

MISCELLANEOUS NEW SPECIES OF BRAZILIAN BROMELIACEAE

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ABSTRACT. Ten new species of Brazilian Bromeliaceae are described: *Encholirium longiflorum*, *Pepinia cristalinensis*, *Vriesea amadoi*, *Aechmea ramusculosa*, *Cryptanthus delicatus*, *Neoregelia sanguinea*, *Nidularium fradensis*, *Nidularium kautskyianum*, *Orthophytum hatschbachii*, and *Wittrockia echinata*.

Subfam. Pitcairnioideae Harms

Encholirium longiflorum Leme sp. nov.

FIGURE 1.

TYPE. Brazil: Minas Gerais State, Serra Azul; December 5, 1984, *Teixeira & Carvalho 380* (MBM, holotype; HB, isotype).

A. E. vogelii Rauh et *E. luxor* L.B.Smith & R.W.Read, quibus affinis, bracteis floriferis minutis, pedicellis 25–35 mm longis, petalis valde longioribus differt.

PLANT known only from fragments; **LEAVES** spinose (Teixeira & Carvalho !). **INFLORESCENCE** simple, at least 30 cm long, ca. 10 cm in diameter, laxly flowered, glabrous; **FLORAL BRACTS** ovate, 4 × 2 mm, apex acute, remotely denticulate, nervate, apex slightly recurved, glabrous. **FLOWERS** suberect to subspreading, ca. 55 mm long (including the petals and pedicels), pedicels 25–35 mm long, 1.5–2 mm in diameter, slender, terete, slightly curved, glabrous; **SEPAL**s asymmetric, ovate, obtuse to emarginate and remotely apiculate, ecarinate, 13–14 × 8–10 mm, glabrous, nervate, green (Teixeira & Carvalho !); **PETALS** narrowly obovate, obtuse, free, 24 × 12 mm, suberect-recurved at anthesis, greenish-white (Teixeira & Carvalho !), glabrous; **STAMENS** included; **FILAMENTS** complanate, the epipetalous basally adnate to the petals for ca. 2 mm; **ANTHERS** ca. 7 mm long, dorsifixed near the base; **PISTIL** ca. 25 mm long, style elongated; **STIGMA** conduplicate, slightly spiral, blades erect, ca. 3 mm long; **OVARY** subpyramidate, ca. 8 mm long.

Despite its fragmentary condition, this new species may be easily distinguished from *E. vogelii* and *E. luxor* by its smaller floral bracts, 25–35 mm long pedicels, and its distinctly longer petals. The name is a reference to its exceedingly long flowers.

Pepinia cristalinensis Leme sp. nov. FIGURE 2.

TYPE. Brazil: Goiás State, Cristalina, Salto do Arrojado; November 10, 1990, *G. & M.*

Hatschbach 53769 & V. Nicolack (MBM, holotype).

A. P. platypetala (Mez) Varadarajan & Gilmartin, cui affinis, inflorescentia pallide lanata, foliis integerrimis, floribus plurimis, pedicellis brevioribus, bracteis floriferis planis, sepalis anguste lanceolatis differt.

PLANT terrestrial in wet sandy soil, flowering ca. 90 cm tall; **LEAVES** fasciculate, monomorphic, suberect, rigid toward base, entire, persistent; **LEAF-SHEATHS** subovate, 5 × 3.5 cm, castaneous toward base, very densely brown-lepidote abaxially, glabrous adaxially, strongly nerved; **LEAF-BLADES** very narrowly linear-attenuate, canaliculate, not narrowed at base, apex long-caudate, 90 × 1 cm, distinctly nervate, pale-lepidote abaxially, glabrous adaxially; **SCAPE** ca. 50 cm long, ca. 1 cm in diameter, lanate but soon glabrous; **SCAPE BRACTS** the basal ones foliaceous, the upper ones narrowly triangulate, acuminate-caudate, slightly longer than the internodes, densely lepidote abaxially, entire. **INFLORESCENCE** racemose, simple, erect, ca. 30 cm long, ca. 8 cm in diameter, pale-lanate at anthesis with exception of the petals; **FLORAL BRACTS** narrowly triangulate, acuminate, apex slightly curved, 15–30 × 4–7 mm, entire, membranaceous, flat, about equaling to slightly surpassing the ovary. **FLOWERS** ca. 50 in number, subdensely to densely arranged, ca. 70 mm long, suberect, pedicellate, pedicels 5–7 mm long, ca. 2 mm in diameter; **SEPAL**s narrowly lanceolate, acuminate, 25–27 × 7 mm, reddish (Hatschbach !); **PETALS** narrowly liguliform, obtuse, 58 × 1 mm, curved and forming an apparently zygomorphic corolla, yellow (Hatschbach !), bearing a single, subobtusate, 6 × 3 mm appendage at base; **STAMENS** about equaling the petals; **ANTHERS** linear, ca. 7 mm long, fixed near the base; **STIGMA** conduplicate in tight spiral, margins slightly crenulate; **OVARY** subpyramidate, ca. 1/3 superior; **OVULES** many, obtuse; **SEEDS** alate.

This new *Pepinia* is very similar to *P. latypetala*, differing by its entire and monomorphic

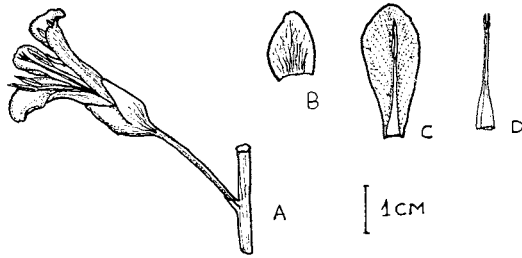


FIGURE 1. *Encholirium longiflorum* Leme. A) flower; B) sepal; C) petal and stamen; D) pistil.

leaves, many-flowered and pale lanate inflorescence, longer pedicels, flat floral bracts, and the narrowly lanceolate sepals. The name refers to the type locality.

Subfam. Tillandsioideae Harms

Vriesea amadoi Leme sp. nov. FIGURE 3.

TYPE. Brazil: Espírito Santo State, locality of Pancas; November 1993, *P. Nahoum* & *E. Amado s.n.* (HB, holotype).

A. V. unilateralis (Baker) Mez, cui affinis, foliis coriaceis, bracteis floriferis obtusis minoribusque, floribus brevioribus, petalis anguste obovatis differt.

