M.D.).—Acaulescent. Leaves with an entire channelled petiole and a lanceolate chartaceous blade 2–3 ft. long, 1–1¼ in. broad at the middle, bright green above, thinly white-furfuraceous beneath. Peduncle 2 ft. long; bract-leaves with long recurving tips. Raceme dense, simple, 6–9 in. long; pedicels ascending, ¼–½ in. long; bracts lanceolate, green, the lower 1–1½ in. long. Sepals lanceolate, bright red, nearly an inch long. Petals bright red, more than twice as long as the sepals, scaled at the base. Stamens and scarlet style just protruded beyond the tip of the petals.

Hab. Andes of Peru. Introduced into cultivation by Roezl about 1882. Very near *P. fulgens* Dene. Described from a living specimen sent by Dr. Edmund Goetze, Nov., 1887, from the Botanic Garden of Griefswald in Pomerania.

66. *P. KLOTZSCHIANA* Baker. — Leaves not distinctly petioled, lanceolate, 2–3 ft. long, 1–1½ in. broad at the middle, acuminate, chartaceous, spine-edged towards the base, green and glabrous above, white-furfuraceous beneath. Peduncle 2 ft. long; bract-leaves long and produced. Racemes lax, simple or slightly compound; axis slightly furfuraceous; pedicels ascending, ¼–½ in. long; bracts small, lanceolate. Sepals lanceolate, reddish, ¾–7⁄8 in. long. Petals bright red, scaled at the base, 2 in. long.

Hab. Venezuela; La Guayra, *Moritz* 1232! (*P. Moritziana* Klotzsch inedit. non K. Koch). Nearly allied to *P. latifolia*.

67. *P. PULVERULENTA* Ruiz et Pavon Fl. Peruv. iii. 36, t. 259. *P. paniculata* R. & P. Fl. Peruv. t. 260. *P. longifolia* Hook. in Bot. Mag. t. 4775. *P. excelsa* E. Morren in Belg. Hort. 1875, 381. — Whole plant 6–12 ft. high. Caudex sometimes a span long. Leaves lanceolate, not distinctly petioled, 3–4 ft. long, 1½–2 in. broad at the middle, spine-margined towards the base, green and glabrous above, white-furfuraceous beneath. Peduncle elongated; lower bract-leaves produced. Racemes many, arranged in a lax panicle, ½–1 ft. long; rachises floccose; pedicels ¼–½ in. long;

bracts minute, lanceolate. Sepals lanceolate, slightly floccose, under an inch long. Petals bright red, 2 in. long, scaled at the base. Stamens about as long as the petals.

Hab. Andes of Peru, ascending to 16,000 ft., *Pavon!* *Mathews* 2089! 3032! Bolivia; Yungas, 6000 ft., *Rusby* 2844! Introduced into cultivation by Nation about 1850, and by Roezl twenty years later. Allied to *P. bromeliaefolia* and *alta*. *P. Klabochorum* Hort., which I have not seen, is one of these tall copiously-panicked species.

68. *P. STRICTA* André Enum. 5.—Leaves erecto-patent above, 5 ft. long,  $1\frac{1}{2}$  in. broad at the middle, white-furfuraceous beneath, with a brown clasping spine-margined base, subpetiolate in the lowest foot. Flowers unknown.

Hab. Southern Columbia at Piedra Ancha, *André* 3335.

69. *P. CORALLINA* Linden & André; Carrière in Rev. Hort. 1875, 251, with figure; Baker in Bot. Mag. t. 6600 (M.D.).—Acaulescent. Leaves about 6 to a rosette, with a channelled spine-edged petiole above a foot long, and a lanceolate-acuminate blade 2-3 ft. long, 3-4 in. broad at the middle, plicate like that of a *Curculigo*, green and glabrous on the face, thinly white-furfuraceous on the back, at first erect, afterwards recurving. Peduncles bright red, cernuous, about a foot long; bract-leaves all small and scariose. Raceme dense, simple, a foot long; pedicels short, cernuous, bracts small, lanceolate. Sepals lanceolate, glabrous, bright red, an inch long. Petals lingulate, 2 in. longer than the calyx, also bright coral-red. Scaled at the base. Stamens as long as the petals.

Hab. New Granada; province of Choco. Introduced by Linden about 1874. Described from a plant flowered by Sir G. Macleay, March, 1881. Very distinct by its dense cernuous spike and broad plicate *Curculigo*-like leaves. *P. Maroni* Rev. Hort. 1885, 108, is a hybrid between this species and *Atensteinii* raised by M. Maron, and *P. Darblayana*, another nearly allied hybrid.

70. *P. XANTHOCALYX* Mart. in Ind. Sem. Hort. Monac. 1848, Adn. 4 (M.D.). *P. flavescens* Baker in Bot. Mag. t. 6318. *Cochliopetalum flavescens* Beer Brom. 69.—Acaulescent. Leaves 20 or more to a stem, sessile, ensiform, 2-3 ft. long,  $1-1\frac{1}{2}$  in. broad at the middle, narrowed gradually to both ends, flaccid, bright green above, persistently white-furfuraceous on the back. Peduncle erect,  $1\frac{1}{2}$ -2 ft. long, thinly pruinose; lower bracts with produced points. Raceme simple, erect, lax in the lower half, 1-2 ft. long; rachis thinly floccose; lower pedicels ascending, central spreading,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long; bracts green, lanceolate,  $\frac{1}{2}$ -1 in. long. Sepals lanceolate, yellowish-white, under an inch long. Petals lingulate, primrose-yellow, 2 in. long. Style finally exerted.

Hab. Brazil. Described from a plant that flowered at Kew, April, 1877.

71. *P. PLUMIERI* Baker. *Brocchinia Plumieri* Griseb. Fl. Brit. West. Ind. 593.—Leaves not seen. Panicle rhomboid,  $1\frac{1}{2}$ -2 ft. long; branches spreading or decurved, the central 4-5 in. long, compound at the base; flowers moderately dense, nearly sessile, deflexed; flower-bracts ovate,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long. Sepals lanceolate,  $\frac{3}{4}$  in. long. Petals yellow, scarcely longer than the sepals. Stamens not protruded. Capsule scarcely longer than the calyx.

Hab. *Dominica*; epiphytic on forest trees at Landat, *Imray* 208! *Ramage*! St. Kitts, *Swartz* teste *Grisebach*. May be identical with *P. penduliflora* A. Rich.

72. *P. PENDULIFLORA* A. Rich. in *Sagra Fl. Cub.* iii. 262.—Leaves lanceolate, 2–3 ft. long, 2–2½ in. broad, white beneath, entire or obscurely dentate. Stem 3 ft. long. Spikes many, dense-flowered, horizontal or drooping; flowers sessile; flower-bracts ovate-acuminate, nearly as long as the flower.

Hab. *Cuba*, *Ramon de la Sagra*. Known to me only from a brief description. May be identical with *P. Plumieri*.

73. *P. GOUDOTIANA* André Enum. 4.—Caulescent, with a stem 3 ft. or more long. Leaves lanceolate-acuminate, not distinctly petioled, 3–4 ft. long, above an inch broad at the middle, spinose on the edge, white-furfuraceous beneath. Stem with inflorescence above 3 ft. long. Panicle ample; branches few, spreading, a foot or more long, laxly racemose; flower-bracts ovate, yellowish-white, rather longer than the ascending pedicels, which are ⅓–½ in. long. Sepals lanceolate-acuminate, pale scarlet, 1¼–1½ in. long. Petals 2 in. long, scaled at the base, white, with a reddish tip.

Hab. *Columbia*; province of Cauca, on rocks of the Quebrada of Guavita, *André* 2861. Near *P. pulverulenta* R. & P.

74. *P. TRIANÆ* André Enum. 4.—Leaves lanceolate, acuminate, 4 ft. long, 1½ in. broad at the middle, narrowed in the lowest third, spinose on the edge towards the base. Stem with inflorescence 6–7 ft. long, slightly furfuraceous; bract-leaves many. Raceme dense, simple, a foot long; rachis slightly floccose; bracts linear, much shorter than the pedicels, which are ½ in. long in the upper and longer in the lower flowers. Sepals linear-lanceolate, obtuse, ⅓ in. long. Petals white or yellowish-white, 1½ in. long, not scaled at the base. Stamens as long as the petals.

Hab. Forests of the Central Cordillera of *Columbia*, *André* 2069.

75. *P. ECHINATA* Hook. in *Bot. Mag.* t. 4709; *Lemaire* in *Jard. Fleur.* t. 407; *Flore des Serres*, t. 844.—Acaulescent. Leaves 12–20 to a rosette, with an indistinct petiole and a lanceolate chartaceous blade 3–4 ft. long, 1½–2 in. broad at the middle, bright green on the face, white-furfuraceous on the back; margin entire or with a few small hooked spines low down. Peduncle 2–4 ft. long; lower bract-leaves with long leafy points. Racemes several, very lax, arranged in an ample deltoid panicle; rachises slightly floccose; pedicels ½–1 in. long; bracts small, lanceolate. Sepals lanceolate, yellowish, tinged with red at the base, 1¼–1½ in. long, clothed with spreading gland-tipped processes. Petals white, less than twice as long as the calyx. Capsule much shorter than the calyx. Seeds minute, with a long tail at each end.

Hab. *Fusagasujá* and other mountains of *New Granada*, *Goudot*! *Holton* 152! Has flowered at *Kew* several times of late years. It was first received from *Linden* in 1853. The alleged locality of *Mexico* is doubtless a mistake.

## Subgenus 2. CEPHALOPITCAIRNIA.

76. *P. HETEROPHYLLA* Beer Brom. 68. *P. Morenii* Lemaire Jard. Fleur. t. 291. *P. cernua* K. Koch et Bouché Ind. Sem. Berol. 1848, 12. *P. excapa* Liebm.; Hook. in Bot. Mag. t. 4591. *Puya heterophylla* Lindl. in Bot. Reg. xxvi. t. 71. *P. longifolia* Morren; Paxt. Flow. Gard. iii. t. 86.—Acaulescent, densely tufted. Outer rudimentary leaves of tuft with a rigid erecto-patent linear spine-edged point from a large ovate base; inner linear, chartaceous, entire, 1–2 ft. long,  $\frac{1}{4}$ – $\frac{1}{2}$  in. broad at the middle, plain green and glabrous above, glaucous beneath. Flowers 6–12 in a capitate nearly sessile central spike; flower-bracts ovate, scariose,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Sepals lanceolate, reddish, pubescent, 1–1 $\frac{1}{4}$  in. long. Petals lingulate, bright red, rarely white, nearly twice as long as the calyx. Stamens nearly as long as the petals.

Hab. Central Mexico southward to Venezuela and New Granada. Introduced into cultivation in 1838.

77. *P. TABULÆFORMIS* Linden Cat. 1862, 5; E. Morren in Belg. Hort. 1862, 257, with figure; Lemaire in Ill. Hort. t. 344; Floral Mag. t. 297 (M.D.).—Leaves 20–30 in a sessile rosette, spreading or reflexing, oblong-spathulate, the outer 5–6 in. long, 2–3 in. broad at the middle,  $\frac{1}{2}$  in. at the base, chartaceous, entire, green and glabrous on both sides. Flowers 30–40 in a dense sessile central capitulum, surrounded by numerous small ovate bract-leaves. Sepals acute, reddish, under an inch long. Petals lingulate, bright scarlet, three times the length of the calyx. Stamens nearly as long as the petals.

Hab. Mexico; province of Chiapas. Introduced into cultivation by Gheisbreght about 1860.

## Subgenus 3. PHLOMOSTACHYS.

78. *P. MEMBRANIFOLIA* Baker. — Leaves few, very thin, clasping the base of the stem, oblong, cuspidate, green on both sides, the largest 5–6 in. long, 1 $\frac{1}{2}$ –2 in. broad at the middle. Peduncle under a foot long. Inflorescence a simple dense spike 3–4 in. long, with all the flowers ascending; flower-bracts ovate, acute, very thin; the upper an inch, the lower 1 $\frac{1}{2}$ –2 in. long. Sepals lanceolate, an inch long. Petals not seen. Seeds with a long tail at each end.

Hab. Costa Rica, *Hoffmann* 657! (Herb. Reg. Berol.).

79. *P. MAIDIFOLIA* Dene. in Flore des Serres, t. 915. *Puya maidifolia* Morren in Ann. Hort. Soc. Gand v. 453, t. 289. *Lamproconus maidifolius* Lemaire. *Pitcairnia zeifolia* K. Koch Mon. 4; Baker in Bot. Mag. t. 6635 (M.D.). *Vriesia tricolor* Hort.—Acaulescent. Leaves 6–12 to a stem, with an unarmed channelled petiole  $\frac{1}{2}$ –1 ft. long and a lanceolate chartaceous recurving blade 2–3 ft. long, 2–2 $\frac{1}{2}$  in. broad at the middle, green and glabrous on both surfaces. Peduncle erect, 1–2 ft. long; lower bract-leaves with long produced spreading tips. Inflorescence a dense simple erect spike,  $\frac{1}{2}$  ft. long; flowers all ascending, or lowest spreading;

flower-bracts ovate, acute,  $1\frac{1}{2}$  in. long, bright red with a green tip. Sepals oblong-lanceolate, greenish, an inch long. Petals white, more than twice as long as the calyx. Stamens reaching to the tip of the petals.

Hab. Guatemala, *Warszewicz*. Santa Martha, *Purdie*! Mountains of Venezuela, *Funck & Schlim*. Described from a plant that flowered at Kew, Dec., 1879, received from Dr. Regel, and again in Feb. 1888. First flowered by Linden in 1848.

80. *P. FUNCKIANA* A. Dietr. in Otto & Dietr. Allgem. Gartenzeit. xix. 337; Regel Gartenfl. t. 113 (M.D.). *Phlomostachys Funkiana* Beer Brom. 47. *Pitcairnia macrocalyx* Hook. in Bot. Mag. t. 4705. Acaulescent. Leaves 12–20 to a rosette, with an unarmed channelled petiole  $\frac{1}{2}$ –1 ft. long and a lanceolate chartaceous reflexing blade 2–3 ft. long, 2– $2\frac{1}{2}$  in. broad at the middle, green and glabrous on both surfaces. Peduncle erect, 2 ft. or more long; bract-leaves lanceolate, adpressed, pale. Inflorescence a simple dense spike,  $\frac{1}{2}$ –1 ft. long; upper flowers ascending, lower spreading; pedicels very short; flower-bracts ovate, greenish-white, 1– $1\frac{1}{4}$  in. long. Sepals oblong-lanceolate, glabrous, an inch long. Petals nearly white, more than twice as long as the calyx. Stamens reaching to the tip of the petals. Capsule as long as the bract. Seeds with a minute nucleus and long tails at each end.

Hab. Mountains of Venezuela, *Funck*. Santa Martha, *Purdie*! Demerara, *Schomburgk*! Introduced into cultivation by Linden about 1850.

81. *P. RECURVATA* K. Koch Mon. 4.—*Puya recurvata* Schiedw. in Otto & Dietr. Allgem. Gartenzeit. x. 275. *Pitcairnia polyanthoides* Brong. *Pepinia recurvata* E. Morren (M.D.).—Acaulescent or shortly caulescent. Leaves 12–20 to a stem, with a short unarmed channelled petiole and a lanceolate chartaceous recurving blade 2–3 ft. long,  $1\frac{1}{2}$  in. broad at the middle, minutely serrulate towards the tip, green and glabrous above, white-furfuraceous beneath. Peduncle stout, erect,  $1\frac{1}{2}$ –2 ft. long; bract-leaves all small and adpressed. Inflorescence a dense simple erect subspicate raceme 6–9 in. long; flower-bracts all ascending, ovate, acute, entirely green, the lowest  $1\frac{1}{2}$  in. long. Sepals oblong-lanceolate, acute, greenish, an inch long. Petals milk-white, much recurved, 3– $3\frac{1}{2}$  in. long, scaled at the base. Stamens reaching to the tip of the petals.

Hab. Said to be a native of Brazil. Described from a plant that flowered at Kew in June, 1877. Introduced into Belgium in 1839.

82. *P. MACRANTHERA* André Enum. 5.—Leaves oblanceolate-acuminate, above 2 ft. long,  $1\frac{1}{2}$  in. broad at the middle, narrowed to a spine-margined petiole, glabrous beneath. Peduncle clothed with imbricated adpressed oblong bract-leaves. Complete inflorescence not seen; pedicels short. Calyx arcuate, above 2 in. long. Petals white, nearly 5 in. long. Stamens as long as the petals; anthers nearly an inch long.

Hab. High plateau of Southern Columbia, on the sandy rocks of el Espino, *André* 2593.

83. *P. BRONGNIARTIANA* André Enum. 5.—Leaves very long.

Peduncle  $4\frac{1}{2}$ –5 ft. long. Inflorescence a simple moderately dense raceme a foot long; rachis and bracts clothed with dense ferruginous tomentum; bracts oblong-deltoid, reaching nearly to the tip of the calyx; pedicels very short. Sepals lanceolate, nearly 2 in. long. Petals large, whitish. Capsule rather shorter than the calyx. Seeds with a long tail at each end.

Hab. Columbia, in the territory of the Cuarques Indians, *André* 3394.

#### Subgenus 4. NEUMANNIA.

84. *P. ALTENSTEINII* Lemaire in *Flore des Serres*, t. 162. *Puya Altensteinii* Klotzsch in Link, Klotzsch & Otto,  *Ic. t. (M.D.)*. *Lamproconus Altensteinii* Lemaire in *Jard. Fleur.* sub t. 127. *Phlomostachys Altensteinii* Beer Brom. 45. *Neumannia Altensteinii* Griseb. in *Gott. Nacht.* 1864, 14. *Pitcairnia undulatifolia* Hook. in *Bot. Mag.* t. 4241. Acaulescent. Leaves 12–20 to a stem, with an unarmed or minutely prickly channelled petiole  $\frac{1}{2}$ –1 ft. long, and a lanceolate blade 2–3 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, chartaceous, undulated, weak and recurving, green and glabrous on both surfaces. Peduncle 1– $1\frac{1}{2}$  ft. long; upper bract-leaves red. Raceme simple, subspicate, 4–6 in. long; flower-bracts bright red, ovate, acute,  $1\frac{1}{2}$ –2 in. long. Sepals oblong-lanceolate, glabrous, 1– $1\frac{1}{4}$  in. long. Petals whitish, lingulate, twice as long as the sepals. Stamens reaching to the tip of the petals.

Var. *GIGANTEA* Hook. in *Bot. Mag.* t. 4309. *Phlomostachys gigantea* Beer Brom. 47. *Pitcairnia Altensteinii* var. *gigantea* Lemaire in *Flore des Serres*, t. 253–254. — Much more robust, with peduncle and spike together 6–7 ft. long, the latter 3–4 in. diam.

Hab. Mountains of Venezuela, *Moritz* 132, 1968! *Fendler* 1529! Introduced into cultivation in 1836. *P. Maroni* *André* in *Rev. Hort.* 1884, 222, 1885, 108, with figure, is a garden hybrid between *P. Altensteinii* and *corallina*, raised by M. Maron, gardener at the Castle of Herbault, Loire et Cher.

85. *P. ARCUATA* *André* Enum. 5. *Neumannia arcuata* *André* in *Rev. Hort.* 1886, 108, with figure.—Shortly caulescent, 2–3 ft. high. Leaves 12–20 to a stem, with a channelled spine-edged petiole a foot long and a lanceolate blade 3–4 in. broad at the middle and green on both surfaces. Peduncle about as long as the petiole. Raceme dense, arcuate, above a foot long; flower-bracts ovate, acute, bright red, 2 in. long; pedicel very short. Sepals oblong-lanceolate, acute, bright red. Petals yellowish-white, an inch longer than the calyx. Stamens nearly as long as the petals.

Hab. New Granada; Cordilleras of Cauca, *André* 3803. First collected in 1876; introduced into cultivation in 1882.

86. *P. LAMARCHEANA* E. Morren inedit (M.D.). — Acaulescent. Leaves about a dozen to a stem, with an unarmed channelled petiole  $\frac{1}{2}$ –1 ft. long, and a lanceolate chartaceous recurving blade 2–3 ft. long, 2– $2\frac{1}{2}$  in. broad at the middle, green and glabrous on both sides. Peduncle erect, a foot or more long, hidden by the adpressed petioles. Inflorescence a cylindrical spike  $1\frac{1}{2}$ –2 ft. long; flower-bracts closely adpressed, ovate-acuminate, bright red, the

lower 2-2½ in. long, the tips erecto-patent, not squarrose. Flowers yellowish-white, 2½ in. long. Stamens rather shorter than the petals.

Hab. Chiriqui. Sent in 1878 by M. Boucard to M. Oscar Lamarche of Liège. Described from Prof. Morren's drawing, made Aug., 1881. Nearly allied to *P. petiolata*.

87. *P. LINDENI* Baker. *Neumannia Lindenii* E. Morren inedit. (M.D.).—Acaulescent. Leaves 8-10 to a stem, with a spine-edged channelled petiole half a foot long, and a lanceolate acuminate chartaceous reflexing blade 1½-2 ft. long, 1½ in. broad at the middle, green and glabrous on both surfaces. Peduncle erect, a foot long. Inflorescence a dense cylindrical spike half a foot long; bract-leaves adpressed, ovate-acuminate, squarrose towards the tip, bright red, greenish upwards, the lower 2 in. long. Flowers whitish, 2 in. long.

Hab. Country not known. Described from Prof. Morren's drawing, made from a plant flowered by Linden, April, 1870. Nearly allied to *P. petiolata*.

88. *P. ATORRUBENS* Baker in Journ. Bot. 1881, 307. *Phlomostachys atorrubens* Beer Brom. 48. *Neumannia atorrubens* K. Koch Ind. Sem. Berol. 1856, App. 3. *Puya Warszewiczii* Wendl.; Hook. in Bot. Mag. t. 5225. *Lamproconus Warszewiczii* Lemaire (M.D.).—Acaulescent. Leaves about a dozen in a rosette, with a channelled spine-edged petiole 3-6 in. long and a chartaceous lanceolate blade 1½-3 ft. long, 2-3 in. broad at the middle, very acute, bright green above, glaucous beneath. Peduncle short, stout, erect. Raceme dense, erect, 6-9 in. long; flower-bracts ovate, very acute, claret-brown, densely imbricated, 2-3½ in. long; pedicel very short. Sepals acute, under an inch long. Petals lingulate, whitish, 2½ in. long. Stamens rather shorter than the petals.

Hab. Mountains of Chiriqui, *Warszewicz!* Introduced into cultivation about 1850. First flowered at Kew in 1860; received from the Hanover Garden.

89. *P. PETIOLATA* Baker in Journ. Bot. 1881. *Neumannia petiolata* K. Koch et Bouché Ind. Sem. Hort. Berol. 1856, App. 2 (M.D.).—Acaulescent. Leaves about a dozen to a stem, with a spine-edged channelled petiole a foot or more long and a lanceolate blade 2-3 ft. long, 1½-2 in. broad at the middle, green and glabrous on both surfaces. Peduncle stout, erect, 1-2 ft. long; lower bract-leaves elongated. Inflorescence a dense simple cylindrical spike 1-1½ ft. long; flower-bracts closely adpressed, ovate-acuminate, reddish-brown, the lower 2-2½ in. long. Sepals oblong-lanceolate, glabrous an inch long. Petals greenish-white, more than twice as long as the sepals, scaled at the base. Stamens rather shorter than the petals.

Hab. Mountains of Guatemala, *Salvin & Goöman!* Introduced into cultivation by Warszewicz in 1856. Flowered by Prof. Morren at Liège in 1872.

90. *P. WENDLANDI* Baker in Journ. Bot. 1881. *Puya sulphurea* Wendl.; Hook. in Bot. Mag. t. 4696. *Phlomostachys sulphurea* Beer Brom. 46. *Neumannia sulphurea* K. Koch Ind. Sem. Berol. 1856, App. 2.—Acaulescent. Leaves with an unarmed channelled petiole ½-1 ft. long, and an entire lanceolate chartaceous reflexing

blade 2-3 ft. long, 2-3 in. broad at the middle, green and glabrous on both surfaces. Peduncle erect, a foot or more long. Inflorescence a dense erect cylindrical subspicate raceme  $\frac{1}{2}$ -1 ft. long; flower-bracts closely adpressed, ovate-acuminate, claret-brown with a green tip, the lower 2 in. long. Sepals oblong-lanceolate, glabrous, an inch long. Petals lingulate, sulphur-yellow, scaled at the base, more than twice as long as the calyx. Stamens reaching to the tip of the petals.

Hab. Country unknown. First flowered at Kew in 1853, received from the Hanover Garden.

91. *P. OCHROLEUCA* Baker in Journ. Bot. 1881, 306. *Neumannia ochroleuca* K. Koch et Bouché Ind. Sem. Berol. 1856, App. 2.—Acaulescent. Leaves not distinctly petioled, lanceolate, 2-3 ft. long,  $1\frac{1}{2}$ -2 in. broad at the middle, entire, green and glabrous on both sides. Peduncle a foot long, floccose. Inflorescence a dense subspicate raceme a foot long; flower-bracts greenish-brown, ovate, acute,  $1\frac{1}{2}$ -2 in. long. Sepals oblong-lanceolate, an inch long. Petals sulphur-yellow, not scaled at the base.

Hab. Country unknown. Salvin and Godman's Guatemalan plant, figured by Hemsley in Bot. Amer. Cent. t. 85, which I formerly referred here, appears to be properly *P. petiolata*, but all the species from 84 to 92 are near allies.

92. *P. IMBRICATA* Baker in Journ. Bot. 1881, 307. *Neumannia imbricata* Brong. in Ann. Sc. Nat. ser. 2, xv. 362 (M.D.). *Phlomatichys imbricata* Beer Brom. 47.—Acaulescent. Leaves 12-20 to a stem, with a channelled petiole  $\frac{1}{2}$  in. long armed with small prickles and a recurving chartaceous lanceolate blade  $1\frac{1}{2}$ -2 ft. long,  $1\frac{1}{2}$ -2 in. broad at the middle, green and glabrous on both surfaces. Peduncle a foot long, hidden by its bract-leaves. Inflorescence a cylindrical subspicate raceme a foot long; flower-bracts ovate, acute, green, closely imbricated,  $1\frac{1}{2}$ -2 in. long; pedicels very short. Sepals oblong-lanceolate, an inch long, whitish-green. Petals cream-white, lingulate, more than twice as long as the sepals. Stamens reaching nearly to the tip of the petals.

Hab. Central Mexico, *Bourgeau* 1778! Described from a plant that flowered at Kew, Oct., 1879. Grown at Berlin in 1843.

93. *P. RHODOSTACHYS* Hassk. in Retzia ii. 8.—Leaves with a petiole above a foot long and lanceolate blade 2-3 ft. long, 2-2 $\frac{1}{2}$  in. broad at the middle, very acuminate, plain green and glabrous above, white beneath. Peduncle arachnoid,  $1\frac{1}{2}$  ft. long. Raceme dense, arachnoid, 8-9 in. long,  $1\frac{1}{2}$  in. diam.; flower-bracts oblong or ovate-oblong, cinnabar-red, the lowest 2 in. long. Sepals ovate-lanceolate, red towards the tip, yellow at the base. Petals whitish.

Hab. Country unknown. A garden plant, known to me only by Hasskarl's description.

94. *P. NIGRA* André Enum. 5. *Neumannia nigra* E. Morren Cat. 1873, 11; Carriere in Rev. Hort. 1881, 390, with figure (M.D.).—Shortly caulescent. Produced leaves about a dozen to a stem, oblong-lanceolate, 9-12 in. long, 2-3 in. broad at the middle, narrowed gradually to the base and an acute point, recurving,

chartaceous, bright green above, pale glaucous-green beneath; petiole erecto-patent, channelled, nearly as long as the blade, minutely spine-margined. Peduncle stout, erect, 6-9 in. long; bract-leaves ovate, green, imbricated. Inflorescence a dense erect raceme a foot long,  $2\frac{1}{2}$ -3 in. diam.; flower-bracts ovate, acute, bright red,  $1\frac{1}{2}$  in. long, spreading towards the tip; pedicel very short. Sepals lanceolate, an inch long. Petals narrow, purplish-black,  $2\frac{1}{2}$  in. long. Stamens rather shorter than the petals.

Hab. Ecuador; Guaranda, *Remy!* (year 1856) *Fraser!* Columbia, *André* 3360. Amazon valley, introduced into cultivation by Linden about 1870. Flowered at Liège in 1872, and at the Luxemburg Gardens in Paris in 1881. Differs from all the other species of this subgenus by its oblong leaves and very dark-coloured flowers.

95. *P. GRAVISIANA* Wittm.—Shortly caulescent. Produced leaves about ten to a stem, lanceolate, chartaceous, 3 ft. long, above an inch broad, white-furfuraceous beneath; petiole 3-4 in. long, armed with stout curved black spines. Peduncle much shorter than the leaves; upper bract-leaves ovate-acuminate, adpressed. Inflorescence a dense simple erect spike; flower-bracts ovate, acute, blood-red, furfuraceous, the lower  $2\frac{1}{2}$ -3 in. long. Sepals lanceolate,  $1\frac{1}{2}$  in. long. Petals lingulate, red-violet, more than twice as long as the calyx.

Hab. Columbia, on the banks of the Rio Dagua, *Lehmann* 3854. Named after Dr. Gravis, Prof. E. Morren's successor in the chair at Liège.

96. *P. DENSIFLORA* A. Brong. in Hort. Univ. vi. 228, with figure. *P. aurantiaca* Tenore in Ann. Sc. Nat. ser. 4, ii. 378. *Lamproconus aurantiacus* E. Morren (M.D.).—Acaulescent. Leaves with an indistinct petiole and a thin lanceolate reflexing blade 2-3 ft. long,  $1\frac{1}{2}$ -2 in. broad at the middle, narrowed gradually to the base and a long point, entire, green on both sides. Peduncle a foot or more long; lower bract-leaves with long points; upper ovate, green, imbricated. Raceme very dense, 3-4 in. long; flower-bracts ovate, acute,  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. long, reddish-yellow. Sepals oblong-lanceolate, under an inch long. Petals bright yellowish-red, twice as long as the calyx. Stamens as long as the petals and style finally a little longer.

Hab. Mexico. Described from Brongniart's type-specimen, dried from the Paris Garden in 1854.

#### Subgenus 5. SCHWEIDELERIA.

97. *P. UNDULATA* Schweid. in Otto & Dietr. Allgem. Gartenzeit. x. 275; Regel Gartenfl. t. 781; Flore des Serres, t. 162 (M.D.). *Lamproconus undulatus* Lemaire in Jard. Fleur. sub. t. 127. *P. speciosissima* Hort.—Acaulescent. Leaves few to a stem, with a slender unarmed petiole  $\frac{1}{2}$ -1 ft. long and an oblanceolate-oblong chartaceous reflexing blade a foot or more long, 4-5 in. broad at the middle, cuneate at the base, green and glabrous on the upper surface, finely white-furfuraceous beneath. Peduncle  $1-1\frac{1}{2}$  ft. long, bright red, with 5-6 small adpressed lanceolate bract-leaves. Raceme simple, a foot long, lax in the lower half; rachis bright red,

nearly naked; pedicels erecto-patent,  $\frac{1}{4}$ – $\frac{1}{2}$  in. long; bracts small, lanceolate. Sepals oblong-lanceolate, glabrous,  $1$ – $1\frac{1}{4}$  in. long. Petals bright red, more than twice as long as the sepals, scaled at the base. Stamens as long as the petals. Stigma finally exserted.

Hab. Brazil; probably the Amazon valley. Introduced into Belgium about 1840. Described from a plant that flowered at Kew, July, 1877.

98. *P. SPRUCEI* Baker in Journ. Bot. 1881. — Acaulescent or shortly caulescent. Leaves a dozen or more to a stem, with a slender petiole 4–6 in. long margined with a few small brown spines towards the base and an oblong-lanceolate entire chartaceous blade 6–8 in. long,  $1$ – $1\frac{1}{2}$  in. broad at the middle, acuminate, cuneate, green and glabrous above, obscurely furfuraceous beneath. Peduncle slender, 6–8 in. long, with several small lanceolate bract-leaves. Raceme simple, very lax, 4–6 in. long; pedicels ascending, lower  $\frac{1}{2}$  in. long; bracts lanceolate,  $\frac{1}{2}$ –1 in. long. Sepals lanceolate, glabrous,  $\frac{3}{4}$  in. long. Petals bright red, twice as long as the calyx. Capsule ovoid, a little shorter than the calyx. Seeds with a broad horny wing, not appendiculate.

Hab. Amazon valley; Barra do Rio Negro, *Spruce* 1653! Also banks of the River Tarumu. Collected in Feb., 1855.

#### Subgenus 6. PEPINIA.

99. *P. PUNICEA* Beer Brom. 56; Hassk. Retz. ii. 12. *Pepinia punicea* Brong. inedit. (M.D.).—Caudex slender, cylindrical,  $\frac{1}{2}$  ft. or more long below the laxly-disposed leaves, of which about 20 are spread over 3–4 inches, linear from an ovate base, under a foot long,  $\frac{1}{4}$ – $\frac{1}{2}$  in. broad at the middle, green and glabrous on the face with a pale central band, white-lepidote on the back, obscurely spine-margined. Peduncle very short. Raceme, lax, simple, 4–9 in. long; pedicels ascending, the lower  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; bracts small, green, lanceolate. Sepals lanceolate, slightly floccose,  $\frac{1}{2}$ – $\frac{5}{8}$  in. long. Petals bright scarlet,  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. long. Stamens reaching to the tip of the petals. Capsule ovoid,  $\frac{1}{2}$  in. long. Seeds angled by pressure, not tailed either at the base or apex.

Hab. Mexico; province of Tabasco, *Linden* 1159! Discovered in 1840. Introduced into cultivation before 1857. Described from a plant that flowered at Kew, July, 1885.

100. *P. APHELANDRÆFLORA* Verschaff.; Lemaire in Ill. Hort. xvi. Misc. 90. *Pepinia aphelandraeflora* André in Ill. Hort. n. s. t. 5 (M.D.).—Stem slender, cylindrical,  $\frac{1}{2}$ –1 ft. long below the leaves. Leaves 30–60, extending over 3–6 in. of the stem, linear, reflexing, 6–9 in. long,  $\frac{1}{4}$  in. broad, very acuminate, minutely serrated, green on both surfaces. Peduncle obsolete. Flowers in a dense subspicate raceme 4–6 in. long; lower bracts linear, leaf-like, 2–3 in. long. Sepals coral-red, glabrous, acute,  $\frac{1}{2}$ – $\frac{5}{8}$  in. long. Petals bright coral-red,  $2\frac{1}{2}$  in. long, scaled at the base, convolute in a tube to the tip. Stamens and style considerably exserted.

Hab. Amazon valley, *Baraguin*. Introduced into cultivation by Linden about 1867. Described from a plant that flowered at Kew in April, 1877, and a specimen in the Paris Herbarium.

## Subgenus 7. MELINONIA.

101. *P. NUDA* Baker in Journ. Bot. 1881, 269. — Acaulescent. Leaves lanceolate,  $\frac{1}{2}$  ft. long,  $\frac{3}{4}$  in. broad low down, sessile, rosulate, chartaceous, green and glabrous on both surfaces, armed from base to apex with small ascending lanceolate brown horny spines. Peduncle slender, glabrous, a foot or more long. Racemes 6–7, forming a large rhomboid panicle, the end a foot long, very lax; rachises slender, glabrous; branch-bracts very small; pedicels slender,  $\frac{3}{4}$ –1 in. long; flower-bracts minute, ovate. Sepals lanceolate, glabrous,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in long. Petals bright red, not more than half an inch longer than the calyx. Style longer than the petals. Capsule  $\frac{1}{2}$  in. long. Seeds triangular, flat, with a broad horny border.

Hab. British Guiana; banks of the Rapununie, *Appun* 1582! Collected about 1863. It is included in Sir R. Schomburgk's series of Demeraran drawings at the British Museum.

102. *P. SUBJUNCTA* Baker. — Acaulescent. Leaves with a distinct petiole half a foot or more long, dilated gradually towards the base and a linear chartaceous indistinctly spine-margined blade 2 ft. or more long,  $\frac{1}{2}$  in. broad at the middle, green and glabrous above, thinly furfuraceous beneath. Raceme lax, simple, finally half a foot long; pedicels very short, arcuate or erecto-patent. Flowers not seen. Calyx-tube oblong,  $\frac{5}{8}$ – $\frac{3}{4}$  in. long in the fruiting stage, adnate to the ovary nearly to its apex; segments shorter than the tube. Seeds with a small nucleus and a broad horny border on three sides.

Hab. French Guiana, *Poiteau*! Described from a specimen from J. Gay's herbarium, given to him in 1824. The ovary is more adnate to the calyx than in any other species of the genus.

103. *P. RUBIGINOSA* Baker. *Melinonia rubiginosa* Brong. inedit. — Acaulescent. Leaves with a channelled petiole a foot long without any prickles and a thin lanceolate blade  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, clothed with rusty-brown furfuraceous tomentum beneath. Inflorescence a lax simple raceme, in flower 3–4 in. finally 6–8 in. long; pedicels erecto-patent, lower  $\frac{1}{2}$  in. long; bracts lanceolate,  $\frac{3}{4}$ – $1\frac{1}{2}$  in. long. Sepals lanceolate,  $\frac{3}{4}$  in. long. Petals red, lingulate,  $1\frac{1}{2}$  in. long. Stamens just exceeding the petals. Inferior ovary  $\frac{1}{2}$  in. long and broad, rusty like the leaves. Seeds with a horny border, not tailed.

Hab. French Guiana, *Leprieur*! Described from Brongniart's specimen, grown in the Paris Garden in 1851. Sent home in 1847. We have had it at Kew for many years, but it has never flowered.

104. *P. INCARNATA* Baker. *Melinonia incarnata* Brong. inedit. *Pepinia incarnata* E. Morren inedit. (M.D.). — Acaulescent. Leaves linear, not distinctly petioled, 2–3 ft. long,  $\frac{3}{4}$ –1 in. broad at the middle, thin in texture, minutely spine-margined, green and glabrous above, white-furfuraceous beneath. Peduncle a foot long; bract-leaves with produced points. Raceme moderately dense, simple,  $\frac{1}{2}$  ft. long; rachis stout, reddish; pedicels ascending,  $\frac{1}{4}$ – $\frac{1}{2}$  in. long; bracts linear, green, the lower an inch or more long. Calyx adnate  $\frac{1}{6}$  in. in the flowering stage; sepals bright red,

$\frac{3}{4}$ – $\frac{7}{8}$  in. long. Petals bright red, 2 in. long. Stamens as long as the petals.

Hab. French Guiana, *Leprieur*! Described from Brongniart's type-specimen, grown in the Paris Garden in Nov., 1851, and Prof. Morren's drawing, made from a plant that flowered at the Botanic Garden of Liège, July, 1873. Habit of *P. latifolia*.

105. *P. SEMIJUNCTA* Baker.—Leaves with a channelled petiole a foot or more long margined with small black spines and a lanceolate very acuminate chartaceous blade 3 ft. long, above an inch broad at the middle, margined with small black teeth in the upper half, green and glabrous above, thinly brown-furfuraceous beneath. Peduncle much shorter than the leaves. Inflorescence a dense simple raceme 3–4 in. long; pedicels erecto-patent, finally  $\frac{1}{2}$  in. long; bracts green, lanceolate, 1–2 in. long. Sepals lanceolate, an inch long. Petals not seen, probably red. Capsule with an obconic base adnate to the ovary  $\frac{1}{3}$  in. long; free ovoid apex  $\frac{1}{2}$  in. long. Seeds with a small nucleus and broad horny wing on three sides.

Hab. British Guiana; Camounie Creek, *Jenman* 2041!

106. *P. AMAZONICA* Baker.—Acaulescent. Leaves with an unarmed channelled petiole a foot long, and an ensiform acuminate unarmed entire chartaceous blade 2 ft. long, an inch broad at the middle, green and glabrous above, thinly clothed with brown-furfuraceous tomentum beneath. Peduncle  $1\frac{1}{2}$ –2 ft. long; bract-leaves with long points. Raceme lax, simple, 4–6 in. long; pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; bracts shorter than the pedicels. Sepals lanceolate,  $\frac{3}{4}$ –1 in. long. Petals bright red, twice as long as the sepals. Seeds with a horny border, not tailed.

Hab. Amazon valley, near San Carlos, *Spruce* 3054! Very near *P. rubiginosa*.

107. *P. LEPRIEURII* Baker.—Leaves thin, long petioled, lanceolate, entire, 3–4 ft. long, 2 in. broad at the middle, not distinctly furfuraceous beneath. Peduncle a foot long. Inflorescence a simple raceme 6–8 in. long, dense in the upper half; lower pedicels  $\frac{1}{2}$  in. long; bracts lanceolate, lower longer than the pedicels. Ovary adnate  $\frac{1}{4}$  in.; sepals lanceolate,  $\frac{3}{4}$  in. long. Petals red, twice as long as the sepals.

Hab. French Guiana, *Leprieur*! (Herb. Mus. Paris). Gathered in 1838.

#### Subgenus 8. PUYOPSIS.

108. *P. FIRMA* Baker in Journ. Bot. 1881, 268.—Leaves linear, very firm in texture for the genus, 1– $1\frac{1}{2}$  ft. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad, sessile, acuminate, the margin armed throughout with distant ascending stramineous teeth  $\frac{1}{3}$ – $\frac{1}{6}$  in. long, the upper surface bright green, the lower paler, but not furfuraceous. Peduncle subglabrous,  $1\frac{1}{2}$ –2 ft. long; bract-leaves all small. Raceme lax, simple, 6–9 in. long; rachis nearly naked; pedicels ascending, the lower  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; bracts small, lanceolate. Sepals lanceolate,

naked,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Petals lingulate, bright red, 2 in. long. Stamens as long as the petals.

Hab. Country unknown. Described from a cultivated specimen in the herbarium of Dr. Karl Koch, where it was labelled "*P. Jacksoni*."

109. *P. BRACHYSTACHYA* Baker.—Acaulescent, the whole plant 9–14 in. high. Leaves in a dense basal rosette, ensiform-acuminate from an ovate base,  $\frac{1}{2}$  ft. long,  $\frac{1}{4}$ – $\frac{1}{2}$  in. broad above the base, tapering gradually to a long point, green, glabrous and channelled down the face, persistently lepidote on the back, armed with small hooked brown horny marginal spines. Peduncle erect, 6–10 in. long; upper bract-leaves ovate, adpressed, scariose. Flowers few, in a dense erect simple subspicate raceme 2–3 in. long; flower-bracts ovate, acute, membranous, an inch long; pedicels very short. Sepals ovate, acute,  $\frac{3}{4}$  in. long. Petals apparently pale, twice as long as the calyx, twisted after flowering. Capsule under  $\frac{1}{2}$  in. long, rigid, septically 3-valved. Seeds with a broad horny border all round.

Hab. Mountains of Santa Marta, *Purdie*! Collected in 1844.

110. *P. PRUINOSA* HBK. Nov. Gen. i. 395. — Leaves lanceolate, a foot long,  $1\frac{1}{2}$  in. broad, firm in texture, deltoid-cuspidate at the apex, armed from base to apex with spreading blackish deltoid-cuspidate prickles  $\frac{1}{8}$ – $\frac{1}{6}$  in. long. Inflorescence a lax simple raceme; pedicels erecto-patent,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; flower-bracts ovate, very small. Sepals lanceolate-acuminate, an inch long. Petals bright red, twice as long as the sepals. Seeds with a horny border, not tailed.

Hab. Island of Pararuma in the Orinoco, *Humboldt & Bonpland* 870! (Herb. Paris).

111. *P. DYCKIOIDES* Baker.—Leaves naked, linear, rigid,  $\frac{1}{2}$  ft. long,  $\frac{1}{6}$  in. broad, armed with small distant hooked spines. Peduncle slender,  $\frac{1}{2}$  ft. long; bract-leaves long-pointed, erect, spine-margined. Inflorescence simple or slightly compound, 6–9 in. long; flower-bracts ovate, rigid, spine-margined,  $\frac{1}{2}$ –1 in. long; pedicels short. Sepals oblong-lanceolate, acute,  $\frac{1}{2}$  in. long. Petals twice as long as the sepals.

Hab. Andes of Bolivia; Chuquisaca, *Weddell* 3739! Pomabamba, *Weddell* 3881! (Herb. Paris).

112. *P. VIOLACEA* A. Brong. in Ann. Flore et Pom. 1847, 116, with figure; Allg. Gartenzeit. xv. 299.—Leaves rigid, linear, a foot long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad low down, green above, thinly white-lepidote beneath, armed all the way up with small toothed spines. Peduncle twice as long as the leaves; bract-leaves small, scariose. Inflorescence a lax panicle 6–8 in. long and broad, with 3–4 laxly racemose branches; flower-bracts very small, ovate; pedicels erecto-patent,  $\frac{1}{4}$  in. long. Sepals lanceolate,  $\frac{1}{2}$  in. long. Petals violet, an inch longer than the sepals.

Hab. Said to be Mexican, but more likely to be Andine. Introduced in 1833. Described from a specimen in the Paris Herbarium, flowered by M. Neumann at Neuilly, in Aug., 1847.

113. *P. CHRYSANTHA* Philip. Atacam. 50, No. 359. — Leaves lanceolate, glabrous, 5–6 in. long, an inch broad, with large recurved marginal spines. Peduncle erect,  $1\frac{1}{2}$  ft. long, with produced leaf-like lower bract-leaves. Spikes paniced, oblong, dense, 3 in. long,  $1\frac{1}{2}$  in. diam.; flower-bracts ovate, scariose, glabrous,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Sepals ovate, obtuse with a minute mucro,  $\frac{1}{3}$  in. long. Petals yellow,  $\frac{3}{4}$  in. long. Stamens rather shorter than the petals. Style exserted. Ovary adnate at the base.

Hab. Shore of the province of Atacama, S. lat. 26–24°, *Philippi* 239! Native name “Chaguar.” Very distinct.

114. *P. CONSIMILIS* Baker in Journ. Bot. 1881, 266. — Leaves in a rosette at the base of the peduncle, ensiform, acuminate, half a foot long, moderately firm in texture, persistently lepidote beneath, armed with ascending hooked horny marginal spines. Peduncle a foot or more long; bract-leaves distant, small, scariose. Inflorescence a panicle with 3–5 very lax secund racemes, the end one above a foot long; flower-bracts ovate, acute, scariose, the lower  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Sepals lanceolate, an inch long, densely clothed at first with brown stellate tomentum. Petals more than twice as long as the calyx, much twisted in fading, bluish black. Capsule ovoid,  $\frac{3}{4}$  in. long. Seeds narrowly bordered.

Hab. Andes of Bolivia, alt. 9000–11000 ft.! *Mandon* 1173! Yungas, 6000 ft., *Rusby* 2847! La Paz, 10000 ft., *Rusby* 2845. Allied to *P. ferruginea*, but known only from dried specimens.

115. *P. FERRUGINEA*, Ruiz et Pav. Fl. Peruv. iii. 36. *P. asterotricha* Pöpp. et Endl. Nov. Gen. t. 158. *Puya grandiflora* Hook. in Bot. Mag. t. 5234. — Whole plant 10–12 ft. high. Caudex 3–4 ft. long below the rosette of leaves, as thick as a man's arm, sometimes forked. Leaves up to 100 in a dense rosette, ensiform acuminate, 2–3 ft. long,  $1\frac{1}{2}$ –2 in. broad, tapering gradually to a long point, rigid, channelled all down the green glabrous face, thinly white-lepidote on the back, armed with large pungent lanceolate horny dark-brown marginal spines. Peduncle 2–3 ft. long. Racemes up to 10–12, lax, secund, forming a large deltoid panicle; flower-bracts ovate, scariose, 1–2 in. long, clothed like the rachises and calyx with bright brown stellate tomentum; lower pedicels 2–3 in. long. Sepals lanceolate, persistently tomentose, 2 in. long. Petals yellowish-white, twice as long as the calyx, scaled at base, much twisted when the flower fades. Stamens rather shorter than the petals. Ovary adherent at the base.

Hab. Andes of Peru, *Pavon*! *Cuming* 976! *Maclean*! *C. Gay* 1921! The Mexican locality, given in Bot. Mag. is no doubt a mistake. First flowered at Kew in Oct., 1860, and again in 1875 and 1877.

116. *P. ECHINOTRICHA* Baker. *Puya echinotricha* André Enum. 5. — Caudex robust, reaching a length of 2–3 ft. Leaves ensiform, rigid,  $2\frac{1}{2}$ –3 ft. long, above an inch broad, glabrous on the upper surface, densely white-tomentose beneath, armed with stout distant hooked spines. Peduncle including the panicle 9–10 ft. long. Panicle deltoid: lower branches  $1\frac{1}{2}$ –2 ft. long, covered like the bracts and sepals with spreading red-brown pubescence; pedicels reaching

2 in.; flower-bracts linear-oblong, shorter than the pedicels. Sepals linear-lanceolate, 2 in. long. Petals narrow,  $\frac{1}{2}$  in. longer than the calyx, twisted after flowering. Capsule ovoid-trigonal, acute. Seeds oblong, slightly arcuate, with a horny border on one side.

Hab. Ecuador; rocks of San José, on the Pacific slope of Mt. Chimborazo, alt. 8000—9000 ft., *André* 4019. Near *P. ferruginea*.

117. *P. SANCTÆ-CRUCIS* Baker.—Leaves rigid, ensiform, 2 ft. long, an inch broad at the base of the blade, with only a few large brown spines towards the base. Inflorescence a lax ample panicle with finely pubescent rachises; lower branches 6–9 in. long; pedicels short, erecto-patent; flower-bracts ovate, acute,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Sepals lanceolate,  $1\frac{1}{4}$  in. long. Petals blue, twisted, shortly protruded.

Hab. Bolivia; department of Santa Cruz, *Castelnaud*! (Herb. Mus. Paris). Collected in 1847. Near *P. megastachya* and *Pearcei*.

118. *P. PEARCEI* Baker.—Whole plant 4–6 ft. high. Leaves sessile, rosulate, ensiform, acuminate, 3–4 ft. long,  $1\frac{1}{2}$ –2 in. broad low down, tapering gradually to a long point, moderately rigid, green and glabrous on both surfaces, armed with large pungent ascending slender brown horny spines. Panicle lax, ample, rhomboid; rachises, pedicels and calyces tomentose; racemes lax, subsecund, lower a foot long; branch-bracts small, spine-edged; flower-bracts ovate, acute, scariose,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; pedicels  $\frac{1}{4}$ – $\frac{1}{3}$  in. Sepals lanceolate, rigid,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long. Petals bluish-green.

Hab. Andes of Peru; valley below Corvico, alt. 3000–4000 ft. *Pearce*! Gathered in May, 1866. Allied to *P. floccosa* and *megastachya*.

119. *P. MEGASTACHYA* Baker. *Puya Roezli* E. Morren in Belg. Hort. 1885, 80 (M.D.).—Caudex shortly produced. Leaves 50 or more in a dense rosette, ensiform-acuminate, 2–2 $\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad above the dilated base, narrowed gradually to a long point, green and glabrous on the face, densely persistently white-lepidote on the back, armed with small ascending brown hooked spines. Peduncle shorter than the leaves. Inflorescence an ample lax rhomboid panicle 2–3 ft. long, with a stout floccose rachis and numerous spreading lax-flowered racemose branches not more than 5–6 in. long; flower-bracts ovate, acute,  $\frac{1}{3}$ – $\frac{3}{4}$  in. long; pedicels short, erecto-patent. Sepals oblong-lanceolate, whitish-pink,  $\frac{3}{4}$  in. long. Petals dark blue, twice as long as the calyx. Stamens reaching nearly to the tip of the petals.

Hab. Andes of Peru. Introduced into cultivation by Roezl in 1873. Allied to *P. floccosa*.

120. *P. GUYANENSIS* Baker. *Puya guyanensis* Klotzsch. *Agallostachys guyanensis* Beer.—Leaves ensiform, acuminate, rigid, above 2 ft. long, an inch broad low down, shining on the face, thinly white-lepidote on the back, armed with small hooked spines. Peduncle as long as the leaves; lower bract-leaves with long linear rigid points. Inflorescence an ample panicle, with many spreading spicate branches, the lower half a foot long; rachises and bracts thinly floccose; lower branch-bracts rigid, spine-margined,  $1\frac{1}{2}$ –2 in.

long; flower-bracts ovate acute,  $\frac{3}{4}$ –1 in. long. Sepals very acuminate,  $1\frac{1}{4}$  in. long. Petals blue, an inch longer than the calyx. Capsule ovoid, shorter than the calyx, nearly free. Seeds with a narrow horny border.

Hab. British Guiana, *Schomburgk* 1062! Southern slope of Mount Roraima, *Im Thurn* 45! Very near *P. floccosa*.

121. *P. QUETAMEENSIS* Baker. *Puya quetameensis* André Enum. 5.—Caudex stout, reaching a length of 3 ft. Leaves densely rosulate, ensiform,  $2\frac{1}{2}$ –3 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, glabrous, finely striated on both faces, margined with distant ascending green spines. Peduncle as long as the leaves, slightly tomentose; bract-leaves long-pointed. Inflorescence a lax panicle 2–3 ft. long; rachises, pedicels, bracts and calyx clothed with thick white tomentum; branch-bracts small, ovate; branches laxly 5–7-flowered, subspicate; flower-bracts ovate, more than half as long as the calyx. Sepals lanceolate, an inch long. Petals narrow, blue, one-third longer than the calyx.

Hab. Eastern Andes of New Granada, near Quetamé, alt. 6000–7000 ft., *André* 1217.

122. *P. FLOCCOSA* Regel in Act. Hort. Petrop. iii. 125. *P. meridensis* Hort. *Pourretia floccosa* K. Koch Wochen. iii. 251. *Puya floccosa* E. Morren inedit. (M.D.). *Pourretia lanuginosa* and *violacea* Hort.—Shortly caulescent. Leaves about 100 in a dense rosette, ensiform-acuminate,  $2\frac{1}{2}$ –3 ft. long, an inch broad above the dilated base, moderately firm in texture, bright green and glabrous on the face, thinly white-lepidote on the back, armed on the margin with middle-sized hooked prickles. Peduncle as long as the leaves; lower bract-leaves with long produced points. Inflorescence a lax panicle, with numerous ascending laxly spicate branches; rachises, bracts and calyx densely persistently white-floccose; flower-bracts ovate, acute,  $\frac{1}{2}$ –1 in. long. Sepals lanceolate, acuminate,  $1$ – $1\frac{1}{4}$  in. long. Petals blue, half as long again as the calyx. Stamens exerted. Ovary nearly free.

Hab. Venezuela; Merida, *Funck & Schlim*! Introduced into cultivation in 1847. Flowered in 1860 at Potsdam. Described mainly from a living plant in the Cactus-house at Kew, received from Dr. Regel.

123. *P. CÆRULEA* Benth. in Gen. Plant. iii. 666. *Pourretia cærulea* Miers Travels, ii. 531 (name only). *P. alpestris* Pöpp. et Endl. Nov. Gen. ii. 41, t. 156. *Puya cærulea* Lindl. in Bot. Reg. 1840, t. 11. *P. Whytei* Hook. fil. in Bot. Mag. t. 5732. *P. alpestris* C. Gay Fl. Chil. vi. 11.—Caudex short. Leaves 60–80 in a dense rosette, ensiform, acuminate, 2 ft. long,  $\frac{1}{2}$  in. broad above the ovate base, tapering gradually to a long point, rigid in texture, green and glabrous on the face, densely persistently white-lepidote beneath, armed with distant middle-sized spreading horny prickles. Peduncle stout, erect, 3–4 ft. long; upper bract-leaves reflexed. Inflorescence a dense rhomboid panicle 3–4 ft. long with numerous erectopatient branches barren towards the tip; pedicels short, erectopatient; flower-bracts ovate, acute, scariose, the lower an inch long; rachis not floccose. Sepals oblong-lanceolate,  $\frac{3}{4}$ –1 in. long.

Petals oblong-spathulate, blue, twice as long as the calyx, soon fading and twisting up spirally. Capsule ovoid, as long as the calyx, with 3 septicial valves.

Hab. Northern provinces of Chili, first noted by the late Mr. Miers in 1826. It was exhibited by Mr. A. B. Lambert in 1838, at the Royal Horticultural Society, and was again introduced by Mr. Mark Whyte in 1868, and has been flowered since at Kew and by Messrs. Veitch and Tyerman. No description was ever given of *Pourretia rubricaulis*, Miers Travels, ii. 531, but if a plant so labelled, that flowered in the Chiswick Garden in 1839, be rightly named, it is a mere form of this species. There are two excellent paintings of the plant in Miss North's gallery, Nos. 25 and 26.

