THE AECHMEA/GRAVISIA COMPLEX (BROMELIACEAE)

ROBERT W. READ

Department of Botany, Smithsonian Institution and The Marie Selby Botanical Gardens, 272 Rose Apple Lane, Naples, Florida 33961

HARRY E. LUTHER

Mulford B. Foster Bromeliad Identification Center, The Marie Selby Botanical Gardens, 811 South Palm Avenue, Sarasota, Florida 34236

ABSTRACT. A key, illustrations, emendations, and descriptions of two recently described species are presented for the large *Aechmea* species with yellow-petaled, polystichously flowered, much-branched inflorescences that are used in tropical landscaping. *Aechmea callichroma* Read & Baensch is described as a new member of the group.

Not all taxonomic problems are as simple as they might at first appear. When the senior author first started collecting live specimens of bromeliads in the *Gravisia/Eurycorymbus* complex in the early 1960's, it was obvious that the plants were all vegetatively similar, with very similar scape, scape bracts, primary bracts, floral bracts, and large yellow petals. There seemed to be a direct line of progressive inflorescence modification and congestion between *Aechmea eurycorymbus* (as it was then understood) and *Gravisia aquilega*. Subsequently, Smith (1970) correctly relegated the genus *Gravisia* to the synonymy of *Aechmea* subgenus *Aechmea*. It then seemed a matter of simply distinguishing between species.

As a result of the number of queries received by the Mulford B. Foster Bromeliad Identification Center, and the addition of recently described species plus one newly recognized species, it has become necessary to clarify identifications among the species of this group. Hence, Luther (1990) published drawings and descriptions of the principal species in an attempt to clarify their taxonomy. However, owing to the fact that the illustration of A. mulfordii in Smith and Downs's (1979) monograph is distorted, A. rubens and a previously undescribed species (A. callichroma) have continued to cause confusion. When compared with the type specimen of A. mulfordii (Foster #84), which was squashed and distorted to begin with, it is obvious that the axes of the strobili are exaggerated even more so in the published drawing. This present attempt will certainly not be the last word on the subject; rather it is intended to present a key to the species, present new illustrations drawn mostly from life, and emend the descriptions as treated by Smith and Downs (1979) in order to facilitate the identification of cultivated and allied wild plants. For more complete descriptions and synonymy, see Smith and Downs (1979).

KEY TO SPECIES COMPLEX

- la. Primary bract greatly exceeding the lowermost branch.

 - 2b. Flowers densely fascicled, lacking a distinct axis among the flowers; floral bracts without conspicuous hyaline margins; spikelets fascicled. 2. A. aquilega. FIGURE 2.
- 1b. Primary bract equaling or barely exceeding, to mostly shorter than the lowermost branch.

 - 3b. Flowers throughout the inflorescence with distinct, obvious axes connecting them in an open panicle or dense spikelets.
 - 4a. Flower bracts (including spine-tips) mostly equal to or exceeding sepals. 4. A. rubens. Figures 4 & 5.
 - 4b. Flower bracts (including spine-tips) definitely shorter than the sepals.
 - 5a. Inflorescence or its branches densely flowered; axes between flowers shorter than the ovary.

 - 6b. Primary bract longer than the sterile portion of the rachis supporting the lowermost branch; flower bracts lacking distinct hyaline margins.
 - 7a. Lowermost branches abruptly curved toward the apex of the inflorescence; primary bract reflexed; flower bracts 20–25 mm long, 17–20 mm

wide. 6. A. discordiae. FIGURE 7.

7b. Lowermost branches more or less spreading; primary 15–20 mm long, 5–7 mm wide. . . 7. A. emmerichiae.

1. Aechmea lanjouwii (L. B. Smith) L. B. Smith, Phytologia 19: 281. 1970. FIGURE 1.

Gravisia lanjouwii L. B. Smith, Acta. Bot. Neerl. 5: 93, fig. 3. 1956. Type: SURINAME. On granite flat near Voltzberg, 18 Sep 1933, Lanjouw 874 (U, holotype; Us, isotype).

Flowers in polystichous spikelets.

DISTRIBUTION. Known only from the type collection in Suriname, apparently not yet in cultivation.

2. Aechmea aquilega (Salisbury) Grisebach, Fl. Brit. W. Ind. 592. 1864. FIGURE 2.

Bromelia aquilega Salisbury, Parad. Lond. pl. 40.