PLANT lithophytic, lacking rhizomes, flowering ca. 40 cm tall; **LEAVES** ca. 15 in number, densely rosulate, coriaceous; **LEAF SHEATHS** broadly elliptic, 10×7 cm, dark castaneous toward base, densely brown-lepidote on both sides; **LEAF BLADES** ligulate, not narrowed at base, suberect to spreading, 10×3.5 cm, apex acute to subrounded, apiculate and recurved, glabrous, green. **SCAPE** suberect, ca. 20 cm long, ca. 0.5 cm in diameter, green, glabrous; **SCAPE BRACTS** erect, ovate-lanceolate, the lowest with acuminate recurved apex, the upper with acute apex, about equaling the internodes. **INFLORESCENCE** simple, suberect, sublinear, 14×1.5 – 2 cm, distichously 25-flowered; **RACHIS** 3–4 mm in diameter, geniculate, angled, green, glabrous; **FLORAL BRACTS** broadly ovate, obtuse, 15×12 mm long, glabrous, ecarinate or the upper obtusely carinate near the apex, slightly nerved when dry, green but soon drying toward apex, with short decurrent auricles at base, about equaling $\frac{1}{2}$ of the sepals and not completely enfolding them, secund with the flowers. **FLOWERS** ca. 30 mm long, anthesis nocturnal, fragrant, densely arranged and secund at anthesis, with a 4mm long stout pedicel; **SEPALS** subelliptic, emarginate, 16×9 mm, green with yellowish or castaneous margins, white-lepidote inside, ecarinate, thick at base; **PETALS** narrowly

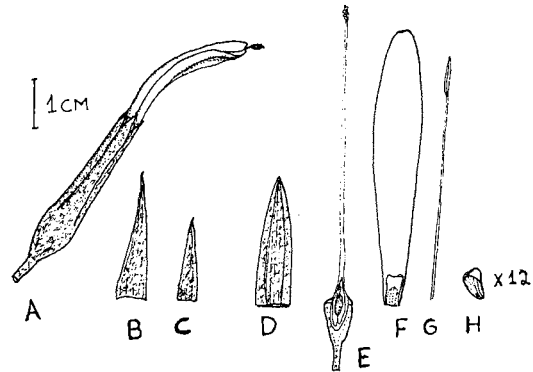


FIGURE 2. *Pepinia cristalinensis* Leme. A) flower; B & C) floral bracts; D) sepal; E) pistil and longitudinal cross-section of ovary; F) petal; G) stamen; H) immature seed.

obovate, apex emarginate, subspreading at anthesis, 24×10 mm, greenish-white, bearing at base 2 acuminate 10×2.5 mm appendages adnate to the petals for ca. 5 mm; **STAMENS** included; **FILAMENTS** flexed about $\frac{1}{2}$ of its length; **ANTHERS** ca. 4 mm long, dorsifixed near the base, base sagittate, apex recurved; **STIGMA** cupulate, lacerate, green.

This new *Vriesea* can be related to *V. unilateralis*, differing by its coriaceous leaves, smaller and obtuse floral bracts, smaller flowers, and narrowly obovate petals. The specific name honors the biologist, Eduardo Amado, who collected the type specimen and has added several new collections of Brazilian bromeliad species.

Subfam. Bromelioideae Reichenbach

Aechmea ramusculosa Leme sp. nov. FIGURE 4.

TYPE. Brazil: Bahia State, Nova Viçosa, locality of Copuva; terrestrial in sandy coastal plain vegetation, 5–10 m, December 9, 1984, *G. Hatschbach* 48762 & *J. M. Silva* (MBM, holotype).

A. A. werdermannii Harms, cui affinis, inflorescentia apicem versus solum bipinnata, bracteis primariis supernis linear-lanceolatis altitudinem ramorum superantibus, bracteis floriferis altitudinem ovariorum aequantibus, sepalis minoribus differt; a *A. rubrolilacina* Leme, cui valde affinis, ramis longioribus, bracteis floriferis ovato-triangularibus, floribus minoribus, sessilibus differt.

PLANT terrestrial, probably flowering about 1 m tall. **LEAF SHEATHS** broadly elliptic, 22×12 cm, dense brown-lepidote on both sides; **LEAF BLADES** linear, apex acute and distinctly apiculate, slightly narrowed toward base, $70 \times$