124. *P. PHILIPPI* Baker. *Puya paniculata* Philippi in Linnæa, xxxiii. 247.—Habit of *P. cœrulea*. Leaves ensiform, acuminate,  $\frac{1}{2}$  in. broad above the dilated base, not white-lepidote beneath; marginal prickles small. Lower branches of the panicle a foot long, peduncled, not sterile towards the tip; branch-bracts small; pedicels ascending,  $\frac{1}{2}$ –1 in. long; flower-bracts ovate-lanceolate, small; sepals lanceolate,  $\frac{3}{4}$  in. long. Petals blue, twice as long as the sepals, twisted after flowering. Capsule subglobose, shorter than the sepals.

Hab. Chili; frequent in the province of Colchagua, *Philippi*! I cannot distinguish specifically a plant in Herb. Berol., labelled by Philippi "*Puya glabrata*."

125. *P. STENOXYRSA* Baker.—Leaves not seen. Upper bract-leaves with long rigid spine-edged points. Inflorescence a narrow panicle with short dense branches; branch-bracts ovate-acuminate, serrated, glabrous, 2–2 $\frac{1}{2}$  in. long; flower-bracts ovate, an inch long; pedicels short, stout, erecto-patent. Sepals lanceolate, an inch long. Petals twice as long as the sepals.

Hab. Andes of Bolivia; Sorata, *Mandon* 1189! Near *P. cœrulea* Benth.

126. *P. PASTOENSIS* Baker.—Leaves not seen. Inflorescence a panicle with shortly peduncled oblong-cylindrical dense subspicate branches 3–4 in. long; rachises, calyx and bracts densely brown-pubescent; pedicels very short and stout; flower-bracts ovate,  $\frac{1}{2}$  in. long. Sepals lanceolate,  $\frac{3}{4}$  in. long. Petals twice as long as the sepals.

Hab. South Columbia; Cordilleras of Pasto, alt. 5000–9000 ft., *Lehmann* 665! Allied to *P. venusta*.

127. *P. WEDDELIANA* Baker.—Habit of *P. cœrulea*. Leaves ensiform, much shorter than the peduncle. Inflorescence a panicle with short dense branches; flower-bracts lanceolate,  $\frac{1}{2}$  in. long; pedicels floccose,  $\frac{1}{4}$  in. long. Sepals lanceolate,  $\frac{3}{4}$  in. long. Petals blue, twisting up spirally, twice as long as the sepals. Upper flowers of racemes abortive.

Hab. Andes of Bolivia; Tarija, *Weddell* 4001. Described from Weddell's sketch and specimens in Mus. Paris.

128. *P. RUSBYI* Baker.—Habit of *P. cœrulea*. Leaves not seen. Racemes reaching a foot in length; axes stout, floccose; flower-bracts ovate-acuminate, 1–1 $\frac{1}{2}$  in. long; pedicels reaching 1 in. Sepals oblong-lanceolate, an inch long. Petals blue, twisting up

spirally, twice as long as the sepals. Capsule broad ovoid-trigonous,  $\frac{3}{4}$  in. long and broad, dehiscing septicidally and then down the keel of the valves. Seeds with a broad horny border.

Hab. Andes of Bolivia; Le Paz, 10000 ft., *Rusby* 2846! *Rusby's* 2850, from the same locality, has much shorter pedicels. Unfortunately our material for these large Bolivian species is very incomplete.

129. *P. VENUSTA* Baker. *Puya venusta* Philippi inedit.—Leaves ensiform, rigid, a foot long,  $\frac{3}{4}$ –1 in. broad low down, tapering gradually to the point, green and glabrous on the face, armed with large hooked spreading spines. Peduncle under a foot long; bract-leaves ovate, scariose. Inflorescence a deltoid panicle a foot long, with dense oblong racemose branches; flower-bracts broad-ovate, acute, scariose, an inch long; pedicels stout,  $\frac{1}{4}$ – $\frac{1}{3}$  in. Sepals lanceolate,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Petals shortly protruded, much twisted after flowering. Capsule subglobose, shorter than the calyx, with 3 brown septicidal valves split down the back.

Hab. Chili, in the provinces of Coquimbo and Aconcagua, *Gaudichaud* 54! 53! *Cuming* 894! *Philippi* 940!

130. *P. SPHÆROCEPHALA* Baker. — Nearly allied to *P. venusta*; heads of the panicle dense, the end one oblong, 3 in. long, 2 in. diam., the side ones few, globose,  $1\frac{1}{2}$  in. diam., on short spreading peduncles; flowers subsessile; flower-bracts small, ovate. Sepals lanceolate,  $\frac{5}{8}$ – $\frac{3}{4}$  in. long. Petals less than twice as long as the sepals. Capsule septicidal, shorter than the calyx.

Hab. Chili; province of Coquimbo, *Gaudichaud* 55! (Herb. Mus. Paris.).

### 23. PUYA *Molina*.

(*Pourretia* R. & P.).

*Sepals* free, ovate or oblong, slightly imbricated. *Petals* free, oblong-spathulate, much longer than the calyx, twisted after flowering. *Stamens* hypogynous, shorter than the petals; filaments filiform; anthers linear, dorsifixed. *Ovary* superior, ampullæform, 3-celled; ovules many, superposed; style long, subulate; stigmas linear, slightly twisted. *Capsule* oblong, loculicidally 3-valved, with the seeds attached to the centre. *Seeds* flat, sessile, with a broad horny border.—*Leaves* densely rosulate, ensiform-acuminate, rigid, armed with large hooked pungent prickles. *Flowers* in simple or paniced spikes, with large ovate flower-bracts. *Corolla* large. Differs from all its allies by the loculicidal dehiscence of the capsule. A few of the *Pitcairnia*s exactly resemble it in leaf and habit.

Inflorescence simple . . . . . Sp. 1–7.  
 Inflorescence paniced . . . . . Sp. 8–14.

1. *P. PYRAMIDATA* Schultes fl. Syst. Veg. vii. 1235. *Pourretia pyramidata* Ruiz et Pav. Fl. Peruv. iii. 34, t. 257. *Pitcairnia pyramidata* Pers.—Acaulescent. Root-leaves ensiform, reflexing,  $\frac{1}{2}$  ft. long,  $\frac{3}{4}$  in. broad low down, tapering gradually to the point, very rigid, glossy on the face, not lepidote on the back, armed with

close middle-sized ascending spines which are dark-brown and horny down to the base. Peduncle stout, stiffly erect, 2-3 ft. long; lower bract-leaves ensiform and spiny, upper ovate and scariose. Inflorescence a dense spike 6-9 in. long; flower-bracts ovate, acute, spine-margined, an inch or more long. Calyx green, glabrous, an inch long; segments ovate, acute. Petals yellowish-green, obovate, twice as long as the calyx. Stamens as long as the petals. Capsule  $\frac{1}{2}$  in. long, glossy brown, loculicidally 3-valved. Seeds with a broad pale horny wing all round the nucleus.

Hab. Andes of Peru, near Chinchao, &c., *Ruiz & Pavon*. Sachapata, *Lechler* 3131! This is much dwarfer than any of the other species of the group.

2. *P. NIVALIS* Baker.—Leaves ensiform-acuminate from a dilated base  $1\frac{1}{2}$ -2 in. broad, under an inch broad above the base, a foot long, narrowed gradually to the tip, not very rigid, green and glabrous on the face, obscurely lepidote beneath, armed with large distant uncinatate decurved spines horny down to the base. Inflorescence with spike 10 ft. long. Spike dense, a foot long; flower-bracts ovate-acuminate, membranous, floccose,  $1\frac{1}{2}$ -2 in. long; pedicel short. Calyx densely floccose, under an inch long. Petals twice as long as the calyx. Stamens reaching to the tip of the petals.

Hab. Nevada of Santa Marta, near the snow, *Purdie*! Gathered in 1844.

3. *P. TRIANÆ* Baker.—Leaves rigid, ensiform, acuminate, under a foot long,  $\frac{1}{2}$  in. broad, armed with large marginal prickles. Peduncle short, stout. Inflorescence a dense simple spike 2 ft. long; flower-bracts ovate, very woolly, scariose, the lower above 2 in. long,  $1\frac{1}{2}$  in. broad. Flowers like those of *P. lanata*.

Hab. New Granada; Cordilleras of Pasto, alt. 11000-12000 ft., *Triana* 559! (Herb. Par.).

4. *P. LANUGINOSA* Schultes fil. Syst. Veg. vii. 1234. *Pourretia lanuginosa* Ruiz et Pav. Fl. Peruv. iii. 33, t. 256. — Trunk reaching a length of 6-8 ft., simple or forked. Leaves 60-100 in a dense rosette, ensiform, 2-2 $\frac{1}{2}$  ft. long, an inch broad low down, rigid, tapering gradually to a long point, green above, persistently white-lepidote beneath, armed with ascending distant furfuraceous spines. Peduncle very stout, 2 $\frac{1}{2}$ -3 ft. long; lower bract-leaves with long points; upper small, scariose. Inflorescence a dense simple spike a foot long, 3 in. diam.; flower-bracts ovate, acute, 1-2 in. long, very woolly on the back. Calyx 1-1 $\frac{1}{4}$  in. long, densely woolly; sepals much imbricated, obtuse. Petals greenish-blue, an inch longer than the calyx; blade obovate. Stamens as long as the petals.

Hab. Andes of Peru, *Pavon*! Described from a plant that flowered at Kew in Oct., 1888. It is figured under the name of *P. chilensis* Gard. Chron. 1872, 1102, fig. 259, from plants flowered in the Scilly Islands by the late Mr. Augustus Smith.

5. *P. BRITTONIANA* Baker. — Leaves ensiform, acuminate, moderately firm in texture,  $\frac{3}{4}$ - $\frac{3}{4}$  in. broad low down, tapering gradually to the point, green and glabrous on the face, thinly white-lepidote

on the back, armed with large brown spreading marginal spines. Upper leaf-bracts crowded at the base of the spike, very acuminate. Inflorescence a dense simple very woolly spike with a thick axis,  $2\frac{1}{2}$ –3 in. diam.; flower-bracts ovate, very acuminate, scariose,  $1\frac{1}{2}$ –2 in. long. Sepals oblong-lanceolate, acute,  $\frac{3}{4}$  in. long. Petals twice as long as the calyx; blade  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Stamens shorter than the petals.

Hab. Bolivia; Ingenio del Oro, alt. 10000 ft., *Rusby*, 2849!

6. *P. LANATA* Schultes fil. Syst. Veg. vii. 1233. *Pourretia lanata* H.B.K. Nov. Gen. i. 296. *Pitcairnia lanata* Dietr. *Bromelia lasiantha* Willd.—Whole plant 12–18 ft. high. Leaves ensiform-acuminate, 3–4 ft. long,  $1\frac{1}{2}$  in. broad low down, like those of *P. chilensis* in texture, tapering gradually to a long point, channelled down the face, glaucescent on both sides, armed with large hooked horny spines. Inflorescence a dense terminal spike 3–4 ft. long, 3 in. diam.; flower-bracts ovate-acuminate, coriaceous,  $1\frac{1}{2}$  in. long, densely white-woolly, as is the stout rachis. Calyx coriaceous, densely woolly,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long; sepals ovate-acuminate. Corolla greenish-white,  $\frac{1}{2}$  in. longer than the calyx. Stamens scarcely exerted. Capsule and seeds not seen.

Hab. Andes of Northern Peru, between Caxamarca and the Rio Magdalena, *Humboldt* 3713! Described from the type-specimen in the Berlin Herbarium.

7. *P. GIGAS* André in Rev. Hort. 1881, 315, with woodcut.—Acaulescent. Leaves numerous in a dense rosette, ensiform-acuminate, 3 ft. long, an inch broad at the middle, tapering gradually to a long point, flexible, recurving, bright green on the face, densely persistently white-lepidote beneath, armed with distant very strong deltoid-cuspidate hooked brown spines. Peduncle with inflorescence 20–30 ft. long; lower bract-leaves with long points; upper adpressed, scariose. Spike dense, much shorter than the peduncle; flower-bracts ovate, acute, imbricated. Flowers white, tinged with red and violet.

Hab. New Granada, at Lake Cocha, the source of one of the tributaries of the Amazon, alt. 6000–7000 ft. Discovered by M. André in May, 1876, and introduced into cultivation by seed in 1880. We first had it at Kew in 1886.

8. *P. ERYNGIODES* André Enum. 5.—Acaulescent. Leaves ensiform, channelled, recurved, 8–10 in. long,  $\frac{1}{4}$  in. broad, furfuraceous above, finely striated and nearly glabrous beneath, margined with fine brown ascending spines. Peduncle a foot long, slightly furfuraceous; lower bract-leaves long-pointed. Inflorescence a dense capitulum 2–3 in. long, composed of numerous clusters of flowers in the axils of ovate-acuminate spine-edged bracts; flower-bracts ovate, shorter than the calyx. Sepals oblong-lanceolate, acute,  $\frac{1}{2}$  in. long. Petals deep blue, obovate, under an inch long. Stamens and style rather shorter than the petals.

Hab. Andes of Ecuador; lomas between Riobamba and Loja, alt. 9000 ft., *André* 4542. This is the smallest plant of the group.

9. *P. VESTITA* André Enum. 5.—Leaves unknown. Inflorescence paniced, with densely spicate branches; branch-bracts ovate-

cuspidate, margined with deltoid teeth, clothed, like the calyx, with reddish woolly tomentum. Sepals oblong, densely tomentose, an inch long. Petals oblong-spathulate, pale green, twice as long as the calyx. Stamens as long as the petals.

Hab. Andes of Ecuador, *André* 3739.

10. *P. ÆQUATORIALIS* André Enum. 5.—Subcaulescent. Leaves few, arcuate, ensiform, 3 ft. long, above an inch broad, slightly lepidote, very finely striated beneath, bordered with robust yellow hooked spines. Peduncle including the panicle  $4\frac{1}{2}$ –5 ft. long; branches of the panicle short, stout, spreading, reddish, slightly cottony; racemes dense, cylindrical; flower-bracts ovate, acute,  $\frac{1}{4}$  in. long; pedicels stout, nearly as long as the bracts. Sepals oblong, subacute, under an inch long. Petals dark violet, obovate, above an inch long. Stamens and style rather shorter than the petals.

Var. *ALBIFLORA* André.—Petals white. Flower-bracts longer than in the type.

Hab. Andes of Ecuador; fissures of dry rocks in the deep valley of the Rio Chota, alt. 6000–7000 ft., *André* 3564. The variety by the Rio Pisqué, *André* 3596.

11. *P. BOLIVIENSIS* Baker.—Leaves rigid, ensiform, a foot long,  $\frac{3}{4}$  in. broad at the base of the blade, armed with large distant marginal spines. Inflorescence an ample panicle with racemose branches, the end one a foot long, the side ones shorter; rachises and bracts floccose; pedicels erecto-patent,  $\frac{1}{2}$  in. long; flower-bracts lanceolate. Sepals lanceolate, an inch long. Petals twisted, twice as long as the sepals. Capsule globose, loculicidal, shorter than the calyx.

Hab. Andes of Bolivia; Cobija, *Gaudichaud*! (Herb. Par.).

12. *P. BONPLANDIANA* Schultes fil. Syst. Veg. vii. 1236. *Pourretia pyramidata* H.B.K. Nov. Gen. i. 296, non R. & P. *P. Achupalla* Hort. Linden.—Whole plant about 10 ft. high. Caudex woody, 3–4 ft. long. Leaves densely rosulate, ensiform-acuminate,  $1\frac{1}{2}$  ft. long,  $\frac{3}{4}$ –1 in. broad at the base, narrowed gradually to the point, not so thick and rigid as in *P. chilensis*, green and glabrous above, obscurely lepidote beneath, armed with distant middle-sized falcate horny spines. Peduncle much longer than the leaves. Inflorescence a panicle of numerous peduncled dense oblong racemes 5–6 in. long: branch-bracts ovate, acute, 2–3 in. long; pedicels 4–5 lines long, floccose like the rachis and bracts; flower-bracts ovate, woolly outside, above an inch long. Sepals oblong-lanceolate, an inch long. Petals white, twice as long as the calyx. Capsule ovoid-trigonous, brown, glabrous, shorter than the calyx. Seeds small, with a broad white horny border all round.

Hab. Temperate region of the Andes of New Granada, *Humboldt & Bonpland* 2120! *Goudot*! *Holton*! Native name "Achupalla," under which it is figured in *Humboldt's* 'Views of the Cordilleras,' tab. 30.

13. *P. CHILENSIS* Molina Sag. Chil. edit. 2, 284; Hook. in Bot. Mag. t. 4715; Flore des Serres, t. 869–870; Regel Gartenfl. t. 225.

*P. suberosa* Molina. *P. coarctata* Fisch. Sert. Petrop. t. 19. *Pourretia coarctata* Ruiz et Pav. Fl. Peruv. iii. 32; Gaudich. Atlas Bonite t. 41—44. *Pitcairnia coarctata* Pers. *Renalmia ramosa lutea* Feuill. Obs. iii. 59 t. 39. — Caudex 6–10 ft. long, as thick as a man, often branched and flexuose. Leaves 100 or more in a rosette, ensiform-acuminate, 3–4 ft. long, 1–1½ in. broad above the dilated base, tapering gradually to a long point, very rigid, green and glabrous on the face, white-lepidote and vertically lineate on the back, armed with large distant spreading toothed horny spines, the lower  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Peduncle stout, erect, much longer than the leaves; upper bract-leaves recurved. Inflorescence a dense rhomboid panicle 2–3 ft. long, with crowded dense-flowered erecto-patent racemose branches which are sterile towards the tip; branch-bracts large, ovate, acute; rachis and flowers more or less floccose; flower-bracts ovate, scariose, the lower an inch long; pedicels short, erecto-patent. Sepals ovate-lanceolate, an inch long. Petals oblong-spathulate, pale greenish-yellow, twice as long as the calyx. Genitalia much shorter than the petals.

Var. *P. GIGANTEA* Philippi in Linnæa, xxxiii. 246. — Caudex 10–15 ft. long. Leaves erect, green beneath, with shorter more robust less hooked floccose prickles.

Hab. Northern provinces of Chili; Valparaiso, Concepcion, &c. Native names “Puya” and “Cardon.” The variety found by Landbeck on the shores of Aconcagua. The structure of the woody caudex is excellently illustrated in Gaudichaud’s plates. There is an excellent life-sized painting of the plant in Miss North’s gallery. A plant received from Mr. A. B. Lambert was flowered at Kew in 1853. The stem is used in Chili for corks and bungs, and the spines by the Indians for fish-hooks.

14. *P. THOMASIANA* André Enum. 5.—Caudex short and stout. Leaves densely rosulate, ensiform, 3–3½ ft. long, bordered with stout recurved spines. Peduncle including the panicle 6–12 ft. long. Panicle pyramidal; branches 6–12 in. long, covered, especially upwards, with reddish pubescence; branch-bracts ovate-acuminate, spine-margined; flower-bracts ovate, nearly glabrous, much shorter than the calyx. Sepals ovate-oblong, acute, covered with reddish pubescence. Petals obovate, broadly unguiculate, 2 in. long, pale greenish-blue. Stamens and style rather shorter than the petals. Capsule ovoid, acute. Seeds compressed, with a horny wing all round.

Hab. Andes of New Granada; rocky banks of the Rio Guaitara, between Pasto and Tuquerres, alt. 6000 ft. *André* 3191. Named after M. Jules Thomas of Tuquerres.

“Several months after this when at Lima, M. Raimondi, the celebrated Peruvian traveller, spoke to me of another giant Bromeliad he had discovered in the department of Ancachs. This plant, which grew in the Quebrada de Cashapampa, not far from the little town of Huaraz, had stems 33½ ft. in height, and its flowers, which were disposed in panicles, he reckoned at not less than 8000. He found it at an altitude of 3800 metres above sea-level.”—*André* in the ‘Garden,’ 1882, 309 (under *P. gigas*).

24. COTTENDORFIA *Schultes fil.*

*Sepals* distinct, oblong, obtuse. *Petals* distinct, obovate-unguiculate, twice as long as the sepals, not twisted after flowering, not scaled at the base. *Stamens* about as long as the petals, 3 hypogynous, 3 adnate to the very base of the petals; filaments subulate; anthers linear, erect. *Ovary* superior, ovoid, 3-celled; ovules superposed; style very short, trifold; stigmas linear, convolute. *Capsule* septicidally 3-valved. *Seeds* linear, with a beak at each end as long as the nucleus.—Structure of *Dyckia*, with the leaf of a typical *Pitcairnia*. *Inflorescence* an ample panicle, with minute white flowers.

Leaves thin, flat . . . . . Sp. 1-5.  
 Leaves rigid, linear-subulate . . . . . Sp. 6.

1. C. FLORIDA Schultes fil. Syst. vii. 1193. — Leaves linear, narrowed into a long subulate point, 3-6 ft. long,  $\frac{1}{3}$ - $\frac{1}{2}$  in. broad, dull glaucous green on the face, white-lepidote beneath, without marginal prickles. Peduncle with inflorescence reaching a length of 8 ft. Panicle ample, lax, erect; rachises glabrous; branches spreading horizontally, 3-5 in. long; branch-bracts small, lanceolate; branchlets 3-5 from near the top of the branches, 1-3 in. long, densely spicate, bearing each 30-60 flowers; flower-bracts ovate, acute, a line long. Sepals ovate, obtuse. Petals white,  $\frac{1}{6}$ - $\frac{1}{4}$  in. long.

Hab. Brazil; province of Bahia, on the stony heights of the Serra de Sincora, *Martius*.

2. C. ALBICANS Griseb. Symb. Argent. 330. — Leaves  $2\frac{1}{2}$ -3 ft. long, linear-acuminate from a large ovate slightly serrated base,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad above the base, narrowed gradually to a long point, entire, nearly naked above, persistently matted with dirty-white tomentum beneath. Peduncle as long as the leaves; lower bract-leaves elongated. Inflorescence a lax panicle  $1\frac{1}{2}$ -2 ft. long; branches short, ascending, bipinnate; final branchlets moderately dense, 1- $1\frac{1}{2}$  in. long; flower-bracts ovate, acute, 1-2 lines long. Sepals  $\frac{1}{8}$ - $\frac{1}{6}$  in. long. Petals obovate-unguiculate, whitish, twice as long as the sepals. Stamens as long as the petals. Ovary ampullæform. Style very short. Seeds with a minute nucleus and long tail at each end.

Hab. Argentine Republic; province of Oran, *Lorentz & Hieronymus* 288! 502! (Herb. Reg. Berol.).

3. C. PEARCEI Baker. — Leaves not seen. Inflorescence a lax decomposed panicle  $1\frac{1}{2}$  ft. long,  $\frac{1}{2}$  ft. broad; branches slender, arcuate, the lower copiously compound; final branchlets laxly subspicate, reaching 2-3 in. long, like the bracts thinly white-floccose; flower-bracts ovate, acute, scariose,  $\frac{1}{8}$ - $\frac{1}{6}$  in. long. Sepals oblong, obtuse,  $\frac{1}{3}$  in. long. Petals obtuse, twice as long as the sepals. Capsule oblong; valves  $\frac{1}{6}$  in. long, tipped with a short style.

Hab. Western slope of the Andes; Butuco, *Pearce* (Mus. Brit.). Gathered in 1865.

4. *C. NEOGRANATENSIS* Baker.—Leaf thin, lanceolate, entire, acute, naked on the face, an inch broad. Peduncle slender; bract-leaves many, small, lanceolate, scariose. Inflorescence a narrow panicle half a foot long, with many ascending subsecund moderately dense racemose branches; pedicels very short; flower-bracts ovate, acute,  $\frac{1}{8}$  in. long. Sepals oblong; obtuse,  $\frac{1}{2}$  in. long. Petals oblong, twice as long as the calyx. Stamens shorter than the petals.

Hab. New Granada, *Jurgensen* 389! Véry near *C. Weddelliana*.

5. *C. WEDDELLIANA* Brong. inedit.—Acaulescent. Leaves few, thin, lanceolate, entire, a foot long,  $1-1\frac{1}{4}$  in. broad at the middle, narrowed to a dilated base, acute, thinly lepidote. Peduncle  $1-1\frac{1}{2}$  ft. long; bract-leaves small, membranous, ascending. Inflorescence a lax panicle a foot long, with secund simple or slightly compound branches; pedicels  $\frac{1}{2}-\frac{1}{3}$  in. long, articulated at the apex; bracts ovate, minute. Sepals oblong,  $\frac{1}{2}$  in. long. Petals white, oblanceolate, twice as long as the sepals. Stamens shorter than the petals. Capsule oblong,  $\frac{1}{8}$  in. long; style as long as the capsule.

Hab. Andes of Bolivia; Yungas, 4000—8000 ft., *Weddell* 4233! *Rusby* 2541!

6. *C. GUIANENSIS* Klotsch in Herb. Berol. *Anoplophytum guianense* Beer Brom. 44.—Leaves linear-subulate, stiffly erect, under a foot long,  $\frac{1}{4}$  in. broad at the base, the entire edges rolled together, the face deeply channelled all the way down, the convex back thinly lepidote. Peduncle above a foot long; upper bract-leaves distant, minute. Inflorescence a lax panicle  $\frac{1}{2}$  ft. long, with several ascending branches; pedicels  $\frac{1}{2}$  in. long; flower-bracts minute. Sepals oblong, obtuse,  $\frac{1}{8}$  in. long. Petals lingulate, twice as long as the sepals. Stamens shorter than the petals.

Hab. British Guiana; banks of the Corentyn River, *Schomburgk* 1564! Gathered in 1843. Has nothing whatever to do with *Tillandsia parvifolia* R. & P., to which it was referred by Dr. Karl Koch.

## 25. *DYCKIA* *Schultes fil.* (including *Encholirion*).

*Flowers* hermaphrodite. *Sepals* ovate or oblong, rigid, free to the base. *Petals* distinct or obscurely connate at the base, usually lingulate-unguiculate, not scaled at the base, spreading above the calyx. *Stamens* hypogynous or 3 adnate to the base of the petals; filaments usually thick and rather flattened; anthers linear, attached on the back near the base. *Ovary* superior, ovoid-pyramidal, 3-celled; ovules many, superposed; style generally short; stigmas linear, slightly twisted. *Fruit* a hard 3-angled capsule split down to the base into three septicidal valves. *Seeds* oblong, compressed, with a horny wing.—*Leaves* rosulate, ensiform, very thick and rigid, margined with pungent spines. *Peduncle* arcuate, produced from the axil of one of the outer leaves of the basal rosette. *Inflorescence* spicate, racemose or paniced. *Flowers* usually bright yellow.

Subgenus 1. *DYCKIA* PROPER.—Flowers in simple or paniced elongated spikes or racemes. Style very short. Filaments thick, fleshy, flattened. Petal-blade orbicular or obovate.

Inflorescence simple.

Leaves lanceolate, not acuminate . . . . .	Sp. 1-4.
Leaves ensiform, acuminate . . . . .	Sp. 5-14.
Inflorescence paniced . . . . .	Sp. 15-21.

Subgenus 2. *PRIONOPHYLLUM* (K. Koch).—Flowers in simple or paniced elongated spikes. Filaments filiform. Petal-blade oblong. Sp. 22-31.

Subgenus 3. *NAVIA* (Mart.).—Flowers in a panicle of strobili-form spikes. Filaments filiform. Petal-blade lanceolate. Sp. 32.

Subgenus 4. *CEPHALONAVIA*.—Inflorescence a central sessile capitulum. Filaments filiform. Petal-blade linear-lanceolate. Sp. 33.

Subgenus 5. *ENCHOLIRION* (Mart.).—Flowers in a long simple raceme. Filaments long, filiform, arcuate. Petal-blade linear-lanceolate. . . . . Sp. 34.

#### Subgenus 1. *DYCKIA* PROPER.

1. *D. GRISEBACHII* Baker. *Navia brevifolia* Griseb. Symb. Argent. 332.—Tufts  $1\frac{1}{2}$  in. long, 1 in. diam. Caudex very short. Leaves lanceolate, an inch long,  $\frac{1}{4}$  in. broad at the dilated base, narrowed gradually to the point; lower surface linear and lepidote; marginal spines 3-5 on each side of the leaf. Flowers unknown.

Hab. Argentine Republic; province of Oran in the valley of Tambo, where it grows in dense masses on the rocks, *Lorentz & Hieronymus* 947!

2. *D. DENSIFLORA* Schultes fil. Syst. Veg. vii. 1194.—Leaves short, lanceolate,  $1-1\frac{1}{4}$  in. broad at the base, narrowed gradually to the point; marginal spines brown, patent,  $\frac{1}{12}$  in. long. Peduncle  $1-1\frac{1}{2}$  ft. long, thinly white-pubescent; lower bract-leaves  $1-1\frac{1}{2}$  in. long; upper  $\frac{1}{2}-\frac{3}{4}$  in. Inflorescence a rather dense raceme 3-7 in. long; flowers 20-24, patent; pedicels short; lower flower-bracts equalling or exceeding the flowers. Sepals ovate,  $\frac{1}{3}$  in. long. Petals shortly exserted. Filaments as long as the calyx.

Hab. Central Brazil; Morro de Villa Rica, *Martius*.

3. *D. BREVIFOLIA* Baker in Saund. Ref. Bot. t. 236.—Leaves 30-40 in an open rosette, 8-10 in. broad, 3 in. deep, lanceolate, 4-6 in. long, an inch broad and  $\frac{1}{4}-\frac{1}{3}$  in. thick at the base, narrowed gradually to a pungent tip, bright green on the flat face, conspicuously vertically lineate with white and green on the rounded back, the marginal spines small, brown, hooked. Peduncle  $1-1\frac{1}{2}$  ft. long; lower bract-leaves crowded, upper remote. Inflorescence a lax spike a foot long, with a stout straight glabrous rachis; lower flowers spreading; flower-bracts as long as the flowers. Sepals

ovate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Petals bright yellow, half as long again as the calyx; blade orbicular,  $\frac{1}{4}$  in. broad. Stamens rather shorter than the petals. Styles very short. Capsule  $\frac{1}{3}$  in. long.

Hab. South Brazil, *Glaziou* 15496! Introduced into cultivation about 1870. Described from a plant that flowered at Kew, April, 1877.

4. *D. SULPHUREA* K. Koch Ind. Sem. Berol. 1873, App. 4, 3. *D. gemellaria* Hort. (M.D.).—Leaves 30–40 in a dense rosette about a foot in diameter, lanceolate, 4–5 in. long,  $\frac{3}{4}$ –1 in. broad above the clasping base, narrowed gradually to a pungent tip, very thick and rigid, channelled down the glabrous face, rounded and conspicuously vertically lineate on the back, the marginal teeth minute and deltoid. Peduncle a foot or more long; lower bract-leaves lanceolate. Inflorescence a lax simple spike 1–1 $\frac{1}{2}$  ft. long; flowers ascending; lower bract-leaves as long as the flower. Sepals oblong,  $\frac{1}{3}$  in. long. Petals obovate-spathulate, pale sulphur-yellow, half as long again as the calyx.

Hab. Montevideo. Introduced into cultivation about 1873. Perhaps only a pale-flowered variety of *D. brevifolia*.

5. *D. BURCHELLII* Baker.—Leaves linear-complicate, very rigid, a foot long,  $\frac{1}{4}$  in. broad at the base, tapering gradually to a pungent point, acutely keeled on the back, the brown hooked marginal spines very minute; outer rudimentary leaves ovate, chestnut-brown, very thick and rigid. Peduncle very slender,  $\frac{1}{2}$  ft. long; bract-leaves few, remote. Inflorescence a lax 2–6-flowered spike; rachis glabrous; flowers ascending; flower-bracts ovate, as long as the calyx or the lowest longer. Sepals oblong,  $\frac{1}{4}$  in. long. Petals half as long again as the sepals. Capsule subglobose,  $\frac{1}{3}$  in. long and broad; styles very short.

Hab. Central Brazil, between San Bento and Rio Cargalho, *Burchell* 8178!

6. *D. LINEARIFOLIA* Baker.—Leaves linear, rigid, a foot long,  $\frac{1}{3}$  in. broad at the base of the blade; spines minute, spreading, black, lanceolate. Inflorescence a lax simple raceme a foot long; pedicels stout, erecto-patent,  $\frac{1}{12}$ – $\frac{1}{8}$  in. long; flower-bracts ovate,  $\frac{3}{8}$ – $\frac{1}{4}$  in. long. Sepals oblong, obtuse,  $\frac{1}{3}$  in. long. Petals twice as long as the sepals. Style short.

Hab. South Brazil, *St. Hilaire* 1010! (Herb. Paris).

7. *D. RARIFLORA* Schultes fil. Syst. Veg. vii. 1195.—Leaves 30–40 in a rosette, ensiform, 6–9 in. long,  $\frac{1}{2}$  in. broad low down, tapering gradually to the point, deeply channelled down the glabrous face, rounded and marked with green and white vertical lines on the back, the apex pungent, the marginal teeth small, spreading, lanceolate, brown, rather hooked. Peduncle simple, 1–2 ft. long; lower bract-leaves with lanceolate free points; upper ovate, scarioso, adpressed. Inflorescence a lax simple spike 6–9 in. long; rachis glabrous or pubescent; flowers generally ascending; flower-bracts ovate, acute, the lower  $\frac{1}{4}$  in. long. Sepals ovate-oblong,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Petals half as long again as the calyx, bright orange-yellow. Stamens as long as or a little longer than the petals; filaments thick and fleshy, connate at the base.

Var. D. REMOTIFLORA Otto and Dietr. Gartenzeit. i. 129 (M.D.). *D. variflora* Grah. in Bot. Mag. t. 3349; Lindl. in Bot. Reg. t. 1782.—Petals twice as long as the calyx, about  $\frac{3}{4}$  in. long; blade obovate-spathulate.

Var. CUNNINGHAMI Baker. — Leaves 2–3 in. long, much recurved. Flowers few, an inch long. Petals three times the length of the calyx.

Var. D. MONTEVIDENSIS K. Koch Ind. Sem. Berol. 1873, App. 4, 4.—Leaves narrower and more complicate. Peduncle  $\frac{1}{2}$  ft. long. Flowers in a short spike,  $\frac{1}{2}$  in. long.

Hab. The type, Central Brazil, *Burchell* 7996! *Gardner* 3979! *Weddell* 1407! *Martius*; *Regnell* 283! All the three varieties, Montevideo and the Argentine Republic. Rio Grande, *Gaudichaud* 278! Bolivia; Chiquitos, *D'Orbigny* 1006! There is a fine series in the Paris Herbarium represented by more than a dozen of Sello's numbers. *Tillandsia tuberosa* Vell. Fl. Flum. iii. t. 136 (*Dyckia tuberosa* Beer) is evidently this species. The best-known species of the genus, introduced into cultivation about 1830. *D. Lemaireana* Hort., judging from the short description in Mr. Bull's catalogue, 1874, No. 97, p. 5, may be another form of this species.

8. D. SORDIDA Baker. — Leaves rigid, ensiform, above a foot long,  $\frac{1}{2}$  in. broad low down; prickles nearly obsolete. Peduncle longer than the leaves. Inflorescence a simple spike 2 ft. long with a pubescent flexuose rachis; flower-bracts ovate, pubescent,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Sepals oblong, obtuse,  $\frac{1}{3}$  in. long. Petals broad, shortly exserted. Style short.

Hab. Central Brazil; Minas Geraes, near Itambé, *St. Hilaire*! (Mus. Paris).

9. D. DISSITIFLORA Schultes fl. Syst. Veg. vii. 1194.—Leaves unknown. Peduncle 2 ft. long; bract-leaves remote, subadpressed,  $\frac{1}{2}$ –1 in. long. Inflorescence a lax raceme a foot long of about 20 flowers; rachis subflexuose; pubescent pedicels  $\frac{1}{2}$ – $\frac{1}{3}$  in. long, spreading; flower-bracts ovate-acuminate, pubescent, the lower  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Sepals elliptic, acute,  $\frac{1}{3}$  in. long. Petals bright yellow,  $\frac{1}{2}$  in. long. Stamens included. Style very short.

Hab. Brazil: province of Bahia, in stony ground at Sincora, *Martius*.

10. D. WEDDELLIANA Baker. — Leaves rigid, ensiform, a foot long, nearly an inch broad at the base of the blade; marginal prickles small, hooked. Peduncle 2–3 ft. long. Inflorescence a lax simple raceme, 2 ft. long; pedicels short, stout, erecto-patent; flower-bracts ovate,  $\frac{1}{8}$ – $\frac{1}{4}$  in. long. Sepals oblong, obtuse,  $\frac{1}{4}$  in. long. Petals half as long again as the sepals. Style short.

Hab. Central Brazil, *Weddell* 2584! (Herb. Paris).

11. D. RACEMOSA Baker. — Leaf ensiform acuminate,  $1\frac{1}{2}$  ft. long,  $\frac{3}{4}$  in. broad at the base, tapering gradually to a long point, not nearly so thick and rigid as in *D. variflora*, the brown lanceolate marginal prickles not above  $\frac{1}{2}$  line long. Peduncle slender, stiffly erect, above 2 ft. long; lowest bract-leaves with free points; all the others minute, ovate, adpressed. Inflorescence a lax simple raceme 6–8 in. long; rachis obscurely pubescent; pedicels erecto-patent, the lower  $\frac{1}{3}$  in. long; flower-bracts very minute, broad-ovate, with a cusp. Sepals ovate-oblong, obtuse,  $\frac{1}{4}$  in. long.

Petals reddish-yellow, half as long again as the calyx. Stamens as long as the petals.

Hab. Central Brazil; province of Goyaz, on dry hills at Arrayas, *Gardner* 4015! Gathered in 1840.

12. *D. LEPTOSTACHYA* Baker in Gard. Chron. 1884, ii. 198. — Leaves about 15 in a rosette, ensiform, falcate, 1–1½ ft. long, 1–1¼ in. broad above the ovate base, narrowed gradually to a long acuminate point, deeply channelled in the upper half, bright green and glabrous on the face, white-lepidote and lineate on the back; marginal prickles distant, brown, lanceolate, hooked, at most ⅓–½ in. long. Peduncle slender, stiffly erect, 3 ft. long; bract-leaves small, distant, ovate, adpressed. Inflorescence a lax erect spike 6–9 in. long; rachis slightly pubescent; flowers sessile, erecto-patent; flower-bracts ovate, ⅓–½ in. long. Sepals ovate, obtuse, imbricated, ⅓ in. long. Petals obovate-unguiculate, ¾ in. long, bright orange with a tinge of red. Stamens just protruded beyond the tip of the petals.

Hab. Parana. Described from a plant that flowered at Kew, Aug., 1884, received in 1867. Burchell's 6791 and two other numbers collected in the province of Goyaz in 1828 are the same or a close ally.

13. *D. TRICHOSTACHYA* Baker. — Leaves rigid, ensiform, a foot long, an inch broad at the base of the blade; marginal spines minute. Peduncle stout, 1½–2 ft. long. Inflorescence a simple spike a foot long, with a stout pubescent rachis; lower flower-bracts ovate-lanceolate, an inch long; upper ovate, ¼–½ in. Sepals oblong, obtuse, ½ in. long. Petals little longer than the sepals. Style short.

Hab. South Brazil, *Sello* 59! (Herb. Paris).

14. *D. GLAZIOVII* Baker. — Root-leaves not seen. Peduncle flexuose, 1½–2 ft. long, its two lower leaves springing from it 6 and 4 in. from the base, linear-complicate, very rigid in texture, tapering to a point, the lowest 3–4 ft. long, armed in the lower part with small hooked brown spines; upper stem-leaves lanceolate, erect, scariose. Inflorescence a dense simple raceme a foot long; pedicels erecto-patent, the lower ⅓ in. long; flower-bracts ovate, ⅓–½ in. long. Sepals obtuse, ⅓ in. long. Petals shortly protruded.

Hab. Brazil, *Glaziov* 15671!

15. *D. MICROCALYX* Baker. — Leaves rigid, ensiform, about a foot long, under an inch broad at the base of the blade; marginal prickles large, hooked. Peduncle 1½ ft. long. Inflorescence a panicle under a foot long, with 5–6 densely spicate branches, 2–4 in. long; flower-bracts small, ovate. Sepals oblong, ⅓ in. long. Petals more than twice as long as the sepals. Capsule-valves castaneous, ¼–½ in. long. Style short.

Hab. Paraguay, *Balansa*, 696!

16. *D. AFFINIS* Baker. — Leaves rigid, ensiform, 2 ft. long, an inch broad at the base of the blade; prickles large. Inflorescence a panicle with a simple lax end-spike a foot long and several shorter ascending branches; flower-bracts small, ovate. Sepals

oblong, obtuse,  $\frac{1}{3}$  in. long. Petals lingulate,  $\frac{1}{3}$  in. longer than the sepals. Style and stamens short.

Hab. Paraguay, *Balansa* 534!

17. *D. FRIGIDA* Hook. fil. in Bot. Mag. t. 6294. *D. regalis* Linden & Morren (M.D.). *Pourretia frigida* Hort. Linden. — Densely cæspitose. Leaves 50–60 in a rosette, ensiform,  $1\frac{1}{2}$  ft. long, an inch broad low down, narrowed gradually to an acuminate point, bright green on the face, finely lineate on the back, the marginal teeth large, ascending, lanceolate, horny and pungent. Peduncle stout,  $1\frac{1}{2}$ –2 ft. long; lower bract-leaves with long serrated tip. Inflorescence rarely simple, usually a panicle with many short dense spicate branches, the end one the longest, 6–8 in. long; flower-bracts ovate-lanceolate,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Sepals ovate, pubescent,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Petals bright yellow; orbicular blade half as long again as the calyx. Filaments thick, fleshy, as long as the calyx. Style very short.

Hab. Central Brazil. Described from a plant that flowered at Kew, Dec., 1879. Probably not more than a variety of *D. altissima*.

18. *D. ALTISSIMA* Lindl. in Bot. Reg. 1841, Misc. No. 183. *D. princeps* Lemaire in Jard. Fleur. t. 224–225, ex parte. *D. laxiflora* Mart. *D. gigantea* K. Koch. *D. ramosa* Hort. *Garrelia encholirioides* Gaudich. Atlas Bonite, t. 115.—Leaves sometimes 100 in a dense rosette 2 ft. in diameter, ensiform-acuminate,  $1\frac{1}{2}$  ft. long, an inch broad low down, tapering gradually to the point, green and glabrous on the face, vertically lineate (green and white) on the back, armed with copious pungent brown spines  $\frac{1}{4}$  in. long. Peduncle stout, not longer than the leaves. Inflorescence an ample panicle, with sometimes 10–12 branches, the lower a foot long, subtended by lanceolate branch-bracts 1–2 in. long; lower pedicels  $\frac{1}{4}$  in. long; flower-bracts as long as the flowers. Sepals ovate,  $\frac{1}{4}$ – $\frac{3}{8}$  in. long. Petals bright yellow, twice as long as the calyx; blade orbicular,  $\frac{1}{4}$  in. broad. Stamens shorter than the petals. Styles very short. Capsule  $\frac{1}{3}$  in. diam.

Hab. Central Brazil. Introduced into cultivation about 1840, and again by Libon from Minas Geraes in 1847.

19. *D. CATHARINENSIS* K. Koch Ind. Sem. Berol. 1873, App. 4, 4. —Leaves ensiform-acuminate, a foot long, an inch broad at the base, glabrous on the face, deeply channelled in the upper half, distinctly vertically lineate on the back, armed with large pungent spreading lanceolate brown spines. Peduncle stout, 6–9 in. long. Spikes simple or compound, the end one much the longest,  $\frac{1}{2}$ –1 ft. long; rachis stout, pubescent; lower flower-bracts ovate-lanceolate, shorter than the flowers. Sepals ovate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long, tomentose. Petals half as long again as the calyx; blade oblong. Stamens shorter than the petals. Styles very short.

Hab. Rocks of the coast of South Brazil; island of Santa Catherina, &c., *Gaudichaud* 130! *Tweedie* 795! 796!

20. *D. FLORIBUNDA* Griseb. Symb. Fl. Argent. 1878, 331.—Structure of *D. rariiflora*, but panicle several feet long, rachises

stouter, branches ascending, 8-12 in. long, flowers in clusters of 3-5, half an inch or an inch apart. Dimensions of flower-bract and flower as in *D. rariflora*. Capsule twice as long as the calyx.

Hab. Argentine Republic; province of Cordoba, *Hieronymus*. *Puya edulis* E. Morren in Belg. Hort. 1878, 354, of which I have only seen an immature living plant at Kew, is probably one of these large Dyckias. It was introduced by Lietze from the region of the Rio Doce, and the fecula contained in the leaves is said to have saved the lives of thousands of Indians in a season of famine.

21. *D. MICRACANTHA* Baker.—Leaves ensiform, a foot long, an inch broad above the dilated base, tapering gradually to the pungent apex, green and naked on the face, thinly white-lepidote on the back, armed with minute ascending horny prickles. Inflorescence panicle, the end spike much the largest, moderately dense, a foot long, with a stout pubescent rachis; flower-bracts ovate,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long. Sepals oblong, obtuse,  $\frac{1}{3}$  in. long. Petals half as long again as the calyx; blade short, obovate. Stamens shorter than the petals. Style very short.

Hab. South Brazil, *Sello* 1097! (Herb. Reg. Berol.). Nearly allied to *D. catharinensis*.

#### Subgenus 2. PRIONOPHYLLUM.

22. *D. SUBSECUNDA* Baker.—Leaves not seen. Inflorescence an ample panicle with long lax subsecund branches; flowers often 2-3-nate; pedicel short, thick; flower-bracts oblong-lanceolate,  $\frac{1}{3}$ - $\frac{3}{4}$  in. long. Sepals oblong,  $\frac{1}{3}$  in. long. Petals little longer than the calyx. Stamens longer than the petals. Style elongated.

Hab. Central Brazil; Minas Geraes, *St. Hilaire*! (Mus. Par.).

23. *D. AUGUSTÆ* Baker. *Encholirion Augustæ* R. Schomb. in Verh. Preuss. Garten. 18, t. 2. *Caraguata Augustæ* Benth. Gen. Plant. iii. 668.—Leaves about a dozen in a sessile rosette, lanceolate-acuminate, nearly a foot long,  $\frac{3}{4}$  in. broad above the dilated base, rigid, green and naked on both sides, armed towards the base with small deltoid spines. Peduncle a foot long; bract-leaves crowded, with a large ovate clasping base and a subulate enrolled rigid tip. Panicle dense, 3-4 in. long; branch-bracts ovate-acuminate, 1-2 in. long; pedicels short. Sepals oblong, naked,  $\frac{1}{3}$  in. long. Petals purple, with an obovate blade  $\frac{1}{2}$  in. long and a distinct claw. Stamens much shorter than the petals. Style  $\frac{1}{2}$  in. long, equalling the ovary.

Hab. British Guiana; Mount Roraima, *Rich. Schomburgk* 1021! Gathered lately by Mr. Im Thurn, on the very summit of the mountain.

24. *D. LONGIPETALA* Baker.—Leaves not seen. Inflorescence a panicle with a slender terete woody rachis and branches and long slender laxly spicate branchlets; flower-bracts ovate,  $\frac{1}{3}$  in. long. Sepals oblong, obtuse, glabrous,  $\frac{1}{3}$  in. long. Petals oblanceolate-unguiculate, an inch long. Stamens nearly as long as the petals; anthers linear,  $\frac{1}{3}$  in. long. Style protruded beyond the tip of the petals, nearly an inch long.

Hab. Banks of the Marañon, *Bonpland* 3595! (Herb. Reg. Berol. named *Puya flava*).

25. *D. DECOMPOSITA* Baker.—Leaves unknown. Lower branch of panicle with several simple moderately dense erecto-patent branchlets 2–5 in. long; rachis stiff, slender, glabrous; flower-bracts ovate, acute, the lower  $\frac{1}{6}$  in. long. Calyx  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; sepals very rigid, oblong, obtuse, glabrous, much imbricated. Petals more than twice as long as the calyx; blade lanceolate, acute,  $\frac{1}{12}$ – $\frac{1}{8}$  in. broad. Stamens as long as the petals; filaments filiform. Style a little overtopping the petals.

Hab. Argentine Republic; province of Mendoza, *Gillies!* (Herb. Kew). Cerros de Chayados, *Miers* 1098! (Herb. Mus. Brit.). A very distinct plant, of which, unfortunately, the material is incomplete.

26. *D. GILLIESII* Baker.—*Pitcairnia spinosa* Gillies inedit.—Leaf lanceolate, 3–4 in. long,  $\frac{1}{3}$  in. broad at the base, narrowed gradually to the point, the edge rolled together above the base, glabrous on the face, argenteo-lepidote and conspicuously vertically lineate on the back, armed on the margin with large hooked spreading stramineous spines, the lower  $\frac{1}{6}$  in. long. Inflorescence a simple lax spike 6–9 in. long; rachis obscurely pubescent; flowers usually solitary; flower-bracts ovate, acute, rigid, the lower as long as the calyx. Sepals oblong-navicular, rigid, glabrous,  $\frac{1}{6}$  in. long. Petals and stamens only seen in the bud-stage, the former with an oblong lamina.

Hab. Argentaria; Las Achiras, province of Cordova, *Gillies!*

27. *D. MARITIMA* Baker.—Leaves ensiform, very thick and rigid, a foot long,  $\frac{3}{4}$  in. broad low down, narrowed gradually to a brown pungent tip; glabrous on both sides, concave on the back, acutely keeled; marginal spines distant, middle-sized, deltoid-cuspidate, horny, brown, hooked. Inflorescence a small panicle of 3–4 spicate branches, the end one the longest, 6–8 in. long; rachis slender, pubescent; flowers solitary or clustered, sessile, pubescent; branch-bracts very small; flower-bracts much shorter than the calyx. Sepals oblong, obtuse, pubescent,  $\frac{1}{6}$  in. long. Petals falcate, lingulate, twice as long as the sepals. Stamens rather longer than the petals; filaments filiform. Styles 3, longer than the ovary.

Hab. Salt marshes of the coast of South Brazil, *Tweedie!*

28. *D. GRANDIFOLIA* Baker. — Leaves rigid, ensiform, 3 ft. long,  $1\frac{1}{2}$ –2 in. broad at the dilated base, an inch at the base of the blade; marginal spines very large. Inflorescence an ample panicle with spicate branches, the lower  $\frac{1}{2}$  ft. long, dense upwards; upper flowers 2–3-nate; flower-bracts small, ovate. Sepals oblong, obtuse,  $\frac{1}{8}$  in. long. Petals lingulate, twice as long as the sepals. Style  $\frac{1}{4}$  in. long.

Hab. South Brazil; Rio Grande do Sul, *St. Hilaire* 276! (Herb. Par.).

29. *D. SELLOA* Baker. *Prionophyllum Sellowii* K. Koch Ind. Sem. Hort. Berol. 1873, App. 4, 7. — Leaves lanceolate, 8–9 in. long,  $\frac{3}{4}$ –1 in. broad above the dilated base, tapering gradually to the point, rigid, glabrous above, thinly lepidote, armed with large spreading deltoid-cuspidate spines. Peduncle  $1\frac{1}{2}$ –2 ft. long; bract-leaves with long toothed tips. Inflorescence a lax panicle above a

foot long, with numerous dense spicate peduncled branches, the lowest 6-8 in. long; flower-bracts ovate, as long as the calyx. Sepals oblong, obtuse,  $\frac{1}{8}$  in. long. Petals lingulate, unguiculate, more than twice as long as the sepals. Stamens as long as the petals. Style  $\frac{1}{2}$  in. long, distinctly trifurcate.

Hab. South Brazil, *Sello* 3339! (Herb. Reg. Berol.).

30. *D. MACRACANTHA* Baker.—Leaves rigid, ensiform, a foot long,  $1\frac{1}{4}$  in. broad above the dilated base, narrowed gradually to the tip, green and glabrous above, thinly lepidote beneath. Peduncle 2-3 ft. long; bract-leaves long and rigid. Panicle  $1\frac{1}{2}$  ft. long; branches laxly spicate, the lower 3-5-furcate; flower-bracts very small, ovate. Sepals oblong, obtuse,  $\frac{1}{8}$  in. long. Petals lingulate, yellow,  $\frac{1}{4}$  in. long. Style as long as the ovary.

Hab. South Brazil, *Sello* 75! (Herb. Paris).

31. *D. MYRIOSTACHYA* Baker.—Leaves not seen. Peduncle  $\frac{1}{2}$ - $\frac{3}{4}$  in. diam.; bract-leaves rigid, ensiform, elongated, spine-margined. Inflorescence a panicle above 2 ft. long, with a stout rachis and 50 or more densely spicate peduncled branches, the lower 4-5 in. long, not more than  $\frac{1}{2}$  in. diam., flowers included; flower-bracts very small, ovate. Sepals less than half as long as the petals, which are lingulate,  $\frac{1}{8}$  in. long. Stamens and style elongated.

Hab. South Brazil, *Sello* 76! (Herb. Paris). Habit of *Hechtia stenopetala*.

### Subgenus 3. NAVIA.

32. *D. CAULESCENS* Baker. *Navia caulescens* Mart.; Schult. fil. Syst. Veg. vii. 1195.—Caudex simple or forked, the thickness of a man's finger, 3-8 in. long. Leaves densely rosulate, lanceolate or linear-lanceolate, 2- $3\frac{1}{2}$  in. long,  $\frac{1}{4}$ - $\frac{5}{8}$  in. broad; marginal teeth small, crowded, patent. Peduncle  $\frac{1}{2}$ -1 ft. long; bract-leaves lanceolate, adpressed, the lower serrated. Inflorescence a short panicle, with a pubescent axis and several dense sessile ovoid strobiliform spikes  $\frac{1}{4}$ - $\frac{1}{2}$  in. long; flower-bracts ovate, acute,  $\frac{1}{8}$  in. long, at first floccose. Sepals ovate acute,  $\frac{1}{2}$  in. long, the two outer acutely keeled. Petals white, above  $\frac{1}{4}$  in. broad; blade lanceolate. Stamens as long as the petals; filaments filiform. Capsule  $\frac{1}{2}$  in. long, ovoid, obtuse, cuspidate.

Var. *MINOR* Mart. loc. cit.—Leaves linear-lanceolate. Peduncle 3-6 in. long, sometimes procumbent. Spikes few, 3-12-flowered,  $\frac{1}{6}$ - $\frac{1}{3}$  in. long.

Hab. Amazon Valley; banks of the Yapura, on hills at Araracoara, *Martius*.

### Subgenus 4. CEPHALONAVIA.

33. *D. ACAULIS* Baker. *Navia acaulis* Mart.; Schult. fil. Syst. Veg. vii. 1196.—Caudex none or very short. Leaves linear-lanceolate, 2 $\frac{1}{2}$ -5 in. long,  $\frac{1}{8}$ - $\frac{1}{3}$  in. broad, glabrous on both surfaces; marginal spines small, crowded, spreading. Flowers in a dense ovoid capitulum  $\frac{1}{3}$ - $\frac{1}{2}$  in. diam., sessile in the centre of the rosette.

of leaves; flower-bracts ovate, acute,  $\frac{1}{4}$  in. long. Sepals oblong, subpungent at the tip,  $\frac{1}{2}$  in. long. Petals white,  $\frac{1}{3}$  in. long, with a linear-lanceolate blade  $\frac{1}{2}$  lin. broad.

Hab. Amazon valley; banks of the Yapura, on rocks at Araracoara, *Martius*.

#### Subgenus 5. ENCHOLIRION.

34. *D. SPECTABILIS* Baker. *Encholirion spectabile* Mart.; Schultes fil. Syst. Veg. vii. 1233.—Leaves dense, rosulate, ensiform-acuminate, 2 ft. long, an inch broad at the base, very rigid, glossy on the face, thinly white-lepidote and lineate beneath, armed with large pungent spreading deltoid teeth. Peduncle stiffly erect, 6–14 ft. long. Inflorescence a dense simple cylindrical raceme 1–2 ft. long, 2–3 in. diam.; pedicels spreading or rather ascending,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; flower-bracts minute, linear. Sepals ovate, under  $\frac{1}{4}$  in. long. Petals linear or linear-lanceolate, greenish-yellow,  $\frac{3}{4}$  in. long. Stamens longer than the petals; filaments filiform; anthers linear,  $\frac{1}{2}$  in. long. Ovary conical,  $\frac{1}{2}$  in. long; style half as long as the ovary.

Hab. Central Brazil; islands of the River St. Francisco, *Martius*. Common about Oeiras, *Gardner* 2329!

#### 26. HECHTIA *Klotzsch*.

*Flowers* subdioicous. *Sepals* distinct, oblong, coriaceous, imbricated. *Petals* free, broad, obtuse, spreading, about twice as long as the calyx. *Stamens* usually shorter than the petals, 3 attached to their base, rudimentary in the pistillate flowers; filaments subulate; anthers oblong, attached on the back near the base. *Ovary* superior, 3-celled, rudimentary in the staminate flowers; ovules few, superposed; style very short; stigmas linear, falcate, not contorted. *Fruit* a capsule with three septicial valves. *Seeds* sessile, with a linear-oblong nucleus with a broad margin.—*Leaves* in a dense rosette, ensiform-acuminate, rigid, armed with large pungent spines. *Peduncle* produced from the axis of some of the outer leaves of the rosette. *Flowers* minute, whitish. All the species require cool treatment in cultivation, like *Dyckia* and *Rhodostachys*.