Hohenbergia capitata Schultes filius in Roemer & Schultes, Syst. 7(2): 1252. 1830. Type: Brazil. Bahia: Almada, Dec 1818, Martius s.n. (M).

Aechmea capitata (Schultes filius) Baker, Journ. Bot. London 17: 167. 1879.

Aechmea exsudans (Loddiges) Baker, Handb. Bromel. 44. 1889.

Aechmea chrysocoma Baker, Handb. Bromel. 44. 1889. Type: Devansaye s.n. cultivated 1881 (LG). Hohenbergia chrysocoma E. Morren ex Baker, Handb. Bromel. 44. 1889. Name only.

Gravisia aquilega (Salisbury) Mez, in Martius, Fl. Brasil. 3: 300. 1892.

Gravisia exsudans (Loddiges) Mez, in Martius, Fl. Brasil. III. 3: 300. 1892.

Gravisia chrysocoma (Baker) Mez, in Martius, Fl. Brasil. III. 3: 301, t. 65. 1892.

Gravisia capitata (Schultes filius) L. B. Smith, Arq.

Bot. S. Paulo II. 1: 57, pl. 73, fig. 2. 1941. Aechmea aquilega var. chrysocoma (Baker) L. B. Smith, Phytologia 8: 219. 1962.

Aechmea hellae Weber, Feddes Repert., Berlin 97: 111–112. 1986; J. Brom. Soc. 35(6): 265. 1985 nom. nud.

Inflorescence of stipitate clusters of smaller fascicles of flowers, or simply a head of several nearly sessile fascicles of flowers; primary bracts bright red, pink, to dull rose; secondary bracts like the floral bracts and scarcely larger, green or yellow; floral bracts green to bright yellow; sepals yellow, connate ca. 4 mm.

DISTRIBUTION. Terrestrial or sometimes epi-

phytic or saxicolous, sea level to 650 m elev.; Costa Rica, Venezuela, Trinidad, Tobago, Guianas, northeastern Brazil.

DISCUSSION. Hohenbergia capitata Schultes. f. (1830) and Aechmea capitata (Schultes f.) Baker (1879) were treated in synonymy of A. exsudans (Lodd.) Baker (1889) by Baker (1889). Likewise, both names were treated in synonymy of Gravisia exsudans (Lodd.) Mez by Mez (1896). Furthermore, the senior author has observed and photographed plants resembling A. capitata, with the inflorescence forming a dense head of clustered fascicles of flowers, among other obviously A. aquilega and thought nothing of it until noting the distinction in Smith and Downs (1979). When Baker (1889: 44) described A. chrysocoma he said that its "Inflorescence [is] a capitulum composed of about 3 oblong or subglobose dense strobiliform spikes ...," and that it is also "allied to A. exsudans [Baker]," which is treated under A. aguilega by Smith and Downs (1979). We feel obligated to relegate A. capitata to synonymy of A. aquilega along with A. exsudans and numerous other variations (including A. chrysocoma) that have been named over the years for three reasons: 1) A. capitata is known from only the type and one other collection; 2) it is distinguished by characters possibly influenced by environmental conditions among the range of variation expected in A. aquilega, and 3) distinctions applied to A. aquilega and its variety chrysocoma differ from the original description of the latter, which compares favorably with A. capitata.

3. **Aechmea mulfordii** L. B. Smith, Phytologia 19: 281. 1970. FIGURE 3.

Type. Brazil: Bahia; Portoa, on ground in low moist places, ¼ mile from ocean, 10 Jun 1939, Foster 84 (GH, holotype).

Gravisia fosteriana L. B. Smith, Phytologia 8: 218, pl. 1, 2. 1962; not Aechmea fosteriana L. B. Smith, 1941.

Scape erect to 40–70 cm tall; inflorescence erect; primary bracts much longer than the sterile base of the branches, equaling them in small specimens, subchartaceous, tan to orange-red; floral bracts orange to yellow; flowers polystichous, greenish-yellow; petals yellow, 22–23 mm long.

DISTRIBUTION. In sand of dunes near sea level, Pernambuco and Bahia, Brazil.

4. Aechmea rubens (L. B. Smith) L. B. Smith, Phytologia 19: 282. 1970.

FIGURES 4 & 5.