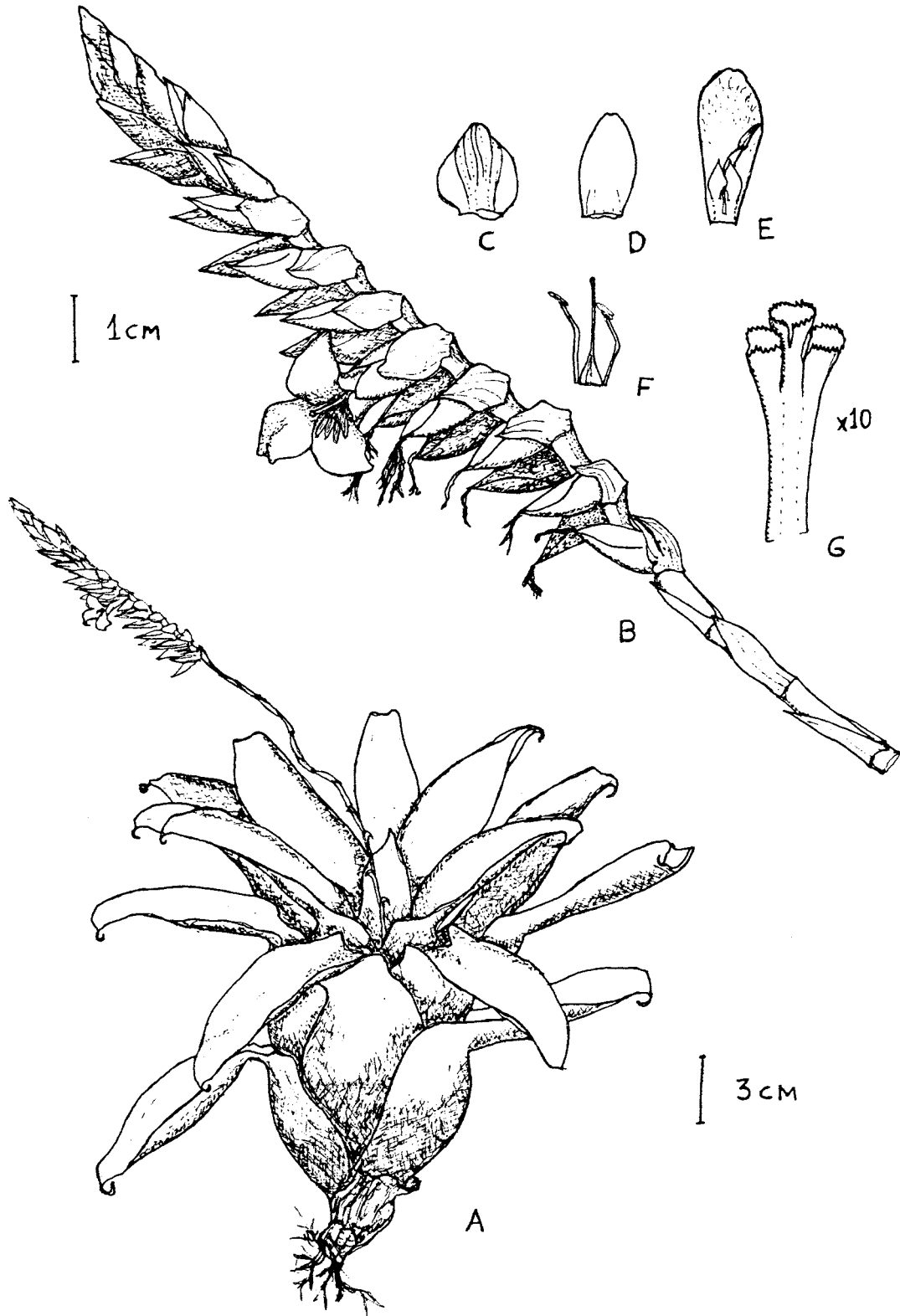




FIGURE 4. *Aechmea ramusculosa* Leme. A) leaf apex; B) mediam segment of inflorescence; C) floral bract; D) flower; E) sepal; F) petal.

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FIGURE 3. *Vriesea amadoi* Leme. A) habit; B) inflorescence; C) floral bract; D) sepal; E) petal and stamen; F) stamen and pistil; G) stigma.

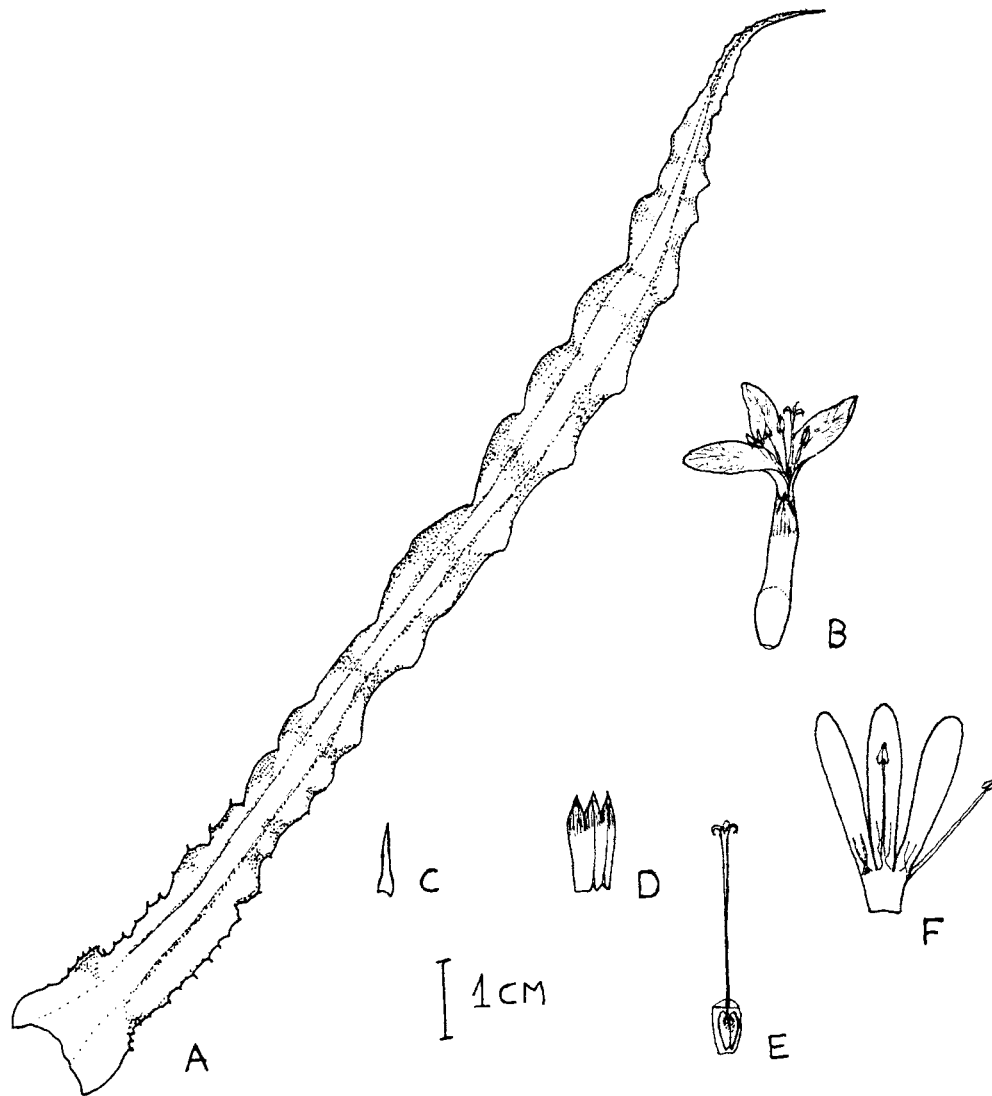


FIGURE 5. *Cryptanthus delicatus* Leme A) leaf; B) flower; C) floral bract; D) sepals; E) pistil and longitudinal cross-section of ovary; F) petals.