1. *H. GLOMERATA* Zuccar. Pl. Nov. Hort. Monac. fasc. iv. 241, t. 6 (M.D.). *H. Ghiesbreghtii* Lemaire in Ill. Hort. t. 378; Hook. in Bot. Mag. t. 5842. *Dasyllirion pitcairniæfolium* Zucc. olim.—Leaves 50 or more in a dense rosette, ensiform-acuminate, 1–1 $\frac{1}{2}$  ft. long,  $\frac{3}{4}$ –1 in. broad low down, much recurved, tapering gradually to the point, turning bright red when old, green and glabrous on the face, silvery-lepidote and distinctly ribbed down the back, armed with large pungent hooked upcurved marginal prickles. Peduncles often 2–3 to a rosette, flexuose, 1–2 ft. long; bract-leaves small, distant, scariose, erect. Inflorescence a lax panicle  $\frac{1}{2}$ –1 ft. long, formed of numerous dense ascending ovoid or oblong strobiliform spikes  $\frac{1}{2}$ –1 in. long; flower-bracts ovate, shorter than the calyx.

Sepals oblong, obtuse, floccose,  $\frac{1}{6}$  in. long in the female flowers. Petals whitish, obtuse,  $\frac{1}{4}$  in. long. Male flowers smaller. Stamens shorter than the petals; filaments thick and fleshy.

Hab. Highlands of Central Mexico, *Ehrenberg* 1001! *Schaffner* 501! *Parry & Palmer* 877! Introduced into cultivation by Karwinski about 1840 and again by Ghiesbreght through Verschaffelt. *H. Demouliana* Hort., of which I have never seen flowers, has habit and leaves very like those of this species, but less lepidote beneath. A plant grown as *H. glomerata* at Kew, for many years, has thicker, broader, more arcuate leaves, and is no doubt a distinct species, but this also has not yet flowered.

2. *H. ARGENTEA* Baker in Bot. Mag. sub. t. 6554, and in Hemsl. Bot. Cent. Amer. iii. 317 (M.D.). — Leaves up to 100 in a dense rosette, ensiform-acuminate,  $1\frac{1}{2}$ –2 ft. long,  $\frac{3}{4}$ –1 in. broad low down, very rigid in texture, tapering gradually to the point, persistently silvery on the face and densely finely lepidote and lineate on the back, not turning red when old, armed with large deltoid ascending pungent prickles. Peduncle 2–3 ft. long; bract-leaves distant, scariose, adpressed. Inflorescence a lax panicle  $1\frac{1}{2}$  ft. long, compound of numerous sessile ascending subglobose or oblong strobiliform spikes  $1$ – $1\frac{1}{2}$  in. long; flower-bracts ovate, brownish,  $\frac{1}{6}$  in. long. Sepals oblong,  $\frac{1}{6}$  in. long in the pistillate flowers. Petals whitish, half as long again as the calyx. Ovary ovoid, filling up the whole flower, with 6 rudimentary stamens at its base.

Hab. Central Mexico. We have had this in cultivation at Kew for many years. It first flowered in April, 1870. It is closely allied to *H. glomerata*, but the leaves are covered on the upper surface with persistent glittering silvery scales.

3. *H. SCHOTTII* Baker in Hemsl. Bot. Cent. Amer. iii. 318. — Leaves ensiform-acuminate,  $1\frac{1}{2}$  ft. long, under an inch broad at the base, glabrous on the face, white-lepidote and lineate on the back, armed with large upcurved brown horny prickles  $\frac{1}{6}$ – $\frac{1}{4}$  in. long. Inflorescence a lax panicle, with many short ascending spicate branches dense upwards and a floccose rachis; flower-bracts ovate, acute,  $\frac{1}{3}$ – $\frac{1}{4}$  in. long. Sepals oblong,  $\frac{1}{6}$  in. long. Petals not seen. Capsule  $\frac{1}{3}$  in. long, the septicial valves slitting down the back.

Hab. South Mexico; province of Yucatan, *Schott* 645! (Herb. Mus. Brit.).

4. *H. TEXENSIS* S. Wats. in Proc. Amer. Acad. xx. 374. — Leaves ensiform-acuminate, very rigid, 15–18 in. long, 2 in. broad at the dilated base,  $1\frac{1}{4}$  in. above it, tapering gradually to the point, green and glabrous on the face, densely white-lepidote and lineate on the back, armed with large hooked spreading deltoid-cuspidate horny brown teeth. Stem 2–4 ft. long. Inflorescence a lax panicle, with ascending spicate branches with a floccose rachis, the lower 6–8 in. long including the short peduncle, subtended by small lanceolate branch-bracts; flower-bracts ovate,  $\frac{1}{6}$  in. long. Sepals oblong,  $\frac{1}{6}$  in. long. Petals white, lingulate, less than twice as long as the calyx. Capsule-valves horny, brown,  $\frac{1}{3}$  in. long, cuspidate with the short styles.

Hab. Western Texas, on the banks of the Rio Grande. Gathered by Dr. Havard in Aug., 1833. Mexico; province of Coahuila, *Pringle* 72!

5. *H. ROSEA* E. Morren inedit. (M.D.). — Leaves ensiform-acuminate,  $1\frac{1}{2}$ –2 ft. long, an inch broad above the ovate base, tapering gradually to a long point, stiffly erecto-patent, much tinged with brown, armed with large ascending hooked pungent marginal prickles. Peduncle erect, longer than the leaves; bract-leaves adpressed, with long red linear tips. Inflorescence a lax panicle 3–4 ft. long, with several long distant ascending or spreading spicate branches, subtended by small scarioso lanceolate branch-bracts; flower-bracts minute, ovate. Sepals oblong,  $\frac{1}{4}$  in. long. Petals bright red, twice as long as the sepals.

Hab. Mexico. Described from Professor Morren's drawing, made Nov., 1885. This may be *H. Roezli* Hort., said to be "entirely red in summer."

6. *H. STENOPETALA* Klotzsch in Otto & Dietr. Gartenzeit. 1835, 401 (M.D.). *H. cordylinoides* Baker in Bot. Mag. t. 6554. *H. Besseriana* Hort. — Leaves about a hundred in a dense rosette, ensiform-acuminate, slightly arcuate,  $1\frac{1}{2}$ –2 ft. long, 1– $1\frac{1}{2}$  in. broad low down, tapering gradually to the point, green and glabrous above, persistently white-lepidote and lineate on the back, armed with middle-sized ascending deltoid-cuspidate pungent prickles. Peduncle stout, stiffly erect, as long as the leaves; bract-leaves ensiform, erecto-patent. Inflorescence an oblong panicle 5–6 ft. long, compound of numerous ascending cylindrical spikes  $\frac{1}{2}$  in. diam., the lower branches sometimes compound; flower-bracts ovate, acute, minute. Sepals oblong, obtuse, under a line long in the staminate flowers. Petals white, oblong,  $\frac{1}{3}$  in. long. Stamens a little longer than the petals. Male flower with a rudimentary ovary and 3 short styles.

Hab. Mountains of Central Mexico, *Schiede & Deppe*. Introduced into cultivation by Karwinski about 1835. Described from a plant that flowered at Kew in the summer of 1880.

7. *H. ? LONGIFOLIA* Hort. — Leaves 40–50 in a rosette, ensiform, 3–4 ft. long,  $1\frac{1}{4}$  in. broad at the middle, narrowing slightly downwards and gradually to an acuminate point, rigid in texture, arcuate, plain green and glabrous on the channelled face, obscurely lepidote on the back, armed with middle-sized deltoid-cuspidate upcurved prickles horny at the tip, but stramineous, not brown. Flowers unknown.

Hab. Country unknown. We have had this at Kew since 1872, but it has not flowered. It came so named from Dr. Regel. In habit and leaf it closely resembles *Bromelia fastuosa*.

### Tribe III. — TILLANDSIEÆ.

#### 27. *SODIROA* André.

*Calyx* gamophyllous, thin; tube cylindrical; segments generally ovate. *Corolla* gamophyllous; tube cylindrical; segments short, oblong. *Stamens* inserted in the corolla-tube; anthers connate. *Ovary* free, ampullæform, 3-celled; ovules many, superposed; style long; stigmas short. *Capsule* oblong-trigonous, coriaceous. *Seeds* linear, erect, with a long funiculus splitting up into fine threads.

*Stems* long, slender. *Leaves* spaced out on the stems, linear, glabrous. *Flowers* few, spicate. Differs widely from all the other *Tillandsia* by its spaced-out leaves and long scarioso calyx-tube.

Calyx-segments small . . . . .	Sp. 1-4.
Calyx-segments large . . . . .	Sp. 5-7.

1. *S. GRAMINIFOLIA* André in Bull. Soc. Bot. France, xxiv. 167.—Stems long, slender, pendent at the apex. Leaves spaced out, linear from an ovate base, channelled all down the face, 6-8 in. long,  $\frac{1}{8}$  in. broad low down, the upper growing gradually shorter, those just below the inflorescence an inch long. Flowers 6-8 in a dense globose capitulum; bracts ovate or oblong, minutely cuspidate, scarlet,  $\frac{1}{2}$  in. long. Calyx-tube cylindrical, pale rose-red, an inch long; segments ovate, falcate,  $\frac{1}{8}$  in. long. Corolla not seen.

Hab. Andes of Southern Columbia, with *S. caricifolia*, André 3402. I am indebted to the kindness of M. André for sketches of these two species, on which he founded the genus. They were gathered in his expedition of 1876.

2. *S. CARICIFOLIA* André in Bull. Bot. Soc. France, xxiv. 167.—Stems slender, very long, sarmentose. Leaves spaced out, linear, firm in texture, pale green, glabrous, channelled down the face,  $\frac{1}{6}$  in. broad low down, the lower a foot long. Peduncle 4-5 in. long; bract-leaves erect, linear. Flowers about 4, in a dense erect spike; bracts oblong, imbricated, brick-red, an inch long. Calyx-tube cylindrical, greenish-purple,  $1\frac{1}{4}$  in. long; segments ovate,  $\frac{1}{4}$  in. long. Corolla green.

Hab. Andes of Southern Columbia, alt. 4500 ft., André 3506.

3. *S. KALBREYERI* Baker.—Stems very long,  $\frac{1}{8}$  in. diam. Leaves spaced out, linear-convolute from an ovate clasping base, not more than 4-5 in. long,  $\frac{1}{12}$  in. broad low down, the upper growing gradually shorter. Flowers about 4 in a dense erect spike; bracts red, oblong, above an inch long, wrapped round each flower. Calyx-tube cylindrical,  $1-1\frac{1}{4}$  in. long; segments ovate,  $\frac{1}{3}$  in. long. Corolla not seen.

Hab. New Granada; Antioquia, alt. 8000 ft., Kalbreyer 1504! Gathered in 1880.

4. *S. SPRUCEI* André Enum. 5—Leaves of the upper part of the stem ovate, shortly acuminate, 2 in. long. Inflorescence a lax raceme of 12-15 spreading shortly-stalked flowers; bracts ovate, acute,  $1\frac{1}{4}-1\frac{1}{2}$  in. long. Calyx scarlet, 2 in. long, connate nearly to the tip. Corolla yellow,  $\frac{1}{3}$  in. longer than the calyx. Stamens inserted at the throat of the corolla-tube, shorter than the segments.

Hab. Cordilleras of South-western Columbia, in the valley of the Rio Nembi, André 3349.

5. *S. PEARCEI* Baker in Journ. Bot. 1887, 53.—Stems as thick as a goose-quill, 1-3 ft. long, pendent from the trunks of trees. Leaves linear-acuminate from a dilated clasping base, 6-8 in. long,  $\frac{1}{8}-\frac{1}{6}$  in. broad low down, moderately firm in texture. Peduncle a few inches long; bract-leaves with long subulate tips. Flowers 2-3 in a dense erect spike; bracts bright red, oblong, acute, scarioso,

1-1½ in. long. Calyx-tube red, cylindrical, 1½ in. long; segments ovate, acute, imbricated, falcate, ¾ in. long. Corolla-tube cylindrical, an inch long; segments oblong, ¼ in. long.

Hab. Andes of Ecuador; forests of Pastassa, alt. 6000—6000 ft., *Pearce* 416! Gathered before 1867.

6. *S. DISSITIFLORA* André Enum. 5.—Leaves lanceolate, narrowed into a long setaceous point, the lower 4-5 in. long, the upper growing gradually shorter. Flowers 7-8 in a very lax spike; bracts ovate, obtuse, obscurely mucronate, nearly as long as the calyx. Calyx above an inch long; segments oblong, obtuse, as long as the tube. Corolla not seen. Capsule as long as the calyx.

Hab. Cordilleras of South-western Columbia, in the valley of the Rio Nembí, *André* 3339, bis.

7. *S. ANDREANA* Wittm. in Engl. Jahrb. xi. 57.—Stems ⅙ in. diam. Leaves linear from a clasping ovate base, spaced out, 6-8 in. long, ⅙ in. broad low down. Flowers 5-6 in a dense terminal head; bracts ovate or oblong, bright red, the inner an inch long. Calyx 1½ in. long; tube cylindrical-trigonus; segments obovate, as long as the tube, ½ in. broad. Corolla not seen. Capsule-valves lanceolate, an inch long.

Hab. New Granada; Antioquia, alt. 6000—7000 ft., *Lehmann!* (Herb. Mus. Brit.).

A plant, without flowers, amongst the Morren drawings, gathered by Pfau in Chiriqui, marked *Pepinia insignis*, is most likely a *Sodirola*. It has shorter and broader leaves than any of the foregoing, with a lax inflorescence and bright red acuminate bracts.

## 28. CARAGUATA Lindl.

(including *Schlumbergeria* E. Morren).

*Sepals* erect, imbricated, shortly connate at the base. *Corolla* gamopetalous; segments oblong, shorter than the cylindrical tube. *Stamens* inserted at the throat of the corolla-tube; filaments short; anthers free. *Ovary* free, ampullæform, 3-celled; style long; stigmas linear, twisted. *Capsule* oblong-trigonus, coriaceous, dehiscing septicidally into three lanceolate valves. *Seeds* numerous, narrow, with a long funiculus, which breaks up into fine threads.—Acaulescent, with leaves in a dense rosette. *Inflorescence* very various. Habit and leaves of *Tillandsia*, from which it only differs by its gamopetalous corolla.

Subgenus CARAGUATA PROPER.—Corolla longer than the calyx. Filaments and corolla-segments short.

Inflorescence capitate . . . . .	Sp. 1-5.
Inflorescence a simple spike or raceme . . . . .	Sp. 6-16.
Inflorescence paniced . . . . .	Sp. 17-27.

Subgenus MASSANGEA.—Corolla shorter than the calyx.

Sp. 28.

Subgenus SCHLUMBERGERIA.—Corolla longer than the calyx. Filaments and corolla-segments longer than in *Caraguata proper*.

Sp. 29–38.

Doubtful species . . . . . Sp. 39.

1. *C. LINGULATA* Lindl. in Bot. Reg. sub. t. 1068; Morren Fuchsia, t. 4; Kern. Hort. Semper. t. 274 (M.D.).—*C. latifolia* Beer. *Tillandsia lingulata* Lam.; Jacq. Stirp. Amer. t. 62 (Plumier Bot. Amer. t. 62, 73, 74; Sloane Hist. Jam. t. 120).—Leaves 30–40, thin, lanceolate, 1–1½ ft. long, 1–1½ in. broad at the middle, 2–3 in. at the dilated base, hardly at all lepidote, usually striped vertically with red-brown on the back. Peduncle ½–1 ft. long; bract-leaves imbricated, upper bright red. Inflorescence dense, globose, overtopped by the bright-red falcate outer bracts; flower-bracts obtuse, 1½–2 in. long. Calyx under an inch long; segments lanceolate, not imbricated. Corolla yellowish-white, 1½–2 in. long; segments short, oblong, obtuse.

Hab. West Indies, Guiana, Columbia and Ecuador. *C. latifolia* Beer, is founded on Plumier's tab. 74; *C. splendens* Bouché, figured Flore des Serres, t. 1091 and Otto Gartenzeit. 1856, t. 4, and *C. cardinalis*, André in Ill. Hort. 1880, t. 674 and Rev. Hort. 1883, 12, are forms with larger, more brightly coloured outer bracts than the type; and *C. virens* Brong., a form with green outer bracts.

2. *C. PALUSTRIS* Wittm. in Engl. Jahrb. xi. 58.—Leaves spread over a short produced stem, ovate-lanceolate, 6–8 in. long, 2 in. broad at the base, narrowed gradually to the point, thinly lepidote. Peduncle as long as the leaves. Inflorescence a globose capitulum surrounded by ovate imbricated bracts. Calyx ¾ in. long; sepals oblong. Corolla lemon-yellow; tube as long as the calyx; segments oblong, ½ in. long. Filaments very short.

Hab. Andes of Southern Columbia, alt. 11000 ft., in marshes, *Lehmann*, 537!

3. *C. SANGUINEA* André in Rev. Hort. 1883, 468, with figure; Baker in Bot. Mag. t. 6765.—Leaves 20–30 in a dense rosette, lanceolate, the outer a foot long, 1½–2 in. broad at the middle, thin, but little dilated at the base, obscurely lepidote on both surfaces, strongly tinged with bright red. Flowers in a sessile central capitulum, each with a short pedicel, subtended by an oblong obtuse membranous bract shorter than the calyx-tube. Calyx ⅝–¾ in. long; segments oblong, obtuse. Corolla yellowish-white, 2½–3 in. long; tube slender; segments small, oblong, obtuse. Stamens half as long as the corolla-segments; filaments very short.

Hab. Western Andes of New Granada, *André* 3369. Discovered by M. André in 1876, and introduced by him into cultivation. Described from a plant that flowered at Kew, Nov. 1883. Var. *erecta* André, is a robust variety with a stalked head of flowers.

4. *C. OSYANA* E. Morren in Belg. Hort. 1885, 254, t. 16, 17. *C. magnifica* Hort.—Acaulescent. Leaves about 30 in a rosette, lanceolate, pale green, above a foot long, 1½ in. broad at the middle, narrowed gradually to the point. Peduncle very short. Flowers in a dense globose head 3–4 in. diam.; bracts ovate, squarrose, scarlet, the outer 1½–2 in. long. Calyx-segments oblong, obtuse,

involute. Corolla bright yellow, twice as long as the calyx; segments oblong, obtuse, much shorter than the tube. Stamens half as long as the corolla-segments.

Hab. Andes of Ecuador; gathered by Wallis in 1875. Flowered at Liège by M. Jacob Makoy in 1882. An allied plant is mentioned in Morren's notes as having been found by Pfau in Chiriqui.

5. *C. CONIFERA* André Enum. 5.—Radical leaves lanceolate, acute, bright green, 2-3 ft. long,  $2\frac{1}{2}$ -3 in. broad at the middle. Stem stout, erect, about as long as the leaves; bract-leaves lanceolate. Inflorescence a dense conical capitulum 8-10 in. long, 4-6 in. broad; flower-bracts much imbricated, deltoid, bright red, passing into golden-yellow at the tip. Calyx much shorter than the bract; segments oblong, acute, an inch long. Corolla pale yellow, above 2 in. long, just overtopping the bract; segments obtuse, above  $\frac{1}{2}$  in. long. Capsule cylindrical,  $1\frac{1}{2}$  in. long.

Hab. Ecuador; Zamora Poortman 416.

6. *C. ANGUSTIFOLIA* Baker in Gard. Chron. 1884, ii. 616 (M.D.). *Guzmania Bulliana* André in Rev. Hort. 1886, 324.—Acaulescent, cæspitose. Leaves linear from an ovate base, 5-6 in. long,  $\frac{1}{2}$  in. broad at the base of the blade, firm in texture, channelled down the face, obscurely lepidote on the concave back. Peduncle 3-4 in. long; bract-leaves crowded, long-pointed. Flowers few, arranged in a simple multifarious spike; outer bracts ovate-lanceolate, bright red 1- $1\frac{1}{2}$  in. long. Calyx  $\frac{1}{2}$  in. long; segments oblong, obtuse. Corolla bright yellow, 2- $2\frac{1}{4}$  in. long; tube very slender; segments oblong, obtuse,  $\frac{1}{4}$  in. long. Stamens half as long as the segments.

Hab. Andes of New Granada. Introduced by Kalbreyer. Described from a plant that flowered with Messrs. Veitch in Nov., 1884. Banks of the Rio Dagua, alt. 4000 ft., Lehmann 1962! I re-examined this alive at Kew in June, 1888, and found that the anthers are not connate.

7. *C. PULCHELLA* André Enum. 5.—Leaves 6-12 in a basal rosette, lanceolate, acute, 4-5 in. long,  $1\frac{1}{2}$  in. broad at the dilated base,  $\frac{1}{3}$  in. at the middle, copiously lepidote low down. Peduncle slender, curved; bract-leaves lax, ovate. Inflorescence a distichous, moderately dense, usually simple spike 2-3 in. long, rarely forked; bracts ovate, apiculate. Calyx lepidote, shorter than the bract; lobes oblong, obtuse. Corolla white,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long; tube as long as the calyx; segments short, obtuse. Filaments very short.

Hab. Andes of Ecuador, alt. 11000 ft., André 4502.

8. *C. DEVANSAYANA* E. Morren. *Guzmania Devansayana* E. Morren in Belg. Hort. 1882, 113, t. 8, 9 (M.D.).—Leaves 20 to a rosette, ensiform from an ovate base,  $1\frac{1}{2}$ -2 ft. long, an inch broad at the middle, vertically striped with brown on the back towards the base, which is  $1\frac{1}{2}$ -2 in. broad. Peduncle much shorter than the leaves; bract-leaves lanceolate, green, imbricated. Inflorescence a dense oblong multifarious spike 2 in. long, above 1 in. diam.; flower-bracts broad ovate, acute, bright scarlet, 1- $1\frac{1}{4}$  in. long. Corolla white, as long as the bract. Anthers free, nearly sessile at the throat of the corolla-tube.

Hab. Ecuador; province of Cuenca, imported by M. Jacob Makoy, of Liège, with whom it first flowered in 1882.

9. *C. MELINONIS* E. Morren. *Guzmania Melinoki* Regel Gartenfl. 1885, 116.—Leaves densely rosulate, lorate, a foot long,  $1\frac{1}{2}$ –2 in. broad, thin, flexible, green above, tinged with brown beneath. Peduncle shorter than the leaves. Inflorescence a dense simple multifarious oblong spike 3 in. long; flower-bracts oblong, red,  $1\frac{1}{4}$  in. long. Calyx half as long as the corolla. Corolla yellow,  $1\frac{1}{4}$  in. long; segments oblong,  $\frac{1}{3}$  the length of the tube. Anthers nearly sessile at the throat of the corolla-tube, not connate.

Hab. French Guiana. Introduced into cultivation by Mélinon in 1879. Habit of *Guzmania erythrolepis*.

10. *C. CORIOSTACHYA* Griseb. in Gotting. Nacht. 1864, 21.—Leaves lanceolate,  $1\frac{1}{2}$  ft. long. Peduncle as long as the leaves. Inflorescence a dense oblong spike 3–4 in. long; bracts round-deltoid, coriaceous, 8–10 lines broad. Calyx as long as the corolla-tube; segments oblong, obtuse. Corolla-tube clavate; segments oblong, obtuse, half as long as the tube. Alternate anthers longer than their filaments.

Hab. Mountains of Venezuela, alt. 4000 ft., *Fendler* 2167.

11. *C. FUERSTENBERGIANA* Kirch. et Wittm. in Berlin Gartenzeit. 1883, 299, with coloured figure.—Leaves about 15 in a rosette, lanceolate, 12–16 in. long, without spots or stripes. Peduncle much shorter than the leaves; bract-leaves numerous, short, ascending, ovate-lanceolate, lower green, upper bright red. Inflorescence a simple multifarious spike 2–3 in. long; bracts broad ovate, bright red. Calyx oblong; segments lanceolate, twice as long as the tube. Corolla whitish,  $1\frac{1}{4}$  in. long; segments much shorter than the cylindrical tube. Stamens half as long as the corolla-segments.

Hab. Andes of Ecuador, *Lehmann* 187. Discovered by Roezl. Flowered in the collection of Prince Fuerstenberg at Donausingen in 1883. Now placed by Dr. Wittmack in *Guzmania*.

12. *C. GRANDIFLORA* Baker.—Leaves densely rosulate, thin, lanceolate, subglabrous, narrowed to the point,  $1$ – $1\frac{1}{2}$  ft. long,  $1$ – $1\frac{1}{2}$  in. broad at the middle. Peduncle much shorter than the leaves. Inflorescence a dense multifarious spike 3–4 in. long,  $1\frac{1}{2}$ –2 in. diam.; bracts ovate, bright red, much imbricated,  $1\frac{1}{2}$ –2 in. long, an inch broad. Calyx much shorter than the bract; sepals obtuse. Corolla  $1\frac{1}{2}$  in. longer than the calyx, bright yellow; segments linear-oblong,  $\frac{1}{2}$  in. long. Anthers linear,  $\frac{1}{3}$  in. long, not united. Capsule 2 in. long,  $\frac{1}{3}$  in. diam., tapering to the point.

Hab. Forests of Porto Rico, *Sintenis* 471! 1577! 2765! 2970! Closely resembles *G. tricolor* and *erythrolepis* in habit, but the anthers are not united.

13. *C. SINTENESII* Baker.—Leaves densely rosulate, lanceolate from an ovate base,  $\frac{1}{2}$ –1 ft. long, an inch broad at the middle, thin, obscurely lepidote. Peduncle  $\frac{1}{2}$  ft. long; bract-leaves large, lanceolate. Inflorescence a lax spike  $\frac{1}{2}$  ft. long; bracts ovate, bright red, 2–4 in. long; flowers usually 2 sessile in the axil of each bract. Sepals oblong, obtuse,  $\frac{3}{4}$ –1 in. long. Corolla-tube cylindrical, as long as the calyx; segments small, oblong, bright yellow. Capsule  $1\frac{1}{2}$  in. long.

Hab. Porto Rico, *Sintenis* 1589! 4712! 6603! Jamaica, on St. Catherine's Peak, alt. 4500 ft., *Eggers* 3624!

14. *C. BRACTEOSA* André Enum. 5. — Radical leaves not known. Peduncle erect, under a foot long, furnished with many imbricated lanceolate bract leaves. Spike dense, simple, 4–5 in. long, 2 in. diam.; flowers solitary in the axils of the obscurely-lepidote oblong bracts, which are above 2 in. long. Calyx an inch long. Corolla yellow, 3 in. long, with a tube gradually widening from the base to the throat and oblong segments  $\frac{1}{5}$  the length of the tube. Stamens shorter than the corolla-segments.

Hab. Andes of Ecuador at Niebli, alt. 6000 ft., *André* 3805.

15. *C. BERTERONIANA* Schultes fl. Syst. Veg. vii. 1229. *Devillea speciosa* Bertero. — Leaves thin, lanceolate, 12–16 in. long,  $1\frac{1}{2}$  in. broad above the dilated base. Peduncle as long as the leaves; bract-leaves many, lanceolate, erect. Inflorescence a simple multifarious spike 6–8 in. long, not dense, each flower placed in the axil of an ovate-lanceolate bract 2–2 $\frac{1}{2}$  in. long. Calyx under an inch long; segments oblong, obtuse. Corolla yellow, 2–2 $\frac{1}{4}$  in. long: tube subcylindrical; segments oblong, obtuse, half as long as the tube. Stamens shorter than the corolla-segments.

Hab. Forests of Porto Rico, *Bertero*.

16. *C. PEACOCKII* E. Morren in Belg. Hort. 1885, 82 (M.D.). — Acaulescent. Leaves about a dozen in a rosette, lanceolate, 1 ft. long,  $1\frac{1}{2}$  in. broad above the dilated base, bright claret-purple on both sides, conspicuously striped vertically on the back towards the base. Peduncle covered with bright red bract-leaves; upper crowded round the densely spicate flowers.

Hab. Probably Andine. Sent by the late Mr. J. T. Peacock, of Hammer-smith, to Professor Morren, in 1879.

17. *C. ACORIFOLIA* André Enum. 6. — Radical leaves linear, 18–20 in. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad at the middle. Peduncle nearly as long as the leaves. Panicle 6–8 in. long, composed of 6–8 dense erecto-patent cylindrical spikes  $1\frac{1}{2}$ –2 in. long; lower branch-bracts ovate-lanceolate, upper ovate; flower-bracts ovate, acute, a little longer than the calyx. Calyx trigonous, arcuate, as long as the corolla-tube. Corolla-tube narrow, cylindrical; segments very short, acute. Filaments very short. Capsule above  $\frac{1}{2}$  in. long.

Hab. South Andes of Columbia; Rio Nembí, alt. 3000 ft., *André* 3396.

18. *C.?* *VITTATA* Baker. *Bonapartea vittata* Mart; Roem. et Schultes Syst. Veg. vii. 1198. *Massangea vittata* E. Morren. — Leaves ensiform-acuminate from a ventricose ovate base, 1–1 $\frac{1}{2}$  ft. long, 2 in. broad at the base, an inch at the middle, lepidote beneath, marked with purple transverse bands  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Peduncle simple,  $1\frac{1}{2}$ –2 ft. long. Spikes 3, dense, congested; branch-bracts ovate-acuminate, as long as the spikes; flower-bracts ovate,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Calyx  $\frac{1}{2}$  in. long; sepals obtuse. Petal-blade oblong, white,  $\frac{1}{3}$  in. long. Stamens shorter than the petals.

Hab. Amazon valley near Para, *Martius*.

19. *C. VIOLACEA* André Enum. 6.—Radical leaves lanceolate, acute, a foot long, above an inch broad at the middle, nearly naked. Peduncle weak, curved, under a foot long; bract-leaves many, long, lanceolate. Inflorescence a moderately dense narrow panicle  $\frac{1}{2}$  ft. long, formed of several short distichous 3-4-flowered spikes, the lower much shorter than the ovate-lanceolate branch-bracts; flower-bracts deltoid, the lower  $\frac{1}{3}$  in. long. Calyx longer than the bract; lobes oblong, obtuse. Corolla violet, under an inch long; segments oblong,  $\frac{1}{5}$  in. long. Filaments just longer than the anthers.

Hab. Southern Andes of Ecuador, *André* 2746.

20. *C. GLORIOSA* André Enum. 5.—Radical leaves not seen. Peduncle very robust; bract-leaves many, lorate, reaching a foot in length, bright red in the middle. Panicle narrow, dense, made of several clusters of sessile flowers which are quite hidden by the deltoid branch-bracts, which reach a length of 4-5 inches and are green at the base, golden-yellow in the middle and scarlet at the tip; flower-bracts oblong, acute,  $1\frac{1}{2}$  in. long. Calyx as long as the bract, with a short tube and oblong acute segments. Corolla yellow, under 2 in. long; segments very short. Filaments shorter than the anthers.

Hab. Andes of Ecuador near Quito, alt. 6000 ft., *André* 3791.

21. *C. MOSQUERÆ* Wittm. in Engl. Jahrb. xi. 58.—Acaulescent. Leaves lanceolate from a large ovate base, 1 ft. long,  $1\frac{1}{2}$  in. broad at the base of the blade, thinly lepidote on the back, narrowed gradually to the point. Peduncle rather shorter than the leaves. Inflorescence a dense panicle, 4-5 in. long; bracts ovate-lanceolate, lower 3 in. long, upper ovate, an inch long, with several flowers crowded in the axis of each. Calyx-segments oblong, obtuse. Corolla yellow, about an inch long; segments oblong, half as long as the tube. Anthers sessile at the throat of the corolla-tube.

Hab. Andes of Columbia; Cauca, alt. 8000 ft., *Lehmann* 3636!

22. *C. MORRENIANA* André in Rev. Hort. 1887, 12, with coloured figure.—Leaves 30-40, densely rosulate, lanceolate, 16-20 in. long, 2 in. broad, green tinged with red-violet, faintly striated vertically. Inflorescence a congested panicle with a short stem (4-6 in. long) in the centre of the rosette of leaves, about 3 in. diam.; branch-bracts ovate, bright red, each subtending several flowers; flower-bracts ovate, obtuse, red-yellow, as long as the calyx. Calyx about an inch long. Corolla bright yellow; tube above an inch long; sepals oblong, nearly  $\frac{1}{2}$  in. long. Stamens much shorter than the corolla-segments.

Hab. Southern Andes of New Granada, *André*. Discovered by M. André in 1876, and introduced by him into cultivation.

23. *C. VAN-VOLXEMI* André in Ill. Hort. n. s. t. 326 (M.D.).—Leaves 20-30 in a dense rosette, thin, lanceolate, plain green, 2-2 $\frac{1}{2}$  ft. long,  $1\frac{1}{2}$ -2 in. broad at the middle. Peduncle shorter than the leaves; bract-leaves erect, green, much imbricated. Inflorescence a narrow panicle 1 ft. long, with a bright red rachis; spikes many, short, erecto-patent, multifarious; branch-bracts ovate or

ovate-lanceolate, red or red-green, 1-2 in. long; flower-bracts small, red, ovate. Calyx red or yellow,  $\frac{1}{2}$ - $\frac{3}{8}$  in. long; sepals oblong, obtuse. Corolla yellowish-white, half as long again as the calyx.

Hab. New Granada; Mount Quindio, alt. 8000-10000 ft., *André* 2228, *Lehmann* 3660.

24. *C. MULTIFLORA* *André* Enum. 6.—Leaves densely rosulate, lanceolate, 2-2 $\frac{1}{2}$  ft. long, 2 in. broad, narrowed gradually to the point, pale green often tinged with red towards the edge. Peduncle longer than the leaves; lower bract-leaves elongated. Inflorescence a lax panicle a foot long, composed of about 16 erecto-patent branches 1-1 $\frac{1}{2}$  in. long; branch-bracts ovate-cuspidate, reddish, the lower as long as the branches; spikes not dense; flower-bracts oblong,  $\frac{1}{3}$  in. long. Calyx as long as the flower-bract, yellow. Corolla white, half as long again as the calyx.

Hab. Andes of Columbia; Cauca near Pasto, &c., alt. 6000-9000 ft., *André* 2970, *Lehmann* 2887.

25. *C. ZAHNI* *Hook.* fil. in *Bot. Mag.* t. 6059.—Leaves 20-30 to a rosette, thin, lanceolate, falcate, 1-1 $\frac{1}{2}$  ft. long, 1-1 $\frac{1}{4}$  in. broad at the middle, narrowed gradually to the point, not lepidote, often tinged with bright red, conspicuously striped vertically with red-brown on both sides towards the base. Peduncle about as long as the leaves; many upper bract-leaves large, lanceolate, bright red. Inflorescence a dense panicle 3-4 in. long, with a few short dense erecto-patent multifarious spikes; branch-bracts small, ovate, acuminate, yellow tipped with red; flower-bracts ovate, acute, yellow, as long as the calyx. Calyx above  $\frac{1}{2}$  in. long; sepals lanceolate, free down nearly to the base. Corolla yellow, an inch long; segments oblong, obtuse, half as long as the tube. Filaments very short.

Hab. Mountains of Chiriqui; sent home by Zahn to Messrs. Veitch about 1870, and regathered by Pfau in 1883.

26. *C. CANDELABRUM* *André* Enum. 6.—Stoloniferous, with several floriferous stems radiating from a centre. Radical leaves lorate, glabrous, 16-18 in. long, above 3 in. broad. Peduncle 2-3 ft. long, bright red, as are the bracts and calyx; lower bract-leaves elongated, upper short. Panicle lax, narrow, 16-20 in. long, composed of several spaced-out spikes 2-2 $\frac{1}{2}$  in. long, usually trifid at the base; branch-bracts small, ovate, acute; flower-bracts ovate, acute, half as long as the calyx. Calyx arcuate; sepals acute, connate halfway up. Corolla white, an inch long; tube as long as the calyx; segments ovate,  $\frac{1}{3}$  in. long. Stamens half as long as the corolla-lobes.

Hab. Southern Andes of Columbia, *André* 2963.

27. *C. MAGNIFICA* *Hort.* (M.D.).—Leaves 30 in a rosette, pliable, lanceolate, above a foot long, 1 $\frac{1}{2}$ -2 in. broad, tinged with claret-brown. Peduncle much overtopping the reflexing leaves. Inflorescence a panicle 1 $\frac{1}{2}$ -2 ft. long, with many dense erecto-patent multifarious branches; flower-bracts ovate-lanceolate, red-yellow,

1 $\frac{1}{4}$  in. long. Calyx as long as the flower-bract. Corolla yellow,  $\frac{1}{3}$  in. longer than the calyx. Style exerted beyond the corolla.

Hab. A garden hybrid between *C. Zahnii* and some robust *Tillandsia*. Described from Prof. Morren's drawing, made from a plant flowered by M. Lemoine at Angers in 1882. See Rev. Hort. 1883, 62.

#### Subgenus MASSANGEA.

28. *C. MUSAICA* André in Ill. Hort. 1877, 27, t. 268; Baker in Bot. Mag. t. 6675. *Massangea musaica* E. Morren in Belg. Hort. 1877, 50, 199, t. 8-9 (M. D.). — Leaves 15-20 in a sessile rosette, lorate, rather horny in texture, 1 $\frac{1}{2}$ -2 ft. long, 2-3 in. broad, banded copiously on the back with fine wavy lines of red-brown on a purple-tinted green ground, rounded at the tip to a small cusp. Peduncle about a foot long; bract-leaves scarioso, adpressed, imbricated. Inflorescence a globose head 3 in. diam.; flower-bracts ovate, obtuse, bright red, the lower an inch long. Calyx oblong, coriaceous, yellowish-white, 1-1 $\frac{1}{4}$  in. long; segments oblong, obtuse. Corolla whitish, shorter than the calyx; segments oblong, as long as the tube. Stamens shorter than the corolla-lobes; filaments very short.

Hab. New Granada; province of Ocana, alt. 3000 ft. Discovered by Wallis in 1857. Was spread widely in gardens, before it flowered, under the names *Billbergia*, *Tillandsia*, and *Vriesea musaica*. I have not seen *Massangea santoviensis* Hort. Linden, imported from South Brazil in 1882. Probably it is a *Vriesea*.

#### Subgenus SCHLUMBERGERIA (Morren).

29. *C. SPHEROIDEA* André, Enum. 6.—Radical leaves lanceolate, acute, 1 $\frac{1}{2}$ -2 ft. long, above an inch broad at the middle, glabrous, but little dilated at the base. Peduncle robust, elongated; bract-leaves lanceolate, adpressed. Panicle dense, 3-4 in. long, formed of about 4 dense globose subsessile clusters above an inch long, containing each 12-15 flowers; branch-bracts lanceolate, the lower as long as the clusters; flower-bracts ovate, acute, the lower  $\frac{1}{3}$ - $\frac{1}{2}$  in. long. Calyx  $\frac{1}{5}$  in. longer than the bract. Corolla yellow or whitish. Capsule three times the length of the calyx.

Hab. Andes of Cauca and Quindio, alt. 5500-7000 ft., André 2068.

30. *C. LEPIDOTA* André, Enum. 6. — Radical leaves lanceolate, coriaceous, densely lepidote, 15-16 in. long, 2 in. broad at the middle. Peduncle rugose; bract-leaves spaced-out, lanceolate. Panicle narrow, formed of several dense ovoid subsessile spikes 1 $\frac{1}{2}$  in. long, containing at least 20 flowers; branch-bracts lanceolate, the lower longer than the spikes; flower-bracts ovate, the lower above  $\frac{1}{2}$  in. long. Calyx nearly an inch long; segments oblong, acute, imbricated, green. Corolla white, half as long again as the calyx; segments linear, acute,  $\frac{1}{4}$  in. long. Filaments half as long again as the anthers.

Hab. Andes of Ecuador, at Niebli, alt. 6000 ft., André 3796.

31. *C. BAKERI* Wittm. in Engl. Jahrb. xi. 59. — Leaves densely rosulate, lingulate, acute, about a foot long, 3 in. broad at the

dilated base, above 2 in. at the middle. Inflorescence a narrow panicle  $1\frac{1}{2}$  ft. long, composed of above a dozen spaced-out sessile dense oblong non-distichous spikes  $1\frac{1}{2}$  in. long; branch-bracts ovate, acute, red, an inch long; flower-bracts oblong,  $\frac{3}{4}$  in. long. Sepals as long as the flower-bract. Corolla yellow, an inch long, with a tube as long as the calyx. Stamens shorter than the corolla-segments.

Hab. Andes of Pasto, alt. 10,000 ft., *Lehmann* 667! Like *C. penduliflora* on a reduced scale.

32. *C. PENDULIFLORA* Wittm. in Engl. Jahrb. xi. 59. *Tillandsia penduliflora* Griseb. Fl. Brit. West Ind. 597. — Whole plant 7–8 ft. high. Leaves lorate, rigidly coriaceous, glabrous, 2–3 ft. long, 2 in. broad at the middle. Inflorescence a huge panicle, probably 4–5 ft. high, the lower branches of which are a foot or more long; spikes dense, deflexed, multifarious, subsessile; flower-bracts ovate-lanceolate,  $1-1\frac{1}{4}$  in. long. Calyx  $1\frac{1}{4}$  in. long; segments lanceolate. Corolla with a narrowly funnel-shaped tube  $\frac{3}{4}$  in. long; segments not seen.

Hab. Dominica, *Inray* 107! *Ramage*! Martinique, *Hahn* 616!

33. *C. LEHMANNIANA* Baker. *Schlumbergeria Lehmanniana* Wittm. in Engl. Jahrb. xi. 60. — Leaves lorate,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, from a large dilated oblong base, obscurely lepidote. Peduncle a foot long; bract-leaves adpressed, imbricated. Panicle lax, 6–8 in. long, with several short arcuate ascending branches, at most 2 in. long; branch-bracts small, ovate; flower-bracts ovate, much shorter than the calyx. Calyx above an inch long; segments lanceolate. Corolla-tube cylindrical, rather longer than the calyx; segments narrow, nearly an inch long. Filaments above  $\frac{1}{2}$  in. long, twice as long as the anthers.

Hab. New Granada; province of Cauca, alt. 7000 ft., *Lehmann* 3629!

34. *C. ANDREANA* E. Morren in Rev. Hort. 1884, 247, with woodcut; 1886, 276, with coloured figure (M.D.); Baker in Bot. Mag. t. 7014. — Acaulescent. Leaves about 20 in a rosette, lanceolate, pliable, plain green,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. broad at the middle, lepidote. Peduncle  $1-1\frac{1}{2}$  ft. long; bract-leaves green, lanceolate, adpressed. Inflorescence a panicle under a foot long, with a bright red rachis and a few flowers crowded in the axis of each of the spreading red-green bracts, which are  $1\frac{1}{2}$ –2 in. long. Calyx green,  $1\frac{1}{2}$  in. long; sepals lanceolate. Corolla yellow; tube as long as the calyx; segments lingulate, an inch long, rolling up spirally. Filaments much longer than the anthers.

Hab. New Granada; Cordillera of Pasto, alt. 11,000 ft., discovered by M. André in 1876. Described from a plant that flowered at Kew, March, 1888.

35. *C. STRAMINEA* Baker. *Anoplophytum vittatum* Beer, Brom. 43. *A. stramineum* K. Koch. — Leaves densely rosulate, lanceolate, from an ovate base,  $1\frac{1}{2}$  ft. long, more than an inch broad at the middle, narrowed gradually to the point. Peduncle with inflorescence 2 ft. long. Inflorescence a panicle composed of several short dense spreading multifarious spikes; lower branch-bracts lanceolate from

an ovate base; flower-bracts green, ovate,  $\frac{3}{4}$  in. long. Calyx green, glabrous,  $1-1\frac{1}{4}$  in. long; segments oblong, obtuse. Corolla-tube straw-white, a little longer than the calyx; segments oblong, half as long as the tube. Stamens shorter than the corolla-segments. Style a little exserted.

Hab. Country unknown. Introduced into cultivation by Linden before 1857.

36. C. VIRESCENS Baker. *Schlumbergeria virescens* E. Morren, Belg. Hort. 1879, 225, 360, t. 19. *S. Roezlii* E. Morren, Belg. Hort. 1878, 311 (M.D.); Antoine in Oester. Bot. Zeits. 1882, 277, with figure. *Puya virescens* Hook. in Bot. Mag. t. 4991. *Pitcairnia virescens* K. Koch.—Acaulescent. Leaves about 30, lorate,  $1\frac{1}{2}-2$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, deltoid-cuspidate at the tip, plain green, with only a few brown spots towards the base, not lepidote. Peduncle slender, as long as the leaves; bract-leaves small, distant, adpressed. Panicle of 2-4 moderately dense peduncled branches 6-9 in. long; branch-bracts small, ovate; flower bracts green, ovate, shorter than the calyx. Calyx an inch long, green; segments lanceolate. Corolla white, half-an inch longer than the calyx; segments spreading, oblong. Stamens nearly as long as the corolla-lobes.

Hab. Andes of Peru, alt. 10,000-13,000 ft., *Roezl* 105, 106. Flowered at Kew in 1857, after which it was lost, and introduced again in 1878.

37. C. LINDENI Baker. *Schlumbergeria Lindeni* E. Morren in Belg. Hort. 1883, 121, t. 10-12 (M.D.). *Massangea Lindeni* André in Ill. Hort. 1878, 55, t. 309. — Acaulescent. Leaves 20-30 in a dense rosette, lorate, 2-2 $\frac{1}{2}$  ft. long, 2-3 in. broad at the middle, marked with very conspicuous transverse bands of green or red-brown all over on both sides. Peduncle overtopping the leaves; bract-leaves adpressed, imbricated. Inflorescence a narrow lax panicle 3-4 ft. long, composed of many short ascending dense spikes; branch-bracts ovate or ovate-lanceolate, variegated, like the leaves; flower-bracts ovate, green,  $\frac{3}{4}$  in. long. Calyx as long as the bract. Corolla white,  $\frac{1}{2}$  in. longer than the calyx. Stamens not exserted.

Hab. Andes of Northern Peru. Introduced by Linden. First exhibited at Ghent in 1878.

38. C. SCHLUMBERGERII Baker. *Schlumbergeria Morreniana* E. Morren in Belg. Hort. 1883, 46, t. 4-6 (M.D.). *Massangea Morreniana* Hort. Linden. — Leaves about 30 in a dense rosette, lorate, 3-3 $\frac{1}{2}$  ft. long, 2-2 $\frac{1}{2}$  in. broad at the middle, plain green on the face, marked on the back with copious transverse vermiform lines of red-brown, not lepidote, deltoid-cuspidate at the apex. Peduncle stout, 2 ft. long; bract-leaves adpressed, imbricated. Panicle of about 5 dense multifarious oblong congested spikes  $1\frac{1}{2}-2$  in. long; flower-bracts ovate, red-brown,  $\frac{3}{4}-1$  in. long. Calyx an inch long, whitish; segments oblong. Corolla pale yellow, 2 in. long; segments lingulate, rather shorter than the cylindrical tube. Stamens shorter than the corolla-lobes.

Hab. Andes of Ecuador or Peru. Introduced by Linden, by whom it was first flowered in 1882.

39. *C.?* *HYGROMETRICA* André, Enum. 6.—Radical leaves lanceolate, soft, fragile, glabrous, under a foot long, 2 in. broad. Peduncle half as long again as the leaves; bract-leaves lanceolate, imbricated. Panicle very narrow, 3 in. long; clusters 2–3-flowered, overtopped by the deltoid branch-bracts; pedicels short; flower-bracts thin, evanescent. Calyx very hygrometric; segments free to the base, obtuse. Corolla white, ventricose at the base, apparently tubular. Stamens inserted at the base of the corolla. Capsule an inch long.

Hab. Southern Andes of New Granada, alt. 3000 ft., André 2638. M. André regards this as a probable new genus.

### 29. GUZMANIA Ruiz & Pavon.

*Sepals* oblong, obtuse, shortly connate at the base. *Corolla* gamopetalous; segments oblong, much shorter than the cylindrical tube. *Stamens* inserted at the throat of the corolla-tube; anthers linear-oblong, united in a ring round the style by their edges. *Ovary* free, ampullæform, 3-celled; style elongated; stigmas short. Capsule, seeds, habit, and leaves as in *Caraguata* and *Tillandsia*. Inflorescence always simply spicate.

Spikes multifarious . . .	Sp. 1–3.
Spikes distichous . . .	Sp. 4–5.

1. *G. TRICOLOR* Ruiz et Pav. Fl. Peruv. iii. 38, t. 261; Lodd. Bot. Cab. t. 462; Hook. Exot. Flora, t. 163 (M.D.). *G. sympanthera* Beer. *Pourretia sympanthera* R. & P. *Tillandsia monostachya* Linn. (Plum. Ic. 238, fig. 1). *T. clavata* Lam. *T. pachycarpa* Baker.—Acaulescent. Leaves 12–20 in a dense rosette, lanceolate from an ovate base, 1–1½ ft. long, 1–1½ in. broad at the middle, thin, glabrous, plain green. Peduncle shorter than the leaves; bract-leaves adpressed, imbricated, upper striped vertically with brown. Inflorescence a moderately dense multifarious spike 4–6 in. long; flower-bracts ovate, 1–1½ in. long; lower green, striped vertically with brown; upper scarlet. Calyx under an inch long. Corolla white, as long as the bract; tube as long as the calyx; segments lingulate, half as long as the tube. Anthers ½ in. long. Valves of capsule rigid, brown, lanceolate, above an inch long.

Hab. Common in the West Indies and along the Andes as far south as Peru. *G. maculata*, *grandis*, and *fragrans* are fine garden varieties. I have not seen *G. Sallieri* and *erythrocephala* Hort., the latter sent by Pfau from Chiriqui in 1883, and said to have a spike ten inches in circumference.

2. *G. ERYTHROLEPIS* Brong.; Planch. in Flore des Serres, t. 1089 (M.D.).—Leaves 12–20 in a rosette, lanceolate, 1–1½ ft. long, 1½ in. broad at the middle, tinged with purple, not striped. Peduncle much shorter than the leaves. Inflorescence a dense multifarious spike 3–4 in. long, 1½ in. diam.; bracts ovate, acute, much imbricated, 1–1½ in. long, crimson, not striped. Calyx much

shorter than the bract; sepals oblong, obtuse. Petal-blade small, oblong.

Hab. Eastern Cuba, *C. Wright* 479! Introduced by Linden in 1852.

3. *G. KRANZLINIANA* Wittm. in Engl. Jahrb. xi. 62. — Leaves spread densely over a stem 3-4 in. long, lanceolate from an ovate base, 4-5 in. long,  $\frac{1}{2}$  in. broad above the base, tapering gradually to the point. Peduncle short. Flowers few, arranged in a capitulum overtopped by ovate-lanceolate bright red bracts, which are 1-3 in. long. Calyx  $\frac{1}{2}$  in. long. Corolla white, under an inch long.

Hab. New Granada; province of Cauca, alt. 6000-7000 ft., *Lehmann* 3325!

4. *G. SEEMANNI* Baker. — Stem more or less produced below the dense rosette. Leaves 12-20 in a rosette, lanceolate from an ovate base, 3-4 in. long,  $\frac{1}{6}$ - $\frac{1}{4}$  in. broad at the base of the blade, tapering gradually to the point, thin, obscurely lepidote. Peduncle shorter than the leaves. Flowers 6-10 in a dense distichous spike 1-2 in. long; bracts broad ovate, red, compressed laterally, many-ribbed,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long. Calyx  $\frac{1}{4}$  in. long; sepals much imbricated, oblong, obtuse. Corolla-segments very short, obtuse.

Hab. Ecuador; province of Loja, *Seemann* 898! *Lehmann*! Discovered by Dr. Seemann in 1847.

5. *G. CRISPA* Baker in Journ. Bot. 1887, 173. — Leaves 30-40 in a dense rosette, linear from a dilated base, 2-3 in. long, thin, recurved, much crisped,  $\frac{1}{8}$  in. broad at the base of the blade. Peduncle 2-3 in. long; bract-leaves small, adpressed, imbricated. Flowers 6-15 in a dense distichous spike  $\frac{1}{2}$ -1 in. long; bracts green, broad ovate, minutely cuspidate,  $\frac{1}{4}$  in. long. Calyx rigid,  $\frac{1}{8}$  in. long; sepals free to the base, oblong, obtuse, much imbricated. Petals not seen. Capsule as long as the calyx.

Hab. New Granada; Ocana, *Purdie*! Antioquia, *Lehmann*!

### 30. CATOPSIS Griseb.

(*Pogospermum* Brong.; *Tussacia* Klotzsch).

*Sepals* free to the base, oblong, obtuse, imbricated. *Petals* free to the base, with only a short blade exerted from the calyx. *Stamens* shorter than the calyx, 3 hypogynous, 3 inserted on the claw of the petals. *Ovary* 3-celled; style and stigmas very short. *Capsule* ovoid, septically 3-valved. *Seeds* with a short funiculus and long flexuose appendage broken up into fine threads. — Acaulescent. *Leaves* lorate or lanceolate, thin, nearly naked. *Spike* simple or paniced, not strictly distichous. *Petals* white or yellow. All the species are closely allied to one another.

Flowers small . . . . .	Sp. 1-4.
Flowers middle-sized . . . . .	Sp. 5-13.
Flowers large for the genus . . . . .	Sp. 14-15.

1. *C. INCONSPICUA* Baker in Journ. Bot. 1887, 174. — *Pogospermum inconspicuum* Brong. — Leaves thin, lorate, falcate. Peduncle short. Spike simple, few-flowered; flower-bracts ovate.

Flowers sessile, very small. Petal with a very small exerted blade. Stamens shorter than the calyx.

Hab. French Guiana, *Melinon*. Flowered at the Jardin des Plantes in Paris, in 1841.

2. *C. APICROIDES* Baker in Journ. Bot. 1887, 175. *Tillandsia apicroides* Cham. et Schlecht in Linnæa, vi. 35. *Tussacia apicroides* Beer.—Leaves 8–10 to a rosette, thin, lorate, plain green, 6–8 in. long, an inch broad at the middle, deltoid-cuspidate at the apex. Peduncle very slender, about as long as the leaves. Spikes 5–10, ascending, peduncled,  $1\frac{1}{2}$ –2 in. long, laxly 12–20-flowered; all the flowers spreading; flower-bracts ovate, shorter than the calyx. Calyx  $\frac{1}{8}$  in. long; sepals oblong, obtuse, imbricated. Petal-blade small, white, suborbicular.

Hab. Mexico; province of Xalapa, *Schiede & Deppe!* *Galeotti!*

3. *C. SCHUMANNIANA* Wittm. in Engl. Jahrb. xi. 70.—Leaves linear from an ovate base,  $\frac{3}{4}$ –1 in. broad, 6–9 in. long,  $\frac{1}{4}$  in. broad at the base of the blade, obscurely lepidote on the back. Peduncle slender, 4 in. long. Panicle lax, 4–5 in. long, consisting of 8–10 very short spikes, subtended by oblong-cuspidate bracts; flowers 6–10 to a spike; flower-bracts shorter than the calyx. Calyx  $\frac{1}{8}$ – $\frac{1}{6}$  in. long; sepals obtuse. Petal-blade very small.

Hab. New Granada; province of Antioquia, in dense woods over Amalfi, alt. 6000–7000 ft., *Lehmann*.

4. *C. FLEXUOSA* Baker in Journ. Bot. 1887, 175.—Leaves lanceolate-acuminate from an oblong base, above a foot long, an inch broad at the top of the base. Peduncle a foot long; bract-leaves adpressed, lanceolate. Panicle very lax, cernuous, above a foot long; main rachis very flexuose; branches deflexed or spreading, many compound; spikes lax, 1– $1\frac{1}{2}$  in. long; flowers erecto-patent; flower-bracts ovate,  $\frac{1}{8}$  in. long. Sepals oblong, obtuse,  $\frac{1}{8}$  in. long. Petal-blade minute.

Hab. Andes of Bolivia; province of Larecaja, alt. 8000–9000 ft., *Mandon* 1172!

5. *C. ALOIDES* Baker (M.D.). *Tillandsia aloides* Cham. et Schlecht. in Linn. vi. 55. *Tussacia aloides* E. Morren.—Leaves about a dozen in a rosette, subulate or lanceolate from an ovate base, under a foot long, an inch broad at the base of the blade, plain green. Peduncle slender, as long or longer than the leaves. Spikes 1 or few, moderately dense, 1–3 in. long: flowers ascending or the lower spreading; flower-bracts ovate,  $\frac{1}{6}$ – $\frac{1}{4}$  in. long. Sepals oblong, obtuse,  $\frac{1}{8}$  in. long. Petal-blade small, white, suborbicular.