Gravisia rubens L. B. Smith, Phytologia 8: 218, pl. 1, figs. 3, 4. 1962. Type: Jardin Botanique de

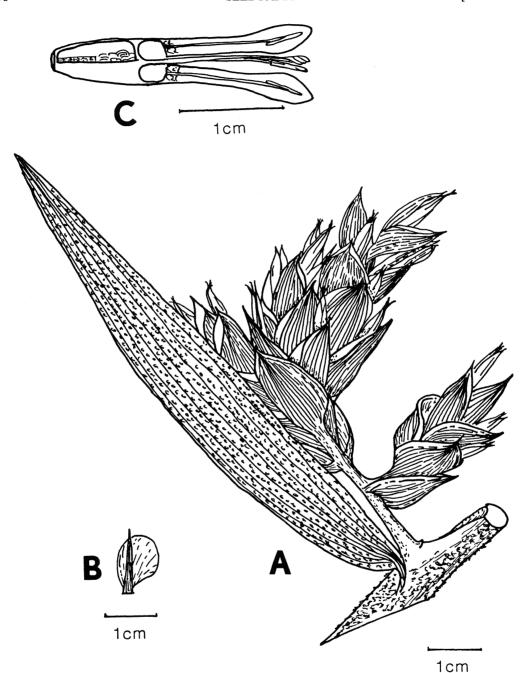


FIGURE 1. Aechmea lanjouwii. A, Lowermost primary branch of the inflorescence with subtending primary bract. B, Sepal. C, Longitudinal section of flower with ovary to the left, epigynous tube (cup) with the style inserted in the base and two petals, with basal appendages, inserted on the rim. Adapted from Smith and Downs (1979: FIGURE 614 I–K).

Montréal 2284-57 (us, holotype) supposedly from Mulford Foster's Brazilian collections.

Leaves 15–20, in an open spreading rosette; sheaths entire; blades ca. 1 m long, apically with

a black splotch and a slight twist, bearing appressed white scales with brown centers; scape erect, 0.5 m long, sparsely pale floccose; inflorescence erect; primary bracts large, elliptic, en-

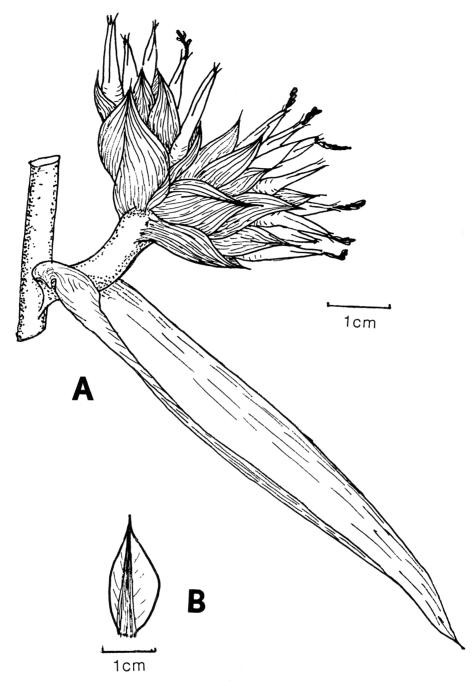


FIGURE 2. Aechmea aquilega. A, Lowermost primary branch of the inflorescence with subtending primary bract. B, Sepal. Drawn from plant #18 cultivated at Tropic Beauty, Nassau, The Bahamas.

tire, subcoriaceous when dry, densely pale-lepidote, usually only slightly longer than the sterile base of the branches; branches to 29 cm long, spreading-ascending, the lowest with the spike-

lets somewhat separated; spikelets (3–)5–10 cm long, becoming more open and cylindrical, the rachis obscure, elongating and becoming exposed with maturity, internodes about equaling to

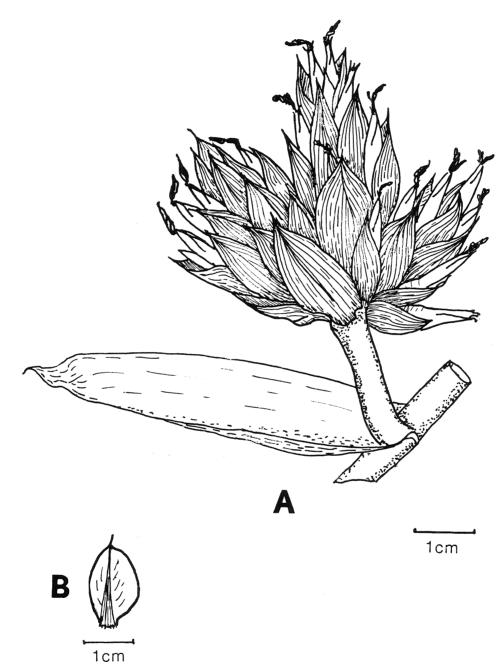


FIGURE 3. Aechmea mulfordii. A, Lowermost primary branch of the inflorescence with subtending primary bract. **B**, Sepal. Drawn from cultivated material.