4 cm, very inconspicuously lepidote on both sides, laxly spinose, spines strongly antrorse, dark brown, 2–3 mm long; **SCAPE** known from fragments but well developed, ca. 1 cm in diameter, white-sublanate but soon glabrous; **SCAPE BRACTS** narrowly elliptic-lanceolate, apex acute, 14×3.5 cm, brown-lepidote inside, entire, erect, imbricate and wholly covering the scape. **INFLORESCENCE** laxly paniculate, subpyramidal, tripinnate near the base and bipinnate toward the apex, at least 25 cm long; **PRIMARY BRACTS** resembling the upper scape bracts, $6-10 \times 1.5-3$ cm, reflexed, red (Hatschbach !), the basal ones slightly shorter than the branches, the

upper ones sublinear-lanceolate, slightly exceeding the branches; **BRANCHES** the basal ones 10–12 cm long, shortly pedunculate, laxly arranged, with 2–5 secondary branches, the upper ones 5–6 cm long, subdensely arranged, with 6–7 flowers; **SECONDARY BRACTS** resembling the floral bracts, distinctly shorter than the secondary branches; **SECONDARY BRANCHES** 3–5 cm long, laxly and evenly arranged, with 3–5 flowers; **RACHIS** slightly flexuous, pale sublanate but soon glabrous; **FLORAL BRACTS** ovate-triangular, filiform-acuminate, $9-12 \times 6$ mm long, entire, distinctly nervate, glabrous, about equaling the ovary, subspreading. **FLOW-**

ERS ca. 33 mm long, sessile, laxly and polystichously arranged, suberect, lilac (Hatschbach !); **SEPALS** asymmetric with a very broad lateral wing, 12×9 mm, mucronulate at apex, connate at base for ca. 2 mm, glabrous; **PETALS** narrowly subspathulate, apex acute, 27×6 mm, free, bearing two cup-form, denticulate, 2mm long appendages at base, as well as two lateral callosities ca. 14 mm about the base; **FILAMENTS** the epipetalous half adnate to the petals, the episepalous free; **ANTHERS** ca. 5 mm long, apiculate; **OVARY** ca. 7 mm long, ca. 5 mm wide, glabrous; **PLACENTAE** apical; **OVULES** few, caudate; **EPIGYNOUS TUBE** ca. 2.5 mm long.

From the related *A. werdermanii*, this new species can be distinguished by the inflorescence bipinnate only at base, upper primary bracts linear-lanceolate and longer than the branches, floral bracts about equaling the ovary, and smaller sepals. It also resembles *A. rubrolilacina*, but may be separated by its longer branches, ovate-triangular floral bracts, and smaller and sessile flowers. The name is a reference to the smaller secondary branches produced in the base of the inflorescence.

Cryptanthus delicatus Leme sp. nov. FIGURE 5.

TYPE. Brazil: Rio de Janeiro State, Campos, locality of Ibitioca; December 1993, *P. Nahoum* & *E. Amado s/n* (HB, holotype).

A *C. sinuosus* L.B. Smith, cui affinis, laminae foliorum distincte angustioribus, apicem versus integerrimis; bracteis floriferis anguste linearibus, brevioribus; sepalis anguste linear-lanceolatis, minoribusque; petalis apice rotundatis differt.

PLANT saxicolous, nearly stemless, stoloniferous, propagating by slender basal stolons of ca. 6 cm in length. **LEAVES** ca. 10 in number, arched to spreading, forming an open irregularly oval rosette; **LEAF SHEATHS** inconspicuous, spinulose toward the apex; **LEAF BLADES** sublinear, acuminate-caudate, $10-15 \times 1$ cm, slightly narrowed at base, canaliculate, green to reddish with darker margins, upper and lower sides slightly contrasting, glabrous adaxially, densely white-lepidote and finely nervate abaxially, margins strongly undulate, subdensely serrulate near the base, spines ca. 1 mm long, entire toward the apex. **INFLORESCENCE** pseudosimple, sessile, with ca. 5 flowers, ca. 1 cm in diameter; **PRIMARY BRACTS** foliaceous; **FLORAL BRACTS** sublinear-filiform, acuminate, subentire, carinate, stramineous, glabrescent, $9 \times 1-2$ mm, about equaling the ovary; **FLOWERS** sessile, ca. 32 mm long; **SEPALS** narrowly linear-lanceolate, acuminate, 12×2 mm, connate for

ca. 8 mm, entire, green, inconspicuously white-lepidote and stramineous near the apex, the posterior carinate; **PETALS** narrowly ligulate, rounded, 27×4 mm, connate at base for ca. 5 mm, white, exceeding the stamens but subspreading at anthesis and exposing them, bearing two well-developed calluses above the tube; **FILAMENTS** 20 mm long, subequally adnate to the petals for the length of its tube; **ANTHERS** ca. 2 mm long, fixed near $\frac{1}{3}$ of its length about the base, base sagittate, apex obtuse; **OVARY** ca. 6 mm long, subtrigonous, white; **EPIGYNOUS TUBE** lacking; **PLACENTAE** apical; **OVULES** obtuse, 5-6 in number in each locule; **STIGMA** simple erect, white, the stylar lobes strongly recurved but not spirally contorted, margins inconspicuously glandulose.

Cryptanthus delicatus differs from *C. sinuosus* by its distinctly narrower leaves, which are entire toward the apex, narrowly linear floral bracts, narrowly linear-lanceolate sepals, and rounded petals. The specific name is a reference to the delicate size of the plant.

Neoregelia sanguinea Leme sp. nov. FIGURE 6.

TYPE. Brazil: Espírito Santo State, Iúna, locality of Laranja da Terra, about 1,000 meters above sea level. Originally collected in July 20, 1987 by *Roberto Kautsky 1013* and flowered in cultivation with E.M.C. Leme (n° 1917), December 1993. (HB, holotype; SEL, isotype).

A *N. macwilliamsii* L. B. Smith et *N. compacta* (Mez) L. B. Smith, quibus affinis, laminae foliorum dense serrulatis, bracteis floriferis obtusis, sepalis obovatis, late acutis, 26 mm longis et basi 4 mm connatis differt.