Hab. Central Mexico, *Schiede & Deppe!* *Bourgeau* 1770! 2104!

6. *C. NITIDA* Baker in Journ. Bot. 1887, 174, non Griseb. (M.D.). *C. nutans* Griseb. excl. syn. *Pogospermum nitidum*, *floribundum* and *Berteronianum* Brong. *Tillandsia nitida*, Hook. Exot. Flora t. 218. *Tussacia nitida* Beer. *T. Cornucopie* Bertero. Leaves 8–12 in a rosette, lanceolate from an ovate base, 8–12 in. long, an inch broad at the middle, plain green, thinly lepidote beneath. Peduncle as long as the leaves; bract-leaves lanceolate, erect. Spikes 10–20, arranged in a lax panicle, with ascending branches, the lower

compound; final spikes 1-3 in. long; flowers sessile, dense, erecto-patent; flower-bracts ovate,  $\frac{1}{6}$  in. long. Sepals obtuse,  $\frac{1}{4}$  in. long. Petals white, with a small oblong blade. Capsule ovoid,  $\frac{1}{3}$  in. long.

Hab. Florida, *Garber*. Common through the West Indies from Cuba to Trinidad. British Guiana, *Parker! Jenman 971!* Sent by Wiles to the Liverpool Botanic Garden in 1827, at which date it was described and figured by Sir W. Hooker. Grisebach has crossed the original names of the two common West Indian species.

7. *C. HAHNII* Baker in Journ. Bot. 1887, 175. *C. paniculata* E. Morren in Cat. Makoy 1883 (M.D.).—Leaves about a dozen in a rosette, lanceolate from an ovate base,  $1\frac{1}{2}$  ft. long, 2-2 $\frac{1}{2}$  in. broad at the middle, plain green, pruinose. Peduncle about as long as the leaves. Inflorescence a lax panicle  $1\frac{1}{2}$  ft. long; branches numerous, ascending or pendulous, the lower compound; spikes dense, 1-2 in. long; flowers sessile, erecto-patent; flower-bracts ovate, shorter than the calyx. Sepals oblong, obtuse,  $\frac{1}{4}$  in. long. Petal-blade small, white, suborbicular.

Hab. Central Mexico; province of Xalapa, *Hahn 587!* Collected during the French expedition in 1865-6. Introduced into cultivation in 1881. Mexican name "Morfina blanca."

8. *C. PENDULA* Baker (M.D.).—Leaves lanceolate from an ovate base,  $1\frac{1}{2}$ -2 ft. long, 2-2 $\frac{1}{2}$  in. broad at the middle, plain green, narrowed gradually to the point. Peduncle about as long as the leaves. Inflorescence a lax panicle  $1\frac{1}{2}$  ft. long; many lower branches compound; spikes lax, sometimes 6-8 in. long; flowers all sessile, ascending; flower-bracts ovate, green,  $\frac{1}{6}$  in. long. Calyx  $\frac{1}{3}$  in. long; sepals oblong, obtuse. Petal-blade small, white. Capsule ovoid, rather longer than the calyx.

Hab. Mexico. Described from Prof. Morren's drawing, made Sept., 1881. Perhaps not distinct from *C. Hahnii*.

9. *C. MACULATA* E. Morren (M.D.).—Leaves about a dozen in a utricular rosette, lanceolate-acuminate, 6-8 in. long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad at base of the blade,  $1\frac{1}{2}$  in. broad at the clasping base, spreading from the top of it, copiously spotted on the face with round confluent red-brown spots. Peduncle 4-5 in. long; bract-leaves few, small, lanceolate. Inflorescence a lax panicle 6-8 in. long, composed of many simple moderately dense ascending spikes  $1\frac{1}{2}$ -2 in. long; flowers ascending; flower-bracts small, ovate. Calyx oblong,  $\frac{1}{4}$  in. long.

Hab. South Brazil. Introduced by Binot. Described from Prof. Morren's drawing, made Sept. 1879.

10. *C. FENDLERI* Baker in Journ. Bot. 1887, 175. *Tillandsia parviflora* Griseb. in Gott. Nacht. 1864, 16, non R. & P. — Leaves 10-12 in a dense rosette, lanceolate from an ovate base, 6-8 in. long, under an inch broad above the base, tapering gradually to a long point. Peduncle under a foot long; bract-leaves adpressed. Panicle lax, erect, 4-5 in. long; main rachis rather flexuose; branches lax-flowered, patent, 1-1 $\frac{1}{2}$  in. long; flowers 5-7 to a spike, erecto-patent; flower-bracts ovate,  $\frac{1}{6}$  in. long. Sepals oblong, obtuse,  $\frac{1}{4}$  in. long. Petal-blade minute. Capsule  $\frac{1}{3}$  in. long.

Hab. Mountains of Venezuela, *Fendler 1523!*

11. *C. GARCKEANA* Wittm. in Engl. Jahrb. xi. 70.—Leaves about 7 to a rosette, lanceolate from a very dilated base, a foot long, above an inch broad at the middle. Peduncle much shorter than the leaves, hidden by its foliaceous bract-leaves. Panicle 6–8 in. long, spikes  $1\frac{1}{2}$  in. long; branch-bracts ovate, nearly as long as the spikes; flower-bracts orbicular,  $\frac{1}{3}$  in. long. Calyx about as long as the flower-bract. Corolla pale yellow.

Hab. New Granada; Antioquia, alt. 8000 ft., *Lehmann*. Very near *C. Fendleri*.

12. *C. TRIPINNATA* Baker.—Leaves not seen. Peduncle and rachis much stouter than in any of the other species. Panicle above a foot long, lax, copiously tripinnate; rachis very zigzag; branches spreading or deflexed, central 2–3 in. long; branch-bracts large, oblong-lanceolate; final spikes dense, the end ones 1– $1\frac{1}{2}$  in. long; flowers erecto-patent; flower-bracts ovate, acute,  $\frac{1}{8}$  in. long, brown-pubescent, like the rachises. Sepals oblong, obtuse,  $\frac{1}{4}$  in. long. Petal-blade minute, oblong, reflexing.

Hab. Andes of Sigsig, alt. 12000 ft., *Pearce*!

13. *C. NUTANS* Baker in Journ. Bot. 1887, 176, non Griseb. *C. nitida* Griseb. excl. syn.—*Tillandsia nutans* Sw. *T. sessiliflora* Ruiz et Pav. Fl. Peruv. t. 271. *Renealmia pendula* Gaertn. *Pogospermum nutans* and *sessiliflorum* Brong. *Tussacia nutans* Beer.—Leaves 6–12 in a rosette, thin, lorate, plain green, 6–8 in. long, an inch broad at the middle, but little dilated at the base, rounded to a small cusp at the tip. Peduncle slender, a little longer than the leaves; bract-leaves distant, minute. Spikes 1–5, erect or drooping, moderately dense, the end one 2–3 in. long; flowers all erecto-patent; flower-bracts small, ovate, obtuse. Sepals oblong, obtuse,  $\frac{1}{3}$  in. long. Petal-blade small, white, oblong. Capsule ovoid, acute,  $\frac{1}{2}$  in. long.

Hab. Frequent in the West Indies. French Guiana, *Melinon*! Sagot 1400! Amazon valley, *Martius*, *Burchell* 9394! *Spruce* 102! New Granada, *André* 440. Bahia, *Blanchet* 2980! Andes of Peru, *Pavon*.

14. *C. STENOPETALA* Baker in Journ. Bot. 1887, 176.—Leaves 10–12 to a rosette, very thin, lanceolate, under a foot long, an inch broad at the middle, tapering gradually to the point. Panicle a foot long, composed of about 4 lax simple arcuate-ascending spikes 4–6 in. long; flowers subpatent; flower-bracts oblong-lanceolate, wrapped tightly round the calyx,  $\frac{1}{3}$  in. long. Sepals oblong, obtuse, much imbricated,  $\frac{1}{2}$  in. long. Petal-blade oblong-lanceolate, yellow,  $\frac{1}{4}$  in. long.

Hab. Guatemala, *Bernoulli & Cario* 685! Gathered in 1877. Nearly allied to *C. vitellina*. A Mexican plant amongst the Morren drawings is probably the same species.

15. *C. VITELLINA* Baker in Journ. Bot. 1887, 176, ex parte. *Tillandsia vitellina* Link, Klotzsch & Otto Ic. t. 40. *Tussacia vitellina* Klotzsch. *Pogospermum flavum* Brong. *C. fulgens* Griseb.—Leaves about a dozen in a rosette, thin, lanceolate, plain green, 6–8 in. long, an inch broad at the base, tapering gradually to the point. Peduncle slender, as long as the leaves. Spike lax-flowered, 2–3 in. long, simple or forked; flowers erecto-patent;

flower-bracts ovate,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long. Sepals oblong, obtuse,  $\frac{1}{2}$  in. long. Petal-blade oblong, bright yellow,  $\frac{1}{8}$ - $\frac{1}{4}$  in. long.

Hab. Mountains of Venezuela, *Fendler* 1507! New Granada, *André* 2389. Introduced into cultivation in 1840. There are closely allied plants, which may prove distinct specifically, in Mexico, the West Indies and Guiana.

### 31. TILLANDSIA Linn.

(*Renalmia* (Plumier) Linn. Gen. edit. 1).

*Sepals* free nearly or quite to the base, oblong or oblong-lanceolate, often imbricated. *Petals* free, unguiculate; blade spreading, oblong or obovate; claw naked or appendiculate with a pair of scales. *Stamens* hypogynous or 3 inner adnate to the base of the petals, shorter or longer than the petals: filaments filiform; anthers linear or linear-oblong, dorsifixed. *Ovary* free, ampullæform, 3-celled; style subulate, long or short; stigmas short, not spirally twisted. *Capsule* coriaceous, septicidally 3-valved. *Seeds* numerous, narrow, crowded, erect, with a long funiculus splitting up into fine threads.—Habit very various. *Leaves* usually densely rosulate, either thick and densely lepidote or thin and nearly naked. *Spikes* distichous or multifarious, simple or paniced. *Corolla* white, yellow or violet-purple.

#### KEY TO THE SUBGENERA.

\* *Leaves spaced out on a long stem.*

1. STREPSIA.—Stems pendulous, filiform. Flowers solitary in the axis of the stem-leaves.

\*\* *Leaves rosulate, coriaceous, acuminate, more or less densely lepidote.*

\* *Spikes distichous.*

2. DIAPHORANTHEMA.—Leafy stem short. Leaves subterete. Flowers 1 or few. Style and stamens short.

3. PHYTARHIZA.—Leaves rosulate, Flowers spicate or paniced. Petal-blade obovate. Style and stamens short.

4. PLATYSTACHYS.—Leaves rosulate. Flowers spicate or paniced. Petal-blade oblong or lingulate, usually lilac. Style and stamens often longer than the petals.

5. PSEUDO-CATOPSIS.—Differs from *Platystachys* by its small flowers, with capsule 3-4-times the length of the obtuse sepals.

\*\* *Spikes not distichous.*

6. ANOPLOPHYTUM.—Flowers spicate or paniced.

7. PITYROPHYLLUM.—Flowers in a capitulum in the centre of the rosette of leaves.

\*\*\* *Leaves rosulate, broader and thinner, subglabrous.*

\* *Spikes distichous.*

8. ALLARDTIA.—Differs from *Platystachys* only in leaf.

9. WALLISIA.—Differs from *Phytarhiza* only in leaf.

10. VRIESEA.—Claw of the petals furnished with a pair of scales.  
Leaf usually lorate.

\*\* *Spikes not distichous.*

11. CYATHOPHORA.—Differs from *Allardtia* in inflorescence.

12. CONOSTACHYS.—Differs from *Vriesea* in inflorescence.

#### KEY TO THE GROUPS.

Subgenus STREPSIA (Nuttall) . . . Sp. 1.

Subgenus DIAPHORANTHEMA (Beer).

Leaves not more than  $\frac{1}{4}$ – $\frac{1}{2}$  in. long . . . Sp. 2–8.  
Leaves 1–2 in. long . . . Sp. 9–15.  
Leaves 2–3 in. or more long . . . Sp. 16–19.

Subgenus PHYTARHIZA (Visiani).

Flowers white or yellow . . . Sp. 20–22.  
Flowers reddish-lilac.  
Spikes simple . . . Sp. 23–32.  
Spikes paniced . . . Sp. 33–39.

Subgenus PLATYSTACHYS (Beer non K. Koch).

Spikes very dense.  
Spikes simple . . . Sp. 40–60.  
Spikes paniced.  
Dwarf species . . . Sp. 61–79.  
Tall species . . . Sp. 80–121.  
Spikes moderately dense.  
Spikes simple . . . Sp. 122–127.  
Spikes paniced . . . Sp. 128–133.  
Spikes lax.  
Spikes simple . . . Sp. 134–139.  
Spikes paniced . . . Sp. 140–147.

Subgenus PSEUDO-CATOPSIS.

Spikes simple . . . Sp. 148.  
Spikes paniced . . . Sp. 149–166.

## Subgenus ANOPLOPHYTUM (Beer).

Leaves linear-subulate.

Spikes simple . . . . Sp. 167-171.

Spikes paniced . . . . Sp. 172-173.

Leaves lanceolate-acuminate.

Spikes simple . . . . Sp. 174-179.

Spikes paniced . . . . Sp. 180-183.

Leaves lanceolate-acute . . . . Sp. 184.

## Subgenus PITYROPHYLLUM (Beer) . . . . Sp. 185-188.

## Subgenus ALLARDTIA (Dietr.)

Spikes simple . . . . Sp. 189-194.

Spikes paniced . . . . Sp. 195-233.

## Subgenus WALLISIA (Regel) . . . . Sp. 234-236.

## Subgenus VRIESEA (Lindl.)

Spikes simple, dense . . . . Sp. 237-253.

Spikes simple, lax.

Spikes erect; flowers erecto-patent Sp. 254-270.

Spikes erect; flowers spreading or  
deflexed . . . . Sp. 271-276.

Spikes drooping . . . . Sp. 277-278.

Spikes paniced.

Flower-bract about as long as calyx Sp. 279-292.

Flower-bract shorter than calyx . Sp. 293-305.

## Subgenus CYATHOPHORA (K. Koch).

Spikes simple . . . . Sp. 306-313.

Spikes paniced . . . . Sp. 314-315.

## Subgenus CONOSTACHYS (Griseb.).

Spikes simple . . . . Sp. 316-318.

Spikes paniced . . . . Sp. 319-323.

## Subgenus 1. STREPSIA (Nuttall).

1. *T. USNEOIDES* Linn. Sp. Plant. 411; Hook. fil. in Bot. Mag. t. 6309; E. Morren in Belg. Hort. 1877, t. 17 (M.D.).—Stems densely cæspitose, filiform, flexuose, pendulous, reaching a length of 15-20 ft. Leaves distant, spreading, subulate, 1-3 in. long, densely clothed like the stem, with lax silvery lepidote scales. Flowers generally solitary, sessile in the dilated ovate bases of the leaves. Calyx  $\frac{1}{4}$  in. long; sepals oblong-lanceolate, naked, pale green. Petals yellow; blade lingulate,  $\frac{1}{8}$ - $\frac{1}{6}$  in. long. Stamens as long as the calyx. Style short. Capsule about an inch long.

Hab. Throughout Tropical and Sub-tropical America, from Florida and Mexico to Chili and South Brazil. *T. trichoides* H. B. K., and *T. crinita* Herb. Willd., are merely old denuded states of this species, which was first noticed by Piso and Marcgraave in 1648.

### Subgenus 2. DIAPHORANTHEMA (Beer).

2. *T. BRYOIDES* Griseb. in Lorentz Pl. Argent. Exsic. No. 128. *T. courc tata* Gillies. *T. polytrichoides* E. Morren in Belg. Hort. 1880, 240.—Leafy stems densely tufted, 1–3 in. long, simple or branched. Leaves tightly packed on the stem, usually adpressed, linear-subulate from a clasping base,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long, densely lepidote. Peduncle none or short. Flowers 1–3, erect; flower-bracts oblong-lanceolate, lepidote,  $\frac{1}{4}$  in. long. Sepals linear-oblong,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Petal-blade minute. Capsule cylindrical, under an inch long.

Hab. Argentaria, Lorentz, 128! Miers 1084! South Brazil, Glaziou 3124! Parana, Christie! Mendoza, Gillies! Andes of Peru, C. Gay! Bolivia, Pentland. Habit of *Lycopodium Selago*. Densely leafy stems  $\frac{1}{2}$  in. diam. *T. polytrichoides* Morren, founded on Glaziou 3124, is a form with erecto-patent rather recurved leaves.

3. *T. TRICHOLEPIS* Baker in Journ. Bot. 1878, 237.—Leafy stems densely tufted, 1–3 in. long, simple or branched. Leaves densely packed on the stem, linear-subulate,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long, tapering gradually to a slender point, adpressed, densely clothed with glittering whitish spreading hair-like scales. Peduncle 1–2 in. long, with 2 minute bract-leaves. Flowers 1–2, erect; flower-bracts oblong,  $\frac{1}{4}$  in. long. Sepals linear-oblong, naked, strongly ribbed,  $\frac{1}{4}$  in. long. Capsule subcylindrical  $\frac{3}{8}$  in. long.

Hab. Andes of Bolivia, alt. 8000–9000 ft., Mandon 1179! Very near *T. bryoides*.

4. *T. PUSILLA* Gillies; Baker in Journ. Bot. 1878, 237.—Leafy stems tufted, simple, an inch long. Leaves laxly placed on the stem, terete from a clasping lanceolate base,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long, spreading, recurved, not tapering to a slender point, densely lepidote all over. Flowers solitary, sessile. Flower-bracts and sepals  $\frac{1}{4}$  in. long, the former lepidote, the latter naked.

Hab. Mendoza, on bushes, Gillies! Near *T. propinqua*.

5. *T. PROPINQUA* C. Gay Fl. Chil. ii. 15; Hieron. Fl. Cordob. t. 3, figs. 2–4. *T. lanuginosa* Gillies.—Stems densely tufted, 1–4 in. long, simple or forked. Leaves laxly placed on the stem, erecto-patent, subterete from a clasping base,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long,  $\frac{1}{4}$  lin. diam. at the middle, channelled down the lower part of the face, densely finely lepidote all over. Peduncle very short, not bracteate. Flowers always solitary. Flower-bract oblong, lepidote,  $\frac{1}{4}$  in. long, tightly clasping the calyx. Sepals linear-oblong, naked,  $\frac{1}{4}$  in. long. Capsule cylindrical,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long.

Hab. Andes of Chili, C. Gay! Cuming 167! Bridges 534! Argentaria, Lorentz! Hieronymus 422! Mendoza, Gillies! Andes of Bolivia, up to 12000–13000 ft., Pentland!

6. *T. RECTANGULA* Baker in Journ. Bot. 1878, 238. *T. propinqua* var. *rectangula* Griseb. Leafy stems densely tufted, about

an inch long, simple or forked. Leaves about a dozen to a stem, subterete from a clasping base,  $\frac{1}{2}$  in. long,  $\frac{1}{2}$  lin. diam., rigid in texture, curved, nearly flat on the face towards the base, densely laxly lepidote all over. Peduncle about an inch long; flower solitary; flower-bract oblong, lepidote,  $\frac{1}{4}$  in. long. Sepals linear-oblong,  $\frac{1}{4}$  in. long. Capsule subcylindrical,  $\frac{1}{2}$  in. long.

Hab. Argentine region; prov. Cordoba, *Lorentz* 126! 127!

7. *T. VIRESCENS* Ruiz et Pav. Fl. Peruv. iii. 43, t. 270, fig. b. *T. incana* Gillies. *Diaphoranthema virescens* Beer.—Stems densely tufted, simple or forked, 2–3 in. long. Leaves subdense, subulate from a clasping base, ascending,  $\frac{3}{4}$ –1 in. long,  $\frac{1}{2}$  lin. diam., densely laxly lepidote all over. Peduncle 1–1 $\frac{1}{2}$  in. long, not bracteate. Flowers always solitary. Flower-bract lepidote,  $\frac{1}{3}$  in. long. Sepals linear-oblong, naked,  $\frac{1}{3}$  in. long. Capsule subcylindrical,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long.

Hab. Andes of Peru, Pavon, *Dombey* 162! High Andes of Bolivia, *Mandon* 1178! 1181! *Weddell*! *Pearce*! *D'Orbigny* 298! Mendoza, *Gillies*! Midway between *T. propinqua* and *capillaris*.

8. *T. RAMEALIS* Klotzsch inedit. — Acaulescent, densely tufted. Leaves subulate from a linear base,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, densely coated all over with whitish peltate adpressed lepidote scales, the inner leaves suberect, the outer recurved. Flowers not seen.

Hab. Island of St. Thomas, on branchlets of *Erythroxyllum*, *Ehrenberg*! (Herb. Berol.). Habit of *T. setacea*. It is given by Klotzsch in Schomburgk's Travels as a plant of British Guiana.

9. *T. CAPILLARIS* Ruiz et Pav. Fl. Peruv. iii. 42, t. 271, fig. c. *Diaphoranthema capillaris* Beer. — Leafy stems densely tufted, 2–3 in. long. Leaves about 20 to a stem, subterete from a clasping lanceolate base, an inch long,  $\frac{1}{12}$  in. diam., not hair-like at the tip, densely clothed with loose spreading acute lepidote scales. Peduncle 1–2-flowered, filiform, 2–3 in. long. Flower-bract clasping tightly the calyx,  $\frac{1}{3}$  in. long. Sepals linear-oblong, naked,  $\frac{1}{3}$  in. long. Capsule subcylindrical, under an inch long.

Hab. Andes of Peru, Pavon! Andes of Bolivia, *Mandon* 1177! Described mainly from Pavon's type-specimens at the British Museum. The figure is not characteristic.

10. *T. ANDICOLA* Gillies; Baker in Journ. Bot. 1878, 239.—Leafy stem produced to a length of about 3 inches, flexuose, bearing about 20 subulate finely lepidote flexuose leaves of firm texture, 1–2 in. long,  $\frac{1}{16}$  in. diam. low down, tapering to the point. Peduncle 1-flowered, bractless, an inch long; flower-bract lanceolate, thinly lepidote,  $\frac{1}{2}$  in. long. Sepals linear-oblong, naked,  $\frac{1}{2}$  in. long. Petals and capsule not seen.

Hab. Andes of Mendoza, *Gillies*!

11. *T. FUSCA* Baker in Journ. Bot. 1878, 240.—Leafy stem stout, woody,  $\frac{1}{2}$  ft. long, copiously branched. Leaves laxly disposed, subterete, 1 $\frac{1}{2}$ –2 in. long,  $\frac{1}{12}$ – $\frac{1}{8}$  in. broad low down, subcoriaceous, channelled down the face, densely clothed all over with ovate acute lepidote scales. Peduncle very short, densely 2–3-flowered; flower-

bracts oblong-lanceolate, lepidote,  $\frac{1}{2}$  in. long. Sepals rigid, naked, lanceolate,  $\frac{1}{3}$  in. long. Petals and capsule not seen.

Hab. Andes of Peru; Obrajilla, *Brackenridge*!

12. *T. RETORTA* Griseb. in Lorentz Pl. Argent. Exsic. No. 215. *T. cæspitosa* Gillies non Leconte.—Leafy stems densely tufted, 1–2 in. long, simple or branched. Leaves laxly disposed, subulate from a clasping base, 1–1 $\frac{1}{2}$  in. long,  $\frac{1}{2}$  lin. diam., rigid in texture, spreading, recurved, densely lepidote all over. Peduncle none or short; flowers solitary; bracts and sepals lepidote,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Capsule subcylindrical, an inch long.

Hab. Cordoba, *Lorentz* 125! *Hieronymus*! Mendoza, *Gillies*! Pampas of Rio Quinto, *Miers* 1366!

13. *T. ERECTA* Gillies; Baker in Journ. Bot. 1878, 239.—Leafy stems 1 $\frac{1}{2}$ –2 in. long, simple or branched. Leaves crowded, ascending, linear-subulate, 1–1 $\frac{1}{2}$  in. long,  $\frac{1}{8}$  in. broad at the base, densely lepidote all over. Peduncle stiffly erect, 1-flowered, bractless, 1–1 $\frac{1}{2}$  in. long. Bracts and sepals oblong-lanceolate,  $\frac{1}{3}$  in. long. Capsule subcylindrical, under an inch long.

Var. *T. RIGIDA* Gillies.—Leaves rather shorter. Peduncle obsolete.

Hab. Andes of Mendoza, both varieties, *Gillies*! This and all the other specimens of Gillies' were collected and sent to Sir. W. J. Hooker, about the year 1822.

14. *T. GILLIESII* Baker in Journ. Bot. 1878, 240. *T. compressa* Gillies non Bertero.—Leafy stem 1–2 in. long, simple or forked. Leaves moderately dense, linear, distichous, 1 $\frac{1}{2}$ –2 in. long, much recurved, channelled down the face,  $\frac{1}{6}$  in. broad low down, very rigid in texture, densely lepidote all over. Peduncle reaching a length of 4–5 in., sometimes short or suppressed; flowers 1–3, erect; flower-bract oblong-lanceolate,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Sepals oblong,  $\frac{1}{3}$  in. long. Capsule subcylindrical, an inch long.

Hab. Foot of the Cordilleras of Mendoza, *Gillies*! Differs from all its allies by its distichous leaves.

15. *T. UNDULATA* Baker in Journ. Bot. 1878, 240.—Leafy stems tufted, simple, an inch long. Leaves terete from a clasping base, 1–1 $\frac{1}{2}$  in. long,  $\frac{1}{2}$  lin. diam. low down, tapering to a slender point, rigid in texture, densely laxly lepidote all over. Peduncle 1–3 in. long, with 3–4 small clasping bract-leaves. Flowers 1–6 in a lax spike with a flexuose rachis, sometimes 1–1 $\frac{1}{2}$  in. long; flower-bracts oblong-lanceolate, thinly lepidote,  $\frac{1}{4}$  in. long. Sepals a little longer than the bract. Capsule cylindrical, 1–1 $\frac{1}{4}$  in. long.

Hab. Paraguay, *Balansa* 619! South Brazil, *Glaziou* 13241! Very distinct by its many flowers and flexuose rachis.

16. *T. RECURVATA* Linn. Sp. Plant. 410; Ruiz et Pav. Fl. Peruv. t. 271a (M.D.). *T. uniflora* H. B. K. *T. Bartrami* Elliott. *T. Landbeckii* Philippi. *T. cordobensis* Hieron. Fl. Cordob. 10, t. 3, fig. 1. *Diaphoranthema recurvata* and *uniflora* Beer.—Leafy stems densely cæspitose, 1–2 in. long. Leaves about a dozen to a stem, subulate from a clasping lanceolate base, 2–3 in. long, spreading, often recurved,  $\frac{1}{4}$  lin. diam. at the middle, channelled

down the face, densely lepidote all over. Peduncle slender, 3-5 in. long, with a single small leaf low down. Flowers 1-3, crowded if more than one, erect; flower-bracts lanceolate, lepidote,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long. Sepals rigid, linear-oblong, naked,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long. Petal-blade minute, ovate, violet. Capsule-valves linear,  $\frac{3}{4}$ -1 in. long.

Hab. Throughout Tropical and Subtropical America, from Florida and Mexico to Buenos Ayres and Chili, ascending to 10000 ft. in the Andes. It has the widest geographical range of any species of the order. In *T. monostachya* Gillies non Linn., the flowers are solitary and the leaves stouter than in the type and only 1-1 $\frac{1}{2}$  in. long.

17. *T. WILSONI* S. Wats. Contr. xv. 266.—Stems simple, very short. Leaves numerous, subterete, 1-4 in. long, gradually narrowed from the clasping base to the long attenuate apex, hoary, with minute adpressed peltate brown-centred scales. Peduncle very slender, recurved, about as long as the leaves, with two distinct bract-leaves, probably 1-3-flowered. Flowers and capsule unknown.

Hab. Florida; Hernando county, on dead branches of red cedar. Discovered by Dr. Wilson, of the University of Pennsylvania, in 1887.

18. *T. QUADRIFLORA* Baker.—Leaves densely tufted, subulate from a clasping base, 1-1 $\frac{1}{2}$  in. long, densely lepidote. Peduncle slender, 2-3 in. long. Flowers 3-4 in a distichous spike; flower-bracts oblong, lepidote,  $\frac{1}{2}$  in. long. Sepals oblong, naked, as long as the bract. Petal-blade lilac, cuneate,  $\frac{1}{8}$  in. long. Capsule an inch long.

Hab. High Andes of Bolivia, *Weddell!* *Mandon 1176!* Banda Oriental, *Miers 1363!* Connects *Diaphoranthema* and *Phytarhiza*.

19. *T. MYOSURA* Griseb. in Lorentz Pl. Argent. No. 122.—Leafy stem 1-3 in. long. Leaves subulate, rigidly coriaceous, densely lepidote, reaching a length of 4-5 in., spreading or recurved,  $\frac{1}{8}$ - $\frac{1}{6}$  in. diam. low down, channelled down the face. Peduncle 2-4 in. long, with a single bract-leaf at the middle; flowers 1-3, erect; flower-bract oblong-lanceolate, lepidote,  $\frac{1}{2}$  in. long. Sepals linear-oblong, rigid, naked,  $\frac{1}{3}$  in. long. Capsule subcylindrical, 1-1 $\frac{1}{4}$  in. long.

Hab. Banda Oriental, *Miers 1367!* Cordoba, *Lorentz 122!* Andes of Bolivia, alt. 8000 ft., *Mandon 1180!*

### 3. Subgenus PHYTARHIZA (Visiani).

20. *T. CROCATA* Baker in Journ. Bot. 1887, 214. *Phytarhiza crocata* E. Morren in Belg. Hort. 1880, 27 (M.D.).—Leafy stem 3-4 in. long. Leaves laxly disposed, reflexing, linear-subulate, 6-9 in. long,  $\frac{1}{6}$ - $\frac{1}{4}$  in. broad low down, firm in texture, densely clothed with spreading hair-pointed whitish scales. Peduncle slender, 6-8 in. long; bract-leaves few, with long erect subulate points. Flowers few, in a simple dense spike 1-1 $\frac{1}{2}$  in. long; flower-bracts oblong-lanceolate, densely lepidote,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Calyx  $\frac{1}{2}$  in. long; sepals acute. Petal-blade obovate, bright yellow,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long. Stamens and style not longer than the calyx.

Hab. South Brazil, *Tweedie* 427! Introduced into cultivation by Lietze in 1879.

21. *T. IXIOIDES* Griseb. Symb. Fl. Argent. 1878, 333.—Leafy stem 2 in. long. Leaves lanceolate-acuminate, 3–6 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad at the base of the blade, very thick, deeply channelled down the lower part of the face, densely coated all over with fine adpressed whitish-lepidote scales. Peduncle 2–3 in. long; bract-leaves scarioso, lanceolate, imbricated. Flowers 4–10 in a moderately dense simple spike, lower distinctly pedicellate. Calyx  $\frac{3}{4}$  in. long; sepals oblong-lanceolate, glabrous. Petal-blade obovate-cuneate, yellow,  $\frac{1}{4}$  in. long. Stamens not longer than the calyx-tube.

Hab. Parana, *Christie*! Argentine Republic, *Lorentz* 1190! 1796! Received alive from Mr. F. W. Burbidge in 1872.

22. *T. XIPHIOIDES* Ker in Bot. Reg. t. 105; Hook. in Bot. Mag. t. 5562. *T. macrocnemis* Griseb. Symb. Argent. 1878, 332. *T. suaveolens* Lemaire (M.D.). *T. sericea* Hort. *T. odorata* Gillies. *Anoplophytum xiphioides* Beer. *Phytarhiza xiphioides* E. Morren.—Acaulescent. Leaves 12–20, lanceolate-acuminate, 4–6 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the base of the blade, very thick and rigid, densely coated with whitish adpressed lepidote scales. Peduncle 3–6 in. long; bract-leaves lanceolate, scarioso, adpressed, imbricated. Inflorescence a moderately dense few-flowered spike 2–3 in. long; flower-bracts oblong-lanceolate, glabrous, 2–2 $\frac{1}{2}$  in. long. Calyx 1 $\frac{1}{2}$ –2 in. long; sepals acute. Petals convolute in a cylindrical tube an inch longer than the calyx, with an obovate white spreading blade an inch long. Stamens and style reaching to the base of the petal-blade.

Hab. South Tropical America, from Uruguay across the Argentine region to Mendoza. Very distinct by its large fragrant white flowers. First gathered by Gillies in 1826.

23. *T. CONDENSATA* Baker.—Leaves densely rosulate, subulate from the clasping base, an inch long, densely laxly lepidote. Peduncle 1–3 in. long. Inflorescence a dense simple distichous spike 1–2 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad; flower-bracts oblong-lanceolate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Calyx as long as the flower-bract. Petal-blade obovate, red-lilac,  $\frac{1}{4}$  in. long. Stamens not longer than the calyx.

Hab. Andes of Bolivia, *Weddell*! (Herb. Mus. Par.). Near *T. scalarifolia*.

24. *T. LINEARIS* Vellazo Fl. Flum. iii. t. 128. *Anoplophytum lineare* Beer. *Phytarhiza linearis* E. Morren. *P. uniflora* E. Morren (M.D.).—Leaves laxly spread over a slender stem 2–3 in. long, spreading, subulate, 3–4 in. long,  $\frac{1}{12}$  in. diam. low down, firm in texture, densely clothed with lax whitish lepidote scales. Peduncle slender, erect, 4–6 in. long, destitute of bract-leaves. Flowers 1–3 in a dense spike; flower-bracts oblong-lanceolate, lepidote,  $\frac{1}{4}$  in. long. Calyx subcylindrical,  $\frac{1}{3}$  in. long; sepals much imbricated. Petal-blade suborbicular, dark lilac,  $\frac{1}{4}$  in. broad. Stamens as long as the calyx.

Hab. South Brazil, *Glaziou* 14345! Introduced into cultivation in 1881.

25. *T. BAKERIANA* Britten in Journ. Bot. 1888, 170. *T. tricholepis* Baker olim.—Leafy stem very short. Leaves linear-subulate, 3–4 in. long,  $\frac{1}{8}$  in. broad at the base of the blade, ascending, rigid, deeply channelled down the lower part of the face, densely clothed all over with hair-pointed spreading scales. Peduncle 4–5 in. long; bract-leaves many, small, scariosse, adpressed. Flowers 2–3 in a dense spike; flower-bracts oblong-lanceolate, rigid, glabrous,  $\frac{1}{3}$  in. long. Calyx as long as the bract; sepals very much imbricated. Petal-blade suborbicular, red-purple,  $\frac{1}{4}$  in. long. Stamens not longer than the calyx.

Hab. South Brazil, *Glaziou* 13243! Allied to *T. linearis*.

26. *T. BANDENSIS* Baker in Journ. Bot. 1887, 234.—Leaves spread over a short stem, subulate, ascending,  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{12}$  in. diam. low down, rigid, deeply channelled down the lower part of the face, densely clothed with fine grey lepidote scales. Peduncle slender, flexuose; bract-leaves 2, small, adpressed. Flowers 3 in a lax spike; flower-bracts oblong, cuspidate,  $\frac{1}{3}$  in. long. Calyx sub-cylindrical,  $\frac{1}{2}$  in. long; sepals acute. Petal-blade obovate, spreading, reddish-lilac,  $\frac{1}{4}$  in. long. Stamens not longer than the calyx.

Hab. Uruguay, *Tweedie*. Near *T. linearis*.

27. *T. SCHENKIANA* Wittm. in Engl. Jahrb. xi. 63.—Leaves spaced out over a 2–3-inch stem, subulate, ascending, 9–10 in. long,  $\frac{1}{8}$ – $\frac{1}{6}$  in. broad low down, densely clothed with lax deflexed linear whitish scales. Peduncle slender,  $\frac{1}{2}$  ft. long; bract-leaves long-pointed. Spike dense, simple, distichous, an inch long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. diam.; flower-bracts oblong-lanceolate,  $\frac{1}{2}$  in. long. Calyx a little overtopping the flower-bract. Petal-blade small, suborbicular, purplish.

Hab. Andes of Columbia; Tolima, alt. 3000 ft., *Lehmann* 2234! Near *T. scalarifolia*.

28. *T. SCALARIFOLIA* Baker in Journ. Bot. 1887, 235.—Leaves spaced out over a stem 2–3 in. long, all except the upper spreading, subulate from the base, rigidly coriaceous, 3–4 in. long, densely persistently lepidote. Peduncle slender, 2–3 in. long; bract-leaves few, with short free points. Inflorescence a dense simple spike 1– $1\frac{1}{2}$  in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. diam.; flower-bracts oblong-lanceolate, lepidote,  $\frac{1}{2}$  in. long. Calyx reaching to the tip of the bract. Petal-blade obovate-cuneate, purple,  $\frac{1}{4}$  in. long. Stamens not longer than the calyx.

Hab. Andes of Bolivia, *Pentland*!

29. *T. UNCA* Griseb. Symb. Fl. Argent. 1878, 333.—Leaves 20 or more to a dense rosette, linear-subulate, 3–4 in. long,  $\frac{1}{8}$  in. broad low down, very thick and rigid, falcate, channelled down the lower part of the face, densely persistently lepidote all over. Peduncle shorter than the leaves; bract-leaves rigid, lanceolate. Flowers few, in a simple distichous spike an inch long; flower-bracts green, oblong-lanceolate, subglabrous,  $\frac{3}{4}$  in. long. Calyx  $\frac{5}{8}$  in. long; sepals glabrous, lanceolate. Petal-blade small, reddish, suborbicular. Stamens not longer than the calyx.

Hab. Argentaria; province of Cordoba, *Lorentz & Hieronymus* 638!

30. *T. CHILENSIS* Baker.—Leafy stem 3 in. long. Leaves laxly disposed, linear, spreading, 2–3 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad low down, densely laxly lepidote all over. Peduncle 4–5 in. long. Inflorescence a dense simple distichous spike  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{4}$  in. broad; flower-bracts oblong,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Calyx as long as the flower-bract. Petals reddish, obovate,  $\frac{1}{4}$  in. long and broad. Stamens not longer than the calyx.

Hab. Andes of North Chili, *C. Gay*! (Herb. Mus. Par.).

31. *T. REICHENBACHII* Baker. Leaves few, spreading, densely rosulate, linear-acuminate, 4–5 in. long,  $\frac{1}{4}$  in. broad low down. Peduncle shorter than the leaves; bract-leaves many, small, lanceolate, adpressed, imbricated. Flower solitary, terminal. Sepals oblong,  $\frac{1}{2}$  in. long. Petal-blade obovate-cuneate; expanded corolla-limb  $\frac{3}{4}$  in. diam. Stamens not longer than the calyx.

Hab. Tucuman. Described from the late Prof. Reichenbach's sketch of a plant flowered at Hamburg in Oct., 1884.

32. *T. CÆRULEA* H. B. K. Nov. Gen. 1, 291. *T. squamulosa* Willd. *Diaphoranthema squamulosa* Beer.—Leaves spread over a short stem, linear-subulate, 5–6 in. long,  $\frac{1}{4}$  in. broad at the clasping base, rigidly coriaceous, densely laxly lepidote. Peduncle slender, as long as the leaves; bract-leaves with long subulate tips. Flowers 4–6 in a very lax simple distichous spike 2–3 in. long, erecto-patent; flower-bracts oblong, densely lepidote,  $\frac{1}{2}$  in. long. Calyx as long as the bract. Petal-blade purple, obovate-cuneate,  $\frac{1}{2}$  in. long and broad.

Hab. Mexico; banks of the River Macara, *Humboldt* 3442! Judging from the descriptions alone I suspect *T. humilis* and *T. paleacea* Presl Rel. Haenk. ii. 125, said to have been gathered in the Chilian Andes by Haenke, to be forms of this species. *T. heptantha* Ruiz & Pavon Fl. Peruv. iii. 41, may be the same species, and if so, this is the oldest name.

33. *T. DURATHI* Vis. *Illustr. i.* 29. *T. circinalis* Griseb. Pl. Lorentz, 224 (M.D.). *T. revoluta* Burbidge. *Phytarhiza Duratii* Vis. Mem. Instit. Ven. v. 340, cum icone. *P. circinalis* E. Morren.—Leafy stem sometimes short, but reaching a foot in length. Leaves lanceolate-acuminate, spreading, 6–9 in. long when fully developed,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad low down, circinate at the apex, rigidly coriaceous, densely finely grey-lepidote all over. Peduncle stout, 3–6 in. long; bract-leaves adpressed, lanceolate, imbricated. Inflorescence a compact panicle 3–6 in. long, consisting of several short ascending distichous spikes  $\frac{1}{2}$  in. diam.; branch-bracts small, ovate; flower-bracts oblong-lanceolate, rigid,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Calyx  $\frac{1}{2}$  in. long; sepals acute. Petals obovate-cuneate, purple,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long and broad. Stamens not longer than the calyx.

Hab. Uruguay and Argentine Republic, *Tweedie*! *Lorentz* 326! 443! 1123! *Lorentz & Hieronymus* 604! *Miers* 1365! Minas Geraes, *St. Hilaire*! Andes of Bolivia, *Weddell* 4035! Southern Peru, *C. Gay*! Introduced into cultivation in 1855. *T. gigantea* Ruchinger Cat., 1876, is a form with a long leafy stem.

34. *T. SORATENSIS* Baker in Journ. Bot. 1887, 235.—Leaves spread over a stem a few inches long, lanceolate-setaceous, 8–10 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad low down, very rigid, not circinate at the apex, densely finely lepidote all over. Peduncle  $\frac{1}{2}$  ft. long; bract-leaves

with long free subulate points. Inflorescence a dense short panicle consisting of many dense spikes an inch long,  $\frac{1}{3}$  in. broad; flower-bracts oblong-lanceolate, glossy,  $\frac{1}{3}$  in. long. Calyx as long as the bract. Petal-blade purple, obovate-cuneate,  $\frac{1}{3}$  in. long and broad. Stamens not longer than the calyx.

Hab. Andes of Bolivia; Sorata, alt. 8000 ft., Mandon 1185! Very near *T. Duratii*.

35. *T. MATHEWSII* Baker in Journ. Bot. 1887, 236.—Leaves ensiform-setaceous, subcoriaceous, 6–9 in. long,  $\frac{3}{4}$ –1 in. broad at the clasping base, densely argenteo-lepidote on both surfaces. Peduncle  $\frac{1}{2}$  ft. long; bract-leaves with long setaceous points. Inflorescence a narrow panicle, with short sessile erecto-patent not strictly distichous dense spikes 1–1 $\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. diam.; flower-bracts ovate, acute, lepidote,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Calyx rather shorter than the bract. Petal-blade small, orbicular-cuneate, purple, spreading.

Hab. Peruvian Andes at Tarma and Obrajilla, Mathews 651!

36. *T. AZUREA* Presl Rel. Haenk. ii. 124, t. 24. *Platystachys azurea* Beer.—Leaves densely rosulate, lanceolate-setaceous, 4–5 in. long,  $\frac{1}{2}$  in. broad low down, firm in texture, densely lepidote on both surfaces. Peduncle as long as the leaves; bract-leaves adpressed, imbricated. Spikes 2–3, lax, 1–1 $\frac{1}{2}$  in. long; flower-bracts oblong-lanceolate,  $\frac{3}{4}$  in. long. Calyx reaching the tip of the bract. Petal-blade small, purple, obovate-cuneate.

Hab. Peruvian Andes near Huanaco, Haenke! Very near *T. purpurea*.

37. *T. PURPUREA* Ruiz et Pav. Fl. Peruv. iii. 41, t. 270 A. *T. longibracteata* Meyen. *Platystachys purpurea* Beer. *Phytarhiza purpurea* E. Morren. *Anoplophytum longibracteatum* Beer.—Leaves densely rosulate, lanceolate-acuminate, 6–12 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad low down, rigidly coriaceous, densely laxly lepidote on both surfaces. Peduncle 3–12 in. long; bract-leaves with long free spreading tips. Inflorescence a panicle sometimes  $\frac{1}{2}$  ft. long, consisting of many lax erecto-patent distichous spikes 1–3 in. long,  $\frac{3}{4}$ –1 in. diam., with a flexuose rachis; flowers erecto-patent, 8–15 to a spike; branch-bracts small, ovate; flower-bracts oblong, naked,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Calyx as long as the bract; sepals obtuse. Petal-blade small, obovate-cuneate, purple. Stamens not longer than the calyx.

Hab. Peruvian Andes about Lima, &c., Pavon! Nation! Dombey! Meyen! Cuming 981! Oran, Lorentz.

38. *T. STRAMINEA* H. B. K. Nov. Gen. i. 292. *T. scoparia* Willd. *Platystachys scoparia* Beer.—Leaves ensiform-acuminate, 8–9 in. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad low down, not very rigid in texture, densely lepidote on both surfaces. Peduncle 1 $\frac{1}{2}$ –2 ft. long; bract-leaves with long points. Panicle of 3–6 lax distichous spikes 4–6 in. long,  $\frac{1}{2}$  in. broad; flower-bracts oblong-lanceolate, acute,  $\frac{3}{4}$ –1 in. long. Calyx reaching the tip of the bract. Petal-blade obovate-cuneate, purple,  $\frac{1}{4}$  in. long and broad.

Hab. Peruvian Andes, near Loxa, &c., Pavon! Humboldt & Bonpland 3496! Ecuador, André 4318.

39. *T. DECOMPOSITA* Baker.—Leaves ensiform-acuminate, rigidly coriaceous, a foot long, an inch broad at the base of the blade, densely finely lepidote. Peduncle 2 ft. long. Panicle as long as the peduncle; lower branches very compound; final spikes dense, distichous, 1–2 in. long,  $\frac{1}{4}$  in. diam.; flower-bracts oblong-lanceolate,  $\frac{1}{2}$  in. long. Calyx as long as the bract. Petal-blade purple, obovate-cuneate,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long.

Hab. Paraguay, *Balansa*, 707! (Herb. Mus. Par.).

#### Subgenus 4. PLATYSTACHYS (Beer, non K. Koch.)

40. *T. DURA* Baker.—Leaves densely spread over a leafy stem 3–6 in. long, linear-subulate, 4–9 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad low down, ascending, rigidly coriaceous, thinly lepidote. Peduncle 3–4 in. long; bract-leaves long-pointed. Inflorescence a dense distichous spike 2–3 in. long,  $\frac{1}{3}$  in. diam.; flower-bracts oblong-lanceolate, rigidly coriaceous, obscurely lepidote,  $\frac{1}{2}$  in. long. Calyx naked,  $\frac{1}{3}$  in. long. Petal-blade oblong, as long as the calyx.

Hab. South Brazil, *Glaziou* 16460! Habit and leaves of *T. stricta* var. *caulescens*.

41. *T. CAULESCENS* Brong.—Leafy stem  $\frac{1}{2}$ –1 ft. long, densely covered with rigid linear-subulate leaves 4–5 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad at the base, resembling those of *T. stricta* in texture and vestiture. Peduncle very short. Inflorescence a simple dense distichous spike  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{3}$  in. broad; flower-bracts oblong-lanceolate, red,  $\frac{3}{4}$  in. long. Calyx nearly as long as the flower-bract. Petal-blade lingulate,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long,  $\frac{1}{6}$  in. broad. Stamens much shorter than the petals.

Hab. Andes of Southern Peru, *C. Gay*! Gathered about 1840 (Herb. Mus. Paris).

42. *T. PUMILA* Griseb. in Gotting. Nacht. 1864, 16, non Lindl.—Habit of *T. pruinosa*, but the lepidote scales adpressed, not loose. Leaf-blade convolute, longer than the short peduncle. Spike short, dense, simple; flower-bracts oblong-lanceolate, acute, lepidote,  $\frac{1}{2}$  in. long. Calyx rather shorter than the bract; posticous sepal oblong, obtuse, the two others acute. Capsule an inch long.

Hab. Venezuela; Mountains of Tovar, alt. 3000 ft., *Fendler* 2163.

43. *T. PRUINOSA* Swartz. Fl. Ind. Occ. i. 594; E. Morren in Belg. Hort. 1876, 257, t. 16, 17 (M.D.). *T. breviscapa* Sagra. *T. tortilis* Klotzsch. *Platystachys pruinosa* and *tortilis* Beer.—Whole plant 3–6 in. long. Leaves linear-subulate from a broad ovate thick clasping utricular base, linear-subulate, 3–4 in. long,  $\frac{1}{4}$  in. broad low down, tapering gradually to a long point, spreading, flexuose, thick, densely coated with loose lepidote scales. Peduncle very short. Inflorescence a dense oblong distichous spike  $1\frac{1}{2}$ –2 in. long,  $\frac{3}{4}$ – $1\frac{1}{4}$  in. diam.; flower-bracts ovate, densely laxly lepidote,  $\frac{3}{4}$ –1 in. long. Calyx reaching the tip of the bract, glabrous. Petal lilac, connivent in a tube  $\frac{1}{2}$  in. longer than the calyx. Stamens longer than the petals. Capsule  $1\frac{1}{2}$ –2 in. long.

Hab. West Indies. Mountains of Venezuela, alt. 5000 ft., *Fendler* 2448! Columbia, *André* 1970. Para, *Herb. Lindley*! Brazil, *Glaziou* 15462! 16461!

44. *T. RHOMBOIDEA* André Enum. 6.—Radical leaves ensiform-acuminate, 6–8 in. long, above an inch broad at the dilated base, rigid, densely lepidote, the edges of the blade convolute. Peduncle with spike as long as the leaves. Spike simple, very dense, 4–5 in. long; bracts rhomboid, acute, red-violet. Calyx half as long as the bract; sepals lanceolate. Petals violet, three times as long as the calyx. Capsule oblong, longer than the bract.

Hab. Andes of Columbia, alt. 3000 ft., *André* 2745.

45. *T. CHONTALENSIS* Baker in Journ. Bot. 1887, 237.—Leaves densely rosulate, linear-subulate from an ovate utriculate base 1–1½ in. broad, rigidly coriaceous, thinly lepidote, the blade 2–3 in. long, deeply channelled all down the face. Peduncle 2–3 in. long; bract-leaves crowded, long-pointed. Inflorescence a dense simple distichous spike 2–3 in. long, ½–¾ in. broad; flower-bracts oblong-lanceolate, acute, thinly lepidote, ¾–1 in. long. Calyx shorter than the bract. Petal-blade oblong, ¼ in. long.

Hab. Nicaragua: Chontales, *Ralph Tate* 413!

46. *T. BRACHYPODA* Baker in Journ. Bot. 1887, 237.—Leaves many in a dense rosette; dilated base ovate, an inch broad; blade lanceolate-setaceous, rigidly coriaceous, ½ ft. long, ½ in. broad low down, tapering gradually to the point, densely finely lepidote. Peduncle 2–3 in. long; bract-leaves crowded, with short free points. Inflorescence a dense simple distichous spike 3–4 in. long, ½ in. broad; flower-bracts oblong-lanceolate, naked, ¾ in. long. Calyx reaching nearly to the tip of the bract. Petal-blade oblong. Stamens longer than the petals.

Hab. Mountains of Venezuela, *Fendler* 1527!

47. *T. BRACTEOSA* Klotzsch inedit. *Vriesia bracteosa* Beer Brom. 263.—Leaves lanceolate-acuminate, forming a large basal utriculus; dilated base an inch broad; blade recurved, thick, convolute, 3–4 in. long, ½ in. broad low down, densely finely lepidote on both surfaces. Peduncle very short. Inflorescence a dense simple spike 4–5 in. long; flower-bracts ovate, acute, an inch long, densely lepidote. Calyx shorter than the bract. Petals not seen. Capsule-valves 1½ in. long.

Hab. San Domingo, *Ehrenberg* 221! (Herb. Reg. Berol.).

48. *T. EHREBERGIANA* Klotzsch inedit. *T. tortilis* Baker in Journ. Bot. 1887, 237. *Platystachys Ehrenbergii* Beer Brom. 264. Leafy stem 1–2 in. long; leaves linear-subulate from a small ovate base, 4–6 in. long, ¼ in. broad low down, recurved, thick, coriaceous, densely coated with loose glittering lepidote scales. Peduncle 2–3 in. long; bract-leaves with long free points. Inflorescence a dense simple spike 1–1½ in. long, ⅓–½ in. diam.; flower-bracts oblong-lanceolate, acute, densely lepidote, ¾ in. long. Calyx shorter than the bract. Petal-blades yellow, ½ in. long, convolute in a tube, shorter than the stamens. Capsule an inch long.

Hab. Mountains of Central Mexico, ascending to 6000–8000 ft., *Ehrenberg!* *Bourgeau* 97! *Parry & Palmer* 872! An allied plant, collected at Realijo by Hinds, has more numerous, more densely rosulate, more slender leaves, and is doubtless a distinct species.

49. *T. EGGERSII* Baker. — Leaves laxly spread over a stem 2–3 in. long, patent, linear-subulate, 4–5 in. long,  $\frac{1}{8}$  in. broad low down, deeply channelled at the base, densely coated with lax whitish lepidote scales. Peduncle slender, 3–4 in. long; bract-leaves with long setaceous points. Inflorescence a dense simple spike  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. diam.; flower-bracts oblong,  $\frac{5}{8}$ – $\frac{3}{4}$  in. long, reddish, lepidote. Calyx rather shorter than the bract. Petal-blade oblong, bright yellow,  $\frac{1}{2}$  in. long. Capsule-valves linear, an inch long.

Hab. St. Domingo, *Eggers* 1806! Near *T. vestita*.

50. *T. VESTITA* Cham. et Schlecht. in *Linnæa* xviii. 423 (M.D.). *T. Schiedeana* Steud. *T. flavescens* Mart. et Gal. — Leaves spaced out over a stem 3–4 in. long, subulate from a small clasping base, 6–8 in. long,  $\frac{1}{6}$  in. broad low down, rigidly coriaceous, spreading, densely persistently laxly lepidote all over. Peduncle 2–3 in. long; bract-leaves with long setaceous points. Inflorescence a dense simple spike  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{3}$  in. broad; flower-bracts oblong-lanceolate, bright red, finely lepidote, an inch long. Calyx nearly as long as the bract. Petals yellow, convolute in a cylindrical tube an inch longer than the calyx, shorter than the stamens. Capsule-valves lanceolate,  $1\frac{1}{2}$  in. long.

Hab. Highlands of Central Mexico, *Schiede & Deppe!* *Galeotti* 4912! *Bourgeau* 2179! *Kerber* 295! *Carruthers!* Yucatan, *Schott!* *Johnson* 84! Described from a plant that flowered at Kew in March, 1887, received from Messrs. Shuttleworth. *T. subulata* E. Morren inedit., founded on Uhde 182! in the Berlin Herbarium, is a form of this species.

51. *T. INCARNATA* H. B. K. Nov. Gen. i. 291. *T. brevifolia* Baker in *Journ. Bot.* 1887, 239. *Platystachys incarnata* Beer. — Leaves 12–20 in a dense rosette, lanceolate-setaceous, 4–5 in. long,  $\frac{1}{2}$  in. broad at the base of the blade, thick in texture, densely finely lepidote on both surfaces. Peduncle 6–15 in. long; lower bract-leaves long-pointed. Inflorescence a dense simple distichous spike  $1\frac{1}{2}$ –3 in. long,  $\frac{1}{2}$  in. broad; flower-bracts oblong, acute, lepidote,  $\frac{3}{4}$  in. long. Sepals shorter than the bract. Petal-blade oblong,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Capsule an inch long.

Hab. Andes of Peru, *Bonpland* 3138! *Pearce!* Ecuador, *Lehmann* 177! New Granada, ascending to 8000 ft., *Linden* 1479! *Goudot!* *Funck & Schlim* 1479! *André* 604. The alleged locality of Mexico is probably an error.

52. *T. ERUBESCENS* Schlecht. in *Linnæa* xviii. 427. — Leaves densely rosulate, 4–5 in. long, softly white-lepidote on both surfaces. Peduncle as long as the leaves. Spike simple, 3 in. long; flower-bracts ovate, lepidote. Calyx naked, above an inch long. Petal-blade narrow, acute, shorter than the stamens.

Hab. Mexico; St. Bartolo, *Schiede*. I have not seen this.

53. *T. XIPHOSTACHYS* Griseb. in *Gotting. Nacht.* 1864, 14. *Vriesea xiphostachys* Hook in *Bot. Mag.* t. 5287. *T. complanata* E. Morren in *Belg. Hort.* 1872, 300, t. 23 (M.D.), non Benth. — Leaves 30–40, densely rosulate, linear-subulate from an ovate base  $\frac{3}{4}$  in. diam., 6–9 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad at the base of the blade, firm in texture, tapering gradually to a long point,

thinly lepidote. Peduncle 6-9 in. long; bract-leaves small, adpressed, imbricated. Inflorescence a dense simple spike 4-5 in. long,  $\frac{3}{4}$ -1 in. diam.; flower-bracts oblong, acute, 1-1 $\frac{1}{4}$  in. long. Calyx shorter than the bract; sepals acute. Petals lilac, three times as long as the calyx, convolute in a cylindrical tube shorter than the stamens.