shorter than the ovary; floral bracts attenuate to a slender spine, very nearly equaling to exceeding the sepals, slightly decurrent and clasping the rachis, yellow at first, becoming bright red postanthesis, subchartaceous, strongly nerved except for the narrow hyaline margins, especially on drying, glabrous, but becoming reddish with age; flowers polystichous, erect against the flattened rachis; sepals yellow at first, becoming rosy in age, connate ca. 1 mm; petals ca. 23 mm long, yellow, obtuse, bearing 2 infundibuliform, irregularly toothed appendages at the base; stamens

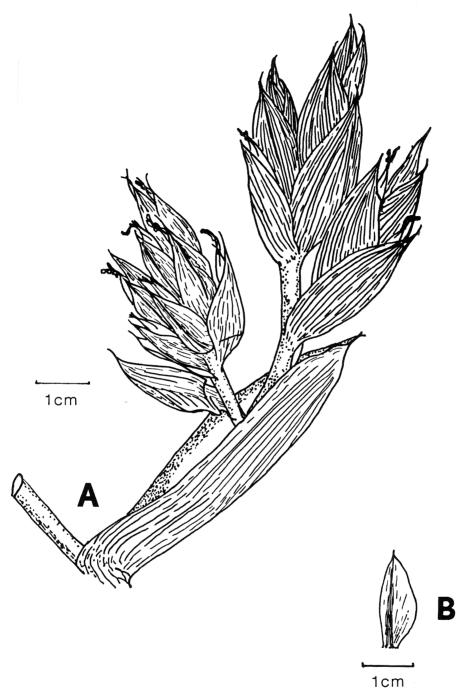


FIGURE 4. Aechmea rubens. A, Early stage; lowermost primary branch of the inflorescence with subtending primary bract. B, Sepal. Drawn from plant #19 cultivated at Tropic Beauty, Nassau, The Bahamas.

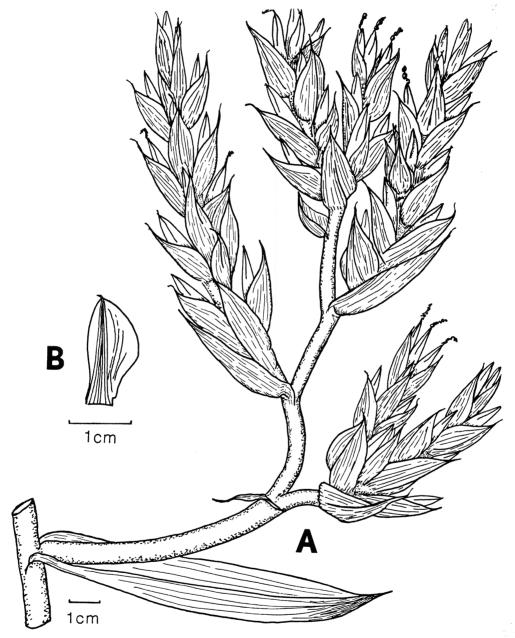


FIGURE 5. Aechmea rubens. A, Later stage of development; lowermost primary branch of the inflorescence with subtending primary bract. B, Sepal. Drawn from plant #A16 cultivated at Tropic Beauty, Nassau, The Bahamas.

included; filaments alternate series highly adnate to the petals; ovary 6–7 mm long, glabrous; epigynous tube 2.5 mm high; placentae throughout the length of the carple; ovules short caudate.

DISTRIBUTION. Known only from the type collection, and cultivation.

5. Aechmea callichroma R. W. Read & U. B. Baensch, sp. nov. FIGURE 6.

Aechmeae mulfordii affinis, sed floribus in spiculis distinctis axes elongatos possidentibus et bracteis floralibus marginibus hyalinis distinctis provisis distinguenda.