PLANT propagating by short basal stolons. **LEAVES** ca. 20 in number, spreading at anthesis, forming a broad crateriform rosette; **LEAF SHEATHS** broadly elliptic, 11×10 cm, densely brown-lepidote on both sides, purplish mainly adaxially; **LEAF BLADES** sublinear, not narrowed at base, apex narrowly to broadly rounded and minutely apiculate, $17-25 \times 5-6$ cm, margins densely serrulate, spines ca. 0.5 mm long, glabrescent, green to purplish with green spots, the inner dark red toward the base; **SCAPE** ca. 3.5 cm long, ca. 1.5 cm in diameter; **SCAPE BRACTS** subreniform, rounded and apiculate, densely serrulate, ca. 2.5 cm long, glabrescent, the upper ones (involucral bracts) broadly ovate, 4.5×3 cm, spinulose near the apex, slightly inflated, red with green spots. **INFLORESCENCE** capitate, simple, subumbellate, sunk in the center of the rosette, ca. 4.5 cm long, ca. 3.5 cm in diameter, densely flowered; **FLORAL BRACTS** sublinear, apex obtuse, slightly cucullate and inconspicuously apiculate, 4.5×1.5 cm,

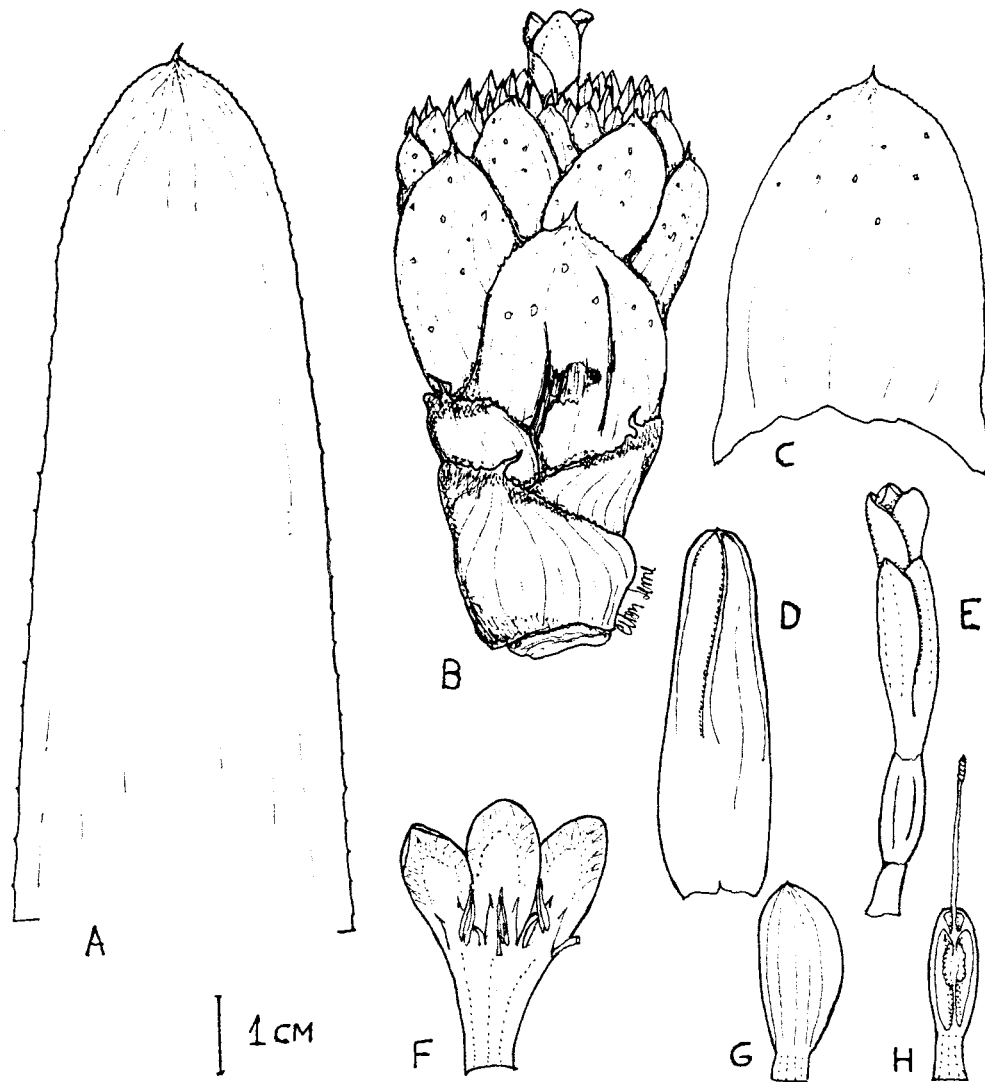


FIGURE 6. *Neoregelia sanguinea* Leme A) leaf apex; B) inflorescence; C) involucral bract; D) floral bract; E) flower; F) petals; G) sepal; H) pistil and longitudinal cross-section of ovary.

entire, ecarinate, membranaceous, reddish, slightly brown-lanate toward apex, equaling the sepals. **FLOWERS** ca. 50 in number, ca. 5.5 cm long, pedicellate, pedicels 4.7 mm long, the outer ones complanate; **SEPALS** asymmetric, obovate, broadly acute and inconspicuously apiculate, 26×11 mm, connate for ca. 4 mm, entire, ecarinate, reddish toward apex, sparsely brown-lepidote inside; **PETALS** subspathulate, obtuse, 37×8 mm, connate for ca. 18 mm at base, suberect at anthesis, white toward base and lilac at apex, bearing two 5 mm long callosities at the base of the lobes; **FILAMENTS** adnate to the

petal tube and free above it; **ANTHERS** sublinear, ca. 7 mm long, fixed at middle, base obtuse, apex apiculate; **STIGMA** ca. 3.5 mm long, conduplicate-spiral, blades strongly contorted, margins shortly lacerate, white; **OVARY** ellipsoid, ca. 16 mm long, ca. 6 mm in diameter, glabrous, white; **PLACENTAE** apical; **OVULES** many, obtuse; **EPIGYNOUS TUBE** ca. 2 mm long.

Neoregelia sanguinea is closely related to *N. macwilliamsii* and *N. compacta* but can be distinguished from them by its densely serrulate leaf blades, obtuse floral bracts, and by its sepals, obovate, shorter, broadly acute and connate at

base for 4 mm only. The name of this new ornamental species is a reference to the intense dark red color of its central leaves at anthesis.

Nidularium fradensis Leme sp. nov. FIGURE 7.

TYPE. Brazil: Rio de Janeiro State, County of Macaé, Pico do Frade; 1,000 m, February 18, 1994, *E.L.C.Leme 2305* & *Cyl F.C.de Sá* (HB, holotype).

A *N. rosulatum* Ule, cui similis, laminis foliorum dense serrulatis; inflorescentia plus compacta, ca. 11 mm diameter; bracteis primariis brevioribus latioribusque, laminis haud distinctis, perdense serrulatis; sepalis basi 4–5 connatis differt.