Hab. Mexico, near Cordoba. Flowered by M. Jacob Makoy at Liège in 1871. Mountains of Venezuela, *Fendler* 3447. Originally described from cultivated specimens at Kew in 1861.

54. *T. TRIGLOCHINOIDES* Presl Rel. Haenk. ii. 125. *T. Hartwegiana* Brong.—Leaves densely rosulate, linear from an ovate base  $\frac{3}{4}$  in. diam.; blade above a foot long,  $\frac{1}{2}$  in. broad at the base, tapering gradually to a setaceous point, subcoriaceous, thinly lepidote all over. Peduncle slender, 6-9 in. long; bract-leaves all small, adpressed. Inflorescence a moderately dense distichous spike 6-9 in. long,  $\frac{1}{3}$  in. diam.; flower-bracts oblong-lanceolate, naked,  $\frac{1}{2}$  in. long. Calyx reaching nearly to the tip of the bract. Petal-limb small, oblong, whitish.

Hab. Ecuador, near Guayaguil, *Haenke*, *Hartweg* 699! *Edmonstone*!

55. *T. ACHYROSTACHYS* E. Morren (M.D.).—Leaves densely rosulate, ensiform-acuminate; dilated base not utriculate,  $\frac{3}{4}$  in. broad; blade 8-9 in. long,  $\frac{1}{2}$  in. broad low down, deeply channelled, tapering to a long setaceous point, tinged with purple. Peduncle about as long as the leaves. Inflorescence a moderately dense simple spike 8-9 in. long, under an inch broad; flower-bracts ovate, acute, 1-1 $\frac{1}{4}$  in. long. Calyx shorter than the bract. Petal-blade narrow.

Hab. Mexico. Described from a drawing of Professor Morren's made April, 1881, from a plant received from M. Kimast of Zurich. Near *T. xiphostachys*, but spike not nearly so dense.

56. *T. BARCLAYANA* Baker in Journ. Bot. 1887, 239.—Leaves densely rosulate; dilated base ovate, 3-4 in. long; blade linear-subulate, above a foot long,  $\frac{1}{2}$  in. broad low down, rigidly coriaceous, obscurely lepidote. Peduncle a foot long; bract-leaves lanceolate, scariose, adpressed, imbricated. Inflorescence a simple distichous spike a foot long; rachis stout, pubescent; flower-bracts oblong, obtuse, an inch long, not so much imbricated as in *T. anceps* and *compressa*. Calyx reaching to the tip of the bract. Petals not seen.

Hab. Ecuador; Valdivia, *Barclay* 822! Collected in 1836, on the voyage of the 'Sulphur.'

57. *T. LATERITIA* André Enum. 6.—Radical leaves ensiform-setaceous, 12-20 in. long, dilated at the base, coriaceous, finely lepidote. Peduncle rather shorter than the leaves; bract-leaves many, the lower long-pointed. Spike simple, 12-16-flowered, 3-4 in. long; bracts ovate, acute, brick-red. Calyx as long as the bract; sepals oblong, shortly mucronate. Petals violet, half as long again as the calyx. Capsule half as long again as the bract.

Hab. Andes of Ecuador at Sabanotas, *André* 4057. Near *T. anceps*.

58. *T. ANCEPS* Lodd. Bot. Cab. t. 771. *Platystachys anceps* Beer. *Phytarhiza anceps* E. Morren in Belg. Hort. 1879, 368, t. 20, 21 (M.D.).—Leaves about 30 in a dense rosette, linear-acuminate from a dilated base 2 in. broad; blade 1–2 ft. long,  $\frac{1}{2}$ –1 in. broad at the base, thinly lepidote, striped vertically on the back towards the base with distinct lines of red-brown. Peduncle 3–6 in. long; bract-leaves long-pointed. Inflorescence a dense simple spike 3–4 in. long,  $1\frac{1}{2}$ –2 in. diam.; flower-bracts ovate, acute, densely imbricated,  $1\frac{1}{2}$ –2 in. long, an inch broad. Calyx reaching nearly to the tip of the bract. Petal-blade oblong, lilac,  $\frac{3}{4}$  in. long, shorter than the stamens.

Hab. Trinidad, *Fendler* 832! Introduced into cultivation by Loddiges in 1823, and again from French Guiana by Mélinon in 1878. Very near *T. compressa*.

59. *T. PUNCTULATA* Cham. et Schlecht. in Linn. vi. 53 (M.D.).—Acaulescent. Leaves 30–40, densely rosulate from an ovate base  $1\frac{1}{2}$  in. diam.; blade linear-setaceous, 6–9 in. long, deeply channelled at the base, which is not above  $\frac{1}{4}$  in. broad, rigidly coriaceous, recurved, thinly lepidote. Peduncle  $\frac{1}{2}$  ft. long; bract-leaves long-pointed. Inflorescence a dense simple spike 3–4 in. long,  $1\frac{1}{2}$ –2 in. broad; flower-bracts ovate, acute, an inch broad,  $1\frac{1}{2}$  in. long, lower bright red. Calyx reaching nearly to the tip of the bract. Petals lilac, convolute in a tube an inch longer than the calyx, shorter than the stamens.

Hab. Highlands of Central Mexico, *Schiede* 1006! *Bourgeau* 2961! 3075! *Hahn!* *Uhde* 183! Very near *T. compressa*. *T. tricolor* Cham. et Schlecht. in Linn. xviii. 423! E. Morren in Belg. Hort. 1879, 162, t. 10, 11 (M.D.), is a robust variety of this species with a branched spike.

60. *T. COMPRESSA* Bertero; Roem. et Schultes Syst. Veg. vii. 1210 (M.D.). *T. setacea* Hook. in Bot. Mag. t. 3275, non Sw. *Platystachys setacea* Beer.—Leaves densely rosulate, ensiform-acuminate from an ovate base  $1\frac{1}{2}$  in. broad; blade 1– $1\frac{1}{2}$  ft. long,  $\frac{3}{4}$ –1 in. broad low down, convolute in the upper half, rigidly coriaceous, thinly lepidote, not striped on the back. Peduncle  $\frac{1}{2}$  ft. long; bract-leaves crowded, with long rigid convolute tips. Inflorescence a dense simple spike 6–8 in. long, 2 in. diam.; flower-bracts ovate, reddish-yellow,  $1\frac{1}{2}$  in. long,  $1\frac{1}{4}$  in. broad low down, rigid, thinly lepidote. Calyx nearly as long as the bract. Petal-blade long, narrow, white, shorter than the stamens.

Hab. Jamaica, *Masson!* *Purdie!* Introduced into cultivation at the Glasgow Botanic Garden in 1833.

61. *T. NANA* Baker.—Whole plant not above 2–3 in. high. Leaves few, lanceolate, ascending, falcate, 1–2 in. long,  $\frac{1}{4}$  in. broad low down, densely lepidote. Peduncle very short. Spikes 1–2, dense, distichous, 5–6-flowered, an inch long,  $\frac{1}{3}$  in. diam.; flower-bracts ovate-lanceolate,  $\frac{5}{8}$ – $\frac{3}{4}$  in. long. Calyx shorter than the bract. Petals not seen.

Hab. Andes of Southern Peru, *C. Gay!* (Herb. Mus. Par.). Collected 1839, 1840.

62. *T. TURNERI* Baker in Journ. Bot. 1888, 143.—Basal leaves not seen. Peduncle 3–4 in. long, quite hidden by the large erect lanceolate-acuminate rigidly coriaceous densely lepidote bract-leaves, which are 3–4 in. long. Inflorescence a dense oblong multifarious capitulum 3–4 in. long; branch-bracts ovate-cuspidate, all as long as the spikes which they nearly hide; spikes dense, distichous, oblong, 1–1½ in. long, ⅓ in. broad; flower-bracts oblong, ¾ in. long, Calyx as long as the bract. Petal-blade oblong, ¼ in. long.

Hab. Andes of Bogota, *Turner!* Columbia, *André* 1248.

63. *T. TECTORUM* E. Morren in Belg. Hort. 1877, 328, t. 18 (M.D.). *T. argentea* K. Koch in Berl. Monat. 1876, t. 3, non Griseb.—Leaves densely spread over a slender stem ½–1 ft. long, linear-subulate from a clasping base, ⅓–½ in. diam., 4–5 in. long, ¼ in. broad low down, deeply channelled down the face, densely clothed with lax white lepidote scales. Peduncle ½ ft. long; bract-leaves adpressed, imbricated, with short erect points. Spikes 6–8, crowded, ascending, dense, distichous, 1½–2 in. long, ⅓ in. diam.; flower-bracts oblong-lanceolate, reddish-white, ¾ in. long. Calyx rather shorter than the bract. Petals blue-lilac with a white tip, convolute in a cylindrical tube twice as long as the calyx. Stamens shorter than the petals.

Hab. Andes of Northern Peru, near Huancabamba. Introduced into cultivation by Wallis in 1865, 66, and again by Roezl in 1872. First flowered by Verschaffelt in 1868.

64. *T. ORANENSIS* Baker.—Leaves densely rosulate, linear-subulate from a suddenly dilated ovate base ¾–1 in. broad, 3–4 in. long, rounded on the back, nearly flat on the face, finely densely lepidote all over. Peduncle ½ ft. long; bract-leaves scariosse, adpressed, imbricated. Spikes 10–12, forming a dense deltoid panicle, 1½–2 in. long, ½ in. broad; flower-bracts oblong-lanceolate, ½ in. long, lepidote. Calyx nearly as long as the bract. Petal-blade oblong, ¼ in. long.

Hab. Argentaria; province of Oran, *Simons!* (Herb. Mus. Brit.). Collected in 1880.

65. *T. BULBOSA* Hook. Exot. Flora t. 173 (M.D.). *Platystachys bulbosa* Beer.—Leaves few, densely rosulate, with connivent ventricose broad ovate tightly-clasping pale greenish unspotted dilated bases above an inch broad; blade convolute from the base, 3–6 in. long, stout, flexuose, thinly lepidote. Peduncle very short. Spikes 1–4, crowded, 1–2 in. long, ½ in. diam.; flower-bracts oblong-lanceolate, ½–¾ in. long, green or reddish, finely lepidote. Calyx reaching to the tip of the bract. Petals bright lilac, convolute in a cylindrical tube an inch longer than the calyx, shorter than the stamens. Capsule above an inch long.

Hab. Florida, Cuba and Mexico to South Brazil and New Granada. *T. erythræa* Lindl. (*T. bulbosa* var. *picta*, Bot. Mag. t. 4283), is a variety with bright red leaf-bases and bracts. *T. inanis* Lindl. in Paxt. Flow. Gard. i. 159, t. 103, 104), is a tall variety with a simple spike. *T. eminens* and *T. pumila* Lindl. in Paxt. Flow. Gard. i. 160, and *T. paucifolia* Baker in Gard. Chron. 1878, 748, are varieties of this species. Introduced into cultivation at Glasgow from Trinidad in 1824.

66. *T. VARIEGATA* Schlecht. in *Linnæa* xviii. 429, Wittm. in *Berlin Gartenzeit.* 1885, 198, fig. 44 (M.D.).—Leaves few in a rosette, with large dilated ovate tightly-clasping leaf-bases variegated with green and brown; blade setaceous, flexuose, a foot long, thinly lepidote. Peduncle 3–4 in. long; bract-leaves with long points. Spikes about 3, crowded, dense, distichous,  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{2}$  in. diam.; flower-bracts oblong-lanceolate, greenish, an inch long. Calyx nearly as long as the bract. Petals lilac, convolute in a long tube.

Hab. Mexico. Introduced into cultivation in 1880. Very near *T. bulbosa*.

67. *T. CAPUT-MEDUSÆ* E. Morren in *Belg. Hort.* 1880, 90 (M.D.).—Leaves few, densely rosulate, subterete from a plain green ovate base, above a foot long, thick, spreading variously,  $\frac{1}{2}$  in. diam. above the base, thinly lepidote. Peduncle  $\frac{1}{2}$  ft. long; bract-leaves long-pointed. Spikes 3–4, moderately dense, 2–3 in. long,  $\frac{1}{2}$  in. diam.; flower-bracts oblong-lanceolate, bright red,  $\frac{3}{4}$  in. long. Calyx nearly as long as the bract. Petals lilac, forming a cylindrical tube an inch longer than the calyx.

Hab. Mexico. Introduced into cultivation by M. Jacob-Makoy & Co., of Liège, in 1880. Very near the large robust varieties of *T. bulbosa*.

68. *T. CANESCENS* Swartz *Prodr. Fl. Ind. Occ.* 57 (M.D.).—Leaves about 20, densely rosulate, linear-acuminate from a slightly dilated base, 6–9 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad low down, rigidly coriaceous, densely lepidote on both surfaces. Peduncle much shorter than the leaves; bract-leaves many, green, shortly pointed. Spikes 1–4, dense, distichous,  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{2}$  in. broad; flower-bracts oblong-lanceolate, greenish-brown, thinly lepidote,  $\frac{1}{2}$  in. long. Calyx as long as the bract. Corolla lilac, twice as long as the calyx. Capsule-valves lanceolate, an inch long.

Hab. Mexico, *Bourgeau* 2103! Jamaica, *Swartz*! *Purdie*! Cuba, *Wright* 3273! Trinidad, *Schacht*! Introduced into cultivation in 1873. A well-marked, but inconspicuous plant.

69. *T. MORITZIANA* Klotzsch. *Platystachys Moritziana* Beer.—Whole plant 9–10 in. high. Leaves densely rosulate, ensiform-acuminate,  $\frac{1}{2}$  ft. long,  $\frac{3}{4}$  in. broad at the dilated base, not rigid in texture, densely finely lepidote on both surfaces. Peduncle much shorter than the leaves. Panicle of about 3 moderately dense distichous spikes 2–3 in. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad; flower-bracts oblong, subglabrous,  $\frac{5}{8}$ – $\frac{3}{4}$  in. long,  $\frac{1}{3}$  in. broad. Calyx under  $\frac{1}{2}$  in. long. Petal-blade narrow,  $\frac{1}{2}$  in. long.

Hab. Mountains of Venezuela, *Moritz* 449! (Herb. Mus. Berol.). Allied to *T. canescens*.

70. *T. CRASSIFOLIA* Baker.—Leaves densely rosulate, thick, linear, rigid, 3–4 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad low down, tapering gradually to the point, densely adpresso-lepidote. Peduncle as long as the leaves. Panicle about 3 in. long, consisting of 10–12 dense distichous spikes 1– $1\frac{1}{2}$  in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. diam.; flower-bracts oblong-lanceolate,  $\frac{1}{2}$  in. long. Calyx as long as the bract. Petal-blade small, oblong, purple.

Hab. Paraguay, *Balansa* 709! Bolivia, in the province of Chiquitos, *Castelnau*!

71. *T. VERNICOSA* Baker in Journ. Bot. 1887, 241. — Leaves about 30 in a dense rosette, ensiform-acuminate, 6–8 in. long, narrowed gradually from a scarcely dilated base  $\frac{3}{8}$  in. diam. to the tip, very thick and rigid in texture, deeply channelled all the way down the face, pale green, glossy, finely lepidote, the outer spreading widely. Peduncle under  $\frac{1}{2}$  ft. long; upper bract-leaves entirely adpressed, rigid, green, imbricated. Spikes 3–4, crowded, dense, 1–1 $\frac{1}{2}$  in. long,  $\frac{1}{3}$  in. diam.; flower-bracts oblong, obtuse, rigid,  $\frac{1}{2}$  in. long. Calyx as long as the bract. Petal-blade oblong, white,  $\frac{1}{4}$  in. long. Stamens shorter than the petals.

Hab. Parana, *Christie*! Flowered at Kew, Oct., 1861.

72. *T. STREPTOCARPA* Baker in Journ. Bot. 1887, 241. — Leaves about 20 in a lax basal rosette, linear-subulate, 6–8 in. long,  $\frac{1}{4}$  in. broad low down, rigidly coriaceous, deeply channelled down the face, densely finely lepidote. Peduncle slender, 5–9 in. long; bract-leaves small, adpressed, lanceolate. Spikes 3–4, dense, crowded, 1–2 in. long,  $\frac{1}{3}$  in. diam.; flower-bracts oblong-lanceolate, very rigid,  $\frac{1}{2}$  in. long. Calyx as long as the bract. Petals not seen. Capsule cylindrical, 1 $\frac{1}{2}$ –1 $\frac{3}{4}$  in. long.

Hab. Paraguay, *Balansa* 615!

73. *T. SETACEA* Sw. Prodr. Fl. Ind. Occ. 593; Baker in Ref. Bot. t. 288 (M.D.) non Hook. in Bot. Mag. t. 3275. *T. tenuifolia* Linn. ex parte (Sloane Jam. i. 190, t. 122, fig. 1), E. Morren in Belg. Hort. 1876, 199, t. 14. *T. juncifolia* Regel Gartenfl. t. 811, *T. Selloa* K. Koch. *T. juncea* and *T. pinifolia* Leconte. *T. Bartramii* Elliott. *Bonapartea juncea* Ruiz et Pav. Fl. Peruv. t. 262. *Renalmia monastachya* Linn. herb. ! *Diaphoranthema versicolor* Beer. — Leaves 30–40 in a dense rosette, subulate from a small ovate base, firm in texture,  $\frac{1}{2}$ –1 ft. long,  $\frac{1}{12}$ – $\frac{1}{8}$  in. diam. low down, thinly lepidote. Peduncle 3–9 in. long; bract-leaves with short setaceous points. Spikes few, crowded, dense, 1–2 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. diam.; flower-bracts oblong-cuspidate, green,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Calyx  $\frac{1}{2}$  in. long. Petals bright violet, more than twice as long as the calyx, convolute in a cylindrical tube shorter than the stamens. Capsule-valves linear, an inch long.

Hab. Mexico and Southern United States to South Brazil. *T. caricifolia* E. Morren, is a robust variety with leaves stouter than in the type. The Mexican *T. quadrangularis* Mart. et Gal. Enum. 9, founded on Galeotti 4917, is said to differ by its yellow flowers. *T. caespitosa* Leconte, appears to be a dwarf variety, with 3–4 flowers in a simple spike and leaves tinged with red.

74. *T. FLORIBUNDA* H. B. K. Nov. Gen. i. 202. *T. coarctata* Willd. *Platystachys floribunda* Beer. — Leaves densely rosulate, linear-subulate, 6–8 in. long,  $\frac{1}{3}$  in. broad at the dilated base, firm in texture, densely lepidote. Peduncle 4–6 in. long; bract-leaves crowded, long-pointed. Spikes 2–8, crowded, very dense, distichous, an inch long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. diam.; flower-bracts ovate,  $\frac{1}{3}$  in. long and broad. Calyx shorter than the bract. Petal-blade violet, as long as the calyx.

Hab. Andes of Peru near Olleros, *Humboldt & Bonpland* 3495! Near *T. setacea*.

75. *T. DREPANOPHYLLA* Baker.—Leaves densely rosulate, thick, rigid, linear, falcate,  $\frac{1}{2}$  ft. long,  $\frac{1}{2}$  in. broad low down, densely finely lepidote. Peduncle as long as the leaves. Spikes 3–4, crowded, distichous, dense, 2–3 in. long,  $\frac{1}{3}$  in. diam.; flower-bracts oblong-lanceolate,  $\frac{1}{2}$  in. long. Calyx equalling or rather exceeding the flower-bract. Petal-blade oblong, white,  $\frac{1}{4}$  in. long.

Hab. Paraguay, *Balansa* 710!

76. *T. ARPOCALYX* André Enum. 7.—Radical leaves short, ovate-lanceolate with a setaceous point, densely argenteo-lepidote on both surfaces. Stem curved; bract-leaves crowded, ovate-lanceolate with setaceous tips, lepidote. Panicle dense, 6–8 in. long, composed of about a dozen dense 6–7-flowered spikes; branch-bracts ovate-lanceolate, as long as the spikes; flower-bracts lanceolate-acuminate,  $1\frac{1}{2}$  in. long. Calyx much shorter than the bract; sepals lanceolate. Corolla greenish, rather longer than the bract. Stamens longer than the petals.

Hab. Andes of Central Ecuador, *André* 4474.

77. *T. MYRIANTHA* Baker in Journ. Bot. 1887, 242. *T. floribunda* Griseb. non H. B. K. — Whole plant 8–12 in. high. Leaves densely rosulate; ovate base 2 in. long,  $1\frac{1}{2}$  in. broad; blade lanceolate-setaceous, 8–9 in. long,  $\frac{1}{2}$  in. broad low down, rigidly coriaceous, finely lepidote. Peduncle 6–8 in. long; bract-leaves crowded, long-pointed. Inflorescence a dense oblong panicle 2–3 in. long; spikes very numerous, erecto-patent, an inch long,  $\frac{1}{4}$  in. broad; flower-bracts ovate,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Calyx as long as the bract. Petals not seen. Capsule an inch long.

Hab. Mountains of Venezuela, *Otto* 646! *Fendler* 1530! 1531! Columbia, *André* 815.

78. *T. RUSBYI* Baker. — Leaves densely rosulate, linear-acuminate from an ovate base, 6–8 in. long,  $\frac{1}{2}$  in. broad low down, finely grey-lepidote. Peduncle shorter than the leaves. Spikes 8–9, dense, distichous, 2–3 in. long,  $\frac{1}{3}$  in. broad; flower-bracts ovate, acute,  $\frac{1}{3}$  in. long. Calyx as long as the bract. Petal-blade very small.

Hab. Andes of Bolivia; Yungas, alt. 6000 ft., *Rusby* 2163!

79. *T. FLABELLATA* Baker in Journ. Bot. 1887, 242.—Leaves densely rosulate; dilated base ovate, 2 in. long, above an inch broad; blade lanceolate-subulate, above a foot long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad low down, not rigid in texture, thinly lepidote. Peduncle 3–4 in. long. Spikes 6–9, peduncled, flabellate, dense, distichous, 2–3 in. long,  $\frac{1}{2}$  in. broad; flower-bracts lanceolate, nearly naked,  $\frac{3}{4}$ –1 in. long, narrowed gradually to the point. Calyx  $\frac{1}{2}$  in. long; sepals oblong-lanceolate, thin, glabrous. Petals not seen. Capsule cylindrical, scarcely longer than the calyx.

Hab. Mountains of Guatemala; Barranco Honda, alt. 3800 ft., *Salvin!* Volcan de Santa Maria, *Lehmann* 1703!

80. *T. DIVARICATA* Benth. Bot. Sulphur 174.—Leaves densely rosulate, ensiform-setaceous from an ovate base an inch broad, a foot long,  $\frac{1}{2}$  in. broad low down, rigidly coriaceous, densely lepidote. Peduncle as long as the leaves; bract-leaves with circinate linear free points. Panicle short, deltoid; spikes 6–8, sessile, spreading horizontally,  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{2}$  in. broad; branch-bracts small, ovate; flower-bracts ovate,  $\frac{1}{2}$  in. long, thinly lepidote. Calyx nearly as long as the bract. Petals narrow,  $\frac{1}{4}$  in. long. Capsule-valves linear, above an inch long.

Hab. Ecuador, near Guayaquil, *Barclay! Sinclair! André* 2250. Gathered in 1836.

81. *T. BARBEYANA* Wittm. in Engl. Jahrb. xi. 66.—Leaves about 16 in a rosette, ensiform-acuminate from a large ovate base  $1\frac{1}{2}$ –2 in. broad, under a foot long,  $\frac{1}{3}$  in. broad at the middle, tapering gradually to a long point, spotted with dark brown. Peduncle as long as the leaves. Panicle 6–8 in. long, composed of 12–15 dense spreading simple sessile distichous spikes 2–3 in. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad; branch-bracts ovate-cuspidate, lower 1– $1\frac{1}{2}$  in. long; flower-bracts oblong-lanceolate,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Calyx as long as the bract. Capsule twice as long as the calyx.

Hab. Ecuador, banks of the Rio Pastasso, alt. 5000–7000 ft., *Lehmann* 444. Near *T. divaricata* Benth.

82. *T. STREPTOPHYLLA* Schiedw. in Hort. Belg. iii (1836) 152, with figure; E. Morren in Belg. Hort. 1878, 296, t. 18, 19 (M.D.); Baker in Bot. Mag. t. 6757. *T. circinnata* Schlecht. in Linnæa xviii. 427. *T. tortilis* Brong.—Leaves densely rosulate, ensiform-acuminate from an ovate base  $1\frac{1}{2}$  in. broad, a foot long,  $\frac{3}{4}$ –1 in. broad low down, circinnate at the apex, densely finely lepidote on both surfaces. Peduncle  $\frac{1}{2}$  ft. long; bract-leaves crowded, with long recurved tips. Spikes 10–12, simple, dense, arcuate, crowded, 3–4 in. long,  $\frac{5}{8}$ – $\frac{3}{4}$  in. diam.; branch-bracts ovate, long-pointed, reddish; flower-bracts ovate, acute, densely lepidote,  $\frac{3}{4}$  in. long, lower reddish, upper green. Calyx rather shorter than the bract. Petals lilac, twice as long as the calyx, convolute in a tube, shorter than the stamens. Capsule 1– $1\frac{1}{4}$  in. long.

Hab. Mosquito shore, *Capt. Miller!* (year 1744). Central Mexico, *Schiede. Bourgeau! Hahn! Uhde* 190! Yucatan, *Schott* 274! Costa Rica, *Ersted. Guatemala, Bernouilli & Cario* 693. Jamaica, *Jenman!* We have an imperfect specimen of a closely-allied species with naked flower-bracts from Guatemala, gathered by Skinner.

83. *T. RESTREPOANA* André Enum. 6.—Radical leaves lanceolate-setaceous,  $1\frac{1}{2}$ –2 ft. long, finely lepidote. Peduncle robust, as long as the leaves; bract-leaves many, the lower very long, the upper with spiral setaceous tips. Panicle dense, a foot long; spikes 10–12, sessile or subsessile, 2–3 in. long,  $1\frac{1}{2}$  in. diam.; branch-bracts ovate-lanceolate, the lower long-pointed; flower-bracts oblong, acute, glabrous, just exceeding the calyx. Sepals oblong, acute, an inch long. Petals violet,  $\frac{1}{3}$  in. longer than the calyx.

Hab. Andes of Columbia; Salto de Tequendama, alt. 8000 ft., *André* 1356.

84. *T. DISTACHYA* Baker in Gard. Chron. 1880, i. 200.—Leaves

12-15 in a dense rosette, ensiform-acuminate from an ovate base an inch broad, above a foot long, not convolute,  $\frac{3}{4}$  in. broad low down, rigidly coriaceous, thinly lepidote. Peduncle  $\frac{1}{2}$  ft. long; bract-leaves with long free linear points. Spikes 2, dense,  $1\frac{1}{2}$ -2 in. long,  $\frac{1}{2}$  in. diam.; flower-bracts oblong-lanceolate, an inch long, not lepidote. Calyx  $\frac{3}{4}$  in. long. Petal-blade oblanceolate, white,  $\frac{1}{4}$  in. long. Stamens longer than the petals.

Hab. Honduras, *Gabb!* Described from a living plant that flowered at Kew, Jan., 1880.

85. *T. POLYPHYLLA* Baker. — Leaves very numerous, very rigid, linear-subulate from an ovate base 1 in. diam., a foot long,  $\frac{1}{3}$  in. broad low down, densely adpresso-lepidote. Peduncle as long as the leaves; bract-leaves long-pointed. Panicle of 8-12 crowded dense distichous spikes  $1-1\frac{1}{2}$  in. long,  $\frac{1}{4}$  in. diam.; flower-bracts oblong, acute, reddish,  $\frac{1}{2}$  in. long. Calyx shorter than the bract. Petal-blade small, oblong.

Hab. Bolivian Andes; Sorata, alt. 8000 ft., *Mandon* 1183!

86. *T. PARVISPICA* Baker in Journ. Bot. 1887, 244.—Leaves 20-30 in a dense rosette, ensiform-subulate from an ovate base an inch broad, above a foot long,  $\frac{1}{2}$  in. broad low down, rigidly coriaceous, densely finely lepidote on both surfaces. Peduncle a foot long; bract-leaves much imbricated, with long free points. Panicle dense, very narrow, 4-5 in. long; spikes dense, simple, erecto-patent, the lowest an inch long; branch-bracts ovate with long linear points; flower-bracts ovate,  $\frac{1}{2}$ - $\frac{5}{8}$  in. long. Calyx nearly as long as the bract. Corolla not seen.

Hab. South Brazil, *Glaziov* 13258!

87. *T. RHODOCINCTA* Baker in Journ. Bot. 1888, 143. — Leaves ensiform-acuminate, a foot long, an inch broad low down, rigidly coriaceous, narrowed gradually to the point, obscurely lepidote, with a narrow scariose red-brown margin. Peduncle as long as the leaves; bract-leaves crowded, erect, with long free lanceolate tips. Inflorescence a congested oblong multifarious panicle 2-3 in. long; branch-bracts ovate-acuminate, lower  $1\frac{1}{2}$  in. long; spikes distichous,  $1-1\frac{1}{2}$  in. long; flower-bracts oblong, acute, glabrous,  $\frac{1}{2}$ - $\frac{5}{8}$  in. long. Calyx as long as the bract; sepals much imbricated. Petal-blade small, oblong.

Hab. British Guiana, Humirida Mountains, *Appun* 1416!; summit of Mount Boraima, *Im Thurn* 316!

88. *T. ANGUSTIFOLIA* Swartz Prodr. Fl. Ind. Occ. 57. — Leaves 10-12 in a rosette, ensiform-subulate from an ovate base an inch broad,  $1-1\frac{1}{2}$  ft. long,  $\frac{1}{2}$  in. broad low down, rigidly coriaceous, convolute, finely lepidote on both surfaces. Peduncle much shorter than the leaves; bract-leaves with squarrose subulate free points. Spikes 3-8, dense, ascending, simple, the end one 2-4 in. long,  $\frac{1}{2}$  in. broad; flower-bracts oblong-lanceolate, acute, glossy, reddish,  $\frac{1}{2}$ - $\frac{5}{8}$  in. long. Calyx as long as the bracts. Petals lilac, convolute in a tube an inch longer than the calyx, shorter than the stamens. Capsule an inch long.

Hab. Jamaica, *Swartz!* British Honduras, *Gabb!* Venezuela, *Fendler* 1258. Described mainly from *Swartz's* type-specimen at the British Museum. Doubtfully distinct from *T. polystachya*.

89. *T. LATIFOLIA* Meyen. *T. Kunthiana* Gaudich. Atlas Bonité, t. 53. *T. grisea* Baker in Journ. Bot. 1887, 245. *Platystachys latifolia* K. Koch. Ind. Sem. Hort. Berol. 1873, App. iv. 5.—Leaves 20 or more, densely rosulate, ensiform-subulate from an ovate base 1–1½ in. broad, a foot long, ½ in. broad low down, convolute from the base, rigidly coriaceous, finely lepidote. Peduncle shorter than the leaves; bract-leaves with long free linear tips. Panicle of few or many dense erecto-patent spikes 2–3 in. long, ¼ in. broad, often viviparous at the tip; branch-bracts ovate, 1–1½ in. long; flower-bracts very rigid, ovate, naked, ¾ in. long. Calyx nearly as long as the bract. Petal-blade as long as the calyx.

Hab. Peru; common about Lima, *Meyen!* *Gaudichaud!* *D'Urville!* *Cuming* 981!

90. *T. CONFERTIFLORA* André Enum. 7.—Root-leaves lanceolate-acuminate, densely lepidote beneath. Stem a foot long; bract-leaves lanceolate-setaceous, imbricated. Panicle very dense, formed of about a dozen dense distichous 12–14-flowered spikes 1–1½ in. long; lower branch-bracts lanceolate-setaceous, longer than the spikes; flower-bracts ovate, acute, ⅔ in. long. Sepals oblong, very acute. Petals yellowish-white. Capsule arcuate, rather longer than the bract.

Hab. Andes of Central Ecuador, *André* 4475, bis.

91. *T. ELONGATA* H. B. K. Nov. Gen. i. 293.—Leaves ensiform-acuminate from an ovate base, 1½–2 ft. long, an inch broad at the base of the blade, rigidly coriaceous, finely lepidote. Peduncle shorter than the leaves. Inflorescence a lax panicle of many ascending distichous spikes nearly a foot long, ¼–⅓ in. broad; branch-bracts small, ovate; flower-bracts ovate-lanceolate, acute, ½ in. long. Calyx a little shorter than the bract. Petal-limb oblong, ½ in. long.

Hab. Andes of New Granada near Honda, *Humboldt & Bonpland* 1703! *André* 297. Gathered in the year 1801.

92. *T. GAYI* Baker.—Leaves densely rosulate, ensiform-subulate, a foot long, ½ in. broad low down, very rigid, thinly lepidote. Peduncle as long as the leaves. Panicle ½ ft. long; spikes 10–12, dense, sessile, erecto-patent, 1½–2 in. long, ⅓ in. broad. Flower-bracts oblong-lanceolate, bright red, ½ in. long. Calyx as long as the bract. Petal-blade oblong, ¼ in. long.

Hab. Andes of Southern Peru, *C. Gay* (Herb. Mus. Par.) Gathered in 1839–1840.

93. *T. FOLIOSA* Mart. et Gal. Enum. ii. 9, non Griseb. *T. Kunthiana* Baker in Journ. Bot. 1887, 246, non Gaudich. *T. Schlumbergeri* E. Morren (M.D.).—Leaves densely rosulate, ensiform-acuminate from an ovate base 1–1½ in. broad, a foot long, ½–¾ in. broad low down, rigidly coriaceous, thinly lepidote. Peduncle shorter than the leaves; bract-leaves long-pointed. Inflorescence a dense short panicle of many ascending dense distichous simple

spikes  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{2}$  in. diam.; lower branch-bracts long-pointed; flower-bracts oblong, acute,  $\frac{3}{4}$ –1 in. long, less imbricated than in *T. polystachya*. Calyx shorter than the bracts. Petals lilac, convolute in a cylindrical tube shorter than the stamens. Capsule  $1-1\frac{1}{4}$  in. long.

Hab. Mountains of Central America, *Galeotti* 4909, *Bourgeau* 1777! 1908! *Hahn*! Introduced into cultivation by Schlumberger in 1873. Allied to *T. polystachya* and *T. Balbisiana*.

94. *T. LEIBOLDIANA* Schlecht. in *Linnaea* xviii. 414. *T. foliosa* E. Morren (M.D.), non Mart. et Gal.—Leaves densely rosulate, ensiform-acuminate from an ovate base  $1\frac{1}{2}$  in. diam.,  $1-1\frac{1}{2}$  ft. long,  $\frac{3}{4}$ –1 in. broad low down, tapering gradually to a long point, not very rigid, thinly lepidote. Peduncle much shorter than the leaves; bract-leaves long-pointed, lower bright red at the base. Panicle  $\frac{1}{2}$ –1 ft. long; spikes simple, dense, sessile, erecto-patent,  $1\frac{1}{2}$ –2 in. long,  $\frac{3}{4}$  in. diam.; branch-bracts red at the base, with long recurved tips; flower-bracts ovate, bright red,  $\frac{3}{4}$ –1 in. long. Calyx shorter than the bract. Petals lilac, convolute in a tube above an inch long, shorter than the stamens.

Hab. Central Mexico, *Liebold* 180, *Schiede & Deppe*. Introduced into cultivation in 1883. Described mainly from Morren's drawing.

95. *T. MACROCHLAMYS* Baker in *Journ. Bot.* 1888, 142.—Leaves lanceolate-acuminate from an oblong base  $1\frac{1}{2}$  in. broad, a foot long, an inch broad above the base, subcoriaceous, finely lepidote on the back. Peduncle a foot long; bract-leaves crowded, with large lanceolate-acuminate free points. Spikes few-flowered, distichous, much overtopped by the ovate-acuminate multifarious imbricated branch-bracts, of which the lower are 4–5 in. long; flower-bracts oblong, obtuse, an inch long. Calyx  $\frac{3}{4}$  in. long; sepals obtuse. Petals not seen.

Hab. Mountains of Central Mexico, *Hahn*! Gathered during the French Expedition of 1865–6.

96. *T. CORNUALTI* André *Enum.* 8.—Radical leaves lanceolate, acute, 16–20 in. long, an inch broad above the base, densely lepidote. Stem with panicle a little overtopping the leaves; lower bract-leaves a foot long. Panicle dense, subglobose, composed of numerous 3–4-flowered spikes; lower branch-bracts longer than the spikes; flower-bracts ovate-oblong, acute, above an inch long. Sepals oblong, acute, as long as the bract. Petals red-violet, tipped white. Capsule longer than the calyx.

Hab. Eastern Andes of Columbia, alt. 8500 ft., *André* 1764.

97. *T. STROBILANTHA* Baker in *Journ. Bot.* 1888, 168. *T. imperialis* E. Morren (M.D.). *Guzmania imperialis* Roezl. — Leaves about a dozen in a dense rosette, lanceolate-acuminate from an ovate base 2 in. broad,  $1\frac{1}{2}$  ft. long, an inch broad low down, moderately firm in texture, subglabrous. Peduncle  $\frac{1}{2}$  ft. long; bract-leaves crowded, with long erect free points. Inflorescence a dense oblong multifarious panicle 5–6 in. long; branch-bracts ovate, with reflexing tip bright red, much imbricated, the lower 3–4 in.

long; spikes dense, few-flowered, distichous, quite hidden by the bracts; flower-bracts ovate, acute,  $1\frac{1}{2}$  in. long. Calyx  $1\frac{1}{2}$  in. long; sepals acute. Petal-blade small, violet.

Hab. Mexico; province of Orizaba, *Pavon!* *Bourgeau* 2389! Flowered at Liège by M. Jacob-Makoy, in March, 1879.

98. T. STROBILIFERA E. Morren (M.D.). — Leaves densely rosulate, ensiform-acuminate from an ovate base 2 in. diam.,  $1\frac{1}{2}$ –2 ft. long, an inch broad low down, tapering gradually to the tip, not rigid, thinly lepidote. Peduncle shorter than the leaves, quite hidden by the crowded long-pointed bract-leaves. Inflorescence a multifarious panicle  $\frac{1}{2}$  ft. long, with many sessile dense erecto-patent distichous spikes  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{2}$  in. diam.; branch-bracts ovate-acuminate, green, lower as long as the spikes; flower-bracts green, oblong, acute,  $\frac{3}{4}$ –1 in. long. Calyx as long as the bract. Petals convolute in a tube an inch long, shorter than the stamens.

Hab. Mexico. Described from Prof. Morren's drawing, made from a plant that flowered May, 1882, received from M. Kienast, of Zurich.

99. T. GYMNOBRYA Baker in Journ. Bot. 1887, 243. *T. tri-dactylites* E. Morren (M.D.). — Leaves 20–30, densely rosulate, ensiform-acuminate from an ovate base  $1\frac{1}{2}$  in. broad, a foot long,  $\frac{3}{8}$  in. broad low down, rigidly coriaceous, finely lepidote on both surfaces. Peduncle a foot long; bract-leaves with long linear tips. Panicle lax, a foot long; spikes numerous, patent, many 3–4-nate, dense, distichous, 1–2 in. long,  $\frac{1}{2}$  in. broad; lower branch-bracts with long linear tips; flower-bracts greenish-red, oblong,  $\frac{1}{2}$  in. long. Calyx nearly as long as the bract. Petals violet, convolute in a tube, twice as long as the calyx. Stamens not longer than the petals.

Hab. Mexico; province of Orizaba, *Bourgeau* 3076! Panama, *Wagner* (Herb. Monac.). Introduced into cultivation in 1883, by M. Jacob-Makoy & Co., of Liège.

100. T. DACTYLIFERA E. Morren inedit. — Leaves ensiform-acuminate, a foot long, rigidly coriaceous, densely finely lepidote. Peduncle shorter than the leaves, hidden by its bract-leaves. Inflorescence a short panicle; spikes dense, sessile, 3–4-nate, 6–8 in. long,  $\frac{1}{2}$ – $\frac{3}{8}$  in. broad, straight or arcuate; flower-bracts ovate-lanceolate,  $\frac{5}{8}$ – $\frac{3}{4}$  in. long. Petals greenish. Stamens not longer than the petals.

Hab. Caracas; mountains near Sanchorquiz, alt. 5000–6000 ft., *Ernst*.

101. T. WEDDELLII Baker. — Leaves densely rosulate, ensiform-acuminate, a foot long, an inch broad low down, very thick in texture, very circinnate at the apex, densely finely lepidote. Peduncle a foot long; bract-leaves long-pointed. Panicle lax,  $1\frac{1}{2}$ –2 ft. long; spikes 20–30, dense, distichous, 2–3 in. long,  $\frac{1}{4}$  in. diam., lower 3–4-nate; flower-bracts ovate,  $\frac{1}{2}$  in. long. Calyx rather shorter than the bract. Petals not seen. Capsule-valves linear, under an inch long.

Hab. Bolivia; Chiquitos, *Weddell* 4035! (Herb. Mus. Par.).

102. *T. POLYSTACHYA* Linn. Sp. Plant. 410 (M.D.). *Platystachys polystachya* Beer. *P. digitata* Beer.—Leaves about 20, densely rosulate, ensiform-acuminate from an ovate base an inch broad, 1-1½ ft. long, ½-¾ in. broad low down, rigidly coriaceous, deeply channelled below the middle, finely lepidote. Peduncle shorter than the leaves; bract-leaves with long free points. Panicle ½-1 ft. long; spikes many, ascending, dense, simple, ½ in. diam., 2-4 rarely 6 in. long; branch-bracts small, ovate, greenish; flower-bracts much imbricated, reddish, oblong, acute, ¾ in. long, ½ in. broad. Calyx a little shorter than the bract. Petals violet, connivent in a cylindrical tube, twice as long as the calyx. Capsule-valves linear, an inch long.

Hab. Mexico, Central America, Columbia, and common in the West Indies. I cannot separate specifically *T. festucoides* Brong. *T. macrostachya* Klotzsch (*Platystachys* Beer), gathered in Haiti by Ehrenberg, is a robust form with long spikes.

103. *T. BALBISIANA* Schultes fl. Syst. Veg. vii. 1212; E. Morren in Belg. Hort. 1879, 98, t. 6, 7 (M.D.).—Leaves about a dozen in a rosette, with ventricose ovate utricular bases 1½-2 in. long, an inch broad; blade linear-acuminate, spreading, rigidly coriaceous, 6-9 in. long, ½ in. broad low down, finely lepidote. Peduncle ½-1 ft. long; bract-leaves with recurved linear tips. Spikes few, dense, distichous, 2-3 in. long, ½ in. diam., forming a short panicle; flower-bracts ovate-oblong, acute, ¾ in. long, obscurely lepidote. Calyx rather shorter than the bract. Petals lilac, convolute in a cylindrical tube ½ in. long. Capsule-valves linear 1½ in. long.

Hab. Florida, Mexico, and West Indies. Best distinguished from the small forms of *T. polystachya* by the utriculate bases of the leaves. Introduced into cultivation by Houzeau in 1874.

104. *T. BLANCHETIANA* Baker.—Basal leaves not seen. Panicle deltoid, a foot or more long; lower branches with 3-4 branchlets; final spikes dense, 3-4 in. long, ⅝ in. diam.; flower-bracts ovate, acute, ¾-7⁄8 in. long. Calyx as long as the bract.

Hab. Brazil; Bahia, *Blanchet!* (Herb. Mus. Brit.). Near *T. polystachya*.

105. *T. LORENTZIANA* Griseb. Symb. Fl. Argent. 1878, 332. *T. didisticha* Baker. *Anoplophytum didistichum* E. Morren in Belg. Hort. 1881, 164. (M.D.).—Leaves about 20 in a dense rosette, lanceolate-acuminate, rigidly coriaceous, 6-9 in. long, ½-¾ in. broad above the dilated base, rigidly coriaceous, densely finely lepidote on both surfaces. Peduncle 6-9 in. long; lower bract-leaves with long spreading points. Inflorescence a short panicle, composed of 3-8 dense distichous spikes, 2-3 in. long, ½ in. diam.; branch-bracts small; flower-bracts oblong, acute, greenish, ½-¾ in. long. Calyx as long as the bract. Petal-blade oblong, white, ½ in. long. Stamens shorter than the petals. Capsule 1¼-1½ in. long.

Hab. Argentina; province of Cordoba, *Lorentz* 69! *Hieronymus!* Paraguay, *Balansa* 613! 4744! Near *T. polystachya*. Flowered by M. Jacob-Makoy, at Liège, in 1830.

106. *T. ENGLERIANA* Wittm. in Engl. Jahrb. xi. 63. —Leaves

densely rosulate, ensiform-subulate from a suddenly dilated ovate base  $1\frac{1}{2}$ –2 in. broad,  $1-1\frac{1}{2}$  ft. long,  $\frac{1}{2}$  in. broad low down, rigidly coriaceous, thinly lepidote. Peduncle much shorter than the leaves. Panicle dense,  $1\frac{1}{2}$  ft. long, 2 in. broad; branch-bracts ovate, lower only with short subulate tip; branches dense, erectopatent, very compound; end spike only an inch long; flower-bracts oblong,  $\frac{1}{2}$  in. long. Calyx shorter than the bract.

Hab. Andes of Southern Columbia; Pasto, alt. 6000–7000 ft., *Lehmann* 520!

107. *T. FOURNIERI* E. Morren inedit. — Leaves linear-subulate from an ovate base, rigidly coriaceous, thinly lepidote. Panicle lax, a foot long; spikes many, dense, ascending, simple, 3–4 in. long, above  $\frac{1}{2}$  in. broad; lower branch-bracts oblong-lanceolate with a subulate point; flower-bracts oblong, acute, an inch long,  $\frac{1}{3}$  in. broad. Calyx rather shorter than the bract. Petals and capsule not seen.

Hab. Central Mexico, *Uhde* 177! (Herb. Reg. Berol.). Near *T. Parryi*. Fournier's specimen was bought in the market of Orizaba in March, 1864. The same or a near ally (*T. Liebmanniana* E. Morren inedit.) was gathered by Liebmann, at Mirador, in 1842.

108. *T. FASCICULATA* Swartz Prodr. Fl. Ind. Occ. 56 (M.D.). *T. bracteata* Chapm. *T. havanensis* Jacq. Amer. Pict. t. 94. *Platystachys havanensis* Beer.—Leaves 20–40, densely rosulate, ensiform-acuminate from an ovate base 2 in. diam.; blade  $1\frac{1}{2}$ –2 ft. long,  $\frac{3}{4}$ –1 in. broad low down, rigidly coriaceous, thinly lepidote. Peduncle shorter than the leaves; bract-leaves with long ascending points. Spikes few or several, dense, distichous, 3–6 in. long, an inch broad, densely paniced, ascending, simple; branch-bracts small, ovate; flower-bracts ovate, acute, bright red,  $1\frac{1}{2}$  in. long, an inch broad. Calyx an inch long. Petal bright lilac, convolute in a cylindrical tube, twice as long as the sepals. Capsule  $1\frac{1}{2}$  in. long.

Hab. Florida, Mexico and West Indies.

109. *T. BOTTERI* E. Morren (M.D.).—Leaves about 30, densely rosulate, linear-setaceous from an ovate base an inch broad, a foot long,  $\frac{1}{2}$  in. broad low down, spreading, rigidly coriaceous, thinly lepidote. Peduncle a foot long; bract-leaves with long setaceous free points. Spikes 3–7, ascending, dense, distichous, crowded, 3–6 in. long, an inch broad; branch-bracts small, ovate; flower-bracts ovate, acute,  $1-1\frac{1}{4}$  in. long, lower red, upper green. Calyx shorter than the bract. Petals lilac, convolute in a cylindrical tube an inch long, shorter than the stamens.

Hab. Mexico. Described from Morren's drawing, made from a plant sent to him by M. Devansaye in June, 1879. Scarcely more than a variety of *T. fasciculata*. A Cuban plant (*C. Wright* 680!) approaches it closely.

110. *T. GLAUCOPHYLLA* Baker in Journ. Bot. 1887, 243. *Vriesea glaucophylla* Hook. in Bot. Mag. t. 4415; Flore des Serres t. 432. *Platystachys glaucophylla* Beer.—Leaves densely rosulate, ensiform-setaceous from an ovate base  $1\frac{1}{2}$ –2 in. diam.,  $1\frac{1}{2}$  ft. long,  $\frac{3}{4}$  in. broad low down, rigidly coriaceous, densely finely lepidote. Peduncle much shorter than the leaves; bract-leaves with long

setaceous points. Spikes 4-6, dense, distichous, crowded, ascending, simple, 4-8 in. long, an inch broad; branch-bracts small, ovate; flower-bracts oblong, acute,  $1\frac{1}{2}$  in. long, an inch broad, green, thinly lepidote. Calyx  $1\frac{1}{4}$  in. long; sepals lanceolate, acute. Petals lilac, twice as long as the calyx. Stamens much longer than the petals. Capsule  $1\frac{1}{2}$  in. long.

Hab. Santa Marta. Introduced into cultivation by Purdie in 1848. Very near *T. fasciculata*.

111. *T. LESCAILLEI* Sauv. Fl. Cub. 167.—Leaves linear-lanceolate from an ovate base, much shorter than the stem. Peduncle with imbricated bract-leaves. Panicle of simple distichous spikes; flower-bracts suborbicular, twice as long as the internodes. Calyx about as long as the flower-bract; sepals elliptic. Petal-limb ovate, obtuse. Capsule three times the length of the calyx.

Hab. Cuba, *C. Wright* 664. Known to me from the description only.

112. *T. LEIOCHLAMYS* Baker.—Leaves not seen. Inflorescence a flabellate panicle of 5 dense simple spikes 6-8 in. long, an inch broad; branch-bracts ovate, acute, rigidly coriaceous, lower 3-4 in. long; flower-bracts oblong, rigid, glossy, narrowed suddenly to a point,  $1\frac{1}{2}$ - $1\frac{3}{4}$  in. long, an inch broad. Sepals lanceolate, acute, an inch long. Petals not seen.

Hab. Mexico, *Ude* 180! (Herb. Reg. Berol.). Gathered in 1845.

113. *T. PARRYI* Baker in Journ. Bot. 1887, 277.—Dilated base of leaf 4 in. long, 3 in. broad; blade ensiform-acuminate, a foot long,  $1-1\frac{1}{2}$  in. broad low down, rigidly coriaceous, thinly lepidote. Panicle rhomboid, 8-9 in. long; spikes about 5, dense, simple, ascending, 4-5 in. long, an inch broad; branch-bracts small, ovate, bright red; flower-bracts oblong-lanceolate, acute, naked, bright red,  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. long,  $\frac{3}{4}$  in. broad. Calyx an inch long. Petal-blade oblong,  $\frac{1}{2}$  in. long. Stamens not longer than the petals.

Hab. Central Mexico; Mountains of San Luis Potosi, alt. 6000-8000 ft., *Parry & Palmer* 873!

114. *T. ROBUSTA* Griseb. in Gott. Nacht. 1864, 15.—Leaves ensiform-setaceous from an ovate base, densely lepidote, not more than a quarter as long as the robust stem. Inflorescence a panicle of a few distant erecto-patent dense spikes; flower-bracts oblong-lanceolate, subacute, three times the length of the calyx. Petal-blade as long as the calyx. Capsule shorter than the flower-bracts.

Hab. Mountains of Venezuela, alt. 3000 ft., *Fendler* 1525.

115. *T. SECUNDA* H. B. K. Nov. Gen. i. 294.—Whole plant 6 ft. high. Leaves ensiform-acuminate, nearly flat, a foot long,  $\frac{3}{4}$  in. broad low down, rigidly coriaceous, finely lepidote. Panicle of many distant dense peduncled secund spikes 3-6 in. long: flower-bracts ovate-oblong, acute, glabrous, an inch long. Calyx an inch long; sepals oblong, obtuse, naked. Petal-limb as long as the calyx, dark violet. Stamens as long as the petals. Capsule  $1\frac{1}{2}$  in. long.

Hab. Andes of Quito, *Humboldt & Bonpland* 3094! Columbia and Ecuador, *André* 2448. Calyx like that of a *Vriesea*.

116. *T. THYRSIGERA* E. Morren (M.D.).—Whole plant 4–5 ft. high. Leaves densely rosulate, lanceolate-acuminate, 3 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, 3 in. at the dilated base, tapering gradually to the point, finely lepidote. Peduncle stout, much shorter than the leaves; bract-leaves with linear spreading tips. Panicle 2 ft. long; spikes numerous, dense, distichous, ascending,  $\frac{1}{2}$ –1 ft. long, an inch broad; flower-bracts ovate-lanceolate, acute, reddish, 2 in. long. Sepals  $1\frac{1}{2}$  in. long. Petals lilac, convolute in a tube an inch longer than the calyx. Stamens longer than the petals.

Hab. Central Mexico, *Uhde* 181! (Herb. Reg. Berol.). Drawn by Morren from a cultivated plant in 1882, received from Kienast of Zurich.

117. *T. LONGIFOLIA* Baker. *T. elongata* Griseb. in Gott. Nacht. 1864, 17, non H. B. K. — Leaves ensiform-subulate from an ovate base 4–5 in. long,  $2\frac{1}{2}$ –3 in. broad, 3–4 ft. long,  $1\frac{1}{2}$  in. broad low down, rigidly coriaceous, tapering gradually to a long point, finely lepidote. Peduncle stout, much shorter than the leaves; bract-leaves long-pointed. Inflorescence a lax ample panicle; lower branch-bracts with linear tips  $\frac{1}{2}$ –1 ft. long; spikes dense, 2–3 in. long,  $\frac{1}{2}$  in. broad; flower-bracts oblong-lanceolate, acute, naked,  $\frac{1}{2}$ – $\frac{3}{8}$  in. long. Calyx as long as the bract; sepals obtuse. Petal-blade small, oblong. Capsule-valves linear,  $1\frac{1}{4}$  in. long.

Hab. Mountains of Venezuela, *Fendler* 1522!

118. *T. DUGESII* Baker in Journ. Bot. 1887, 278. — Leaves densely rosulate, ensiform-setaceous from an ovate base, 5–6 in. long,  $2\frac{1}{2}$  in. broad, convolute in the upper half, an inch broad low down, rigidly coriaceous, thinly lepidote. Peduncle very stout, much shorter than the leaves. Inflorescence a dense panicle above a foot long, composed of 20–30 erecto-patent simple nearly sessile spikes 2–3 in. long, an inch broad; branch-bracts small, ovate, glossy; flower-bracts oblong, acute, glossy, strongly keeled, 1– $1\frac{1}{2}$  in. long. Calyx an inch long. Petals and capsule not seen.

Hab. Northern Mexico; Guanajuato, *Duges*! Received from Dr. Asa Gray in 1885.

119. *T. VIOLACEA* Baker in Journ. Bot. 1887, 279. *T. Bourgaei* Baker. *Platystachys violacea* Beer. — Leaves densely rosulate, ensiform-setaceous from an ovate base, 3–4 in. long,  $1\frac{1}{2}$ –2 in. broad,  $1\frac{1}{2}$ –2 ft. long, an inch broad low down, rigidly coriaceous, finely lepidote. Peduncle very robust, shorter than the leaves; bract-leaves long-pointed. Inflorescence a dense panicle 1– $1\frac{1}{2}$  ft. long; lower branch-bracts with long setaceous points; spikes dense, sessile, oblong, 2–3 in. long, an inch broad; flower-bracts oblong, acute, naked, 1– $1\frac{1}{4}$  in. long. Calyx glabrous, an inch long. Petals violet, their blades convolute in a tube as long as the calyx. Capsule-valves lanceolate,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long.

Hab. Mountains of Central Mexico, *Andrieux* 60! *Bourgeau* 893! *Kerber* 241! *T. flagellifera* E. Morren inedit., founded on Hahn 1009, of which the long-pointed lower branch-bracts are a foot or more long, is either a form of this species or a near ally.

120. *T. COSSONI* Baker in Journ. Bot. 1887, 279.—Basal leaves lanceolate-acuminate,  $1\frac{1}{2}$  ft. long, an inch broad low down. Peduncle stout; bract-leaves with large lanceolate free tips. Inflorescence a dense panicle  $1-1\frac{1}{2}$  ft. long, composed of 30 or more oblong dense simple erecto-patent nearly sessile spikes 2-3 in. long, an inch broad; branch-bracts ovate, bright red, many as long as the spikes; flower-bracts ovate, acute, naked, an inch long,  $\frac{3}{4}$  in. broad low down. Calyx an inch long, glabrous; sepals lanceolate, acute. Petal-blades convolute in a cylindrical tube an inch long.

Hab. Mountains of Central Mexico, *Uhde* 188! *Bilimek*!