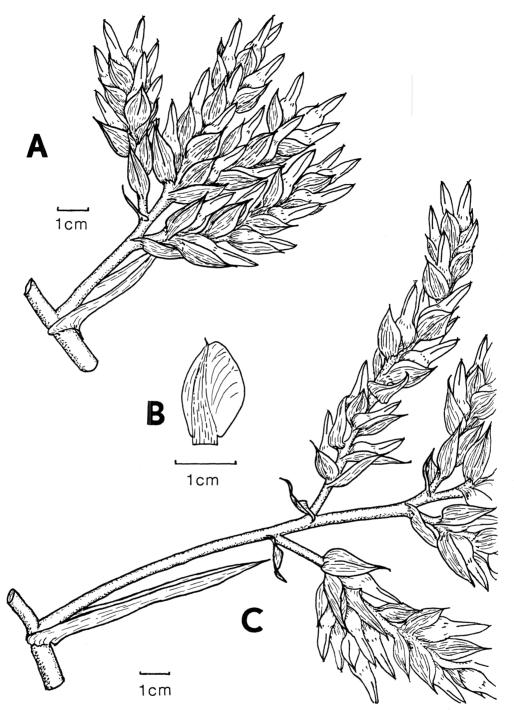


FIGURE 6. Aechmea callichroma. A, Early stage; lowermost primary branch of the inflorescence with subtending primary bract. B, Sepal. C, Later stage of development; lowermost primary branch and subtending primary bract. Note that primary bracts in A & C equal to barely exceed sterile portion of branch. Drawn from type collection Read #90–20 cultivated at Tropic Beauty, Nassau, The Bahamas.

Type. Cultivated: The Bahamas: Nassau, Tropic Beauty, by Ulrich Baensch, flowered July 1990, R. W. Read #90-20 (SEL, holotype; US, HB, RB, isotypes).

Plant flowering over 1 m tall; leaves ca. 14, ca. 1 m long, spreading basally but at maturity closing the reservoir forming a bottlelike rosette; sheath distinct, entire, broader than the blade, ca. 10 cm wide by 15-20 cm long, densely brownlepidote adaxially, purplish but gray-lepidote abaxially; blades strap-shaped, arcuate, channeled, ca. 1 m long, 5-6.5 cm wide, subdensely serrate with dark sharp teeth, yellow-green to purplish and obscurely lepidote adaxially, graylepidote abaxially, apex rounded and strongly mucronate with a dark spine 5-10 mm long; scape stout, ca. 50 cm long, 15 mm diam., soon glabrous, bright red at anthesis, lasting until fruiting; scape-bracts red at first, clasping, imbricate, ca. 13 cm long, elliptic, entire, not entirely obscuring the scape, tan and papyraceus when dry, lightly pale lepidote, especially abaxially; inflorescence tripinnate, ca. 50 cm long, laxly branched; axes soon glabrous; primary bracts red, like the scape bracts, much longer than broad, nearly equaling to shorter than the sterile portion of the lowermost branches; branches elongate, spreading-ascending, 10-25 cm long, the lowest with the spikelets somewhat separated; spikelets polystichously, densely flowered along an elongate axis, 7–12 cm long; floral bracts bright yellow, ovate, mucronate with a 2 mm long mucro, clasping the rachis below the flower, 17-20 mm long, 12-14 mm wide, exceeding the ovary, not equaling the sepals, subchartaceous, strongly nerved, broadly convex, carinate for most of their length, glabrous; sepals yellow, 14-16 mm long, plus 1 mm long mucro, asymmetric with a large semielliptic wing, connate 2 mm, 2 posterior sepals carinate and decurrent onto ovary, anterior sepal ecarinate, glabrous; petals yellow, ca. 25 mm long, with 2 irregularly dentate margined infundibuliform appendages at the base, and 2 parallel fleshy ridges or folds clasping the adnate portion of the stamen-filament; stamens included, ca. 21 mm long, filaments alternately adnate to the petals ca. 15 mm, anthers ca. 9 mm long, dorsafixed near the middle, pollen grains globose; ovary bicarinate, at first green becoming yellow then purplish-black at maturity, glabrous, 6 mm long; epigynous tube ca. 2 mm high; placentae full length of central axis; ovules caudate.

DISTRIBUTION. Probably Eastern coastal Brazil, but known only from cultivation.

ETYMOLOGY. Named "beautifully colored" in reference to the entire plant with its green or purplish leaves suffused with silver-gray scales

and the inflorescence of bright red axes, and yellow floral bracts and sepals.

CULTIVATION. This species has been in cultivation for some time, but because of the considerable taxonomic confusion within this group, it has remained unrecognized as distinct. It has often been confused with Aechmea mulfordii as a result of a slightly distorted published illustration. The illustration of A. mulfordii published in the monograph by Smith and Downs (1979) exaggerates the elongation of the rachis, and does not illustrate the fact that the spikes are strongly digitately congested into fascicles of very much foreshortened spikes. Furthermore, in A. mulfordii the primary bracts equal or are only slightly shorter than the branches, while in the present species, the primary bracts only equal the sterile portion of the lower branches, and the spikelets are not fascicled.