PLANT terrestrial, propagating by very short basal rhizomes. **LEAVES** ca. 18 in number, suberect-arcuate, forming a funnelform rosette; **LEAF SHEATHS** elliptic, 14 × 6.5 cm, greenish, densely pale-lepidote on both sides; **LEAF BLADES** ligulate, distinctly narrowed toward base, apex acute and apiculate, 50 × 4 cm, green, glabrescent, margins densely spinulose, spines ca. 1 mm long; **SCAPE** 8 cm long, ca. 0.9 cm diameter, greenish-white, inconspicuously brown-lepidote, distinctly shorter than the leaf-sheaths; **SCAPE BRACTS** subfoliaceous, shorter than the inflorescence. **INFLORESCENCE** subcapitate-rosulate, ca. 8 cm long, ca. 11 cm in diameter; **PRIMARY BRACTS** ovate, apex acute and distinctly apiculate, suberect to spreading-recurved, the lowest ca. 10 cm long, 6–7 cm wide at base, reddish-rose, inconspicuously white-lepidote and densely serrulate toward apex, spines 1 mm long; **FASCICLES** ca. 10 in number, the lowest shortly pedunculate, ca. 4-flowered, complanate, subflabellate, 3.7 × 2 cm (excluding the petals); **FLORAL BRACTS** ovate-lanceolate, apex acute and apiculate, slightly recurved, entire, 25–30 × 15 mm, carinate, brown-lepidote on both sides, scales fimbriate, greenish, equaling 3/4 of the sepals. **FLOWERS** subsessile, ca. 60 mm long, slightly fragrant; **SEPALS** elliptic, apex acute and distinctly apiculate, 23 × 9 mm, connate for 4–5 mm, obtusely if carinate, glabrous, rose toward apex; **PETALS** 50 mm long, connate for 3/4 their length, erect, lobes 12 × 6 mm, suboblong, apex obtuse-cucullate, dark blue with exception of the white margins, becoming pale rose to whitish after the anthesis, bearing two well developed callosities at base; **FILAMENTS** adnate to the petal tube; **ANTHERS** linear, ca. 8 mm long, base sagittate, apex mucronulate, fixed near the middle; **OVARY** 10 mm long, 6 mm in diameter, white, glabrous; **PLACENTAE** subcentral; **OVULES** obtuse; **EPIGYNOUS TUBE** ca. 1 mm long; **STIGMA** conduplicate-spiral, ellipsoid, white, lobes with crenulate margins.

Besides its known habitat preference at high elevation, this new species can be distinguished from *N. rosulatum* by its densely serrulate leaf-blades; more compact, 11 mm in diameter inflorescence; primary bracts shorter and broader, very densely serrulate and without distinction between sheaths and blades, and by its sepals connate at base for only 4–5 mm. The name of *N. fradensis* is a reference to the species-rich and endangered locality where it was found.

Nidularium kautskyanum Leme sp. nov.

FIGURE 8.

TYPE. Brazil: Espírito Santo State, County of Alfredo Chaves, locality of Maravilha; 900–1,000 m, September 1985, *R.Kautsky 881* (HB, holotype).

A *N. scheremetiewii* Regel, cui similis, laminis foliorum, bracteis scapalibus et bracteis primariis subduplo minoribus, bracteis floriferis angustioribus, sepalis anguste ellipticis, petalis brevioribus angustioribusque differt.

PLANT epiphyte, propagating by short suberect 2–6 cm long stolons. **LEAVES** ca. 12 in number, suberect, forming a narrow funnelform rosette; **SHEATHS** elliptic or obovate, 8–10 × 4–5 cm, greenish, dense pale-lepidote on both sides; **BLADES** narrowly ligulate, distinctly narrowed toward base, apex acute and apiculate, 10–25 × 1.5–2 cm, green, glabrous, margins slightly undulate toward apex, laxly spinulose, spines ca. 0.5 mm long; **SCAPE** 6–8 cm long, ca. 0.5 cm diameter, greenish, glabrous, distinctly shorter than the leaf-sheaths; **SCAPE BRACTS** subfoliaceous, distinctly shorter than the inflorescence. **INFLORESCENCE** subtubular-obconic, ca. 5 cm long, ca. 4 cm in diameter; **PRIMARY BRACTS** ovate-triangular, apex narrowly acute and apiculate, the lowest suberect with distinctly recurved apex, 7–8 cm long, ca. 4 cm wide at base, laxly to subdensely serrulate toward apex, spines 0.5 mm long, rose to reddish toward apex, inconspicuously brown-lepidote; **FASCICLES** ca. 5 in number, the lowest shortly pedunculate, ca. 3-flowered, complanate, subflabellate, 2–2.5 × 1.5 cm (excluding the petals); **FLORAL BRACTS** ovate-lanceolate, apex acute and apiculate, slightly recurved, entire, 15 × 6 mm, carinate, lepidote, greenish with exception of the rose apex, equaling the middle of the sepals. **FLOWERS** sessile ca. 4 cm long; **SEPALS** narrowly elliptic, apex acute and minutely apiculate, 13–14 × 4 mm, connate for 3–5 mm, obtusely carinate, glabrous, rose toward apex; **PETALS** 30–35 mm long, connate for 4/5 their length, erect, dark blue toward apex, lobes ca. 8 × 4 mm long, suboblong, apex obtuse-cucullate, bearing