121. *T. PRODIGIOSA* Baker in Journ. Bot. 1888, 140. *Vriesea prodigiosa* Lemaire.—Leaves ensiform-acuminate from an ovate base 3-4 in. broad,  $1\frac{1}{2}-2$  ft. long, 2 in. broad low down, tapering gradually to a long point, rigidly coriaceous, finely lepidote. Peduncle stout, as long as the leaves. Panicle  $1\frac{1}{2}-2$  ft. long, consisting of very numerous oblong dense erecto-patent simple spikes 3-4 in. long, an inch broad; branch-bracts ovate-acuminate, lower longer than the spikes; flower-bracts oblong-lanceolate, acute,  $1\frac{1}{2}-2$  in. long. Sepals lanceolate, acute,  $1\frac{1}{2}$  in. long. Petal-blades convolute in a cylindrical tube.

Hab. Central Mexico; Orizaba, *Bourgeau* 3375! Introduced into cultivation by Gheisbreght.

122. *T. ARGENTEA* Griseb. Cat. Cub. 254.—Rosettes tufted. Leaves densely rosulate, linear-subulate from an ovate base, 3-4 in. long,  $\frac{1}{8}-\frac{1}{4}$  in. broad low down, laxly albo-lepidote, especially beneath. Peduncle declinate, twice as long as the leaves; bract-leaves very small. Spike simple, moderately dense, about 6-flowered; rachis flexuose; flower-bracts oblong-lanceolate, subacute,  $\frac{1}{2}$  in. long, equalling the internodes. Calyx shorter than the bract; sepals oblong, obtuse. Capsule 2-3-times the length of the calyx.

Hab. Cuba, *C. Wright*.

123. *T. YUCATANA* Baker in Journ. Bot. 1887, 280.—Leaves 8-12 in a rosette, lanceolate-setaceous, 3-4 in. long,  $\frac{3}{4}$  in. broad at the dilated base, rigidly coriaceous, densely finely lepidote on both surfaces. Peduncle 2-3 in. long; bract-leaves crowded, with long free points. Spike simple, erect, moderately dense, 3-4 in. long, 1 in. diam.; flower-bracts oblong lanceolate, lepidote,  $1-1\frac{1}{2}$  in. long. Calyx much shorter than the bract; sepals lanceolate.

Hab. Yucatan, *Schott* 250! (Herb. Mus. Brit.). Habit of *T. canescens*.

124. *T. CONSPERSA* Miquel in Linnæa xviii. 376.—Leaves densely rosulate, linear-setaceous, 4-5 in. long, rigidly coriaceous, densely clothed with silvery lepidote scales. Peduncle as long as the leaves. Inflorescence a simple moderately dense spike  $1\frac{1}{2}-2$  in. long; flowers 6-8 on a side; flower-bracts oblong-lanceolate, spreading, the lower longer than the flowers, which are nearly an inch long.

Hab. Surinam, on dead trees near Paramaribo. Habit of *T. setacea*.

125. *T. INCURVA* Griseb. in Gotting. Nacht. 1864, 15.—Leaves densely rosulate, ensiform-acuminate from an ovate base  $1\frac{1}{4}$  in.

broad, 6-9 in. long, above  $\frac{1}{2}$  in. broad low down, rigidly coriaceous, densely persistently lepidote. Peduncle curved, 3 in. long; bract-leaves with long free points. Inflorescence a moderately dense simple spike 8-9 in. long,  $\frac{3}{4}$  in. diam.; flower-bracts ovate, obtuse, an inch long, equalling the internodes. Calyx nearly as long as the bract. Petal-blade narrow,  $\frac{1}{2}$  in. long. Capsule-valves lanceolate,  $1\frac{1}{2}$  in. long.

Hab. Mountains of Venezuela, *Fendler* 1524!

126. *T. SUBLAXA* Baker in Journ. Bot. 1887, 280. — Leaves few in a rosette, ensiform-setaceous from an ovate base an inch broad, 6-9 in. long,  $\frac{1}{2}$  in. broad low down, rigidly coriaceous, thinly lepidote. Peduncle as long as the leaves; bract-leaves with long free points. Inflorescence a moderately dense simple spike 4-5 in. long,  $\frac{3}{4}$  in. diam; flowers 6-8 on a side, very ascending; rachis flexuose; flower-bracts oblong-lanceolate,  $\frac{3}{4}$ - $\frac{7}{8}$  in. long. Calyx  $\frac{1}{2}$  in. long; sepals oblong, obtuse. Petal-blades lilac, convolute in a cylindrical tube  $\frac{1}{2}$  in. long. Capsule an inch long.

Hab. Jamaica, *Purdie*! Porto Rico, *Sintenis* 6885! St. Domingo, *Eggers* 1569! 2618! Habit of *T. polystachya*, from which it differs by its simple sub-lax spike. I cannot, from the brief description, separate the Mexican *T. variabilis* Schlecht. in Linnæa xviii. 418.

127. *T. GONIORACHIS* Baker in Journ. Bot. 1887, 303. — Leaves densely rosulate, lanceolate-setaceous from an ovate base  $1\frac{1}{2}$  in. broad, nearly a foot long,  $\frac{3}{4}$  in. broad low down, tapering gradually to a short convolute point, rigidly coriaceous, densely finely lepidote. Peduncle as long as the leaves; bract-leaves crowded, with long setaceous points. Inflorescence a moderately dense spike a foot long, with a stout naked very flexuose axis; flowers ascending, 12-15 on a side; flower-bracts broad ovate, coriaceous, glabrous,  $\frac{3}{4}$  in. long and broad. Calyx an inch long; sepals oblong, obtuse, much imbricated. Petals and capsule not seen.

Hab. South Brazil, *Glaziou* 15471! 16462! A very distinct species, with a calyx like that of a *Vriesea*.

128. *T. DASYLIRIIFOLIA* Baker in Journ. Bot. 1887, 304. — Leaves linear-subulate, very thick and rigid in texture, a foot long,  $\frac{1}{3}$  in. broad low down, tapering gradually to the point, obscurely lepidote. Inflorescence paniced; branches  $\frac{1}{2}$  ft. long; rachis naked, flexuose; flowers 8-10, ascending; flower-bracts ovate-oblong, obtuse, rigid, naked,  $\frac{5}{8}$  in. long. Calyx  $\frac{1}{4}$  in. longer than the bract. Petal-blade oblong, violet,  $\frac{1}{2}$  in. long. Stamens longer than the petals.

Hab. Holbox Island, Bay of Honduras, *Gaumer*! Received from Mr. F. D. Godman, F.R.S., in 1886.

129. *T. FRASERI* Baker.—Basal leaves not seen.—Inflorescence an ample panicle; lower branches with about 10 moderately dense spicate branchlets 2-2 $\frac{1}{2}$  in. long,  $\frac{1}{3}$  in. broad; branch-bracts small, ovate; flower-bracts ovate, acute,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long. Calyx nearly as long as the bract; sepals oblong, subacute.

Hab. Andes of Ecuador, *Fraser*! (Herb. Mus. Brit.).

130. *T. VALENZUELANA* A. Rich. in *Sagra Fl. Cub.* iii. 367. *T. laxa* Griseb. *Flora Brit. West. Ind.* 596. *T. Houzeavii* E. Morren (M.D.). — Leaves densely rosulate, ensiform-setaceous from an ovate base  $1\frac{1}{2}$  in. broad,  $1\frac{1}{2}$  ft. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad low down, rigidly coriaceous, finely lepidote. Peduncle much shorter than the leaves; bract-leaves with long free points. Spikes few or many; forming a short panicle, moderately dense, 2–4 in. long,  $\frac{1}{2}$  in. broad; branch-bracts small, lanceolate; flower-bracts oblong-lanceolate, green,  $\frac{3}{4}$ –1 in. long. Calyx a little shorter than the bract. Petal-blades violet, convolute in a tube as long as the calyx, shorter than the stamens. Capsule 1– $1\frac{1}{2}$  in. long.

Hab. Cuba, *C. Wright* 1516! Florida, *Houzeau*. Jamaica, *Wulschagel*. Colombia, *André* 492. Near *T. polystachya*, from which it differs mainly by its laxer spikes.

131. *T. PEREZIANA* André Enum. 7.—Radical leaves lanceolate-setaceous, 12–20 in. long, much dilated at the base, finely lepidote. Stem cernuous, shorter than the leaves; bract-leaves ovate-oblong with a setaceous tip. Panicle moderately dense, pendent, a foot long, composed of 5–6 10–12 flowered spikes 4–6 in. long; branch-bracts ovate-lanceolate, the lower long-pointed; flower-bracts acute,  $1\frac{1}{2}$  in. long, densely lepidote. Calyx more than half as long as the bract; sepals oblong, acute. Petals greenish-white, 2 in. long. Stamens longer than the petals.

Hab. Andes of Columbia, near Tequendama, alt. 8000 ft., *André* 1348, and var. *canescens* André, with bracts more densely lepidote, in Ecuador.

132. *T. SUBIMBRICATA* Baker in *Journ. Bot.* 1887, 307.—Leaves densely rosulate, ensiform subulate from an ovate base 2 in. broad, 2– $2\frac{1}{2}$  ft. long, an inch broad low down, rigidly coriaceous, thinly finely lepidote. Peduncle 2 ft. long; lower bract-leaves with long free points. Inflorescence a lax panicle  $1\frac{1}{2}$  ft. long; spikes 12–20, moderately dense, 6–8 in. long,  $\frac{1}{2}$  in. broad; branch-bracts small, lanceolate; flower-bracts oblong-lanceolate, acute, subglabrous,  $\frac{3}{4}$  in. long. Calyx reaching nearly to the tip of the bract. Corolla lilac, an inch long.

Hab. Trinidad, *Fendler* 816! Near *T. valenzuelana*.

133. *T. DREPANOCLADA* Baker.—Leaves ensiform-acuminate from an ovate base 2 in. broad, 2–3 ft. long, an inch broad low down, moderately firm in texture, nearly naked. Peduncle stout, much shorter than the leaves; bract-leaves with long free points. Panicle of 5–6 moderately dense arcuate flexuose branches a foot long; flower-bracts ovate, acute, rigid, an inch long. Calyx as long as the bract. Petal-blade short, oblong.

Hab. Mexico; Chiquihuite, *Bourgeau* 2193! (Herb. Mus. Paris).

134. *T. GRISEBACHII* Baker in *Journ. Bot.* 1887, 335. *T. carulea* Griseb. non H. B. K.—Leaves densely rosulate, linear-subulate, channelled all down the face,  $\frac{1}{2}$  ft. long,  $\frac{1}{4}$  in. broad at the clasping base, rigidly coriaceous, densely persistently lepidote. Peduncle shorter than the leaves; bract-leaves few, with long erect setaceous free points. Inflorescence a short few-flowered lax simple erect

spike; flower-bracts oblong-lanceolate, acute, an inch long. Calyx reaching nearly to the tip of the bract.

Hab. Mountains of Venezuela, alt. 3000 ft., *Fendler* 1533 !

135. *T. LOLIACEA* Mart.; Roem. et Schultes Syst. Veg. vii. 1204.—Leaves densely rosulate, short, linear-subulate from an ovate base, densely clothed with ovate spreading silvery lepidote scales. Peduncle 3-4 in. long, Flowers 4-7 in a simple lax spike with a flexuose rachis, ascending; flower-bracts ovate, lepidote,  $\frac{1}{6}$ - $\frac{1}{4}$  in. long. Calyx naked,  $\frac{1}{4}$  in. long; sepals ovate-oblong, obtuse. Capsule cylindrical, under an inch long.

Hab. Brazil; province of Bahia, on rocks, *Martius*.

136. *T. KARWINSKIANA* Roem. et Schultes Syst. Veg. vii. 1209.—Leaves 20-30, densely rosulate, ensiform-subulate from an ovate base  $1\frac{1}{2}$  in. diam., a foot long, an inch broad low down, moderately firm in texture, nearly naked on the face, thinly lepidote on the back. Peduncle  $\frac{1}{2}$  ft. long; lower bract-leaves with long free points. Inflorescence a lax simple spike, 3-4 in. long; flowers 8-12, adpressed to the rachis; flower-bracts oblong-lanceolate, naked,  $\frac{3}{4}$ -1 in. long. Calyx shorter than the bract. Petal-blade violet, as long as the calyx, shorter than the stamens.

Hab. Mexico, *Karwinsky*. Described from a plant that flowered at Kew, Dec., 1877. Sent by Mr. C. S. Sargent.

137. *T. NARTHECIOIDES* Presl Rel. Haenk. ii. 125.—Leaves 20-30, densely rosulate, linear-setaceous,  $1-1\frac{1}{2}$  ft. long,  $\frac{1}{3}$  in. broad above the dilated base, tapering gradually into a long point, rigidly coriaceous, thinly lepidote on the back. Peduncle slender, much shorter than the leaves; bract-leaves small, adpressed, imbricated. Inflorescence a lax simple spike 6-9 in. long; flowers erectopate,  $\frac{1}{2}$  in. apart; flower-bracts oblong, naked,  $\frac{1}{2}$  in. long. Calyx nearly as long as the bract. Petal-limb white,  $\frac{1}{4}$  in. long. Capsule cylindrical,  $1-1\frac{1}{4}$  in. long.

Hab. Ecuador, near Guayaquil, *Haenke*, *Jameson* 376 ! *André* 4077. Described from a plant flowered by Mr. Wm. Bull, Dec., 1877.

138. *T. MAKOYANA* Baker.—Leaves densely rosulate, lanceolate-acuminate,  $1\frac{1}{2}$  ft. long, 2 in. broad low down, tapering gradually to a long point, channelled down the face. Peduncle a foot long; bract-leaves many, small, adpressed. Inflorescence a lax simple spike 5-6 in. long with the flowers adpressed to the flexuose rachis; flower-bracts ovate, green, an inch long. Calyx  $\frac{1}{4}$  in. longer than the bract; sepals obtuse. Corolla violet,  $\frac{1}{3}$  in. longer than the calyx, shorter than the stamens.

Hab. Mexico. Described from a drawing of Professor Morren's made from a plant flowered by M. Jacob-Makoy & Co., at Liège, in 1879.

139. *T. BRASSICOIDES* Baker in Journ. Bot. 1888, 12.—Leaves 20 or more in a dense rosette; dilated base ovate, 3-4 in. long, 2 in. broad; blade ensiform-acuminate,  $\frac{1}{2}$  ft. long, an inch broad at the base, tapering gradually to a short convolute point, rigidly coriaceous, thinly lepidote. Peduncle rather longer than the leaves; upper bract-leaves small, adpressed, not imbricated. In-

florescence a lax subsecund spike 4-5 in. long; flowers 5-6, lower spreading; flower-bracts ovate,  $\frac{3}{4}$  in. long. Calyx 1-1 $\frac{1}{2}$  in. long; sepals obtuse. Corolla not seen. Capsule not longer than the calyx.

Hab. Brazil; Rio Janeiro, *Burchell* 1393! Very distinct. Calyx and bract like those of *T. regina*.

140. *T. FILIFOLIA* Cham. et Schlecht. in *Linnæa* vi. 53, *T. staticiflora* E. Morren in Belg. Hort. 1871, 177, t. 12 (M.D.). *Platystachys filifolia* Beer.—Leaves very numerous, filiform from an ovate base  $\frac{1}{8}$  in. broad, 4-6 in. long,  $\frac{1}{3}$  lin. diam. at the middle, obscurely lepidote. Peduncle very slender, shorter than the leaves. Panicle lax, deltoid, 4-6 in. long and broad; spikes many, simple, lax, arcuate; branch-bracts small, lanceolate; flowers erecto-patent; flower-bracts oblong-lanceolate, glabrous,  $\frac{1}{3}$  in. long. Calyx just protruding beyond the bract. Petal-blade ovate, acute  $\frac{1}{8}$  in. long, pale lilac. Capsule twice as long as the calyx.

Hab. Central Mexico, Vera Cruz and Yucatan. Very distinct.

141. *T. FLEXUOSA* Swartz. Prodr. Fl. Ind. Occ. 57; *T. tenuifolia* Jacq. Amer. 92, t. 53,; Pict. t. 93. *T. aloifolia* Hook. Exot. Flora, t. 205. *T. limbata* Schlecht. *T. patens* Willd. *Platystachys patens* K. Koch. *Vriesea aloifolia* and *V. tenuifolia* Beer. — Leaves 10-20 in a rosette, lanceolate-acuminate from a large ovate base 2-3 in. broad; blade 1-1 $\frac{1}{2}$  ft. long, an inch broad low down, tapering gradually into a long point, moderately firm in texture, obscurely fasciated on the back, green or tinged with red-brown, obscurely lepidote. Peduncle  $\frac{1}{2}$ -1 ft. long; bract-leaves small, adpressed. Spikes very lax, few-flowered,  $\frac{1}{2}$ -1 ft. long, simple or forked; rachis slightly flexuose; flowers erecto-patent; flower-bracts oblong-acute,  $\frac{3}{4}$  in. long. Calyx  $\frac{1}{4}$ - $\frac{1}{3}$  in. longer than the bract. Petal-blade whitish, lingulate,  $\frac{1}{3}$  in. long, shorter than the stamens. Capsule a little longer than the calyx.

Hab. Mexico, West Indies, Venezuela, Columbia and Guiana. Var. *fasciata* E. Morren (M.D.), is a form with leaves transversely banded with white and reddish calyx and petals.

142. *T. GENICULATA* E. Morren (M.D.). — Leaves densely rosulate, ensiform from an ovate base 1 $\frac{1}{2}$  in. broad, 1 $\frac{1}{2}$  ft. long, an inch broad low down, tapering gradually to a long point, moderately firm in texture, thinly lepidote. Peduncle 2 ft. long; bract-leaves with long reflexing linear tips. Panicle very lax, 2-3 ft. long; branches arcuate, all simple,  $\frac{1}{2}$ -1 ft. long; branch-bracts small; rachis very zigzag; flowers ascending; flower-bracts oblong, greenish-brown, an inch long. Calyx  $\frac{1}{2}$  in. longer than the bract; sepals naked, oblong. Petal-blade white, lingulate, shorter than the stamens.

Hab. Mexico. Introduced by M. Kienast, of Zurich. Described from Professor Morren's drawing, made June, 1886. Allied to *T. flexuosa*.

143. *T. PULVINATA* E. Morren (M.D.).—Leaves about 20, densely rosulate, lanceolate-acuminate from an ovate base 3 in. broad, 1 $\frac{1}{2}$ -2 ft. long, 2 in. broad at the base of the blade, tapering gradually to a long point, moderately firm in texture, glaucous

beneath. Peduncle longer than the leaves; bract-leaves all small, adpressed. Inflorescence a lax panicle  $1\frac{1}{2}$  ft. long; branches few, lax, subpatent, simple, the lower a foot long; rachises not flexuose; flowers adpressed to the rachis; flower-bracts ovate,  $\frac{3}{4}$  in. long. Calyx not longer than the bract; sepals oblong. Petals lingulate, white, twice as long as the calyx.

Hab. Mexico. Described from Prof. Morren's drawing, made April, 1883. Allied to *T. flexuosa*.

144. *T. CORCOVADENSIS* Britten in Journ. Bot. 1888, 172. *T. ventricosa* Wawra non Griseb.—Leaves densely rosulate, linear-setaceous from an ovate base  $1\frac{1}{2}$  in. broad,  $\frac{1}{2}$ –1 ft. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad at the middle, rigidly coriaceous, densely lepidote. Peduncle 8–16 in. long; lower bract-leaves with long points, upper adpressed. Inflorescence a lax panicle, with 2–4 lax spreading 6–8-flowered spikes 2–3 in. long; flowers spreading; flower-bracts oblong-lanceolate, reddish-brown, above an inch long. Calyx rather shorter than the bract; sepals oblong, obtuse. Corolla not seen. Capsule  $1\frac{1}{2}$  in. long.

Hab. South Brazil; Corcovado Mountains, *Wawra & Maly* ii. 224. *Glaziou* 11583!

145. *T. BREVIBRACTEATA* Baker in Journ. Bot. 1887, 346. — Leaves 20–30 in a dense rosette, ensiform-setaceous from an ovate base 2 in. broad, a foot long, an inch broad low down, rigidly coriaceous, densely finely lepidote. Peduncle a foot long; bract-leaves with long free tips. Panicle above a foot long; branches numerous, ascending, peduncled, lax-flowered, lower 6–8 in. long, 10–12-flowered; rachises flexuose; flower-bracts ovate-oblong,  $\frac{1}{3}$  in. long. Calyx glabrous, twice as long as the bract; sepals obtuse. Corolla not seen. Capsule  $1\frac{1}{2}$  in. long.

Hab. Forests of Martinique, *Hahn* 524! 578! 680!

146. *T. ERECTIFLORA* Baker in Journ. Bot. 1887, 346. — Leaves densely rosulate, lanceolate from a suborbicular base 2 in. broad,  $\frac{1}{2}$  ft. long,  $\frac{1}{2}$  in. broad at the middle, flexible, thinly finely lepidote. Peduncle shorter than the leaves; bract-leaves small. Panicle lax, a foot long, with several ascending lax-flowered short spikes; flowers 4–6 to a spike, adpressed to the rachis; flower-bracts oblong-lanceolate, glabrous, an inch long. Calyx reaching to the tip of the bract. Corolla and capsule not seen.

Hab. South Brazil, *Boog*! Allied to *T. flexuosa*.

147. *T. SWARTZII* Baker in Journ. Bot. 1888, 12. *T. paniculata* Swartz in Herb. Mus. Brit. non Linn.—Basal leaves not seen. Peduncle a foot long; lower bract-leaves with long free points. Inflorescence a very lax panicle 2 ft. long, with ascending slender lax-flowered flexuose branches; flower-bracts ovate, acute,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Calyx  $\frac{3}{8}$  in. long. Capsule at least twice as long as the calyx.

Hab. Jamaica, *Swartz*! (Herb. Mus. Brit.). Allied to *T. utriculata*.

## Subgenus 5.—PSEUDO-CATOPSIS.

148. *T. MONADELPHA* Baker in Journ. Bot. 1887, 281. *Phytarhiza monadelpha* E. Morren in Belg. Hort. 1882, 168, t. 7. *T. graminifolia* Baker. *Catopsis (Andrea) alba* E. Morren (M.D.). — Leaves 50–60 in a rosette, linear-setaceous from an ovate base an inch broad, 7–8 in. long,  $\frac{1}{4}$  in. broad at the middle, much tinged with red-brown, thin, subglabrous. Peduncle 6–8 in. long; bract-leaves small, only the lowest with small spreading tips. Inflorescence a simple moderately dense spike 4–5 in. long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. broad; flowers erecto-patent, about 10 on a side; flower-bracts green, naked, ovate-oblong,  $\frac{3}{4}$  in. long. Calyx as long as the bract; sepals acute. Petal-blade oblong, spreading, white,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Stamens and style not longer than the calyx. Capsule cylindrical, above 2 in. long.

Hab. Cayenne, *Martin!* Poiteau! Sagot 859! Melinon 134! Perottet! Demerara, *Parker!* Trinidad, *Fendler* 828. Differs from typical *Platystachys* by its thin subglabrous leaves, broader spreading petals, and short stamens, of which the filaments are connate towards the base.

149. *T. URBANIANA* Wittm. in Engl. Jahrb. xi. 65. — Leaves densely rosulate, linear-setaceous, above a foot long, under an inch broad at the dilated base, the edges involute down nearly to the base. Peduncle much shorter than the leaves. Spikes 2, dense, distichous, ascending,  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{3}$  in. diam.; branch-bracts small; flower-bracts oblong-lanceolate,  $\frac{1}{2}$  in. long. Sepals as long as the flower-bract. Petals violet. Capsule cylindrical, three times the length of the calyx.

Hab. Costa Rica, near Cartago, alt. 5000 ft., *Lehmann* 1771. Near *T. disticha* H. B. K.

150. *T. PARVIFLORA* Ruiz et Pavon, Fl. Peruv. iii. 41, t. 269. *Platystachys parviflora* Beer. *Pogospermum parviflorum* Brong.— Leaves densely rosulate, ensiform acuminate from an ovate base,  $\frac{1}{2}$  in. broad at the middle, thin in texture, thinly lepidote. Peduncle slender, above a foot long; bract-leaves many, small, distant, ovate, adpressed. Panicle lax, 6–9 in. long; spikes moderately dense, ascending,  $1$ – $1\frac{1}{2}$  in. long,  $\frac{1}{3}$  in. diam., lower forked; flowers spreading; flower-bracts oblong, green, naked,  $\frac{1}{6}$  in. long. Calyx as long as the bract; sepals oblong, obtuse. Petal-blade small, oblong. Capsule cylindrical, 3–4 times the length of the calyx.

Hab. Andes of Peru, Muna, *Pavon!* Chacapoyas, *Mathews!* Habit and calyx of *Catopsis*, but fruit and seeds of *Tillandsia*. I have followed M. André in regarding as a distinct section a group of species of which this is the type.

151. *T. ROPALOCARPA* André, Enum. 6. — Radical leaves lanceolate-setaceous, coriaceous, lepidote, 10–12 in. long. Stem slender, compressed; bract-leaves few, distant, small, ovate. Panicle lax; lower branches compound; spikes sublux, 5–10-flowered; branch-bracts small, ovate; flower-bracts oblong, acute, nearly an inch long. Corolla small, yellow. Capsule cylindrical, four times the length of the calyx.

Hab. Columbia; Andes of Quindio, alt. 4000 ft., *André* 2319. Near *T. parviflora*.

152. *T. ADPRESSA* André, Enum. 6. — Radical leaves lanceolate from a dilated base,  $\frac{1}{2}$  ft. long, coriaceous, densely lepidote. Stem very short, slender, curved; bract-leaves spaced-out, lanceolate-acuminate, lepidote. Panicle very narrow, 6–8 in. long, consisting of about 15 short erect spikes above an inch long; flower-bracts ovate, shorter than the calyx. Sepals oblong,  $\frac{1}{5}$  in. long. Capsule cylindrical, four times the length of the calyx.

Hab. Andes of Ecuador; Volcano of Pululagua, André 3792. Near *T. parviflora*.

153. *T. DECIPiens* André, Enum. 7.—Radical leaves lanceolate-setaceous, a foot long, nearly an inch broad at the middle, finely lepidote. Peduncle  $1\frac{1}{2}$ –2 ft. long; bract-leaves lanceolate-setaceous. Panicle very lax, above a foot long; branch-bracts lanceolate, the lower  $1\frac{1}{2}$  in. long; lower branches compound; spikes dense, with a flexuose rachis; flower-bracts ovate, acute, glabrous, as long as the calyx. Calyx  $\frac{1}{5}$  in. long; sepals acute. Corolla white, very small. Capsule cylindrical, four times the length of the calyx.

Hab. Andes of Ecuador, at Sabanetas, André 4055. Near *T. parviflora*.

154. *T. BREVISPICULA* André, Enum. 7. *T. Beleana* André.—Radical leaves lanceolate from a dilated base, acute, 6 in. long, 2 in. broad at the middle, slightly lepidote. Peduncle straight,  $1\frac{1}{2}$  ft. long, with scattered white lepidote scales; bract-leaves ovate-lanceolate, the lower acuminate. Panicle 4–5 in. long, composed of about 10 very dense shortly-peduncled spikes, the lower forked at the base; branch-bracts small, ovate; flower-bracts ovate, acute, longer than the calyx. Sepals ovate, subacute,  $\frac{1}{5}$  in. long. Corolla small, yellow.

Hab. Andes of Southern Columbia, near Pasto, alt. 8500 ft., André 2496. Near *T. parviflora*.

155. *T. HOMOSTACHYA* André, Enum. 7. — Radical leaves linear-lanceolate, acute, a foot long, above an inch broad at the middle, coriaceous, abundantly lepidote. Stem slender, above a foot long, covered throughout with white scales; bract-leaves small, oblong, acute. Panicle lax, with a compressed flexuose axis, half a foot long, composed of about 10 dense sessile or subsessile spikes  $1\frac{1}{2}$  in. long; branch bracts small, oblong, acute; flower-bracts ovate, acute, lepidote, one-third longer than the calyx, the lower  $\frac{2}{3}$  in. long. Sepals obtuse, very lepidote. Petals small, yellowish.

Hab. Andes of Ecuador; slopes of Mount Corazon, alt. 8000–9000 ft., André 3763.

156. *T. SUBALATA* André, Enum. 7. — Radical leaves lanceolate from a dilated base, acute, 12–16 in. long, under an inch broad at the middle, coriaceous, densely lepidote. Stem slender, compressed, above a foot long; scales white, scattered; bract-leaves oblong, spaced-out. Panicle lax, narrow, under a foot long; axis very scaly; branches spreading,  $1\frac{1}{3}$ –2 in. long; branch-bracts ovate, acute, the lower  $1\frac{1}{2}$  in. long; spikes lax, with a subalate axis, very

flexuose; flower-bracts ovate, subacute, a little exceeding the calyx. Sepals ovate, obtuse,  $\frac{1}{3}$  in. long. Petals small, yellow.

Hab. Central Columbia, on Mount Quindio, alt. 6000 ft., *André* 3763.

157. *T. MICRANTHA* Baker in Journ. Bot. 1887, 303. — Leaves 12–20, densely rosulate, linear-lanceolate from an ovate base  $1\frac{1}{2}$  in. broad, a foot long,  $\frac{1}{2}$  in. broad at the middle, spotted with purple, moderately firm in texture, finely lepidote, not setaceous at the tip. Peduncle slender, much shorter than the leaves; bract-leaves small, ovate, adpressed. Inflorescence a lax panicle, with 6–8 ascending spikes 1–2 in. long; branch-bracts small, lanceolate; flowers erecto-patent, 6–8 on a side; flower-bracts ovate,  $\frac{1}{3}$  in. long. Calyx as long as the bract; sepals obtuse. Capsule cylindrical,  $\frac{1}{2}$  in. long.

Hab. Trinidad, *Fendler* 818! Near *T. parviflora*.

158. *T. DISTICHA* H. B. K. Nov. Gen. i. 292. *T. cinerascens* Willd. *Platystachys cinerascens* Beer. — Leaves rosulate, linear-subulate from an ovate utriculate base  $\frac{3}{4}$ –1 in. diam.,  $\frac{1}{2}$ –1 ft. long, rigidly coriaceous, convolute down to the base, thinly lepidote. Peduncle  $\frac{1}{2}$ –1 ft. long; bract-leaves crowded, with long setaceous tips. Inflorescence a panicle of 6–10 dense simple erecto-patent spikes 2–3 in. long, under  $\frac{1}{2}$  in. broad; branch-bracts small, ovate; flower-bracts ovate, acute,  $\frac{1}{3}$  in. long. Calyx  $\frac{1}{4}$  in. long; sepals lanceolate. Petal-blade oblong, as long as the calyx. Capsule-valves linear, 2 in. long.

Hab. Peruvian Andes, *Humboldt & Bonpland* 3455! Guayaquil, *Edmonstone*! *Cuming* 1188! Atacamas, *Hinds*! Ecuador, *André* 4061.

159. *T. JENMANI* Baker in Journ. Bot. 1887, 345. — Leaves few in a rosette, lanceolate-subulate from an ovate-utriculate base  $1\frac{1}{2}$  in. broad; blade 3 in. long,  $\frac{1}{4}$  in. broad at the base, rigidly coriaceous, thinly lepidote. Peduncle slender, curved, under a foot long; bract-leaves small, lanceolate, adpressed. Panicle very lax, deltoid,  $\frac{1}{2}$  ft. long; branches about 5, the lateral patent, 8–10-flowered; flowers lax, patent; flower-bracts shorter than the calyx. Sepals oblong,  $\frac{1}{3}$  in. long. Petals not seen. Capsule-valves linear, an inch long.

Hab. Demerara; Kaieteur Savanna, *Jenman* 848! Allied to *T. parviflora*.

160. *T. AURANTIACA* Griseb. in Gott. Nacht. 1864, 16. *Tussacia fulgens* Klotzsch; Beer, Brom. 100. — Leaves a dozen or more in a rosette, lanceolate from an ovate base, an inch broad at the middle, thin, subglabrous, much flushed and spotted with claret-purple. Peduncle a foot long; bracts small, ovate, scariose. Panicle drooping, under a foot long; branches simple, deflexed, sessile,  $1\frac{1}{2}$ –2 in. long; branch-bracts small, ovate; flower-bracts ovate,  $\frac{1}{4}$  in. long. Sepals oblong, obtuse,  $\frac{1}{3}$  in. long. Petal-blade small, obovate, yellow.

Hab. Andes of Venezuela, Columbia, and Ecuador. M. *André* distinguishes three varieties, *densiflora*, *miniata*, and *scarlatina*, the two latter with bright red branch-bracts, and more acuminate flower-bracts.

161. *T. SPICULOSA* Griseb. in Gott. Nacht. 1864, 17. — Leaves lanceolate from an ovate base  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. broad,  $\frac{1}{2}$  ft. long, thin, subglabrous. Peduncle as long as the leaves; bract-leaves small, adpressed, not imbricated. Panicle of few crowded erecto-patent spikes  $\frac{1}{2}$ – $1\frac{1}{2}$  in. long,  $\frac{1}{4}$  in. diam.; flower-bracts ovate,  $\frac{1}{4}$  in. long. Calyx as long as the bract; sepals obtuse. Petal blade small, violet. Capsule under an inch long.

Hab. Mountains of Venezuela, alt. 4000–7000 ft., *Fendler* 1511, 1518, 2446.

162. *T. MULTIFLORA* Benth. Bot. Sulphur, 174. — Leaves lanceolate-subulate, above a foot long, an inch broad at the base of the blade, rigidly coriaceous, finely densely lepidote on both surfaces. Peduncle stout, a foot long; bract-leaves crowded, with long free erect setaceous points. Panicle a foot long; lower branches copiously compound; spikes at most an inch long,  $\frac{1}{2}$ – $\frac{5}{8}$  in. broad; flowers close, rather ascending; flower-bracts ovate, naked,  $\frac{1}{8}$ – $\frac{1}{6}$  in. long. Calyx glabrous,  $\frac{1}{4}$  in. long; sepals oblong, minutely cuspidate. Capsule cylindrical,  $\frac{1}{2}$  in. long.

Hab. Ecuador, near Guayaquil, *Pavon! Sinclair! Edmonstone! Barclay* 524! *Cuming* 1249!

163. *T. RIOCREUXII* André, Enum. 7. — Radical leaves lanceolate from a dilated base, nearly a foot long, finely lepidote, the edges enrolled, except at the point. Peduncle slightly curved,  $1\frac{1}{2}$  ft. long; bract-leaves ovate-oblong, as long as the internodes, adpressed to the stem. Panicle lax, pyramidal, nearly  $1\frac{1}{2}$  ft. long, 5 in. broad at the base; spikes simple, 13–16-flowered, sessile, spreading; rachis flexuose, very compressed; branch-bracts ovate, subglabrous; flower-bracts ovate, acute, subglabrous,  $\frac{1}{2}$  in. long. Sepals oblong, obtuse, just exceeding the bracts. Petals yellow,  $\frac{3}{4}$  in. long.

Hab. Andes of Ecuador; foot of Mount Chimborazo, alt. 7500 ft., *André* 4408.

164. *T. BRITTONIANA* Baker. — Leaves few in a rosette, thin, lorate, subglabrous, above a foot long,  $1\frac{1}{4}$  in. broad at the middle. Peduncle above a foot long; bract-leaves small, adpressed. Panicle a foot long; spikes 20–30,  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{4}$  in. broad; lower branch-bracts an inch long; flower-bracts oblong,  $\frac{1}{8}$  in. long. Calyx as long as the bract; sepals obtuse. Petal-blade small.

Hab. Bolivia; province of Yungas, alt. 6000 ft., *Rusby* 2852! This and two following have the flowers of *Pseudo-Catopsis*, and the lorate leaves of *Allardtia*.

165. *T. TENUISPICA* André, Enum. 7. — Radical leaves lorate, cuspidate, a foot long, above 2 in. broad, soft, obscurely lepidote. Peduncle stout, as long as the leaves; bract-leaves spaced-out, ovate, adpressed. Panicle distichous, 2 ft. long, made up of about 20 flexuose very compound branches, the lower having 9–10 peduncled very lax 10–15-flowered branchlets; lower branch-bracts lanceolate,  $1\frac{1}{2}$  in. long; flower-bracts ovate,  $\frac{1}{6}$  in. long. Calyx rather exceeding the bracts. Petals pale violet. Capsule nearly an inch long.

Hab. Columbia; Cauca Valley, alt. 3000–5000 ft., *André* 2414.

166. *T. INCONSPICUA* André, Enum. 8. — Radical leaves flexible, glabrous, lorate-cuspidate, 3 ft. long, 3 in. broad. Peduncle robust, 4–6 ft. long, clothed with whitish scales; bract-leaves green or red. Panicle lax, distichous, 2 ft. long, consisting of about 20 simple spikes, the lower 4 in. long; branch-bracts ovate, the lower above an inch long; spikes 15-flowered, moderately lax, with a very scaly flexuose rachis; flower-bracts ovate, acute, above  $\frac{1}{2}$  in. long. Sepals obtuse, lepidote, shorter than the bracts. Corolla not seen.

Hab. Andes of Ecuador, at Niebli, *André* 3795.

#### Subgenus 6. ANOPLOPHYTUM (Beer).

167. *T. RUPICOLA* Baker in Journ. Bot. 1888, 13. — Leaves 30–40, crowded on a stem an inch long, subulate from an ovate base, 2 in. long,  $\frac{1}{12}$  in. broad above the dilated base, densely clothed all over with large spreading glittering linear scales. Peduncle about as long as the leaves; bract-leaves crowded, with long subulate points. Flowers 8–12 in a dense subglobose multifarious head  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; flower-bracts ovate-acuminate, rigid, stramineous,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Calyx glabrous,  $\frac{1}{4}$  in. long; sepals acute. Petal-blade oblong, lilac.

Hab. Andes of Ecuador, alt. 8000 ft., *Col. Hall!* Allied to *T. plumosa*.

168. *T. PLUMOSA* Baker in Journ. Bot. 1888, 13. — Leaves densely rosulate, subulate from an ovate base  $\frac{1}{3}$  in. diam., 3–4 in. long,  $\frac{1}{16}$  in. diam. low down, densely beset with spreading hair-pointed scales. Peduncle shorter than the leaves; bract-leaves crowded, long-pointed. Inflorescence a dense capitulum  $\frac{1}{2}$  in. long and broad; flower-bracts ovate-cuspidate,  $\frac{1}{4}$  in. long. Calyx as long as the bract, flattened on the side nearest the axis; sepals acute. Petals not seen.

Hab. Mexico; province of Puebla, on trees, *Andrieux* 57! Connects the sections *Anoplophytum* and *Pityrophyllum*.

169. *T. FUNCKIANA* Baker. — Leafy stem produced to a length of 5–6 in., densely beset with rigid linear-subulate ascending leaves  $1\frac{1}{2}$  in. long,  $\frac{1}{12}$  in. broad above the dilated base, densely laxly lepidote all over. Peduncle very short. Spike laxly 2–3-flowered; flower-bracts oblong-lanceolate, bright red,  $\frac{1}{3}$  in. long. Calyx as long as the flower-bract; sepals red, acute. Petals white, half as long again as the calyx.

Hab. Mountains of Venezuela, *Funck & Schlim* 1258! Nearly allied to *T. pulchra*. *Anoplophytum brachypodium* E. Morren (M.D.) is a nearly allied form from Brazil.

170. *T. PULCHRA* Hook. Exot. Flora, t. 154; Wawra, Itin. Prin. Sax. Cob. 173, t. 34. *T. pulchella* Hook. in Bot. Mag. t. 5229. *T. pityphylla* Mart. *Anoplophytum pulchellum* Beer. — Leafy stem sometimes short, sometimes produced to the length of half a foot. Leaves densely crowded, ascending, linear-subulate, 3–4 in. long,  $\frac{1}{8}$  in. broad low down, channelled down the lower part of the face, narrowed into a long slender point, finely lepidote all over. Peduncle

slender, 2-3 in. long; bract-leaves with erect subulate points. Flowers 6-12 in a dense simple multifarious spike; flower-bracts scarious, oblong, acute, bright red,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Calyx  $\frac{1}{2}$  in. long; sepals oblong, acute. Petals white or violet, half as long again as the calyx. Capsule-valves lanceolate, an inch long.

Hab. Common in South Brazil. First gathered by Bowie & Cunningham in 1817. Cuba, *Wright* 685! Martinique, *Belanger*! Trinidad, *Schacht*! Surinam, *Regel* 801. Introduced into cultivation by Mr. Shepherd, at Liverpool, in 1824. *Anoplophytum amœnum* E. Morren in Belg. Hort. 1883, 265, t. 17 (M.D.), is a handsome variety with violet flowers, introduced by Glaziou. *Regnell* 1250! has a long leafy stem with falcate leaves an inch long.

171. T. KRAMERI Baker. *Anoplophytum Krameri* E. Morren (M.D.).—Acaulescent. Leaves linear-subulate, 4-6 in. long,  $\frac{1}{8}$  in. broad above the dilated base, moderately firm in texture, densely finely lepidote all over, narrowed into a long slender point. Peduncle much shorter than the leaves; bract-leaves with long linear-subulate points. Inflorescence a dense simple multifarious spike  $1\frac{1}{2}$ -2 in. long; lower bracts oblong, acute, bright red, the lower cuspidate. Calyx  $\frac{1}{2}$  in. long; sepals acute. Petals violet, half as long again as the calyx.

Hab. Mountains of South Brazil. First gathered by Bowie & Cunningham in 1817; *Sello* 1549! *Blanchet* 1764! *Gardner* 696! *Glaziou* 8498!

172. T. GLOBOSA Wawra in Itin. Prin. Sax. Cob. 170, t. 32, fig. A. *Anoplophytum undosum* E. Morren (M.D.).—Acaulescent. Leaves 30-40 in a dense rosette, linear-subulate, 6-9 in. long,  $\frac{1}{8}$  in. broad above the dilated base, moderately firm in texture, narrowed into a long slender point, finely lepidote all over. Peduncle 3-6 in. long; bract-leaves with long erect rigid points. Inflorescence a moderately dense panicle 2-3 in. long; lower branch-bracts lanceolate with a long slender point; flower-bracts lanceolate, bright red,  $\frac{1}{2}$  in. long. Calyx as long as the bract; sepals acute. Petals violet, half as long again as the calyx. Capsule-valves lanceolate, an inch long.

Hab. Mountains of South Brazil, *Burchell* 1893! 3493! *Gaudichaud* 360! *St. Hilaire* 284! *Wawra & Maly*. Var. *crinifolia* Wawra t. 32, fig. B., has much more slender leaves than the type 1-24th in. diam. low down. Introduced into cultivation by Binot in 1879.

173. T. FRAGRANS André Enum. 7.—Radical leaves subulate from a dilated base, 6-8 in. long, densely argenteo-lepidote. Stem curved; bract-leaves spaced-out, their tips setaceous. Panicle dense, composed of 7-8 5-6-flowered spikes; branch-bracts ovate, finely lepidote, the lower long-pointed; flower-bracts lanceolate,  $\frac{1}{2}$  in. long, finely lepidote. Calyx as long as the bract; sepals lanceolate, glabrous. Corolla white, fragrant,  $\frac{3}{4}$  in. long; petal-limb broad. Stamens shorter than the petals.

Hab. Andes of Central Ecuador, alt. 8000 ft., *André* 4397.

174. T. MERIDIONALIS Baker in Journ. Bot. 1888, 15. *Anoplophytum refulgens* E. Morren (M.D.).—Acaulescent. Leaves about 30 in a dense rosette, lanceolate-acuminate, 6-7 in. long,  $\frac{1}{2}$  in. broad above the dilated base, firm in texture, deeply channelled down the lower part of the face, densely finely lepidote all over.

Peduncle as long as the leaves; bract-leaves with long erect linear points. Inflorescence a dense simple spike 2-3 in. long; flower-bracts ovate, acute, greenish-white, lepidote, the lower an inch long. Calyx  $\frac{5}{8}$ - $\frac{3}{4}$  in. long; sepals acute. Petals white, half as long again as the calyx.

Hab. Uruguay, *Tweedie!* Paraguay, *Balansa 708!* There is an old specimen in Vaillant's herbarium at Paris, labelled "*T. monostachya.*" Introduced into cultivation by La Devansaye in 1883.

175. *T. LUTEA* Baker. *Anoplophytum luteum* E. Morren (M.D.).—Acaulescent. Leaves 15-20 in a dense rosette, lanceolate-acuminate, 4-5 in. long,  $\frac{1}{3}$  in. broad above the base, firm in texture, finely lepidote, deeply channelled down the lower part of the face, the lower very spreading. Peduncle longer than the leaves; bract-leaves small, linear. Inflorescence a few-flowered simple dense spike; flower-bracts ovate, acute,  $\frac{3}{4}$  in. long. Calyx  $\frac{1}{2}$  in. long; sepals lanceolate. Petals fulvous-yellow, half as long again as the calyx.

Hab. Uruguay. Described from Prof. Morren's drawing, made from a plant flowered by M. Jacob-Makoy at Liège, in April, 1880. Introduced by Ruchinger, of Venice, in 1876 (*T. lutea* and *T. canescens* Hort.).

176. *T. DIANTHOIDEA* Rossi. Cat. Madoet. 1825, t. 1; Regel Gartenfl. t. 85. *T. stricta* Lindl. in Bot. Reg. t. 1338. *T. rosea* Lindl. in Bot. Reg. t. 1357. *T. recurvifolia* Hook. in Bot. Mag. t. 5216. *Anoplophytum aeranthos*, *dianthoides*, and *roseum* Beer. *Pourretia aeranthos* Lois. *Amalia aerisicola* Bahi.—Leafy stem short or produced to a length of a few inches. Leaves crowded, falcate, linear-acuminate, 3-4 in. long,  $\frac{1}{4}$ - $\frac{1}{3}$  in. broad at the dilated base, very rigid in texture, densely lepidote all over. Peduncle 3-4 in. long; bract-leaves with long erect linear rigid points. Inflorescence a moderately dense simple multifarious spike 1-1 $\frac{1}{2}$  in. long; flower-bracts oblong, acute, pale red, scariose,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Calyx  $\frac{1}{2}$  in. long. Petals lilac or white, half as long again as the calyx. Capsule-valves lanceolate, an inch long.

Hab. South Brazil, Uruguay and Argentine region. Scarcely distinct specifically from *T. stricta*.

177. *T. STRICTA* Soland.; Sims in Bot. Mag. t. 1529. *T. bicolor* Brong. Voy. Coquille t. 36. *T. surinamensis* Miquel. *Anoplophytum strictum* Beer; E. Morren in Belg. Hort. 1878, 188, t. 13 (M.D.). *A. bicolor* Beer.—Leafy stem short or produced to a length of several inches. Leaves crowded, falcate, linear-acuminate, 4-6 in. long,  $\frac{1}{4}$  in. broad above the dilated base, rigid in texture, deeply channelled down the lower part of the face, thinly adpresso-lepidote all over. Peduncle 3-4 in. long; bract-leaves crowded, with long rigid erect linear-subulate points. Inflorescence a dense simple multifarious spike 1-1 $\frac{1}{2}$  in. long; flower-bracts oblong, acute, scariose, pale red,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Calyx  $\frac{1}{2}$  in. long; sepals oblong, acute. Petals lilac or white, half as long again as the calyx. Capsule-valves lanceolate, an inch long.

Hab. Common in South Brazil, Uruguay and Argentina. British Guiana, *Jenman 1845!* *Im Thurn!* Surinam, *Hostmann 592!* Andes of Bolivia, up to 8000—9000 ft., *Mandon 1184!* North Patagonia, *Middleton!* *T. subulata*

Vellozo Fl. Flum. iii. t. 197 (*Diaphoranthema subulata* Beer), is a form with a long leafy stem and shorter falcate leaves.

178. *T. HILAIREANA* Baker.—Acaulescent. Leaves lanceolate-acuminate, 3 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad at the base, rigid in texture, nearly flat on the face in the lower half, finely adpresso-lepidote all over. Peduncle about as long as the leaves. Inflorescence a lax simple multifarious spike 1–1 $\frac{1}{2}$  in. long; flower-bracts scarious, pale red, ovate or oblong,  $\frac{3}{4}$ –1 in. long. Sepals oblong, acute,  $\frac{1}{2}$  in. long. Petals red, shortly protruded.

Hab. Central Brazil; Minas Geraes, *St. Hilaire* 508! (Herb. Mus. Par.) Closely allied to *T. stricta*.

179. *T. BENTHAMIANA* Klotzsch; Baker in Journ. Bot. 1888, 15. *T. vestita* Benth. in Plant. Hartweg. 25, non C. & S. *T. Hartwegiana* E. Morren (M.D.). *Anoplophytum Benthamianum* and *A. vestitum* Beer.—Acaulescent. Leaves 30–40 in a dense rosette, ensiform-acuminate, 6–8 in. long,  $\frac{1}{4}$  in. broad above the dilated base, moderately firm and thick, densely laxly lepidote all over. Peduncle 3–6 in. long; bract-leaves crowded, long-pointed. Inflorescence a dense multifarious oblong spike 3 in. long, 1 $\frac{1}{2}$  in. diam.; flower-bracts oblong, scarious, pale pink, 2 in. long, the lower cuspidate. Calyx much shorter than the bract, above an inch long. Petals greenish-white or lilac, an inch longer than the calyx, convolute in a tube nearly to the tip. Stamens a little and style much exerted. Capsule-valves lanceolate, 1–1 $\frac{1}{2}$  in. long.

Hab. Mountains of Central Mexico, *Hartweg* 223! *Bourgeau* 894! *Coulter* 1579! *Uhde* 187! *T. melanopus* E. Morren, from Chiriqui, gathered by Pfau in 1883, is a near ally with obscurely spotted leaves and green inner bracts. Connects the sections *Anoplophytum* and *Pityrophyllum*.

180. *T. DOMBEYI* Baker.—Acaulescent. Leaves lanceolate-acuminate, 6–8 in. long,  $\frac{3}{4}$  in. broad above the dilated base, densely coated all over with loose glittering whitish lepidote scales. Peduncle  $\frac{1}{2}$  ft. long; bract-leaves with long free points. Inflorescence a lax panicle 3–4 in. long; spikes lax; lower 1–1 $\frac{1}{2}$  in. long, 3–4-flowered; flower-bracts oblong-lanceolate,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Calyx  $\frac{1}{2}$  in. long. Capsule-valves an inch long.

Hab. Andes of Peru, *Dombey*! (Herb. Mus. Paris). Allied to *T. Gardneri*.

181. *T. CALDASIANA* Baker.—Acaulescent. Leaves 30–40, densely rosulate, lanceolate-acuminate, 6–8 in. long,  $\frac{1}{2}$  in. broad above the dilated base, finely lepidote over both surfaces. Peduncle as long as the leaves; bract-leaves with long lanceolate points. Inflorescence a dense panicle 2–3 in. long; branch-bracts ovate-acuminate, 1–1 $\frac{1}{2}$  in. long; lower spikes an inch long; flower-bracts oblong-lanceolate,  $\frac{1}{2}$  in. long. Calyx  $\frac{1}{2}$  in. long. Petal-blade red, lingulate,  $\frac{1}{4}$  in. long.

Hab. Central Brazil; Caldas, *Regnell* 282! Near *Gardneri*, but much more finely lepidote.

182. *T. GARDNERI* Lindl. in Bot. Reg. 1842 sub t. 63. *T. incana* Wawra. *Anoplophytum incanum* E. Morren in Belg. Hort. 1881, 209, t. 11 (M.D.). *A. Rollisoni* Hort.—Acaulescent. Leaves 30–40 in. a dense rosette, lanceolate-acuminate, 5–6 in. long,  $\frac{1}{2}$  in.

broad above the dilated base, tapering gradually to a long point, not at all rigid in texture, densely clothed on both surfaces with glittering whitish-lepidote scales. Peduncle 2-3 in. long; bract-leaves crowded, with long linear points. Inflorescence a dense globose panicle  $1\frac{1}{2}$ -2 in. long, composed of 3-4 crowded dense spikes; flower-bracts ovate,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, densely lepidote on the back. Calyx  $\frac{1}{3}$ - $\frac{1}{2}$  in. long; sepals oblong-lanceolate. Petals bright red, half as long again as the calyx. Capsule-valves lanceolate,  $1\frac{1}{2}$  in. long.

Hab. South and Central Brazil, *Burchell* 994! *Gardner* 134! *Glaziou* 11676! 16453! *Blanchet* 535! 2981! Trinidad, *Fendler* 822! Introduced into cultivation by Rollison about 1879.

183. T. GEMINIFLORA Brong. Voy. Coquille 186. *T. rubida* Lindl. in Bot. Reg. xxviii. t. 63. *Anoplophytum rubidum* Beer. *A. geminiflorum* E. Morren in Belg. Hort. 1880, 191, t. 11. *A. paniculatum* E. Morren (M.D.).—Acaulescent. Leaves 30-40 in a dense rosette, lanceolate-acuminate, 4-6 in. long,  $\frac{1}{2}$  in. broad above the dilated base, moderately firm in texture, long-pointed, finely lepidote all over. Peduncle 2-3 in. long; bract-leaves crowded, long-pointed. Flowers 20-40 in a dense ovoid panicle 2-3 in. long; lower branch-bracts green, lanceolate-acuminate, exceeding the spikes; flower-bracts ovate, reddish. Calyx  $\frac{1}{2}$  in. long, reddish; sepals acute. Corolla red-purple, half as long again as the calyx. Capsule-valves lanceolate, an inch long.

Hab. Forests of South Brazil, *Burchell* 2353! 3146! *Sello* 1003! *D'Urville*! *Glaziou* 4263! Introduced into cultivation by Loddiges in 1842. Drawn by Platzmann from Paranagua, under the name of *T. coccinea*.

184. T. BRACHYPHYLLA Baker in Journ. Bot. 1888, 16. *T. Sprengeliana* Klotzsch. *Anoplophytum Sprengelianum* Beer. *A. Binoti* E. Morren (M.D.).—Acaulescent. Leaves densely rosulate, lanceolate, acute, not acuminate,  $1\frac{1}{2}$ -2 in. long,  $\frac{1}{4}$ - $\frac{1}{3}$  in. broad above the dilated base, tapering gradually from the base to the point, moderately firm in texture, densely lepidote all over. Peduncle 2-3 in. long; bract-leaves small, lanceolate. Inflorescence a lax simple spike an inch long; flower-bracts ovate or oblong, acute, red, scarious,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Sepals oblong, acute,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long. Petals half as long again as the calyx.

Hab. Rio Janeiro, *Sello*, *St. Hilaire* 106! *Glaziou* 8018! Introduced alive by Binot in 1879.

#### Subgenus 7. PITYROPHYLLUM (Beer).

185. T. ANDREANA E. Morren; André Enum. 7. — Leaves densely rosulate, subulate, 2-2 $\frac{1}{2}$  in. long,  $\frac{1}{12}$  in. diam., densely argenteo-lepidote, the inner tinged with red. Flower solitary, sessile in the centre of the rosette of leaves. Sepals ovate, obtuse, above  $\frac{1}{2}$  in. long. Capsule cylindrical, mucronate, above 2 in. long.

Hab. Columbia; valley of the Río de la Honda, alt. 4000-5000 ft., *André* 1762.

186. T. MAGNUSIANA Wittm. in Engl. Jahrb. xi. 66.—Leaves densely rosulate, subulate from a linear base  $\frac{1}{2}$  in. broad, 3-4 in. long, densely clothed with spreading lanceolate lepidote scales.

Flowers forming a small ovoid capitulum in the centre of the rosette; flower-bracts oblong,  $1-1\frac{1}{2}$  in. long. Sepals ovate, acute,  $\frac{2}{3}$  in. long. Petals violet, three times as long as the sepals.

Hab. Mountains of Guatemala, alt. 4000—5000 ft., *Lehmann* 1467!

187. *T. IONANTHA* Planch. in *Flore des Serres*, t. 1006; Hook. fil. in *Bot. Mag.* t. 5892 (M.D.). *T. erubescens* Wendl. in *Allg. Gartenzeit.* 1854, 153. *T. Scopus* Hook. fil. *Pityrophyllum erubescens* and *gracile* Beer.—Tufts crowded, 3–4 in. long. Leaves 30–40 to a rosette, linear, 2–3 in. long,  $\frac{1}{4}-\frac{1}{3}$  in. broad at the dilated base, all but the outer ascending, channelled down the lower part of the face, finely lepidote all over. Flowers few, forming a subsessile capitulum in the centre of the rosette of leaves, surrounded by the reduced inner leaves, with bright red tips; flower-bracts ovate-lanceolate. Calyx green,  $\frac{1}{2}$  in. long; sepals lanceolate. Petals bright violet, thrice as long as the calyx, convolute in a long tube. Stamens and style exerted.