6. **Aechmea discordiae** Leme, Bradea 4(33): 255–256, Fig. 1. 1986. FIGURE 7.

Type. Brazil: Bahia; Ubaitaba-Maraú, vicinity of Maraú. Plants terrestrial, full exposure to sun, in small grouped populations, in herbaceous restinga vegetation. 24/1/1986, Elton M. C. Leme 822, Roberto Menescal e Renato Bello (HB, holotype; RB, isotype).

Plant terrestrial, flowering ca. 90 cm tall; leaves ca. 30, suberect, strap-shaped, forming a funnelshaped vase; sheath broadly elliptic-obovate, ca. 18 cm long, 13 cm wide, very densely brownishlepidote on both sides especially toward the base; blade narrowing gradually toward the apex, ca. 33 cm long, width 7 cm at widest, inconspicuously but subdensely white-lepidote on both surfaces, yellow-green, margins subdensely serrate, teeth brownish, 1-3 mm long, apically subrounded, apiculate; scape erect, rigid, rosy, sparsely white-lanate, ca. 60 cm long, in life 8 mm in diameter; scape bracts sublinear, margins entire, apex broadly acute, apiculate, inconspicuously pale, brownish-lepidote on both surfaces, especially apically, imbricate and longer than the internodes, scape obscured; inflorescence subdensely tripinnate, subcylindric to subpyramidal, 20-25 cm long, distinctly higher than the foliage: primary bracts like the scape bracts but smaller, reddish, equaling to scarcely exceeding the lower branches, shorter than the upper branches, reflexed, margins involute; branches erect to suberect, ca. 12, 5-9 cm long; spikelets erect to suberect, densely to subdensely arranged, stalked; stalks 7-20 mm long, subcomplanate, ca. 5 mm in diameter, rosy and lightly whitelanate; secondary bracts broadly elliptic, apically

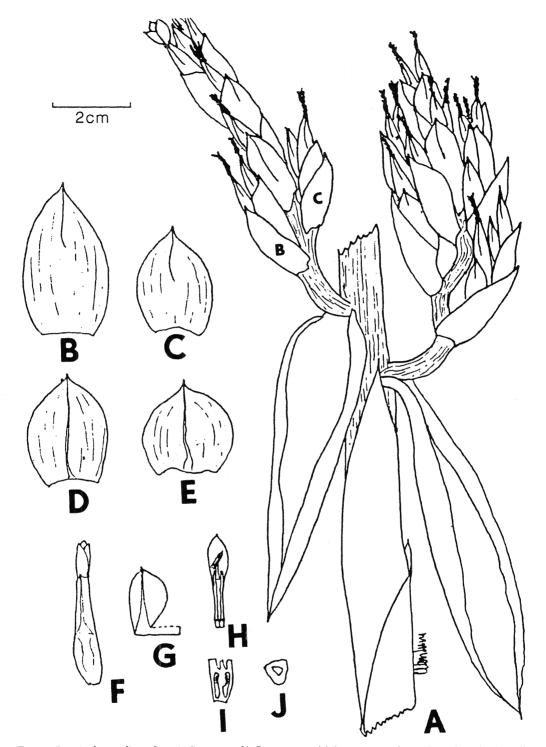


FIGURE 7. Aechmea discordiae. A, Segment of inflorescence with lowermost primary branch and subtending bract to the right. **B** & C, Secondary bracts. **D** & E, Floral bracts. **F**, Flower. **G**, Sepal. **H**, Petal (showing basal appendages, longitudinal callosities clasping long-adnate stamen filament). **I**, Ovary, longitudinal section. **J**, Ovary, transverse section. From original publication of the species by E. M. C. Leme, Bradea 4(33): FIGURE 1. 1986.

broadly acute and apiculate, entire reddish, apically carinate, nerved, equaling the middle of the spikelet, glabrous; spikelets subcylindrical to slightly complanate, sparingly and subdensely flowered, 3-6 cm long, 10-15 mm in diameter, shortly stalked; floral bracts elliptic to suborbiculate, 20–25 mm long, 17–22 mm wide, entire, apically broadly acute, apiculate, nerved, carinate, reddish except for paler margins, to ²/₃ the height of the sepal, glabrous; flowers erect, sessile, ca. 35 mm long; sepals obovate, very asymmetric, apically broadly acute and apiculate, obtusely carinate, ca. 15 mm long by ca. 9 mm wide, connate at base ca. 2 mm, rose to yellowish, glabrous; petals spathulate apically acute and minutely apiculate, 22 mm long, free, yellowish, basally with a pair of fimbriate appendages 3 mm long, and with a pair of longitudinal callosities 14 mm long, parallel with and clasping the stamen filament; stamens included; filaments alternate series high adnate to the petal; anther linear, 4 mm long, dorsafixed near the middle; ovary elliptic, subtrigonous, 10 mm long, 6 mm in diameter, green, glabrous; epigynous tube 2 mm high; placentae apical; ovules caudate.