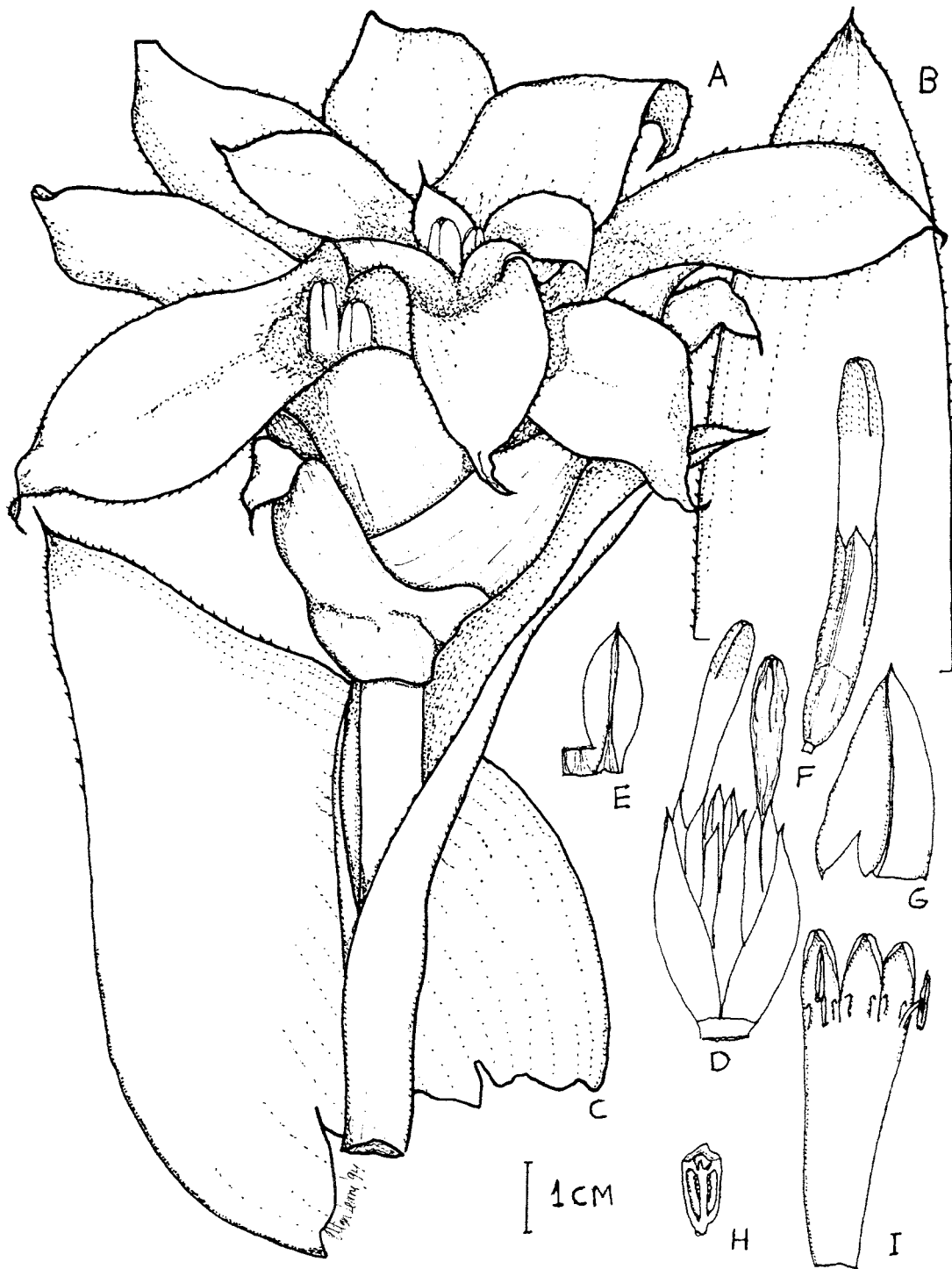


FIGURE 7. *Nidularium fradensis* Leme A) inflorescence; B) leaf apex; C) primary bract; D) fascicle; E) sepal; F) flower; G) floral bract; H) longitudinal cross-section of ovary; I) petals.

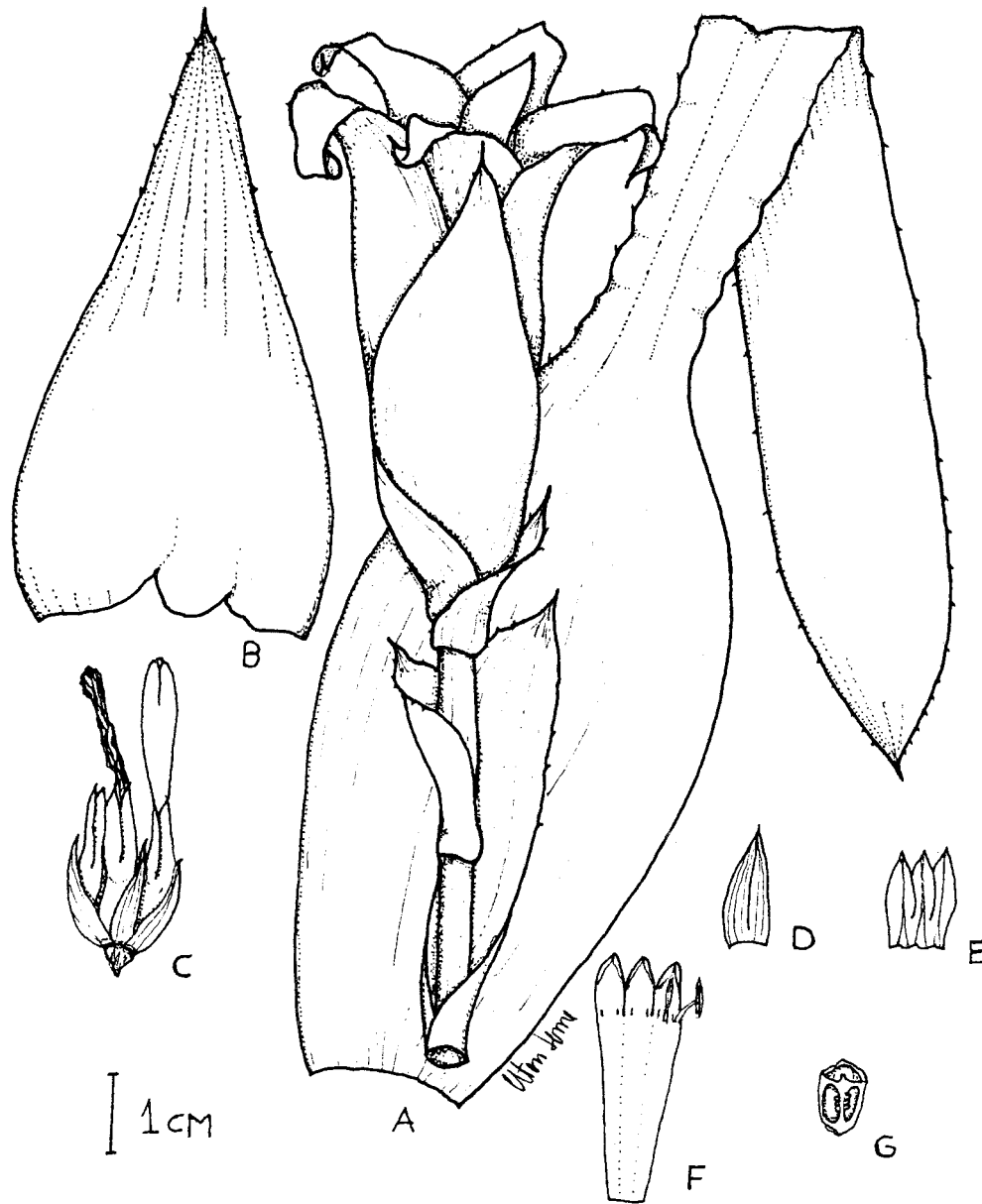


FIGURE 8. *Nidularium kautskyanum* Leme A) leaf & inflorescence; B) primary bract; C) fascicle; D) floral bract; E) sepals; F) petals; G) longitudinal cross-section of ovary.

two very inconspicuous callosities at base; **FIL-AMENTS** adnate to the tube of petals; **ANTHERS** sublinear, ca. 4 mm long, base obtuse, apex apiculate, fixed near the middle; **OVARY** 8 mm long, 5–6 mm in diameter, white, glabrous; **PLACENTAE** subcentral; **OVULES** obtuse; **EPIGYNOUS TUBE** ca. 1 mm long.