Hab. Central Mexico. Yucatan, *Schott*! First gathered by Galeotti in 1840, and Karwinski in 1841. Introduced in the Herrenhausen Garden before 1857.

188. *T. BRACHYCAULOS* Schlecht. in *Linn.* xviii. 422; E. Morren in *Belg. Hort.* 1878, 185, t. 11 (M.D.).—Leaves about 30 in a dense rosette, lanceolate-acuminate, 6–9 in. long,  $\frac{1}{2}$  in. broad above the dilated base, firm in texture, densely finely lepidote, more or less tinged with red-brown. Flowers 10–12 in a capitulum in the centre of the rosette of leaves. Calyx  $\frac{1}{2}$  in. long; sepals subacute. Petals bright lilac,  $1\frac{1}{2}$  in. long, convolute nearly to the tip. Stamens and style exerted.

Hab. Central Mexico. Discovered by Schiede and Karwinski. Introduced into cultivation by Roezl in 1876, and flowered in 1878 in the collection of Prince Fürstenberg at Donausingen.

### Subgenus 8. ALLARDTIA (Dietr.).

189. *T. BRACHYCEPHALA* Baker in *Journ. Bot.* 188, 40. — Leaves few in a rosette, linear, acute, glabrous, thin in texture, above a foot long,  $\frac{1}{3}$  in. broad at the middle,  $\frac{3}{4}-1$  in. at the dilated base. Peduncle slender, as long as the leaves; lower bract-leaves with long free tips. Flowers in a dense globose spike; flower-bracts oblong, obtuse,  $\frac{1}{2}$  in. long. Calyx as long as the bract. Petals not seen. Capsule-valves linear, above an inch long.

Hab. South Peru; St. Gavan, *Lechler* 2409!

190. *T. GYMNOPHYLLA* Baker in *Journ. Bot.* 1889, 41. *T. heliconioides* Griseb. non H. B. K. — Leaves few in a rosette, lanceolate from a slightly dilated base, a foot long,  $\frac{1}{2}-\frac{3}{4}$  in. broad at the middle, thin, subglabrous, acute. Peduncle arcuate, shorter than the leaves. Spike simple, moderately dense, 3–4 in. long; flowers adpressed to the axis; flower-bracts oblong-lanceolate, glabrous,  $\frac{1}{2}$  in. long. Calyx nearly as long as the bract. Petals not seen. Capsule-valves lanceolate, an inch long.

Hab. Mountains of Venezuela, *Fendler* 2615!

191. *T. DREPANOCARPA* Baker in Journ. Bot. 1888, 41. — Leaves about 20 in a rosette, lanceolate from an ovate base,  $1\frac{1}{2}$  in. broad, 8–9 in. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad at the middle, thin, bright green, subglabrous. Peduncle as long as the leaves; lower bract-leaves with lanceolate free points. Spike lax, simple, erect, 5–6 in. long; flowers ascending; flower-bracts lanceolate, scariose, lower 2 in. long. Calyx glabrous,  $\frac{1}{2}$ – $\frac{5}{8}$  in. long. Petals not seen. Capsule-valves lanceolate, 1– $1\frac{1}{4}$  in. long.

Hab. South Brazil; province of St. Paulo, *Burchell* 3596!

192. *T. COMPLANATA* Benth. Bot. Sulphur 173. *T. axillaris* Griseb.—Leaves about 20 in a dense rosette, lanceolate from an ovate base 2 in. broad, a foot long, an inch broad at the middle, thin, flexible, subglabrous. Peduncles many to a rosette, slender, shorter than the leaves; bract-leaves small, scariose, adpressed. Inflorescence a dense simple distichous spike 2–3 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. diam.; flower-bracts oblong-lanceolate, much compressed,  $\frac{3}{4}$  in. long. Calyx  $\frac{1}{2}$  in. long; sepals acute. Petal-blade narrow, reddish-lilac,  $\frac{1}{2}$  in. long. Capsule-valves lanceolate, above an inch long.

Hab. Jamaica, *Purdie*! Venezuela, *Fendler* 1512! 1513! Columbia *André* 2248. Ecuador, *Barclay* 525! *Cuming* 1190! *Lehmann* 732! Andes of Bolivia, alt., 10,000 ft. *Rusby* 2855!

193. *T. LANCIFOLIA* Baker.—Leaves densely rosulate, lanceolate, 6–9 in. long, 2 in. broad low down, tapering gradually to an acute point, thin flexible, subglabrous. Peduncle twice as long as the leaves; lower bract-leaves with small spreading foliaceous tips. Spike sublax, simple, 3–4 in. long; flower-bracts oblong,  $\frac{1}{3}$  in. long. Calyx  $\frac{3}{4}$  in. long; sepals obtuse. Petal-blade narrow, oblong  $\frac{1}{2}$  in. long.

Hab. Bahia, *Blanchet* 3458 (Herb. Mus. Brit.).

194. *T. VIRGINALIS* E. Morren in Belg. Hort. 1880, 238 (M.D.). *T. heterophylla* E. Morren.—Leaves about 20 in a dense rosette, lanceolate from an ovate base, 2 in. broad,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, thin, flexible, subglabrous, pale green above, glaucous beneath. Primordial leaves linear. Peduncle 2 ft. long; bract-leaves small, adpressed, imbricated. Inflorescence a dense simple spike 8–9 in. long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. broad; flower-bracts green, ovate, acute, 2 in. long, an inch broad. Calyx shorter than the bract. Petal-blade white, lingulate, an inch long. Stamens shorter than the petals.

Hab. Mexico; province of Cordova. Introduced into cultivation about 1870, by M. Omer de Malzine. Habit of a *Vriesea*, but petals not scaled at the base.

195. *T. BIFLORA* Ruiz et Pav. Fl. Peruv. t. 268 b. *Diaphoranthema biflora* Beer. — Leaves 20–30 in a dense rosette, lanceolate from an ovate base an inch broad,  $\frac{1}{2}$  ft. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the middle, narrowed gradually to the point, thin, flexible, subglabrous. Peduncle as long as the leaves; bract-leaves large, lanceolate. Panicle moderately dense, non-distichous, 3–4 in. long; branch-bracts ovate-acuminate, thin, lower  $1\frac{1}{2}$  in. long, as long as the short

dense spikes; flower-bracts ovate,  $\frac{1}{3}$  in. long. Calyx as long as the bract; sepals obtuse. Petal-blade small. Capsule more than twice as long as the calyx.

Hab. Andes of Peru, *Ruiz & Pavon, Lechler* 2312! Bolivia, alt. 8000—9000 ft., *Mandon* 1174! Columbia, *André* 1210, *Lehmann* 603.

196. *T. GRISEBACHIANA* Baker in Journ. Bot. 1888, 143. *T. tetrantha* Griseb. non R. & P. *Anoplophytum violaceum* Beer.—Leaves about a dozen in a dense rosette, lorate from an ovate base,  $1\frac{1}{2}$  in. broad, 6–8 in. long, an inch broad at the middle, narrowed suddenly to the point, thin, flexible, subglabrous. Peduncle rather shorter than the leaves; bract-leaves ovate, adpressed, imbricated. Inflorescence a narrow moderately dense multifarious panicle 4–5 in. long; branch-bracts ovate-cuspidate, 1– $1\frac{1}{2}$  in. long; spikes dense, erecto-patent, distichous, lower an inch long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad; flower-bracts thin, ovate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Calyx as long as the bract; sepals oblong, obtuse. Petal-blade small, violet. Stamens shorter than the petals.

Hab. Mountains of Venezuela, *Moritz* 771! *Fendler* 1509!

197. *T. HUMBOLDTII* Baker.—Leaves thin, lorate, subglabrous, an inch broad, narrowed suddenly to the point. Inflorescence a dense narrow multifarious panicle 6–8 in. long; 1– $1\frac{1}{4}$  in. broad; branch-bracts ovate, acute, 1–2 in. long, hiding dense sessile spikes  $\frac{3}{4}$ –1 in. long; flower-bracts ovate, acute, glossy,  $\frac{1}{2}$ – $\frac{5}{8}$  in. long. Calyx as long as the bract. Petal-blade small.

Hab. Probably Mexico, *Humboldt* 2164 (Herb. Berol.). Near *T. xiphophylla* Baker.

198. *T. RHODOCHLAMYS* Baker (M.D.).—Leaves lanceolate, densely rosulate, 6–8 in. long, under an inch broad at the middle, thin, flexible, subglabrous, pale green, copiously spotted, especially in the lower half, with blotches of claret-brown. Peduncle as long as the leaves; upper bracts small, crowded, ovate, erect, spotted like the leaves. Inflorescence a panicle 2–3 in. long; branch-bracts lanceolate, bright red, the lowest  $1\frac{1}{2}$ –2 in. long; spikes dense, simple, sessile, the lowest  $1\frac{1}{2}$  in. long; flower-bracts oblong-lanceolate,  $\frac{5}{8}$ – $\frac{3}{4}$  in. long. Calyx shorter than the bract.

Hab. Mexico, *Pfau* 255. Described from Prof. Morren's drawing, made in 1883. Near *T. xiphophylla*.

199. *T. ASCHERSONIANA* Wittm. in Engl. Jahrb. xi. 68.—Leaves about 15 in a rosette, lorate from an ovate base, 6–9 in. long, nearly an inch broad at the middle, thin, pale green, deltoid-cuspidate at the tip. Peduncle as long as the leaves. Panicle nearly a foot long, consisting of 10–12 dense simple subsessile spikes 1–2 in. long, under  $\frac{1}{2}$  in. broad; branch-bracts oblong-lanceolate, lower longer than the spikes; flower-bracts oblong-lanceolate, dark red, nearly an inch long. Calyx much shorter than the bracts. Petals violet.

Hab. Costa Rica, alt. 2500 ft., *Lehmann* 1810. Near *T. xiphophylla*.

200. *T. RECTIFLORA* André Enum. 7.—Radical leaves variable, lorate-lanceolate, flat, glabrous, a foot long,  $1\frac{1}{2}$ –3 in. broad. Ped-

uncle robust. 5-6 ft. long; bract-leaves ovate-oblong, shortly pointed, bright red, like the stem. Panicle pyramidal, 12-16 in. long, with about 15 branches, the lower 4 in. long, bearing 3-6 moderately dense finally secund spikes; branch-bracts lanceolate-acuminate, more or less lepidote, the lower  $1\frac{1}{2}$ -2 in. long. Flower-bracts ovate-acuminate,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long. Sepals acute,  $\frac{1}{3}$  in. long. Corolla very small. Capsule above an inch long.

Hab. Andes of Ecuador, alt. 6000-8500 ft., *André* 3201.

201. *T. PECTINATA* André Enum. 7. — Radical leaves lorate, acute, flexible, subglabrous, a foot long,  $1\frac{1}{2}$  in. broad at the middle. Peduncle  $1\frac{1}{2}$  ft. long; bract-leaves lanceolate, acuminate, erect, yellow, like the stem, calyx and corolla. Panicle narrow,  $1\frac{1}{2}$  ft. long, consisting of 15-20 erecto-patent branches, the lower 3 in. long, bearing 3-4 spikes with a finely scaly rachis; branch-bracts lanceolate, the lower 3-4 in. long; flower-bracts ovate, acute, lepidote,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long. Sepals obtuse, as long as the bract. Petal-limb small.

Hab. Andes of Southern Columbia and Ecuador, alt. 9000 ft., *André* 3032.

202. *T. XIPHOPHYLLA* Baker in Journ. Bot. 1888, 143 (M.D.).—Leaves about 20, densely rosulate, lanceolate from an ovate base, a foot long, under an inch broad at the middle, bright green, thin, flexible, subglabrous. Peduncle shorter than the leaves, quite hidden by the large lanceolate bract-leaves. Panicle lax, non-distichous, 4-6 in. long; branch-bracts ovate, bright red, the lower 2-3 in. long; spikes short, dense, distichous, erecto-patent; flower-bracts oblong-lanceolate,  $\frac{3}{4}$ -1 in. long. Calyx  $\frac{1}{2}$  in. long; sepals oblong, obtuse. Petals dark lilac, convolute in the cylindrical tube. An inch longer than the calyx. Capsule an inch long.

Hab. Mexico; valley of Cordova, *Bourgeau* 1906! Drawn by Professor Morren from a plant flowered in 1881. Allied to *T. Lieboldiana*, but quite different in leaf.

203. *T. PHYLLOSTACHYA* Baker in Journ. Bot. 1888, 143.—Leaves about 20, densely rosulate, lanceolate-acuminate from an ovate base above an inch broad, a foot long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad at the middle, moderately firm in texture, subglabrous. Peduncle rather shorter than the leaves, quite hidden by the large lanceolate bract-leaves. Panicle multifarious, 3-4 in. long; branch-bracts ovate-lanceolate, recurved, the lower 3 in. long; spikes dense, few-flowered; flower-bracts ovate, acute,  $\frac{1}{3}$  in. long. Calyx  $\frac{1}{2}$  in. long; sepals oblong. Petal-blade violet, as long as the calyx.

Hab. Central Mexico, *Hahn*! Gathered during the French Expedition of 1865-6.

204. *T. VIRIDIS* Baker. *Vriesea viridis* E. Morren (M.D.).—Leaves few, rosulate, lorate, thin, flexible, pale green, 3-4 in. long,  $\frac{1}{2}$  in. broad at the middle. Peduncle slender, shorter than the leaves. Inflorescence a lax panicle 3-4 in. long; spikes dense, simple, sessile, lower patent, 1- $1\frac{1}{2}$  in. long,  $\frac{1}{4}$  in. broad; flower-bracts ovate, obtuse,  $\frac{1}{3}$  in. long. Calyx as long as the bract. Capsule cylindrical,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long.

**Hab.** South Brazil; island of Paranagua, *Platzmann*. Described from Prof. Morren's drawing, copied from one of Platzmann's. Near *T. triticea* and *T. Parkeri*.

205. *T. TRITICEA* Burchell; Baker in Journ. Bot. 1888, 42. — Leaves lorate from a large ovate base, 3 in. broad, a foot long,  $1\frac{1}{2}$  in. broad at the middle, thin, flexible, subglabrous, deltoid-cuspidate at the tip, copiously blotched with claret-purple. Peduncle slender, as long as the leaves; bract-leaves small, adpressed. Panicle a foot long; spikes 10–12, arcuate, ascending, subax, all simple, 2–3 in. long; lower branch-bracts lanceolate,  $1-1\frac{1}{2}$  in. long; flower-bracts oblong, obtuse,  $\frac{1}{4}$  in. long. Calyx as long as the bract; sepals obtuse. Petals not seen. Capsule-valves lanceolate,  $\frac{3}{4}$  in. long.

**Hab.** Brazil; province of St. Paulo, *Burchell* 3217. Collected in 1826.

206. *T. PARKERI* Baker in Journ. Bot. 1888, 42. — Leaves lorate from an ovate base  $1\frac{1}{2}$  in. broad, a foot long, an inch broad at the middle, flexible, subglabrous. Peduncle slender; upper bract-leaves small, adpressed, scariose. Panicle 6–8 in. long; branches about 6, shortly peduncled, erecto-patent; spikes moderately dense, 1–2 in. long; flowers erecto-patent; flower-bracts ovate-oblong, subobtuse,  $\frac{1}{4}$  in. long. Calyx nearly as long as the bract; sepals obtuse. Capsule under an inch long.

**Hab.** British Guiana, *Parker*! Nearly allied to *T. triticea*.

207. *T. BRUNONIS* André Enum. 8. — Radical leaves lanceolate or subulate, a foot long, 3–4 in. broad above the base, green, glabrous, blotched with brown-violet at the base, bright red at the tip. Peduncle cernuous, as long as the leaves, bright red, as are the bracts and calyx; bract-leaves lanceolate, imbricated. Panicle pendent, a foot long, composed of about 20 spikes; branch-bracts ovate-acuminate, half as long as the spikes; flower-bracts oblong, acute, an inch long. Sepals acute, rather shorter than the bracts. Petals linear, with a violet limb and a white claw. Stamens shorter than the petals.

**Hab.** Columbia; between Bogota and Fusagasuga, alt. 9000 ft., *André* 1757. *Var. mutabilis* André has longer leaves and petals fading brown.

208. *T. CARRIEREI* André Enum. 8. — Radical leaves lorate, obtuse, shortly cuspidate, glabrous,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle. Peduncle cernuous, much shorter than the leaves; bract-leaves short, ovate, acute. Panicle narrow, moderately dense, a foot long, composed of 15 dense elliptic 10–12-flowered spikes 2 in. long; branch-bracts ovate, acuminate, half as long as the spikes; flower-bracts ovate, very acute,  $\frac{3}{4}$  in. long. Sepals oblong-lanceolate, very acute, as long as the bracts. Corolla yellow,  $\frac{1}{3}$  in. longer than the calyx. Capsule overtopping the bract.

**Hab.** Columbia; valley of Cauca, alt. 5500 ft., *André* 2700.

209. *T. COMPACTA* Griseb. in Gott. Nacht. 1864, 18. — Leaves about a dozen in a rosette, lorate from an oblong base  $1\frac{1}{2}$  in. broad, a foot long, an inch broad at the middle, thin, flexible, subglabrous, Peduncle as long as the leaves; bract-leaves many, small, adpressed, imbricated. Panicle short, dense; spikes oblong, erecto-

patent, 1-1½ in. long, an inch broad; flower-bracts oblong-cuspidate, glossy ¾ in. long. Calyx ¾ in. long; sepals acute. Petals and capsule not seen.

Hab. Mountains of Venezuela; Tovar, *Fendler* 1508!

210. *T. GHIESBREGHTII* Baker.—Leaves lanceolate from an ovate base 2 in. broad, 1½ ft. long, an inch broad low down, narrowed to the point, flexible, subglabrous. Peduncle 1½ ft. long. Panicle above a foot long; branch-bracts small, ovate; branches lax-flowered, arcuate, ascending, mostly simple; spikes 3-5 in. long, ½ in. broad; flower-bracts ovate, obtuse, ¾ in. long. Calyx ¼ in. long; sepals obtuse. Petal-blade small.

Hab. Mexico; Oaxaca, *Ghiesbreght!* (Herb. Mus. Paris).!

211. *T. TETRANTHA* Ruiz et Pav. Fl. Peruv. iii. 39, t. 265. *Billbergia tetrantha* Beer.—Leaves a dozen or more in a rosette, lanceolate from an oblong base 2 in. broad, a foot or more long, an inch broad at the middle, thin, flexible, subglabrous, spotted with purple on both sides. Peduncle as long as the leaves. Inflorescence a lax tripinnate panicle with ovate-cuspidate branch-bracts 1-1½ in. long, branches about as long as the leaves, with small erect secund few-flowered dense spikes; flower-bracts oblong-lanceolate, ¼-½ in. long. Calyx as long as the bract; sepals oblong. Petal-blade small, oblong, violet.

Hab. Peru; Andes of Muna, *Ruiz & Pavon*. Not seen.

212. *T. MACULATA* Ruiz et Pav. Fl. Peruv. iii. 40, t. 267. *Vriesea maculata* Beer.—Leaves a dozen or more to a rosette, lorate from an ovate base, 1½ ft. long, thin, flexible, subglabrous, copiously spotted with red-brown. Peduncle above a foot long; bract-leaves small and distant. Inflorescence a lax panicle a foot or more long, with a bright red rachis; spikes 1-2 in. long, ½ in. broad; flower-bracts oblong-lanceolate, ¾ in. long. Calyx reaching to the tip of the bract. Petal-blade small, oblong, violet.

Hab. Peruvian Andes at Muna, &c., *Ruiz & Pavon*. According to Morren it was re-gathered by Poeppig at Cuchero in 1829.

213. *T. RUBRA* Ruiz et Pav. Fl. Peruv. iii. 40, t. 266. *Vriesea rubra* Beer. *Phytarhiza rubra* E. Morren. Leaves 10-12 in a rosette, lorate from an ovate base, 2 in. broad, 1½-2 ft. long, 1¼-1½ in. broad at the middle, thin, flexible, subglabrous. Peduncle shorter than the leaves; bract-leaves entirely adpressed. Inflorescence a lax panicle above a foot long; rachis red; branches erecto-patent, lower forked; branch-bracts ovate, lower 2-3 in. long; spikes dense, 2-4 in. long, an inch broad; flower-bracts ovate-oblong, ¾-1 in. long. Calyx nearly as long as the bract. Petal-blade oblong, violet, ½-¾ in. long.

Hab. Andes of Peru, *Ruiz & Pavon*. Argentaria; province of Oran, *Lorentz* 538!

214. *T. CARACASANA* Baker in Journ. Bot. 1888, 44. — Leaves lorate from an oblong base 2 in. broad, thin, flexible, subglabrous, a foot long, an inch broad at the middle. Peduncle shorter than the leaves; bract-leaves all adpressed. Inflorescence a panicle of

8-9 erecto-patent spikes 1-1½ in. long,  $\frac{3}{4}$  in. diam.; lower branch-bracts as long as the spikes; flower-bracts oblong-cuspidate, glossy,  $\frac{3}{4}$  in. long. Calyx  $\frac{1}{2}$  in. long; sepals acute. Petal-blade oblong,  $\frac{1}{4}$  in. long.

Hab. Caracas, Moritz 448! (Herb. Mus Brit.). Near *T. rubra*.

215. *T. ROEZLI* E. Morren in Belg. Hort. 1877, 272, t. 15 (M.D.). *Allardtia Roezlii* E. Morren. *Vriesea Roezlii* Linden. — Leaves 15-20 in a dense rosette, lanceolate from an oblong base 2 in. broad, 1½ ft. long, 1½ in. broad at the middle, thin, flexible, subglabrous, marked on the back with blackish blotches running into transverse bands. Peduncle as long as the leaves; upper bract-leaves with short lanceolate free points. Inflorescence a lax panicle  $\frac{1}{2}$  ft. long, consisting of a few simple sessile dense spikes 2-4 in. long,  $\frac{3}{4}$ -1 in. broad; branch-bracts small, red, lanceolate; flower-bracts ovate-lanceolate, green, 1-1½ in. long. Calyx an inch long. Petal-blade reddish-lilac,  $\frac{1}{2}$  in. long. Stamens shorter than the petals.

Hab. Andes of North Peru. Introduced by Roehl in 1871.

216. *T. RUBELLA* Baker in Journ. Bot. 1888, 44. — Leaves lanceolate from an ovate base 2 in. broad a foot long, an inch broad at the middle, thin, flexible, subglabrous. Peduncle much longer than the leaves; bract-leaves ovate-lanceolate, almost entirely adpressed, the upper bright red. Panicle 6-8 in. long; spikes many, erecto-patent, 1-1½ in. long,  $\frac{5}{8}$  in. broad; branch-bracts ovate-cuspidate, shorter than the spikes, bright red; flower-bracts ovate-oblong,  $\frac{1}{2}$  in. long, bright red. Calyx as long as the bract; sepals glossy, much imbricated. Petal-blade narrow,  $\frac{1}{4}$  in. long. Stamens not longer than the petals.

Hab. Andes of Bolivia; Sorata, alt. 8000 ft., Mandon 1187! Near *T. maculata*.

217. *T. FENDLERI* Griseb. in Gott. Nacht. 1864, 17.—Root-leaves lorate, acute, with minute cross ridges. Inflorescence a panicle with a few long distichous branches; flower-bracts ovate-oblong, acute. Calyx as long as the bract. Petal-blade small.

Hab. Venezuela; between Caracas and Tovar, alt. 6000 ft., Fendler 1515. Allied to *T. rubra*.

218. *T. RIGIDULA* Baker in Journ. Bot. 1888, 44.—Leaves lorate from an ovate dilated base 1½ in. broad, a foot long, an inch broad at the middle, deltoid at the tip, subrigid, green, subglabrous. Peduncle as long as the leaves; bract-leaves small, adpressed. Spikes 2, distichous, the end one 6-8 in. long, 1½ in. diam.; lower flowers patent; flower-bracts ovate, obtuse,  $\frac{1}{2}$ - $\frac{5}{8}$  in. long. Calyx glabrous,  $\frac{1}{2}$  in. longer than the bract; sepals obtuse. Petal-blade small.

Hab. British Guiana, Appun 840! Very distinct.

219. *T. LUCIDA* E. Morren (M.D.). — Leaves 20-30, densely rosulate, lanceolate from an ovate base, a foot long, 1½ in. broad at the middle, thin, flexible, green above, glaucous beneath. Peduncle 1½ ft. long; upper bract-leaves with short lanceolate reflexing tips. Spikes about 5, dense, ascending, 5-6 in. long, an inch broad; branch-bracts small; flower-bracts ovate, acute, greenish-purple,

$1\frac{1}{2}$  in. long. Calyx shorter than the bract. Petal-blade narrow, pale lilac, an inch long.

Hab. Mexico and Guatemala. Described from Professor Morren's drawing, made from a plant flowered by M. Jacob-Makoy & Co. in 1881. Spikes and bracts like those of *T. fasciculata*.

220. *T. LAJENSIS* André Enum. 7. — Radical leaves linear-lanceolate, acute, flat, glabrous,  $2\frac{1}{2}$  ft. long, above 2 in. broad at the middle. Peduncle very robust; bract-leaves many, imbricated, lanceolate, the lower nearly a foot long. Panicle large, lax; spikes dense, sessile, 4 in. long, above 2 in. broad; branch-bracts ovate-lanceolate, the lower as long as the spikes; flower-bracts ovate, acute, glabrous nearly 2 in. long. Sepals oblong, acute, above an inch long, violet, longer than the bracts. Stamens shorter than the petals.

Hab. South Columbia near La Laja, alt. 9000 ft., André 3477.

221. *T. SCHIMPERIANA* Wittm. in Engl. Jahrb. xi. 67. — Leaves densely rosulate, lanceolate from an ovate base,  $2\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, narrowed gradually to the point. Peduncle much shorter than the leaves, hidden by the long-pointed erect bract-leaves. Panicle  $\frac{1}{2}$  ft. long, consisting of 6–8 nearly sessile dense oblong spikes  $1\frac{1}{2}$ – $2\frac{1}{2}$  in. long, above an inch broad; branch-bracts ovate-acuminate, longer than the spikes; flower-bracts oblong-lanceolate, an inch long. Sepals lanceolate, as long as the bracts. Petal-blade small, white lingulate. Stamens shorter than the petals.

Hab. Columbia; Antioquia, alt. 5000–6000 ft., Lehmann.

222. *T. PASTENSIS* André Enum. 8. — Radical leaves lanceolate, purplish-violet, glabrous, 20 in. long, 2 in. broad at the middle. Peduncle as long as the leaves; bract-leaves lanceolate, imbricated. Panicle narrow, 20 in. long, formed of very numerous distant dense 7–8-flowered spikes  $1\frac{1}{2}$ –2 in. long; branch-bracts ovate-acuminate, the lower longer than the spikes; flower-bracts ovate, acute, above an inch long. Sepals ovate, acute, shorter than the bract. Capsule half as long again as the calyx.

Hab. Andes of Columbia, alt. 9000 ft., André 1747.

223. *T. KALBREYERI* Baker in Journ. Bot. 1888, 45. — Leaves lanceolate, rigid, subglabrous, pale green,  $1\frac{1}{2}$ –2 ft. long, 3–4 in. broad at the dilated base, 2 in. at the middle, narrowed gradually to the point. Peduncle with panicle 2– $2\frac{1}{2}$  ft. long; branches many, subsessile, dense-flowered, 5–6 in. long, an inch broad; flower-bracts oblong  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long. Calyx just protruded beyond the bract. Petal-blade small, violet.

Hab. New Granada; between Ocana and Pamplona, alt. 3500 ft., Kalbreyer 1013! Spikes like those of *T. fasciculata*.

224. *T. CYANEA* E. Morren in Belg. Hort. 1879, 297. *T. columnaris* E. Morren (M.D.). *Allardtia cyanea* Dietrich. *Platystachys cyanea* K. Koch. — Leaves 20–30, densely rosulate, lanceolate from a large ovate-oblong base,  $2\frac{1}{2}$ –3 in. broad,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, thin, flexible, glaucous-green, subglabrous. Peduncle

as long as the leaves; upper bract-leaves with large erect lanceolate tips. Panicle lax, 2-3 ft. long, 5-6 in. broad; branch-bracts lanceolate, 2-3 in. long; numerous branches patent, compound; spikes  $1\frac{1}{2}$ -2 in. long,  $\frac{1}{2}$  in. broad; flower-bracts oblong,  $\frac{1}{2}$ - $\frac{5}{8}$  in. long. Calyx as long as the bract. Petal-blade small, oblong, bright violet. Stamens not longer than the petals. Capsule  $\frac{3}{4}$  in. long.

Hab. Guatemala. Introduced by Warszewicz about 1856, and again by Rodrigues in 1884.

225. *T. MARTINICENSIS* Baker in Journ. Bot. 1888, 168.—Leaves lorate from an ovate base  $2\frac{1}{2}$ -3 in. broad,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, thin, flexible, subglabrous. Peduncle as long as the leaves. Panicle  $1\frac{1}{2}$  ft. long; branches very numerous, spreading or ascending, the central sometimes slightly compound; branch-bracts ovate, acute, shorter than the spikes; spikes 2-3 in. long,  $\frac{1}{2}$  in. broad; flower-bracts ovate  $\frac{1}{3}$ - $\frac{1}{2}$  in. long. Calyx  $\frac{1}{2}$ - $\frac{5}{8}$  in. long; sepals obtuse. Petals and capsule not seen.

Hab. Forests of Martinique, *Hahn* 521, ex parte! 523! 623! Near *T. cyanea*.

226. *T. EXCELSA* Griseb. Fl. Brit. West. Ind. 597.—Leaves lorate from an oblong base 2-3 in. broad,  $1\frac{1}{2}$  ft. long, 2 in. broad at the middle, thin, flexible, subglabrous. Peduncle stout, as long as the leaves; lower bract-leaves with large lanceolate free points. Panicle lax, a foot long; many lower branches compound, spreading; lower branch-bracts ovate-lanceolate, 3 in. long; spikes 1-2 in. long,  $\frac{1}{2}$ - $\frac{5}{8}$  in. broad; flower-bracts oblong-lanceolate,  $\frac{3}{4}$  in. long. Calyx  $\frac{1}{2}$  in. long; sepals acute. Petal-blade oblong,  $\frac{1}{4}$  in. long. Capsule an inch long.

Hab. Jamaica; mountains of Manchester and Westmoreland, *Purdie*! Eastern Cuba, *Wright* 1517!

227. *T. RARIFLORA* André Enum. 8.—Leaves lanceolate, 3 ft. long, 2- $2\frac{1}{2}$  in. broad at the middle, glabrous. Peduncle stout, 3-6 ft. long; bract-leaves ovate-lanceolate, slightly imbricated. Panicle long; branches very distant, upper simple, lower compound; flowers very laxly disposed; branch-bracts lanceolate-acuminate,  $1\frac{1}{2}$ -2 in. long; flower-bracts ovate, acute. Flowers only seen imperfectly developed.

Hab. Columbia; valley of Cauca, alt. 5500 ft., *André* 2333.

228. *T. DENUDATA* André Enum. 8.—Leaves lanceolate, acute,  $1\frac{1}{2}$ -2 ft. long, thick, coriaceous, glabrous. Peduncle robust, 8-9 ft. long. Panicle very lax; branches distant, the lower compound, flexuose, cernuous, bearing 2-4 spikes 1- $1\frac{1}{2}$  in. long; branch-bracts lanceolate, 3-4 in. long; flower-bracts acute under an inch long. Sepals oblong, acute,  $\frac{5}{8}$  in. long. Capsule half as long again as the bract.

Hab. Andes of Columbia and Ecuador, alt. 6000-9000 ft., *André* 1358.

229. *T. ELATA* Baker in Journ. Bot. 1888, 46.—Leaves lorate,  $2\frac{1}{2}$ -3 ft. long, 2 in. broad at the middle, thin, flexible, subglabrous. Peduncle stout. Panicle lax,  $2\frac{1}{2}$ -3 ft. long; central branches copiously compound; branch-bracts oblong-lanceolate, 2-3 in

long; spikes erecto-patent,  $1\frac{1}{2}$ –2 in. long,  $\frac{3}{4}$  in. broad; flower-bracts oblong-lanceolate, acute,  $\frac{3}{4}$ –1 in. long. Calyx  $\frac{1}{2}$  in. long; sepals acute. Petal-blade  $\frac{1}{4}$  in. long.

Hab. Santa Marta, *Purdie!* Near *T. excelsa*.

230. *T. MEGASTACHYA* Baker in Journ. Bot. 1888, 46. *T. foliosa* Griseb. non Mart. et Gal.—Leaves lorate from an ovate base 3 in. broad, 2–2 $\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, flexible, subglabrous. Peduncle stout; lower bract-leaves with large lanceolate free points  $\frac{1}{2}$ –1 ft. long. Panicle above a foot long; spikes very numerous, subsessile, oblong, 2–3 in. long,  $1\frac{1}{2}$ –2 in. broad; branch-bracts ovate, the lower much longer than the spikes; flower-bracts oblong-lanceolate, acute, an inch long. Calyx nearly as long as the bract; sepals acute. Capsule-valves lanceolate,  $\frac{1}{2}$  in. longer than the calyx.

Hab. St. Vincent, *Rev. L. Guilding!*

231. *T. MAGNA* Baker.—Leaves lanceolate from an ovate base,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$  in. broad at the middle, thin, flexible, subglabrous, narrowed to the tip. Peduncle stout, nearly as long as the leaves; upper bract-leaves adpressed, imbricated. Inflorescence a narrow panicle a foot long, with many short spreading dense oblong spikes; lowest subsessile,  $1\frac{1}{2}$ –2 in. long, an inch broad; branch-bracts ovate, lowest 2–3 in. long; flower-bracts ovate-lanceolate,  $1\frac{1}{2}$  in. long. Calyx as long as the bract; sepals lanceolate. Petal-blade oblong, violet,  $\frac{1}{2}$  in. long.

Hab. Martinique, *Hahn 521!* (Herb. Reg. Berol.). Dominica, *Ramage!* Near *T. megastachya*.

232. *T. ARMADÆ* André Enum. 8.—Radical leaves lorate, attenuate at the apex, 16 in. long, 2–2 $\frac{1}{4}$  in. broad, very glabrous, finely striated, violet, more or less tinged with green or pale at the edge. Flowers unknown.

Hab. South Columbia; l'alto de Armada, alt. 4500 ft., *André 1756 bis*.

232. *T. LINEATA* André Enum. 8. — Radical leaves lorate, glabrous, finely striated, green striped with violet above, violet beneath. Flowers unknown.

Hab. Columbia, *André 1755*.

### Subgenus 9. WALLISIA (Regel).

234. *T. LINDENI* E. Morren in Belg. Hort. 1869, 321, t. 18 (M.D.); Ill. Hort. t. 610; Floral Mag. 1872, t. 44; Rev. Hort. 1878, 300; Garden 1876, 466. *T. cyanea* Hort. *T. Morreniana* Regel. *Phytarhiza Lindenii* E. Morren.—Acaulescent. Leaves 40–60 in a dense rosette, ensiform-acuminate, 1–1 $\frac{1}{2}$  ft. long,  $\frac{3}{4}$ –1 in. broad above the dilated base, thin, subglabrous, vertically striped with brown on the back towards the base. Peduncle  $\frac{1}{2}$ –1 ft. long; bract-leaves lanceolate, imbricated. Inflorescence a dense distichous simple spike 4–6 in. long, 2 in. broad; flower-bracts ovate, acute,  $1\frac{1}{2}$ –2 in. long, green or more or less tinged with red. Calyx  $1\frac{1}{2}$  in. long; sepals oblong, glabrous. Petal-blade spreading, sub-

orbicular, an inch broad, bright blue. Stamens not longer than the calyx.

Hab. Andes of Western and Central Peru. Gathered by Wallis and first shown by Linden at the Paris Exhibition of 1867. For garden purposes it is the finest of all the Tillandsias. Vars. *intermedia*, *luxurians* and *major* are garden forms. Var. *Regeliana* E. Morren (*T. Lindeniana* Regel Gartenfl. t. 619; Bot. Mag. t. 5850) has a longer peduncle than the type, green bracts and a large white eye to the petal-limb. Var. *tricolor* André, from the western slope of Chimborazo, is a fine form with red bracts and a white eye to the petals.

235. *T. HAMALEANA* E. Morren in Gard. Chron. 1869, ii. 460. *T. platypetala* Baker in Journ. Bot. 1888, 46. *Wallisia Hamaleana* E. Morren in Belg. Hort. 1870. 97, t. 5. *Phytarhiza Hamaleana* E. Morren.—Acaulescent. Leaves 15–20, densely rosulate, lorate, acute, thin, green, subglabrous, a foot or more long, 1–1½ in. broad at the middle. Peduncle 9–12 in. long; bract-leaves many, small, adpressed, scariose. Inflorescence a short congested panicle, composed of 4–6 dense distichous spikes 2–3 in. long, an inch broad; branch-bracts small, ovate; flower-bracts green, oblong, acute, glabrous, ¾ in. long. Calyx as long as the bract; sepals oblong. Petal-blade orbicular, ¾ in. broad, bright blue with a white eye. Stamens shorter than the calyx.

Hab. Andes of Ecuador; Cordillera of Cisné. First gathered by Hartweg. Introduced into cultivation by Wallis. First shown by Linden at Paris in 1867. Named after M. Cannart d'Hamale. *T. umbellata*, André in Rev. Hort. 1886, 60, with coloured figure (Ecuador *Poortman* 469), is, I believe, a form of this species.

236. *T. DYERIANA* André Enum. 8.—Leaves 10–15 in a rosette, lorate from a dilated base, obtuse, obscurely cuspidate, 6–8 in. long, under an inch broad, flat, finely lepidote, blotched with violet. Peduncle slender, 1–1½ ft. long; bract-leaves spaced out, linear-oblong. Spike 4–6 in. long, subslax, usually simple; bracts scarlet, thin, glabrous, ovate-lanceolate, above an inch long, spreading horizontally. Calyx rather shorter than the bract; sepals oblong, imbricated, finely lepidote. Petals white; limb small, orbicular. Stamens shorter than the calyx.

Hab. Central Andes of Ecuador, *André* 4256.

#### Subgenus 10. *VRIESEA* (Lindl.).

237. *T. TRINITENSIS* Baker.—Leaves thin, flexible, subglabrous, lorate, obtuse, 2½ ft. long, 1½–2 in. broad at the middle. Peduncle 2–3 ft. long; bract-leaves many, all small, adpressed, scariose. Inflorescence a simple moderately dense spike 6–8 in. long, with all the flowers ascending; flower-bracts ovate, acute, reddish, nearly an inch long. Calyx not longer than the bract. Petals not seen.

Hab. Trinidad, *Fendler* 820!

238. *T. HELICONIODES* H. B. K. Nov. Gen. i. 234. *Vriesea heliconioides* Lindl.; E. Morren in Ill. Hort. n. s. t. 490; Antoine Brom. 11, t. 8; Gard. Chron. 1884, ii. 140, fig. 26. *V. bellula* and *V. Falkenbergii* Hort. *T. disticha* Willd. *Platystachys disticha* Beer.—Leaves 15–20 in a rosette, lanceolate from an ovate base

1½ in. broad, a foot long, an inch broad at the middle, thin, flexible, subglabrous, green above, tinged with purple beneath. Peduncle much shorter than the leaves; bract-leaves small, adpressed. Flowers 6–10 in a moderately dense spike 4–6 in. long, 2 in. diam.; flower-bracts ovate, acute, 1½ in. long, bright red at the base, green at the tip. Calyx shorter than the bract; sepals obtuse. Petals white, lingu- late, twice as long as the calyx. Stamens as long as the petals.

Hab. Valley of the Rio Magdalena, *Humboldt & Bonpland* 1655! Introduced into cultivation in 1883.

239. *T. CARINATA* Baker in Journ. Bot. 1888, 49. *Vriesea carinata* Wawra Bot. Ergeb. 154, t. 26; Antoine Brom. 9, t. 7. *V. brachystachys* Regel Gartenfl. 1866, 258, t. 518; Bot. Mag. t. 6014. *V. psittacina* var. *brachystachys* E. Morren in Belg. Hort. 1870, 161, t. 8 (M.D.). *V. psittacina* var. *carinata* E. Morren. *V. erythrodactylis* Platz.—Leaves 15–20 in a rosette, lorate from an ovate base 1½ in. broad, 6–8 in. long, an inch broad at the middle, thin, flexible, subglabrous, plain green. Peduncle a little longer than the leaves; bract-leaves adpressed. Flowers 10–12, arranged in a dense distichous spike 2–3 in. long; flower-bracts oblong-lanceolate, 1½ in. long, bright red at the base, yellow in the upper half. Calyx rather shorter than the bract. Petal-blade pale yellow, lingu- late, ½ in. long, shorter than the stamens. Capsule- valves lanceolate, from an inch long.

Hab. Forests of South Brazil. First gathered by Sello, Burchell & Bowie, and Cunningham. Introduced into cultivation about 1865 by Messrs. Booth, of Hamburg. *V. Morreniana* Hort.; E. Morren in Belg. Hort. 1887, 287, t. 10–12, fig. 2, is a hybrid between *carinata* and *psittacina*. Var. *constricta* Wawra (*V. squamosa* E. Morren), which has white flowers and a very short peduncle with red bracts, will probably prove a distinct species.

240. *T. DUVALIANA* Baker in Journ. Bot. 1888, 48. *Vriesea Duvaliana* E. Morren in Belg. Hort. 1884, 105, t. 7, 8 (M.D.).—Leaves 15–20 in a rosette, lorate from an ovate base 1½ in. diam., half a foot long, an inch broad at the middle, thin, flexible, subglabrous, green on the face, tinged with purple beneath. Peduncle as long as the leaves. Spike moderately dense, 5–6 in. long, 2 in. broad; flower-bracts oblong-lanceolate, acute, red-green, 1½–2 in. long. Calyx shorter than the bract; sepals obtuse. Petal-blade lingu- late, yellowish-green, an inch long. Stamens as long as the petals.

Hab. South Brazil, *Glaziov* 14344! Introduced into cultivation about 1875. Named after M. Duval, of Versailles. Very near *T. carinata*. *V. fulgida* Hort. (Illust. Hort. 1888, t. 67), is a hybrid between this species and *T. incurvata*.

241. *T. PARABAICA* Baker in Journ. Bot. 1888, 82. *Vriesea parabaica* Itin. Prin. Sax. Cob. 160, t. 36, 36 b; Antoine Brom. 4, t. 4 (M.D.). *V. carinata* var. *constricta* Wawra.—Leaves about a dozen in a rosette, lorate from an ovate base 2 in. diam., 6–8 in. long, 1–1½ in. broad at the middle, thin, flexible, subglabrous, plain green. Peduncle shorter than the leaves; bract-leaves ad- pressed. Inflorescence a dense spike 3–4 in. long, 2 in. diam.; flower-bracts oblong, acute, 1½ in. long, reddish-green. Calyx nearly as long as the bract; sepals obtuse. Petal-blade lingu- late, yellow, an inch long, shorter than the stamens.

Hab. South Brazil; woods of Juiz de Fora, *Wawra & Maly* ii. 184. Introduced into cultivation about 1884. Very near *T. carinata*.

242. *T. GUADELUPENSIS* Baker.—Leaves lanceolate, 2 ft. long, 2–2½ in. broad at the middle, thin, flexible, subglabrous. Peduncle much shorter than the leaves; bract-leaves small, ovate-cuspidate, ovate, scariose. Inflorescence a dense simple spike 6–8 in. long; ovate-flower-bracts ovate, subobtusate, 1½ in. long. Calyx rather shorter than the bract. Petals not seen.

Hab. Guadeloupe, *Duchassaing!* (Herb. Berol.).

243. *T. CLAUSSENIANA* Baker.—Leaves lorate from an ovate base 2 in. broad, under a foot long, 1½ in. broad at the middle, flexible, subglabrous. Peduncle 1–1½ ft. long. Inflorescence a dense simple secund spike a foot long; flower-bracts suborbicular, coriaceous, an inch long and broad. Calyx an inch long; sepals oblong, obtuse. Petal-blade lingulate, ½ in. long.

Hab. Brazil; Minas Geraes, on the Serra de Carassa, *Claussen!*

244. *T. INCURVATA* Baker in Journ. Bot. 1888, 49. *Vriesea incurvata* Gaudich. Atlas Bonité, t. 68; E. Morren in Belg. Hort. 1882, 52, t. 2 (M.D.). *T. inflata* Baker in Bot. Mag. t. 6882. *Vriesea inflata* Wawra; Antoine Brom. 28, t. 18. *V. Truffautiana* Hort.—Leaves about a dozen in a rosette, lorate from an ovate base 2 in. broad, a foot long, 1½ in. broad at the middle, thin, flexible, subglabrous, plain green. Peduncle much shorter than the leaves; bract-leaves adpressed. Inflorescence a dense distichous spike 6–9 in. long, 2 in. broad; flower-bracts ovate with a small incurved tip, 1½–2 in. long, 1½ in. broad, the lower greenish-yellow, the upper reddish-yellow. Calyx much shorter than the bract. Petal-blade greenish-yellow, lingulate, an inch long, shorter than the stamens. Capsule as long as the calyx.

Hab. Frequent in South Brazil. First gathered by Burchell & Sello. Introduced into cultivation by Binot, in 1880.

245. *T. SCHLECHTENDAHLI* Baker in Journ. Bot. 1888, 49. *T. cæspitosa* Cham. et Schlecht. in Linnæa vi. 54, non Leconte. *Vriesea cæspitosa* E. Morren (M.D.).—Leaves lanceolate from an ovate base 2 in. broad, above a foot long, 1½ in. broad at the middle, thin, flexible, subglabrous, plain green, tinged with purple towards the base. Peduncle much shorter than the leaves; bract-leaves adpressed. Spike dense, simple, 5–6 in. long, 2 in. broad; flower-bracts ovate, acute, pink, 1½–2 in. long, an inch broad. Calyx 1¼ in. long. Petal-blades violet, lingulate, as long as the calyx.

Hab. Central Mexico, *Pavon! Schiede & Deppe! Bourgeau 2960! Hahn! Costa Rica, Hoffmann! Lehmann 1188! Chiriqui, alt. 8000 ft., Pfau!* Near *T. incurvata*. Introduced into cultivation in 1883.

246. *T. APPUNIANA* Baker.—Leaves not seen. Spike dense, simple, 8–9 in. long, 1½ in. diam.; flower-bracts oblong-lanceolate, 2½ in. long, tapering gradually to a small incurved point. Calyx an inch long. Petal-blades connivent in a cylindrical tube 1½ in. long, just reaching to the tip of the bract.

Hab. British Guiana; Kaieteur Falls, *Appun!* Collected in 1872. Near *T. incurvata*.

247. *T. VIMINALIS* Hemsl. Biol. Cent. Amer. iii. 323. *Vriesea viminalis* E. Morren in Belg. Hort. 1878, 257, t. 14, 15 (M.D.); Antoine Brom. 21. t. 14. *T. viridiflora* Hort.—Leaves about 15 in a rosette, lanceolate from an ovate base 2 in. diam., a foot or more long, 1-1½ in. broad at the middle, plain green, flexible, subglabrous. Peduncle much longer than the leaves; bract-leaves scariose, adpressed, imbricated. Inflorescence a simple dense spike 5-6 in. long, 1 in. diam.; flower-bracts ovate, green, an inch long. Calyx as long as the bract; sepals oblong, obtuse. Petal-blade white, lingulate, ½ in. long. Stamens as long as the petals. Capsule 1½ in. long.

Hab. Costa Rica, near Cartago. Sent alive by Wendland to Liège, in 1873.

248. *T. GLADIOLIFLORA* Wendl. in Hamb. Gartenzeit. 1863, 31. *Vriesea gladioliflora* E. Morren in Belg. Hort. 1880, 87, 216 (M.D.); Antoine in Weiner Gartenzeit. 1880, 97, with figure; Brom. 23, t. 15.—Leaves 15-20 in a rosette, lorate from an ovate base 3-4 in. broad, 1½-2 ft. long, 1½-2 in. broad at the middle, thin, flexible, subglabrous, green on the face, purplish brown on the back. Peduncle as long as the leaves; bract-leaves adpressed, imbricated. Inflorescence a simple dense lanceolate spike 1-1½ ft. long, 1½ in. broad; flower-bracts ovate, acute, green, 1½-2 in. long. Calyx nearly as long as the bract; sepals oblong, obtuse. Petal-blade suborbicular, whitish, ¾ in. long and broad. Stamens nearly as long as the petals.

Hab. Costa Rica. Received alive by Dr. Wendland, of Herrenhausen, in 1863. This is the type of Morren's subgenus *Xiphion*, characterized by its short broad petal-blade and short stamens.

249. *T. LONGICAULIS* Baker in Journ. Bot. 1888. 80.—Leaves lorate from an ovate base 2 in. broad, 1½ ft. long, an inch broad at the middle, thin, flexible, subglabrous. Peduncle stiffly erect, 2½-3 ft. long; bract-leaves small, scariose, imbricated, adpressed. Inflorescence a dense simple lanceolate spike 6-8 in. long, an inch broad; flower-bracts ovate, acute, much imbricated, 1½-2 in. long, an inch broad. Calyx ½ in. shorter than the bract. Petals not seen.

Hab. South Brazil, *Glaziou* 8988! Allied to *T. gladioliflora*.

250. *T. VIRIDIFLORA* Baker in Journ. Bot. 1888, 81. *Platy-stachys viridiflora* Beer Brom. 81.—Leaves a dozen or more in a utricular rosette, lorate from an ovate base 2½-3 in. broad, above a foot long, an inch broad at the middle, thin, flexible, subglabrous. Peduncle stiffly erect, 1½-2 ft. long; bract-leaves with small, free, lanceolate tips. Inflorescence a dense flat simple spike 8-12 in. long, 2 in. broad, with sometimes a small second one; flower-bracts oblong-lanceolate, acute, 2-2½ in. long, an inch broad, pale green, glabrous. Calyx 1½ in. long. Petals greenish, shorter than the stamens.

Hab. Mexico; Province of Cordova, *Bourgeau* 2274! Introduced into cultivation by Carl Heller in 1854. Allied to *T. gladioliflora*. It may be the

imperfectly-described *Vriesea Billbergiæ* Lemaire in. Ill. Hort. xvi. Misc. 91, gathered by Ghiesbreght.

251. T. BARILLETI Baker in Journ. Bot. 1888, 79. *Vriesea Barilleti* E. Morren in Belg. Hort. 1883, 33, t. 3; Antoine Brom. 20, t. 13. *V. crotalophora* Hort. (M.D.).—Leaves 15–20 in a rosette, lanceolate from an ovate base,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, thin, flexible, subglabrous, bright green. Peduncle as long as the leaves; bract-leaves small, scariose, adpressed. Flowers in a simple dense spike 8–12 in. long, 2– $2\frac{1}{2}$  in. broad; flower-bracts ovate, with a small incurved point,  $1\frac{1}{2}$  in. long, brownish-yellow. Calyx shorter than the bract. Petal-blade lingulate, pale yellow,  $\frac{1}{2}$  in. long. Stamens a little longer than the petals.

Hab. Andes of Ecuador. Discovered by M. Barillet Deslongchamps. Introduced about 1877. Flowered by Prof. Morren at Liège in 1883. *Vriesea Wittmackiana* Kittel; Gartenflora t. 1283, is a hybrid between this species and *T. Morreniana*, raised lately by M. Kittel, at Eckersdorf in Silesia, with the ovate flower-bracts coloured bright red-yellow.

252. T. SPLENDENS Brong. in Flore des Serres, May 1846, t. 4. *Vriesea splendens* Lemaire. *V. speciosa* Hook. in Bot. Mag. t. 4382; Antoine Brom. 18, t. 12 (M.D.). *T. vittata* Richard. *T. picta* and *T. zebrina* Hort.—Leaves 12–20 in a rosette, lorate from an ovate base 2 in. broad,  $1-1\frac{1}{2}$  ft. long,  $1-1\frac{1}{2}$  in. broad at the middle, thin, flexible, subglabrous, marked with very distinct broad cross-bands of purplish-black, especially beneath. Peduncle  $\frac{1}{2}$ –1 ft. long; bract-leaves adpressed, imbricated. Inflorescence a dense distichous spike  $\frac{1}{2}$ –1 ft. long,  $1\frac{1}{2}$  in. broad; flower-bracts oblong-lanceolate, acute, 2– $2\frac{1}{2}$  in. long, all bright red or the lower green. Calyx much shorter than the bract; sepals acute. Petal-blade pale yellow, 2 in. long. Stamens as long as the petals. Capsule-valves lanceolate, an inch long.

Hab. French Guiana. Originally gathered by Aublet. Introduced into cultivation by Leprieur and Melinon about 1840. British Guiana, *Schomburgk*! Has been hybridized with *T. gladioliflora* and *T. Barilleti*, at the Leyden Botanic Garden, by M. Witte.

253. T. LONGIBRACTEATA Baker in Journ. Bot. 1888, 81.—Leaves thin, flexible, lorate, subglabrous,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$  in. broad and narrowed to the point in the Venezuelan plant, 2 in. broad and rounded to a cusp in the Trinidad plant. Peduncle stiffly erect; bract-leaves small, adpressed, imbricated. Inflorescence a dense simple spike a foot long, 3 in. broad; flower-bracts oblong-lanceolate, 2– $2\frac{1}{2}$  in. long,  $\frac{3}{4}$ –1 in. broad low down. Calyx much shorter than the bract; sepals oblong, obtuse. Petals not seen. Capsule-valves lanceolate,  $1\frac{1}{2}$  in. long.

Hab. Venezuela; mountains of Tovar, *Fendler* 2449! Trinidad, *Fendler* 830! 831!

254. T. OLIGANTHA Baker in Journ. Bot. 1887, 345. *Vriesea rubida* E. Morren (M.D.).—Leaves densely rosulate, ensiform-acuminate from an ovate base  $1\frac{1}{2}$  in. broad, under a foot long,  $\frac{1}{2}$  in. broad low down, rigidly coriaceous, thinly lepidote. Peduncle a foot long; upper bract-leaves adpressed, bright red. Inflorescence a lax simple spike 3–4 in. long; lower flowers erecto-patent;

flower-bracts ovate-oblong, bright red,  $\frac{3}{4}$  in. long. Calyx  $\frac{1}{2}$  in. longer than the bract, bright red; sepals oblong, obtuse. Petals white, convolute in a tube more than  $\frac{1}{2}$  in. longer than the calyx.

Hab. South Brazil, *Glaziou* 15472! Introduced into cultivation in 1885.

255. *T. PSITTACINA* Hook. in. Bot. Mag. t. 2841. *Vriesea psittacina* Lindl. in Bot. Reg. xxix. t. 10; E. Morren in Belg. Hort. 1882, 287, t. 10-12; Antoine Brom. 8, t. 6 (M.D.).—Leaves about a dozen in a rosette, lanceolate from an ovate base 2 in. broad, about a foot long, an inch broad at the middle, thin, flexible, subglabrous, green on both sides. Peduncle about as long as the leaves; bract-leaves adpressed, imbricated, bright red. Flowers 6-10 in a simple lax erect spike with a red rachis; lower flowers erecto-patent; flower-bracts oblong,  $1\frac{1}{2}$  in. long, bright red at the base, bright yellow upwards tipped with green. Calyx rather longer than the bract; sepals obtuse. Petal-blade lingulate, yellow,  $\frac{1}{2}$  in. long, shorter than the stamens.

Hab. Woods of South Brazil, *Burchell* 2540! *Blanchet* 3373! *Miers* 3766! 3874! Introduced into cultivation by Mr. Shepherd, at the Liverpool Botanic Garden in 1827. Probably this is *T. simplex* Vell. Fl. Flum. iii. t. 130 (*Vriesea simplex* Beer). *V. Krameri* Hort. (Bot. Mag. t. 5108), is a form with entirely red flower-bracts, var. *decolor* Wawra, a form with green flower-bracts and calyx, and *V. retroflexa* E. Morren (M.D.), a hybrid between *psittacina* and *scalaris*, with a longer cernuous peduncle. This is the type of Morren's subgenus *Euvriesea*, characterised by its moderately long lingulate petal-blade and exerted stamens longer than the petals.

256. *T. LAXA* Griseb. in Gott. Nacht. 1864, 18, non Fl. Brit. West Ind. 596.—Leaves lorate from an ovate base. Peduncle longer than than the leaves; bract-leaves small, adpressed. Spike lax, simple, 6-8-flowered; flower-bracts ovate-oblong, obtuse. Calyx slightly longer than the bract. Corolla 2 in. long. Capsule as long as the calyx.

Hab. Mountains of Venezuela, alt. 3000 ft., *Fendler* 2166. Allied to *T. psittacina*.