DISTRIBUTION. Known from the type collection only.

ETYMOLOGY. The specific epithet derives from an argument that arose among the collectors regarding the identity of the freshly collected specimen.

7. **Aechmea emmerichiae** Leme, Bradea 4(39): 309–310, Fig. 1. 1987. FIGURE 8.

Type. Brazil: Bahia; Seabra. Flowered in cultivation, September 1986, *Alvim Seidel 1048* (HB, holotype).

Plant flowering ca. 12 dm tall; leaves ca. 18, suberect, in an open spreading, vase-like, funnelform rosette, ca. 8 dm long; sheath ca. 11 cm wide, adaxially brownish to purplish, abaxially brownish toward the base, densely brownish-lepidote on both surfaces; blade sublinear, ca. 6.2 dm long, at its broadest 6 cm wide, basally slightly narrowed, inconspicuously densely white-lepidote on both surfaces, greenish, margins subdensely serrate, with brownish teeth 2–3 mm long; apically subrounded and clearly apiculate; scape erect, rigid, at first sublanate, scales whitish, long fimbriate, at length glabrous, 8 mm in diameter, ca. 80 cm long; scape bracts sublinear, ca. 12 cm long, ca. 3 cm wide, apically remotely serrulate, acutely apiculate, glabrous within except apically where lepidote, outwardly sparsely white-lepidote, erect, imbricate and scape always obscured, longer than internodes; inflorescence laxly bipin-

nate to centrally tripinnate, ca. 30 cm long, ca. 7 cm in diameter, exceeding the foliage; primary bracts linear-lanceolate, apically acute, 3-10 cm long, exceeding the lowermost branches but shorter than the upper branches, tan to rose colored, entire, reflexed, subglabrous within, outwardly white-lepidote, scales subentire to fimbriate; branches ca. 10, suberect, shortly stalked, stalk subcomplanate 5-30 mm long, spikelets densely flowered, slightly elongate, 5-8 cm long, 2-2.5 cm in diameter, shortly stalked, stalk subcomplanate 5-30 mm long; floral bracts oblongovate, attenuate and conspicuously apiculate, dull vellow tinged with rose, nerved, 15-20 mm long, 5-7 mm wide, sometimes apically slightly carinate, margins entire and narrowly hyaline, equaling to shortly exceeding the ovary, sparsely white-lepidote on both surfaces, scales fimbriate; flowers suberect, 35-40 mm long, polystichous, shortly pedicellate, pedicels 1-2.5 mm long; sepals very asymmetric, ecarinate, connate 2 mm, glabrous, yellowish tinged rose, ca. 20 mm long, width 12 mm at widest, apex apiculate, mucro rigid, 1.5 mm long; petals suberect, free, pale yellow, ca. 30 mm long, width 6 mm at widest, apex acute and minutely apiculate, a pair of 3 mm long subovate, subentire appendages at the base, and a pair of longitudinal callosities 20 mm long paralleling and clasping the stamen filament; stamens included; filaments alternate series high adnate to petals; anthers linear, 7 mm long, obtuse basally, apically mucronulate, dorsafixed near the middle; ovary terete, broadly elliptic, ca. 10 mm long; 7-9 mm in diam, glabrous; epigynous tube ca. 2 mm high; placentae apical; ovules caudate.

DISTRIBUTION. Known from the type collection and cultivation.

ETYMOLOGY. Named for Margarete Emmerich, Director of the Herbarium Bradeanum, and editor of Bradea.

8. Aechmea eurycorymbus Harms, Notzbl. Bot. Gart. Berlin 12: 528. 1935. FIGURE 9.

Type. Brazil: Pernambuco, Negra east of Serra Floresta; Mar 1932, *Werdermann 2931* (B, holotype; photo B1192/32).

Leaves 20–30, in an open funnel-form rosette; blades ca. 80 cm long, 5–7 cm wide at base; scape ca. 40 cm long, glabrate; scape bracts densely imbricate, entire, green, pale punctate lepidote, subcoriaceous; inflorescence erect, 50–70 cm long, rachis angled; primary bracts longer than the sterile base of the branches, 0.3–18 cm long, tan to orange; branches spreading; spikelets laxly 3–10 flowered; rachis orange; floral bracts not at

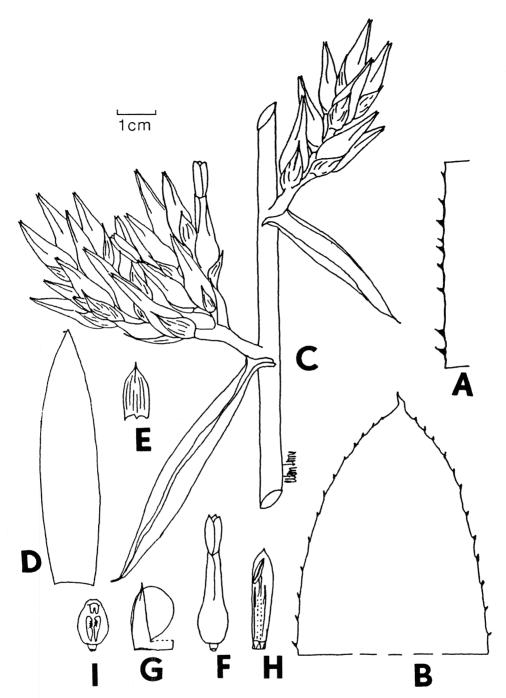


FIGURE 8. Aechmea emmerichiae. A, Leaf margin. B, Leaf apex. C, Segment of the inflorescence with lowermost primary branch and subtending primary bract to the left. D, Primary bract. E, Floral bract. F, Flower. G, Sepal. H, Petal (showing basal appendages, longitudinal callosities clasping long-adnate stamen filament). I, Longitudinal section of ovary. From original publication of the species by E. M. C. Leme, Bradea 4(39): FIGURE 1. 1987.

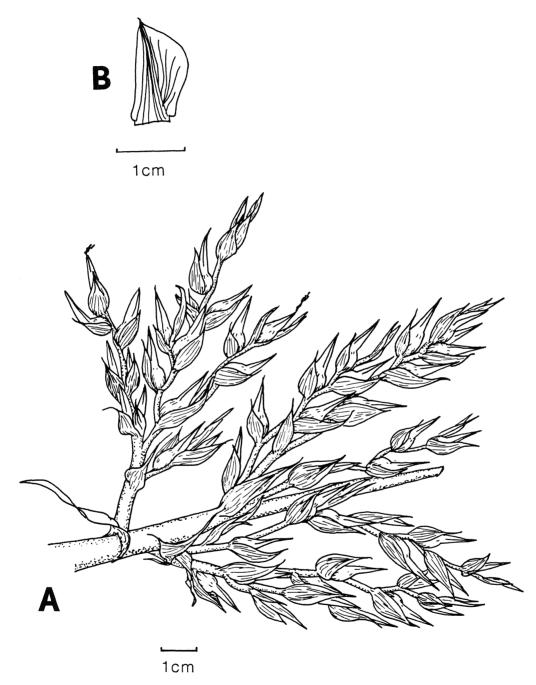


FIGURE 9. Achmea eurycorymbus. A, Segment of the inflorescence. B, Sepal. Drawn from material cultivated at Tropic Beauty, Nassau, The Bahamas.

all obscuring the rachis or flowers; flowers subsessile, orange to golden yellow; sepals free or connate ca. 0.5 mm; petals orange to yellow; filaments alternate series highly adnate to the petals; ovary flattened adaxially.

DISTRIBUTION. Terrestrial and epiphytic, 300–525 m elev., northeastern Brazil.

DISCUSSION. There are two very different plants in cultivation that may be identified as Aechmea

eurycorymbus. One, however, commonly cultivated, develops very large rosy fruits on short stubby pedicels and has rather elongate axes, scarcely fitting the description of "spikelets minute." There is some suspicion that Mulford Foster may have hybridised A. eurycorymbus with Portea petropolitana; also it is believed he made crosses with A. blanchetiana. The large-fruited form with elongate open spikes has been in cultivation for more than thirty years under the erroneous name of A. blanchetiana, but should be treated tentatively as × Portemea.

ACKNOWLEDGMENTS

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