257. *T. ENSIFORMIS* Vell. Fl. Flum. iii. t. 129. *Vriesea ensiformis* Beer. *V. conferta* Gaudich. Atlas Bonite, t. 65; Antoine Brom. 3, t. 3.—Leaves 20 to a rosette, lorate from an ovate base 3 in. diam.,  $1\frac{1}{2}$ -2 ft. long,  $1\frac{1}{2}$  in. broad at the middle, deltoïd-cuspidate at the tip, thin, flexible, subglabrous, pale green. Peduncle as long as the leaves; bract-leaves adpressed, imbricated. Inflorescence a simple erect distichous spike  $\frac{1}{2}$ - $1\frac{1}{2}$  ft. long, 3 in. diam.; all the flowers erecto-patent, upper crowded; flower-bracts ovate, acute, reddish,  $1\frac{3}{4}$ -2 in. long, an inch broad. Calyx as long as the bract. Petal-blade lingulate, yellow,  $\frac{1}{2}$  in. long, shorter than the stamens. Capsule 2 in. long.

Hab. Southern provinces of Brazil, *Sello* 63! *Gaudichaud* 366! *Glaziou* 13263! *T. imbricata* Vell. Fl. Flum. iii. t. 131 (*Vriesea imbricata* Beer), differs by its larger flower-bracts, more gradually narrowed to an acute point. The plant drawn for *conferta* by Morren is, I think, a variety of *psittacina*.

258. *T. DECURVATA* Baker. *T. recurvata* Baker in Journ. Bot. 1888, 106, non Linn. *Vriesea recurvata* Gaudich. Atlas, Bonite t. 69 (M.D.).—Leaves lorate from an ovate base 2 in. broad, 2 ft. long,

an inch broad at the middle, thin, flexible, subglabrous. Peduncle shorter than the leaves; bract-leaves adpressed, imbricated. Flowers 10-12 in a lax simple spike 8-10 in. long; lower subpatent; flower-bracts oblong, obtuse, dark red,  $1\frac{1}{2}$ -2 in. long, an inch broad, with a small decurved cusp. Calyx as long as the bract. Petal-blade lingulate, yellow,  $\frac{1}{2}$  in. long, shorter than the stamens.

Hab. Rio Janeiro, *Gaudichaud!* Bahia, *Blanchet!* Near *T. ensiformis*. Drawn by Prof. Morren, in 1880, from cultivated specimens.

259. *T. ORIZABENSIS* Baker in Journ. Bot. 1888, 105. — Leaves 20 or more in a rosette, lanceolate from an ovate base 2 in. broad, a foot long,  $1\frac{1}{2}$  in. broad at the middle, thin, flexible, subglabrous, narrowed gradually to the point. Peduncle longer than the leaves; lower bract-leaves with lanceolate free points. Inflorescence a lax simple spike 6-8 in. long,  $2\frac{1}{2}$ -3 in. broad; flowers 12-20, erecto-patent; flower-bracts oblong, obtuse,  $1-1\frac{1}{2}$  in. long. Calyx  $\frac{1}{2}$  in. longer than the bract; sepals oblong, obtuse. Petals not seen. Capsule-valves 2 in. long,  $\frac{1}{2}$  in. broad.

Hab. Mexico; province of Orizaba, *Bourgeau* 3055! *Hahn!* Allied to *T. ensiformis*.

260. *T. HAPLOSTACHYA* Sauvalle Fl. Cub. 169. — Leaves lanceolate from an ovate base. Peduncle twice as long as the leaves; bract-leaves adpressed. Inflorescence a lax simple spike, with a flexuose rachis; flower-bracts broad ovate, subobtuse. Calyx shorter than the bracts; sepals oblong. Petals greenish, spatulate, twice as long as the calyx. Stamens shorter than the petals.

Hab. Eastern Cuba, *Wright*.

261. *T. GRADATA* Baker in Journ. Bot. 1888, 105.—Leaves lorate from an ovate base 3 in. broad,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, thin, flexible, subglabrous, deltoid-cuspidate at the apex. Peduncle much shorter than the leaves; bract-leaves adpressed, imbricated. Spike simple, erect, 8-9 in. long; flowers 20-25, all erecto-patent; flower-bracts ovate, bright red,  $1-1\frac{1}{2}$  in. long, an inch broad. Calyx half inch longer than the bract; sepals acute. Petal-blade oblong,  $\frac{1}{2}$  in. long, a little shorter than the stamens.

Hab. South Brazil, *Glaziou* 15473! Near *T. ensiformis*.

262. *T. HETEROSTACHYS* Baker in Journ. Bot. 1888, 166. — Leaves lorate from an oblong base  $2\frac{1}{2}$  in. broad, a foot long, above an inch broad at the middle, flexible, subglabrous, deltoid-cuspidate at the tip. Peduncle as long as the leaves; bract-leaves imbricated. Spike simple, erect, 6-8 in. long; upper flowers crowded; the rest non-contiguous, erecto-patent; flower-bracts oblong, obtuse,  $1\frac{1}{2}-1\frac{3}{4}$  in. long, an inch broad. Calyx as long as the bract. Petals not seen.

Hab. South Brazil, *Glaziou* 13260! Near *T. ensiformis*.

263. *T. SUBSECUNDA* (Wittm.).—Leaves about 20 in a dense rosette, ensiform from an ovate base, acuminate, brownish-green, about a foot long, above  $\frac{1}{2}$  in. broad at the middle. Peduncle as long as the leaves. Spike lax in the lower half, subsecund, 3-4 in. long, 1 in. diam.; flower-bracts ovate, acute, ascending, an inch

long; sepals ovate, acute, just overtopping the bract. Petals lingulate, apparently yellow. Stamens shorter than the petals.

Hab. Costa Rica, alt. 1200 ft., *Lehmann* 1775.

264. *T. UNILATERALIS* Baker in Journ. Bot. 1888, 105.—Leaves about a dozen in a rosette, lorate from an oblong base  $1\frac{1}{2}$ –2 in. broad, above a foot long, an inch broad at the middle, thin, flexible, subglabrous, pale green on both sides. Peduncle rather longer than the leaves; bract-leaves imbricated, adpressed. Spike simple, unilateral, 6–8 in. long; flowers 9–12, erecto-patent; flower-bracts ovate, an inch long. Calyx an inch long. Petals not seen. Capsule-valves  $1\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. broad.

Hab. South Brazil; woods near Santos, *Burchell* 3347! Near *T. Platzmanni*.

265. *T. MACROPODA* Baker.—Leaves densely rosulate, lanceolate from an ovate base 2 in. broad, in all only 8–9 in. long, an inch broad low down, thin in texture, tapering gradually to the point. Peduncle more than twice as long as the leaves; bract-leaves small, remote, adpressed. Inflorescence a simple lax erect spike 3–4 in. long; flowers erecto-patent; flower-bracts suborbicular,  $\frac{1}{3}$  in. long and broad. Calyx  $\frac{3}{4}$  in. long; sepals obtusè. Petals not seen.

Hab. South Brazil, *Sello*!

266. *T. AMETHYSTINA* Baker in Journ. Bot. 1888, 104. *Vriesea amethystina* E. Morren in Belg. Hort. 1884, 330, t. 15, 16 (M.D.).—Leaves 20–30, densely rosulate, lanceolate from an ovate base 2 in. diam.,  $1\frac{1}{2}$  ft. long, an inch broad at the middle, thin, flexible, subglabrous, green on the face, purple all over the back. Peduncle slender, as long as the leaves; bract-leaves small, adpressed, not imbricated. Inflorescence a lax spike 6–8 in. long; flower-bracts ovate, greenish, an inch long. Calyx bright lemon-yellow,  $1\frac{1}{2}$  in. long. Petal-blade yellow, lingulate, an inch long, shorter than the stamens.

Hab. South Brazil. Sent alive by Dr. Glaziou to Prof. Morren in 1881.

267. *T. PLATZMANNI* Baker in Journ. Bot. 1888, 104. *Vriesea Platzmanni* E. Morren in Belg. Hort. 1875, 349, t. 23 (M.D.).—Leaves about a dozen in a rosette, lorate, a foot long, an inch broad, green on the face, tinged with red-brown on the back. Peduncle stiffly erect, more than twice as long as the leaves; bract-leaves small, adpressed, not imbricated. Flowers 8–10 in sublax second spike 4 in. long; flower-bracts ovate, brownish, an inch long,  $\frac{3}{4}$  in. broad. Calyx yellowish,  $1\frac{1}{4}$  in. long; sepals oblong, obtuse. Petal-blade yellow, lingulate,  $\frac{1}{2}$  in. long, shorter than the stamens.

Hab. South Brazil; island on the coast of Parana, *Platzmann*. Introduced into cultivation about 1875.

268. *T. WAWRANEA* Baker in Journ. Bot. 1888, 105. *Vriesea Wawranea* Antoine Brom. 1, t. 1, 2.—Leaves about 30 in a rosette, lorate,  $1\frac{1}{2}$ –2 ft. long,  $2\frac{1}{2}$ –3 in. broad, obtuse, cuspidate. Peduncle shorter than the leaves; bract-leaves small, adpressed, imbricated. Inflorescence a lax simple spike of 8–10 erecto-patent flowers; flower-bracts ovate, acute, dark green,  $1\frac{1}{4}$  in. long. Calyx yellowish-

green, 2 in. long; sepals oblong, acute. Petal-blade oblong-spathulate, yellowish,  $\frac{3}{4}$ –1 in. long. Stamens shorter than the petals.

Hab. Probably Brazil. Described by Antoine from a plant cultivated at Vienna in 1884.

269. T. SELLOANA Baker in Journ. Bot. 1888, 104. — Leaves lorate from an oblong base 2 in. broad,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, deltoid-cuspidate at the tip, thin, flexible, subglabrous. Peduncle  $1\frac{1}{2}$  ft. long; lower bract-leaves with a free lanceolate tip; upper adpressed. Inflorescence a simple lax spike; flowers erecto-patent; flower-bracts oblong,  $1\frac{1}{2}$  in. long, an inch broad. Calyx as long as the bract; sepals oblong, obtuse, much imbricated. Petal-blade lingulate,  $\frac{1}{2}$  in. long.

Hab. South Brazil, *Sello* 192! (Herb. Mus. Brit.).

270. T. WARMINGII Baker in Journ. Bot. 1888, 104. *Vriesea Warmingii* E. Morren in Belg. Hort. 1884, 200, t. 12, 13 (M.D.). — Leaves about 30 in a rosette, lanceolate from an ovate base 3 in. broad, 2 ft. or more long, 2 in. broad at the middle, flexible, subglabrous, green, tinged with purple on the back towards the base, sometimes maculate with anastomosing green lines. Peduncle as long as the leaves; bract-leaves adpressed, imbricated. Spike simple, erect, dense in the upper half, lax in the lower half; flowers 20–30, all erecto-patent; flower-bracts ovate, acute, greenish-white, 2 in. long. Calyx as long as the bract, lemon-yellow; sepals oblong, obtuse. Petal-blade lingulate, pale yellow;  $\frac{1}{2}$  in. long, shorter than the stamens.

Hab. South Brazil. Sent alive by Dr. Glaziou to Prof. Morren in 1880.

271. T. LUBBERSII Baker. *Vriesea Lubbersii* E. Morren (M.D.). — Leaves 12–20, densely rosulate, ensiform from an ovate base 1 in. diam., 6–8 in. long,  $\frac{1}{3}$  in. broad low down, not setaceous at the point, firm in texture, pale glaucous green. Peduncle slender, as long as the leaves. Inflorescence a few-flowered lax simple distichous spike 2–3 in. long; lower flowers patent; flower-bract oblong-lanceolate, greenish-red, nearly an inch long. Calyx a little longer than the bract. Petal-blade lingulate, white,  $\frac{1}{2}$  in. long, shorter than the stamens; claw scaled.

Hab. South Brazil. Described from Prof. Morren's drawing, made Aug., 1882. Sent by Binot to the Brussels Botanic Garden. Leaves like those of a *Platystachys*, but petals scaled at the base.

272. T. PLATYNEMA Griseb. in Gott. Nacht. 1864, 19. *Vriesea platynema* Gaudich. Atlas, Bonite, t. 66. *V. bituminosa* Wawra, Reise Kais. Max. 157, t. 86; Itin. Prin. Cob. 168, t. 38 A. — Leaves lorate from an ovate base 4 in. broad, 2–2 $\frac{1}{2}$  ft. long, 3 in. broad at the middle, thin, flexible, subglabrous, tinged with brown beneath. Peduncle stout, stiffly erect,  $1\frac{1}{2}$ –2 ft. long; bract-leaves small, adpressed, imbricated. Spike simple, distichous, a foot long, 3 in. broad; flowers 20–30, spreading; flower-bracts ovate,  $1\frac{1}{2}$ –2 in. long. Calyx  $\frac{1}{2}$ – $\frac{3}{4}$  in. longer than the bract, very glutinous; sepals obtuse. Petal-blade not seen. Capsule-valves  $1\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. broad.

Hab. Eastern Cuba, *Wright* 1523! Jamaica, *Purdie*! Porto Rico, *Sintenis* 477! 2969! Venezuela, alt. 6000 ft., *Fendler* 2540. Rio Janeiro, *Burchell* 2321! *Gaudichaud*!

273. T. FENESTRALIS Hook. fil. in Bot. Mag. t. 6998. *Vriesea fenestralis* Linden & André Ill. Hort. n. s. t. 215; E. Morren in Belg. Hort. 1884, 65, t. 4, 5 (M.D.).—Leaves 20–30, lorate from an ovate base 3–4 in. broad,  $1\frac{1}{2}$  ft. long, 2 in. broad at the middle, thin, flexible, reflexing, subglabrous, marked all over with fine green cross veins on a greenish-white groundwork. Peduncle as long as the leaves; bract-leaves adpressed, imbricated. Flowers 20–30 in a lax distichous spike a foot long, nearly all spreading horizontally; flower-bracts ovate, green,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long. Calyx glossy green,  $\frac{1}{2}$  in. longer than the bract. Petal-limb obovate, yellowish-white,  $\frac{1}{2}$  in. long. Stamens shorter than the petals.

Hab. Parana. Introduced into cultivation by Linden in 1878. Described from a plant that flowered at Kew in June, 1886.

274. T. JONGHEI K. Koch Wochen, 1868, 91; E. Morren in Belg. Hort. 1874, 291, t. 12, 13 (M.D.); Baker in Bot. Mag. t. 6945. *Encholirion Jonghei* Libon. *Vriesea Jonghei* E. Morren; Antoine Brom. 24, t. 16.—Leaves 30–50, densely rosulate, lorate from an ovate base 3 in. broad,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$  in. broad at the middle, thin, flexible, all reflexing from halfway down, green on the face, tinged with dark violet on the back. Peduncle stiffly erect,  $1\frac{1}{2}$ –2 ft. long; bract-leaves with lanceolate free points. Flowers 12–30 in a distichous spike  $\frac{1}{2}$ –1 ft. long, central patent, lower a little deflexed; flower-bracts ovate, 1– $1\frac{1}{2}$  in. long, green with a brown edge. Calyx greenish,  $1\frac{1}{2}$  in. long; sepals oblong, obtuse. Petal-blade yellowish, obovate,  $\frac{1}{2}$  in. long. Stamens shorter than the petals.

Hab. Central Brazil. Introduced into cultivation by Libon in 1856.

275. T. CORALLINA K. Koch Ind. Sem. Berol. 1873, App. 5. *Encholirion corallinum* Linden Ill. Hort. n. s. t. 70; Floral Mag. n. s. t. 116. *Vriesea corallina* Regel Gartenfl. 1870, 354, t. 671; Antoine Brom. 26, t. 17. —Leaves 20–30, densely rosulate, lorate from an ovate base 3–4 in. broad,  $1\frac{1}{2}$ –3 ft. long, 2– $2\frac{1}{2}$  in. broad at the middle, thin, flexible, subglabrous, green on the face, tinged with purplish-brown on the back. Peduncle stiffly erect, 2 ft. long; bract-leaves small, adpressed, reddish-brown. Flowers 20–50 in a lax distichous spike 1–2 ft. long, many lower deflexed; flower-bracts ovate, bright red, 1– $1\frac{1}{2}$  in. long. Calyx yellow or reddish, 2 in. long. Petal-blade very short, yellowish-green. Stamens not exerted.

Hab. Central Brazil; Minas Geraes, *Regnell* 1799! Introduced into cultivation by Libon in 1875. *Encholirion roseum* Hort., is a slight variety with green leaf-bracts and smaller flower-bracts than in the type. There is an *E. Liboni* Hort., which I have never seen. *Nidularium Eckhautei* Hort., of which the leaves are compared to those of this species, is said by Morren to be a Mexican *Tillandsia*.

276. T. AMAZONICA Baker in Journ. Bot. 1888, 108. —Leaves lorate from an ovate base 3–4 in. diam.,  $1\frac{1}{2}$  ft. long, 3 in. broad at the middle, thin, flexible, subglabrous, pale green on both sides, deltoid at the apex, with a very large cusp. Peduncle stout,

stiffly erect, twice as long as the leaves; lower bract-leaves with large lanceolate erect free points. Spike moderately dense, unilateral, above a foot long; flowers patent or rather deflexed; flower-bracts broad, ovate, an inch long. Calyx an inch long; sepals oblong, obtuse, much imbricated. Petals not seen. Capsule  $1\frac{1}{2}$  in. long.

Hab. Amazon valley, near Para, *Burchell* 9440! Near *T. Jonghei* and *T. Platzmanni*.

277. *T. GUTTATA* Baker in *Journ. Bot.* 1888, 108. *Vriesea guttata* André et Linden in *Ill. Hort.* n. s. t. 200; E. Morren in *Belg. Hort.* 1880, i. t. 1—3.—Leaves lorate from an ovate base 2 in. diam., a foot long,  $1-1\frac{1}{2}$  in. broad at the middle, firm in texture, suberect, copiously decorated with irregular transverse bands of large claret-purple spots. Peduncle much longer than the leaves; bract-leaves small, adpressed. Spike simple, sublux, drooping, above a foot long, 3 in. diam.; flowers all erecto-patent; flower-bracts ovate, acute, reddish-white,  $1\frac{1}{2}$  in. long, an inch broad. Calyx yellow, a little longer than the bract. Petal-blade lingulate, yellow,  $\frac{1}{2}$  in. long, shorter than the stamens.

Hab. South Brazil, *Glaziov* 15474! Introduced into cultivation in 1870, by seed sent from the province of Santa Catherina by M. Gautier. Flowered in 1878 at the Luxembourg, and by Dr. Le Bele at Mans.

278. *T. SCALARIS* Baker in *Journ. Bot.* 1888, 108. *Vriesea scalaris* E. Morren in *Belg. Hort.* 1880, 309, t. 15 (M.D.).—Leaves 12–15 in a rosette, lorate from an ovate base 2 in. broad, a foot long,  $\frac{3}{4}-1$  in. broad at the middle, thin, flexible, subglabrous, green on both sides. Peduncle slender, cernuous, a little longer than the leaves; bract-leaves small, adpressed, not imbricated. Flowers 10–12 in a very lax spike a foot long, with a reddish rachis, spreading horizontally; flower-bracts oblong, acute, bright red,  $1\frac{1}{2}$  in. long. Calyx yellow, an inch longer than the bract. Petal-blade greenish-yellow, lingulate,  $\frac{1}{4}$  in. longer than the calyx. Stamens longer than the petals.

Hab. South Brazil, *Burchell* 3197! Introduced into cultivation by Binot in 1879. Allied to *T. psittacina*, from which it differs by its lax drooping spike.

279. *T. HETERANDRA* André *Enum.* 7. — Radical leaves lanceolate-setaceous, 6–8 in. long, an inch broad at the base, densely argenteo-lepidote. Stem curved, shorter than the leaves; bract-leaves much imbricated, with long setaceous tips. Panicle moderately dense, 6–8 in. long, composed of about 20 dense peduncled 10–12-flowered spikes; branch-bracts ovate, the lower long-pointed; flower-bracts ovate, acute, grey-red, slightly lepidote,  $\frac{1}{3}-\frac{1}{2}$  in. long. Sepals oblong, acute, glabrous, as long as the bracts. Petals white, half as long again as the sepals, scaled at the base. Stamens shorter than the petals.

Hab. Eastern Andes of Columbia; Puente de Quetame, alt. 4500 ft. *André* 1213. Habit of *Platystachys*, but petals scaled at the base. It is regarded by M. André as the type of a distinct section, which he calls *Heterandra*.

280. *T. CHRYSOSTACHYS* Baker in Bot. Mag. t. 6906. *Vriesea chrysostachys* E. Morren in Belg. Hort. 1881, 87; 1882, 335. *V. aurea* and *cryptantha* Hort. (M.D.).—Leaves about 30 in a rosette, lorate from an ovate base 3 in. broad, 1-1½ ft. long, 2 in. broad at the middle, thin, flexible, glabrous, pale green on the face, tinged with purple on the back. Peduncle 1-1½ ft. long; bract-leaves many, small, scarioso, adpressed. Spikes 1-4, dense, distichous, ½-1 ft. long, an inch broad; flower-bracts ovate, acute, bright yellow, an inch long. Calyx shorter than the bract; sepals oblong-lanceolate. Petal-blade short, lingulate, bright yellow. Stamens as long as the petals.

Hab. Andes of Peru, *Davis!* Introduced by Messrs. Veitch about 1880. Described from a plant that flowered at Kew in 1884.

281. *T. RINGENS* Griseb. Cat. Pl. Cub. 255. — Leaves lanceolate from an ovate base 2 in. broad, 1½ ft. long, 1½ in. broad at the middle, thin, flexible, subglabrous, narrowed gradually to the point. Peduncle 1½ ft. long; lower bract-leaves with large lanceolate free points. Inflorescence a lax-flowered forked spike; flowers few, ascending; flower-bracts ovate, acute, 1½-2 in. long. Calyx ½-¾ in. shorter than the bract; sepals acute. Petal-blade lanceolate, as long as the calyx. Stamens as long as the petals.

Hab. Eastern Cuba, near Monte Verde, *Wright* 1518!

282. *T. CHAGRESIANA* Baker in Journ. Bot. 1888, 109. — Leaves lorate from a slightly dilated base, 1½-2 ft. long, above 2 in. broad at the middle, thin, flexible, subglabrous, deltoid at the apex. Peduncle as long as the leaves; bract-leaves adpressed, much imbricated. Panicle a foot long, consisting of about four laxly few-flowered ascending branches with a rather flexuose rachis; flowers 3-4 to a branch, ascending; flower-bracts ovate, acute, 1¼-1½ in. long, an inch broad at the base. Calyx an inch long; sepals acute. Petals not seen. Capsule as long as the calyx.

Hab. Chagres, Panama, *Fendler* 448!

283. *T. STENOSTACHYA* Baker in Journ. Bot. 1888, 109. *T. glutinosa* Griseb. Fl. Brit. West. Ind. 597, non Mart.—Leaves lorate, above 2 ft. long, 2 in. broad at the middle, thin, flexible, subglabrous, deltoid-cuspidate at the apex. Inflorescence a forked spike, the ascending branches of which are 1-1½ ft. long; flowers close, very ascending; flower-bracts oblong, 2 in. long, ¾-1 in. broad. Calyx ½ in. shorter than the bract. Petal-blade oblan- ceolate-oblong, ¾ in. long.

Hab. Trinidad; Maraccas waterfall, *Dr. Crueger!* Collected in 1845.

284. *T. GIGANTEA* Mart.; Roem. et Schultes Syst. vi. 1224. — Leaves lorate, flexible, subglabrous, 1½ ft. long, 3 in. broad, deltoid-cuspidate at the apex. Peduncle with panicle 3 ft. long, the latter a foot broad; branches spreading, 8-10 in. long, laxly 7-8-flowered; flowers secund, subcernuous; flower-bracts ovate, ¾-1 in. long. Calyx under an inch long; sepals obtuse. Capsule 1¼ in. long.

Hab. Forests of the Rio Negro, *Martius.* The name *gigantea*, given to this species fifty years ago, is now quite inappropriate.

285. *T. DISSITIFLORA* Sauvalle Fl. Cub. 168. *T. excelsa* Griseb. Cat. Cub. 254, non Fl. Brit. West. Ind. 597. — Leaves lanceolate, flexible, subglabrous, 5 in. broad low down, narrowed gradually to an acute point. Panicle ample; lower branches peduncled, above a foot long; flowers ascending, contiguous; flower-bracts sub-orbicular, an inch long. Petal-limb oblong,  $\frac{1}{2}$  in. long. Stamens shorter than the petals.

Hab. Cuba, *Wright* 3276!

286. *T. GLUTINOSA* Mart.; Roem. et Schultes Syst. vii. 1225. — Leaves lanceolate from an ovate base 3–4 in. broad,  $1\frac{1}{2}$ –2 ft. long, 2 in. broad at the middle, thin, flexible, subglabrous, narrowed to the point. Peduncle shorter than the leaves; bract-leaves scarious, adpressed. Panicle 1– $1\frac{1}{2}$  ft. long; branches many, lax-flowered, erecto-patent, the lower  $\frac{1}{2}$ –1 ft. long; flowers all erecto-patent; flower-bracts oblong, 1– $1\frac{1}{4}$  in. long. Calyx as long as the bract. Petal-blade lingulate,  $\frac{1}{2}$  in. long, shorter than the stamens. Capsule  $1\frac{1}{2}$  in. long.

Hab. Forests of South Brazil, *Martius*, *Burchell* 4367! *Glaziou* 12225! &c.

287. *T. TEQUENDAMÆ* André Enum. 8.—Radical leaves lanceolate, 18–20 in. long, nearly 3 in. broad at the middle, green, finely lepidote beneath. Peduncle cernuous, a foot long; bract-leaves many, a foot or more long. Panicle dense, very narrow, 8–16 in. long, consisting of 10–12 distichous 7–9-flowered spikes; branch-bracts ovate, the lower long-pointed; flower-bracts ovate, subacute, under an inch long. Sepals oblong, acute, just exceeding the bracts. Petals narrow,  $1\frac{1}{2}$  in. long, green with a blue edge. Capsule half as long again as the calyx.

Hab. Andes of Columbia; rocks of Tequendama, *André* 1355.

288. *T. DEPPEANA* Steud.; Mart. et Gal. Enum. 8. *T. paniculata* Cham. et Schlecht., non Linn. *T. excelsa* var. *latifolia* Griseb. *T. incurvata* Sauvalle.—Leaves lanceolate from an ovate base, 2–3 ft. long, 4–5 in. broad, thin, flexible, subglabrous, narrowed gradually to the point. Panicle ample; lower branches peduncled,  $\frac{1}{2}$ –1 ft. long; flowers contiguous, erecto-patent; flower-bracts oblong,  $1\frac{1}{2}$ –2 in. long. Calyx nearly as long as the bract; sepals obtuse. Petals not seen. Capsule-valves  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad.

Hab. Central Mexico, *Schiede & Deppe* 1008! Venezuela, *Fendler* 1516! Eastern Cuba, alt. 6000 ft., *Wright* 1522! Columbia, *André* 1690.

289. *T. VEITCHII* Baker. *Vriesea Veitchii* E. Morren (M.D.). — Leaves about 30, lorate from an ovate base 3 in. broad, 2 ft. long, 2 in. broad at the middle, flexible, subglabrous, pale green with transverse blotches of darker green. Peduncle 2–3 ft. long; bract-leaves lanceolate, adpressed, imbricated. Panicle of about 3 ascending few-flowered spikes 3–4 in. long; flower-bracts green, oblong-lanceolate, very acute,  $1\frac{1}{2}$ –2 in. long. Calyx about as long as the bract; sepals oblong. Petal-blade oblanceolate, whitish,  $1\frac{1}{2}$  in. long. Stamens a little longer than the petals.

**Hab.** Andes of New Granada. Collected by Wallis for Messrs. Veitch in 1876.

290. *T. ITATIALE* Baker in Journ. Bot. 1888, 110. *Vriesea Itatiaia* Wawra Itin. Prin. Sax. Cob. 169, t. 31 and 34 c.—Leaves 30–40 in a dense rosette, lorate from an ovate base 3–4 in. broad, 1½ ft. long, 2½–3 in. broad at the middle, thin, flexible, subglabrous, rounded at the apex to a small cusp. Peduncle shorter than the leaves; bract-leaves small, scariose, adpressed. Inflorescence a lax panicle 1–1½ ft. long; branches short, ascending; branch-bracts small, ovate; flowers moderately dense, erecto-patent; flower-bracts ovate, brownish, an inch long. Calyx about as long as the bract; sepals much imbricated, obtuse. Petal-blade obovate, small, greenish-white. Stamens shorter than the petals.

**Hab.** Central Brazil; Serra Itatiaia, ascending to 9000 ft., *Glaziou* 11694! Allied to *T. hieroglyphica*, but leaves plain green.

291. *T. HIEROGLYPHICA* Baker in Journ. Bot. 1888, 110. *Vriesea hieroglyphica* E. Morren in Ill. Hort. n. s. t. 514; Belg. Hort. 1885, 57, t. 10–12 (M.D.). *Massangea hieroglyphica* Rev. Hort. 1878, 175. *M. tigrina* Hort. — Leaves 30–40, densely rosulate, lorate from a dilated base 4–5 in. broad, 2½–3 ft. long, 2½–3 in. broad at the middle, thin, flexible, subglabrous, bright green, marked with very conspicuous irregular broad transverse bands of black. Peduncle stout, stiffly erect, as long as the leaves; bract-leaves with large falcate free tips. Inflorescence a lax panicle 2 ft. or more long, with 12–20 closely-flowered erecto-patent branches; branch-bracts small, ovate; flower-bracts ovate, greenish, 1–1¼ in. long. Calyx as long as the bract. Petal-blade short, broad, dull yellow. Stamens shorter than the petals.

**Hab.** South Brazil, *Glaziou* 16468! Introduced into cultivation by Mr. Wm. Bull about 1878. First flowered by M. Lubbers at the Brussels Botanic Garden in 1885.

293. *T. CITRINA* Baker. *Vriesea citrina* E. Morren inedit. — Leaves densely rosulate, stiffly erect, lorate, 7–8 in. long, 1½ in. broad at the middle, green, glabrous, rounded at the tip to a large cusp. Peduncle slender, erect, nearly twice as long as the leaves; bract-leaves small, adpressed. Spikes 1–3, 3–6 in. long, laxly-flowered; flowers erecto-patent or subpatent; flower-bracts sub-orbicular, ½ in. long. Calyx 1–1¼ in. long; sepals obtuse. Petal-blade oblong, pale yellow, ⅓ in. long. Stamens much longer than the petals.

**Hab.** Central Brazil; Serra de Piedade, *Warming* 2176, *Glaziou* 16466! May be a montane variety of *T. Tweediana*.

294. *T. TWEEDIANA* Baker in Journ. Bot. 1888, 138. — Leaves lorate from an ovate base a foot long, 1½ in. broad at the middle, thin, flexible, subglabrous. Peduncle a foot long; bract-leaves adpressed. Inflorescence a small panicle, with several laxly few-flowered spreading and ascending branches; branch-bracts small, ovate; flower-bracts ovate, ½ in. long. Calyx ¾–1 in. long; sepals oblong, obtuse. Petals lingulate, ½ in. long, shorter than the stamens.

Hab. Central and Southern Brazil, *Sello* 70! 1311! *Tweedic* 1342! Glaziou's 16467 differs by having large foliaceous tips to the leaf-bracts, large branch-bracts and larger flowers, and is probably a distinct species.

295. *T. RODIGASIANA* Baker in Journ. Bot. 1888, 128. *Vriesea Rodigasiana* E. Morren in Ill. Hort. n. s. t. 467 (M.D.); Antoine Brom. 16, t. 11.—Leaves about 20, densely rosulate, lorate from an ovate base 2 in. broad, 1–1½ ft. long, an inch broad at the middle, thin, flexible, subglabrous, rounded to a cusp at the tip. Peduncle slender, erect, equalling or exceeding the leaves; bract-leaves small, adpressed. Panicle lax, a foot long, with several spreading laxly 4–5-flowered branches; branch-bracts small, ovate, bright red; flower-bracts ovate-oblong, pale yellow, ½ in. long. Calyx pale yellow, an inch long. Petal-blade lingulate, yellow, ½ in. long, shorter than the stamens.

Hab. South Brazil. Introduced into cultivation by Linden about 1880. I have seen the allied *V. billbergioides* E. Morren inedit., founded on Glaziou 3630.

296. *T. PROCERA* Mart.; Roem. et Schultes Syst. Veg. vii. 1224. *T. gracilis* Griseb. *Vriesea gracilis* Gaudich. Atlas Bonite t. 67.—Leaves 30–40 in a dense rosette, lanceolate from an ovate base 2–3 in. broad, 1½ ft. long, 1½ in. broad at the middle, thin, flexible, subglabrous, narrowed to the point. Peduncle slender, erect, 1½–2 ft. long; bract-leaves small, adpressed. Inflorescence a large lax panicle; lower branches 6–9 in. long, 6–10-flowered; branch-bracts small, ovate; flower-bracts oblong, under an inch long. Calyx green, an inch long. Petal-blade yellow, oblong, ½ in. long. Capsule-valves lanceolate, 1½ in. long.

Hab. Demerara, *Jenman* 3828! Pernambuco, *Ridley & Ramage*! Bahia, *Blanchet* 2995! Rio Janeiro, *Burchell* 2354! *Gaudichaud* 365! Habit of *T. flexuosa*, which it closely resembles when dried.

297. *T. PHILIPPO-COBURGI* Baker in Journ. Bot. 1888, 138. *Vriesea Philippo-Coburgi* Wawra Itin. Prin. Sax. Cob. 165, t. 29 and 37 a.—Leaves about 20 in a rosette, lorate from an ovate base 3 in. broad, 1½–2 ft. long, 2–2½ in. broad at the middle, thin, flexible, subglabrous, brown at the tip and rounded to a small cusp, spotted with purple on the back towards the base. Peduncle shorter than the leaves; upper bract-leaves bright red. Panicle 1½–2 ft. long; branches many, ascending, sometimes a foot long, the lower sometimes forked; branch-bracts bright red, the lowest ovate-lorate, 4–5 in. long; flower-bracts ovate, bright red, ¾–1 in. long. Calyx yellowish, 1–1¼ in. long; sepals oblong-lanceolate. Petals greenish-yellow, half as long again as the calyx, shorter than the stamens.

Hab. South Brazil; forests of Rio Janeiro and St. Paulo, *Wawra & Maly*, Glaziou 8017! 16473! *Mosen* 3248!

298. *T. RETICULATA* Baker in Gard. Chron. 1887, i. 140. *Vriesea reticulata* E. Morren (M.D.).—Leaves 30–40 in a dense rosette, lorate from an ovate base 4–5 in. broad, 1½–2 ft. long, 2½–3 in. broad at the middle, thin, flexible, subglabrous, marked all over with very distinct cross-veins of green on a pale ground. Peduncle stout, stiffly erect, as long as the leaves; bract-leaves ovate, erectopate. Inflorescence a lax panicle 3–4 ft. long, with many ascend-

ing laxly-flowered branches; branch-bracts small, ovate; flower-bracts oblong, acute, green,  $1-1\frac{1}{4}$  in. long. Calyx green; half as long again as the bract. Petal-blade small, white, suborbicular. Stamens as long as the petals.

Hab. South Brazil; Rio Grande do Sul. Described from a plant flowered by Mr. Wm. Bull in March, 1873.

299. T. MORRENI Baker in Journ. Bot. 1888, 139. *Vriesea Morreni* Wawra Itin. Prin. Sax. Cob. 166, t. 30, 37 v. *T. Pastuchoffiana* Hort. ?—Leaves 30 or more in a dense rosette, lorate from an ovate base 3-4 in. broad,  $1\frac{1}{2}$  ft. long,  $2\frac{1}{2}-3$  in. broad at the middle, thin, flexible, subglabrous, rounded to a cusp at the tip, green, transversely banded with brown flexuose lines. Peduncle shorter than the leaves. Panicle rhomboid,  $1\frac{1}{2}-2$  ft. long; branches few, long, erecto-patent; flowers lax, ascending, secund; branch-bracts small, ovate; flower-bracts oblong, brownish an inch long. Calyx half as long again as the bract; petal-blade narrow, greenish-yellow,  $\frac{1}{2}$  in. long. Stamens not longer than the petals. Capsule twice as long as the calyx.

Hab. South Brazil; waterfall of Itamariti, near Petropolis, *Wawra & Maly* ii. 72.

300. T. TESSELLATA Linden & André in Ill. Hort. 1874, 123, t. 179. *Vriesea tessellata* E. Morren in Belg. Hort. 1882, 381, t. 14-16. — Leaves 30-40 in a dense rosette, lorate from an ovate base,  $1\frac{1}{2}-2$  ft. long, 3-4 in. broad at the middle, thin, flexible, subglabrous, marked all over with fine green cross-lines on a pale ground. Peduncle as long as the leaves; bract-leaves with foliaceous spreading tips, also tessellated. Panicle 3-5 ft. long; branches many, ascending, lower a foot long; flowers lax, ascending, secund; flower-bracts oblong,  $1\frac{1}{4}-1\frac{1}{2}$  in. long. Calyx green, 2 in. long. Petal-blade yellowish-white,  $\frac{1}{2}$  in. long. Stamens as long as the petals.

Hab. South Brazil; province of Santa Catherina. Introduced into cultivation by Linden about 1872.

301. T. SANGUIOLENTA Baker. *Vriesea sanguinolenta* Cogn. et March. in Album Dalliere ii. 1874, t. 52; André in Ill. Hort. n. s. t. 200 (M.D.).—Leaves densely rosulate, lorate from an ovate base 4-5 in. broad, 2-3 ft. long, 3 in. broad at the middle, thin, flexible, subglabrous, bright green, with irregular spots of claret-brown. Peduncle as long as the leaves; lower bract-leaves with large lanceolate free points. Spikes about 3, moderately dense, ascending, peduncled, 6-9 in. long; lower flowers patent, subsecund; flower-bracts ovate, green,  $1\frac{1}{2}$  in. long, an inch broad. Calyx green, oblong, 2 in. long. Petal-blade short, broad, whitish, falcate. Stamens shorter than the petals.

Hab. New Granada; Choco. Gathered by Roezl in 1872. Described mainly from Prof. Morren's drawings, made in 1880 and 1885.

302. T. ALTA Baker. *Vriesea alta* E. Morren (M.D.).—Whole plant 8-10 ft. high. Leaves about 20, densely rosulate, lorate, 3 ft. long,  $2\frac{1}{2}-3$  in. broad at the middle, flexible, subglabrous, green on both sides, narrowed to the point. Peduncle stout, erect, twice as long as the leaves; bract-leaves with lanceolate or ovate spreading

tips. Panicle rhomboid, 3 ft. long; branches laxly-flowered, erecto-patent, ascending, the lower  $1\frac{1}{2}$ –2 ft. long, sterile in the lower third; branch-bracts small, ovate; flower-bracts ovate,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long. Calyx green,  $\frac{1}{2}$  in. longer than the bract. Petal-blade lanceolate, whitish, as long as the calyx. Stamens as long as the petals.

Hab. Chiriqui, imported by Van Houtte in 1879. Flowered in 1885. Near *T. regina*.

303. *T. GRANDIS* Schlecht. in Linnæa xvii. 424.—Leaves lorate from a dilated base 3 in. broad,  $1\frac{1}{2}$ –2 ft. long, 2 in. broad at the middle, thin, flexible, deltoid-cuspidate at the apex. Inflorescence an ample panicle; lower branches  $1\frac{1}{2}$  ft. long, the lowest half-foot sterile; flowers  $\frac{1}{2}$ –1 in. apart; flower-bracts ovate-oblong, obtuse,  $1\frac{1}{2}$  ft. long, an inch broad. Calyx just exceeding the bract; sepals oblong, obtuse, above  $\frac{1}{2}$  in. broad. Petals not seen. Capsule oblong, 2 in. long.

Hab. Mexico; Hacienda do la Laguna, Schiede & Deppe (Herb. Mus. Berol.). Nearly allied to *T. regina*. There is a closely allied plant in the Morren drawings, without name or locality, with shorter denser spikes and lanceolate white petals three inches longer than the calyx.

304. *T. REGINA* Vell. Fl. Flum. iii. t. 142. *Vriesea regina* Beer; Wawra Itin. Prin. Sax. Cob. 163, t. 36 a; Gard. Chron. 1875, fig. 41; Antoine Brom. t. 9–10 (M.D.). *V. gigantea* Lemaire in Ill. Hort. t. 516. *V. Glazioviana* Lemaire. *V. geniculata* Wawra Reise Kais. Max. 159, t. 25. *V. imperialis* and *Hillegeeriana* Hort.—Whole plant reaching a height of 8–10 feet. Leaves 30–50, densely rosulate, lorate from an ovate base 6–9 in. broad, 3–4 ft. long, 3–4 in. broad at the middle, narrowed to the point, thin, flexible, subglabrous, pale green with a glaucous bloom. Peduncle overtopping the leaves; bract-leaves crowded, with ovate-lanceolate spreading tips. Panicle deltoid, 4–5 ft. long; branches many, lower 1– $1\frac{1}{2}$  ft. long, spreading or ascending; branch-bracts green, ovate-cuspidate, lower 6–9 in. long; flower-bracts green, ovate, 1– $1\frac{1}{2}$  in. long. Calyx  $1\frac{1}{2}$ –2 in. long; sepals oblong, obtuse. Petal-blade lanceolate, white, reaching a length of 2–3 in. Stamens as long as the petals. Capsule oblong,  $1\frac{1}{2}$ –2 in. long.

Hab. South Brazil; forests of Rio Janeiro and St. Paulo. Collected by Burchell in 1826 and introduced into cultivation by Linden in 1868. This is the giant of the genus. It is the type of Morren's subgenus *Alcantaræa*, named after the Emperor of Brazil, characterised by its long narrow petal-blade and long stamens. *V. gigantea* Lemaire, is a form with shorter deflexed branches than in the type and more crowded flowers. *V. gigantea* Gaudich. Atlas, Bonite t. 70, from Santa Catherina, seems to be a starved variety of the same species with calyx only an inch long. †Another very large species, 9–12 ft. high, with a very ample laxly bipinnate panicle, gathered by Roehl in New Granada in the province of Cauca, is mentioned in Haage and Schmidt's catalogue in 1872, under the name of *T. gigantea*.

305. *T. PANICULATA* Linn. Sp. Plant. 410 (Plum. Ic. t. 237).—Habit of *T. regina*, *alta* and *grandis*. Leaves large, lanceolate, densely rosulate. Panicle very large, with spreading branches and short secund laxly-flowered ascending branchlets; flower-bracts oblong, acute, shorter than the calyx. Calyx 2 in. long; sepals

acute. Petal-blade lanceolate, as long as the calyx. Stamens longer than the petals.

Hab. West Indies. Known only from two figures of Plumier, drawn between 1689 and 1697.

### Subgenus 11. CYATHOPHORA (K. Koch).

306. *T. NIGRESCENS* André Enum. 8.—Radical leaves lanceolate from a dilated base, acute, a foot long, spotted and streaked with violet. Peduncle much longer than the leaves; bract-leaves imbricated, adpressed, the lower striped with violet, the upper tipped and margined with red. Spike oblong, dense, multifarious, 2–3 in. long; bracts ovate, acute, scariose, margined with brownish-red. Calyx brown; tube short; segments oblong. Corolla white.

Hab. Andes of Southern Columbia at Altaques, alt. 4200 ft., André 3327.

307. *T. ? CONANTHA* Baker. *Bonapartea strobilantha* Ruiz et Pav. Fl. Peruv. t. 263. *Misandra strobilantha* Dietr. *Acanthospora conantha* Spreng.—Leaves few, thin, lanceolate, flexible, a foot long, an inch broad at the middle, narrowed to the point. Peduncle  $1\frac{1}{2}$  ft. long; bract-leaves lanceolate, adpressed. Inflorescence a dense subglobose multifarious capitulum 2 in. long; flower-bracts suborbicular,  $\frac{1}{2}$  in. long. Calyx as long as the bract; sepals acute. Petal-blade small, ovate, white. Stamens as long as the petals.

Hab. Peruvian Andes. Known to me only from Ruiz and Pavon's figure and description. It may be *Anoplophytum calothyrsus* Beer, gathered by Poeppig in 1829, at Pampayaco.

308. *T. CAPITATA* Griseb. Cat. Cub. 255.—Leaves about a dozen in a dense rosette, lanceolate-acuminate from an ovate base an inch broad, 5–6 in. long,  $\frac{1}{2}$  in. broad at the middle, subcoriaceous, thinly persistently lepidote on both surfaces. Peduncle shorter than the leaves; bract-leaves crowded, with large free lanceolate recurved tips. Inflorescence a dense oblong multifarious capitulum  $1\frac{1}{2}$  in. long; bracts ovate-acuminate, firm in texture, lepidote, the lower 2–3 in. long. Calyx  $\frac{1}{2}$  in. long; sepals obtuse. Petals not seen. Capsule above an inch long.

Hab. Cuba, Wright 3274!

309. *T. SPHEROCEPHALA* Baker in Journ. Bot. 1888, 141.—Leaves few in a rosette, lanceolate-acuminate from an ovate base an inch broad, half a foot long,  $\frac{1}{2}$  in. broad at the middle, narrowed gradually to a setaceous point, subcoriaceous, thinly lepidote. Peduncle 3–4 in. long; bract-leaves with large lanceolate free points. Inflorescence a globose multifarious capitulum 1 in. diam.; flower-bracts ovate, acuminate, subcoriaceous, the lower 3–4 in. long. Calyx  $\frac{3}{4}$ –1 in. long; sepals acute. Petal-blade oblong,  $\frac{1}{4}$  in. long. Capsule an inch long.

Hab. Andes of Bolivia; Sorata, alt. 9000–10,000 ft., Mandon 1188! Le Paz, alt. 10,000 ft., Rusby 2848!

310. *T. OXYSEPALA* Baker in Journ. Bot. 1888, 141.—Leaves about a dozen in a rosette, lanceolate-acuminate from an ovate base an inch broad, 8–9 in. long,  $\frac{1}{2}$  in. broad at the middle, subcoria-

ceous, thinly lepidote. Peduncle as long as the leaves; bract-leaves with long linear-setaceous free tips. Inflorescence a dense oblong multifarious capitulum 2-3 in. long; flower-bracts ovate-acuminate, subcoriaceous, 2-2½ in. long. Calyx ¾ in. long; sepals acute. Petals not seen.

Hab. Andes of Southern Peru, *Bridges!* Gathered about 1830.

311. *T. CRYPTANTHA* Baker in Journ. Bot. 1888, 142. — Leaves few in a rosette, lanceolate-acuminate from an ovate base an inch broad, 8-9 in. long, ½ in. broad at the middle, coriaceous, finely lepidote. Peduncle much shorter than the leaves; bract-leaves crowded, with long lanceolate free points. Inflorescence a dense globose multifarious capitulum; flower-bracts ovate-acuminate, 4-5 in. long, like the leaves in texture. Calyx above ½ in. long; sepals oblong, acute. Petals not seen. Capsule twice as long as the calyx.

Hab. Mexico; Cuernavaca, *Bourgeau* 1423!

312. *T. LONGIPETALA* Baker in Journ. Bot. 1888, 142.—Leaves short, green above, tinged with red beneath. Inflorescence a lax multifarious spike 3-4 in. long, each flower subtended by a chartaceous red falcate lanceolate bract 3-4 in. long. Calyx an inch long. Petal-blade white, narrow, more than an inch long, shorter than the stamens.

Hab. Andes of Columbia, alt. 3000-4000 ft. Received from Messrs. Sander & Co., of St. Alban's, in March, 1881.

313. *T. GLAZIOVII* E. Morren (M.D.).—Leaves about 20 in a dense rosette, with an ovate base 1-1¼ in. broad, and a reflexing linear-convolute, rigidly-coriaceous blade 2-3 in. long, thinly lepidote. Peduncle 6-8 in. long; bract-leaves crowded, with long subulate reflexing tips. Inflorescence a moderately dense nondistichous spike 3-4 in. long, 2 in. broad; flower-bracts oblong-lanceolate, 1-1¼ in. long. Calyx as long as the bract. Petal-blade ½ in. long.

Hab. South Brazil, *Glaziou* 3627. Described from Professor Morren's drawing.

314. *T. ACORIFOLIA* Griseb. in Gott. Nacht. 1864, 19. — Leaves lanceolate-acuminate from a short ovate base, 2 ft. or more long, under an inch broad, thin in texture, subglabrous. Peduncle with lanceolate bract-leaves. Inflorescence a dense panicle, the spikes about as long as the lanceolate-acuminate bracts; flower-bracts multifarious, roundish, ½ the length of the capsule.

Hab. Mountains of Columbia, alt. 6500 ft., *Fendler* 1771.

315. *T. UTRICULATA* Linn. Sp. Plant. 286 (Sloane Hist. Jam. i. 188) (M.D.). *T. flexuosa* var. *pallida* Lindl. in Bot. Reg. t. 749. *T. Nuttalliana* Schultes fil. *T. Bartrami* Nutt. *T. ramosa* Sweet. *T. Sintenisii* Baker. *Platystachys utriculata* Beer. *P. Ehrenbergii* K. Koch. *Vriesea ramosa* Beer. *Allardtia Potockii* Antoine.—Leaves densely rosulate, ensiform-acuminate from a large ovate base 2-3 in. broad, 1-1½ ft. long, an inch broad low down, tapering gradually to a long point, rigidly coriaceous, thinly lepidote.

Peduncle as long as the leaves; lower bract-leaves with long free points. Panicle lax, 1-1½ ft. long; branches few or many, slender, ascending, the lower often compound, above a foot long; branch-bracts small; flowers spaced out, not distichous, adpressed to the slightly flexuose rachis; flower-bracts ovate or oblong, ½-¾ in. long. Calyx ¾ in. long; sepals oblong, obtuse. Petal-blade lingu- late, white, ½-¾ in. long, shorter than the stamens. Capsule 1½-2 in. long.

Hab. Florida, West Indies, Venezuela and Guiana. It was first noticed in Bauhin's 'Pinax,' in 1623, as "Visci modo arboribus indicis adnascens."

### Subgenus 12. CONOSTACHYS (Griseb.).

316. T. POENULATA Baker. *Vriesea poenulata* E. Morren (M.D.).—Leaves about 30, densely rosulate, linear from a suddenly dilated base ¾ in. diam., 6-8 in. long, ⅓ in. broad low down, tapering to a setaceous point, reflexing from low down, green above, glaucous beneath. Peduncle slender, ½ ft. long; bract-leaves with long setaceous tips. Inflorescence a simple lax non-distichous spike 2 in. long; lower flowers patent; flower-bracts oblong, an inch long, bright red tipped with white. Calyx as long as the bract. Petal-blade short, white, lingu- late, a little shorter than the stamens; claw scaled.

Hab. Country unknown. Described from a drawing of Professor Morren's, made July, 1885. Flowers of *Conostachys*; leaves of *Platystachys*.

317. T. MALZINEI Baker in Bot. Mag. t. 6495. *Vriesea Malzinei* E. Morren in Belg. Hort. 1874, 313, t. 14 (M.D.).—Leaves 15-20 in a dense rosette, lanceolate from an ovate base 3 in. diam., a foot long, 1½ in. broad at the middle, thin, flexible, subglabrous, much tinged with claret-purple, especially on the back. Peduncle as long as the leaves; bract-leaves with small lanceolate free tips. Inflorescence a simple dense multifarious spike 6-8 in. long, an inch broad. Flower-bracts ovate, acute, green and yellow, an inch long. Calyx a little longer than the bract. Petal-blade white, lingu- late, above an inch long, shorter than the stamens.

Hab. Province of Cordova, discovered by M. de Malzine. Introduced into cultivation by MM. Jacob-Makoy & Co., of Liège, in 1872. There is also a variety with bright red flower-bracts.

318. T. MUCRONATA Griseb. in Gott. Nacht. 1864, 20.—Leaves lanceolate from a dilated oblong base 3 in. diam., 2 ft. long, 2 in. broad at the middle, flexible, subglabrous. Peduncle shorter than the leaves; bract-leaves crowded, with large erect lanceolate free tips. Inflorescence a dense oblong multifarious spike 3-4 in. long, 2 in. diam.; flower-bracts broad ovate, much imbricated, 1½-2 in. long. Calyx an inch long; sepals acute. Corolla reaching to the tip of the bract.

Hab. Venezuela; Mountains of Tovar, alt. 6500 ft., Fendler 2159!

319. T. SAUNDERSII K. Koch Ind. Sem. Berol. 1873, App. 6. *Encholirion Saundersii* André in Ill. Hort. n. s. t. 132 (M.D.).—Leaves about 20 in a dense rosette, lorate from a dilated ovate

base 2 in. diam., a foot long,  $1\frac{1}{2}$  in. broad at the middle, very flexible, recurved from below the middle, dull glaucous green on the face, copiously spotted with claret-brown on the back. Peduncle a foot long; upper bract-leaves with small free points. Inflorescence a lax panicle a foot long, with 4-8 lax-flowered short ascending branches; branch-bracts small, ovate; flowers erecto-patent, not distichous; flower-bracts oblong, acute, bright yellow, an inch long. Calyx bright yellow,  $1\frac{1}{2}$  in. long; sepals oblong, obtuse, much imbricated. Petal-blade lingulate, yellow,  $\frac{1}{2}$  in. long, shorter than the stamens.

Hab. Brazil. Imported by Mr. Wilson Saunders about 1870.

320. *T. CAPITULIGERA* Griseb. Cat. Cub. 254.—Leaves lanceolate, 2-3 ft. long, 2 in. broad at the middle, moderately firm in texture, subglabrous on both surfaces. Peduncle  $1\frac{1}{2}$  ft. long; bract-leaves with long erect lanceolate free points. Inflorescence a panicle a foot long, with masses of flowers in globose sessile multifarious clusters, as in *Pironneava*, 1- $1\frac{1}{2}$  in. diam.; lower branch-bracts lanceolate, upper ovate; flower-bracts oblong, acute, an inch long. Calyx  $\frac{3}{4}$  in. long; sepals oblong, obtuse. Petals not seen. Capsule an inch long.

Hab. Cuba, *Wright* 3275! Very different in inflorescence from any other *Tillandsia*.

321. *T. PLEIOSTACHYA* Griseb. in Gott. Nacht. 1864, 19.—Leaves lorate from an ovate base,  $2\frac{1}{2}$ -3 in. broad,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, deltoid-cuspidate at the tip, thin, flexible, subglabrous. Peduncle as long as the leaves; bract-leaves with large lanceolate free points. Inflorescence a panicle  $1\frac{1}{2}$  ft. long, with several short erecto-patent moderately dense non-distichous spikes; flower-bracts ovate, obtuse,  $\frac{3}{4}$  in. long. Calyx an inch long; sepals obtuse. Petals not seen. Capsule-valves an inch long,  $\frac{1}{3}$  in. broad.

Hab. Venezuela; Mountains of Tovar, alt. 7000-8000 ft., *Fendler* 1514!

322. *T. VENTRICOSA* Griseb. in Gott. Nacht. 1864, 19.—Leaves lanceolate from a dilated ovate base above 3 in. broad,  $2\frac{1}{2}$ -3 ft. long, 2- $2\frac{1}{2}$  in. broad at the middle, thin, subglabrous. Peduncle shorter than the leaves. Inflorescence a lax panicle of few dense multifarious spikes, the end one half a foot long,  $1\frac{1}{2}$  in. diam.; branch-bracts large, ovate; flower-bracts ovate, obtuse, an inch long. Calyx  $\frac{3}{4}$  in. long; sepals oblong. Petals greenish-yellow; blade small, oblong. Capsule a little longer than the calyx.

Hab. Venezuela; Mountains of Tovar, alt. 7000 ft., *Fendler* 1517!

323. *T. FASTUOSA* André Enum. 8.—Radical leaves lanceolate, acute, bright green, 20-24 in. long, 3 in. broad at the middle. Peduncle stout, shorter than the leaves; bract-leaves many, imbricated, yellow-brown. Panicle narrow,  $1\frac{1}{2}$  ft. long; rachis bright red; flowers in many dense subglobose subsessile fascicles, 10-15 in each; branch-bracts large, ovate-lanceolate; flower-bracts ovate, about as long as the calyx. Sepals an inch long, yellowish-white,

oblong, acute. Petals white,  $\frac{1}{3}$  in. longer than the calyx, scaled at the base. Stamens shorter than the petals. Capsule yellow.

Hab. Columbian Andes; Fusagasuga, alt. 9000 ft., *André* 1746.

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The following plant, as yet imperfectly known, will probably constitute a new genus of *Tillandsiæ*:—

Stem strong, erect, 4–5 ft. long; bract-leaves soft, glabrous, linear-lanceolate, the lower 3 ft. long. Panicle made up of numerous many-flowered sessile fascicles; flower-bracts oblong, obtuse, scariose, nearly 3 in. long. Sepals linear, acute, membranous, free to the base, 2 in. long. Corolla yellow. Ovary free; style long, filiform.

Hab. South Columbia, between Altaguer and Paramo, *André* 3298.

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