PARATYPE. Brazil, Espírito Santo State,

County of Alfredo Chaves, locality of São Bento do Urânia; 1,000 m, September 11, 1990, *E.M.C.Leme 1595, R.Kautsky & J.C. da Silva* (HB, RB).

This new species can be distinguished from *N. scheremetiewii* by its very distinct smaller size, narrower floral bracts, narrowly elliptic sepals, and shorter and narrower petals. Its native populations can be recognized at geographically re-

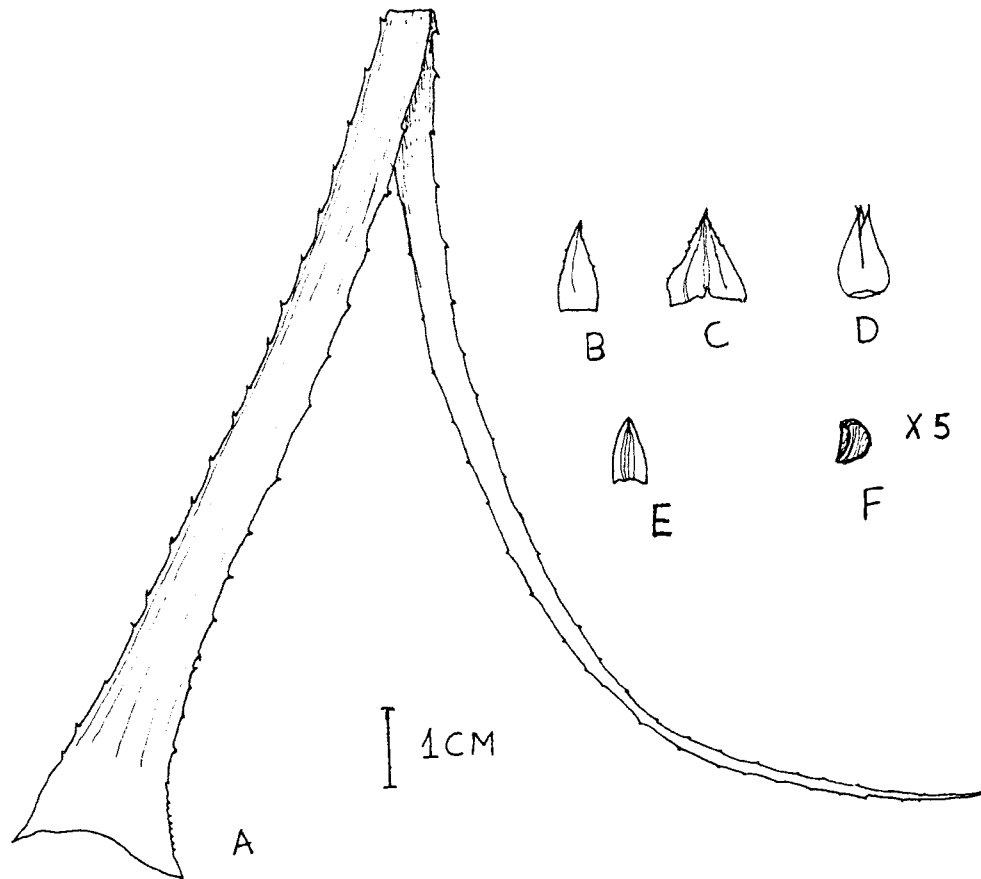


FIGURE 9. *Orthophytum hatschbachii* Leme A) leaf; B & C) floral bracts; D) flowers; E) sepal; F) seed.

stricted sites in the Atlantic rainforest of Espírito Santo State. The specific name honors Roberto A. Kautsky, of Domingos Martins, Espírito Santo, who has provided the author with numerous interesting bromeliad collections.

Orthophytum hatschbachii Leme sp. nov.

FIGURE 9.

TYPE. Brazil: Bahia State, Rio de Contas; 1,300 m, April 7, 1992, *G. Hatschbach* 56827, *M. Hatschbach* & *E. Barbosa* (MBM, holotype).

A *O. amoenum* (Ule) L.B.Smith, cui affinis, foliis 20–30 cm longis, laminis foliorum spinis 0.5–1.5 mm longis, bracteis involucreatis perminute sed subdense spinulosis, inflorescentia ca. 3 cm diameter, petalis basi ligulis subintegris differt.

PLANT saxicolous, nearly stemless. **LEAVES** ca. 60 in number, spreading, forming a very dense round rosette; **LEAF SHEATHS** inconspicuous but broader than the blades, subtire to spi-

nulose toward the apex; **BLADES** narrowly sub-linear-triangular, long acuminate-caudate, 20–30 cm long, ca 1.2 cm at base, glabrous, strongly nervate, margins laxly serrulate, spines subspreading, 0.5–1.5 mm long. **INFLORESCENCE** pseudosimple, sessile, many-flowered, ca. 3 cm in diameter; **INVOLUCRAL BRACTS** triangulate, very minutely but subdensely spinulose; **FLORAL BRACTS** oval-triangular to triangulate, acute, subtire to inconspicuously spinulose, ecarinate, glabrous, 11 × 5–10 mm; **FLOWERS** ca. 13 mm long (excluding the petals), very densely arranged; **SEPALS** ovate, acute, 8 × 5 mm, free, entire, glabrous, the posterior ones alate-carinate; **PETALS** known only from fragments, free, bearing two subtire appendages 4 mm above the base; **OVARY** ca. 3 mm long; **EPIGYNOUS TUBE** lacking; **PLACENTAE** apical; **OVULES** few; **SEEDS** obtuse, ca. 1 mm long, finely nerved.

This species is similar to *O. amoenum* but differs by the distinctly longer leaves (20–30 cm

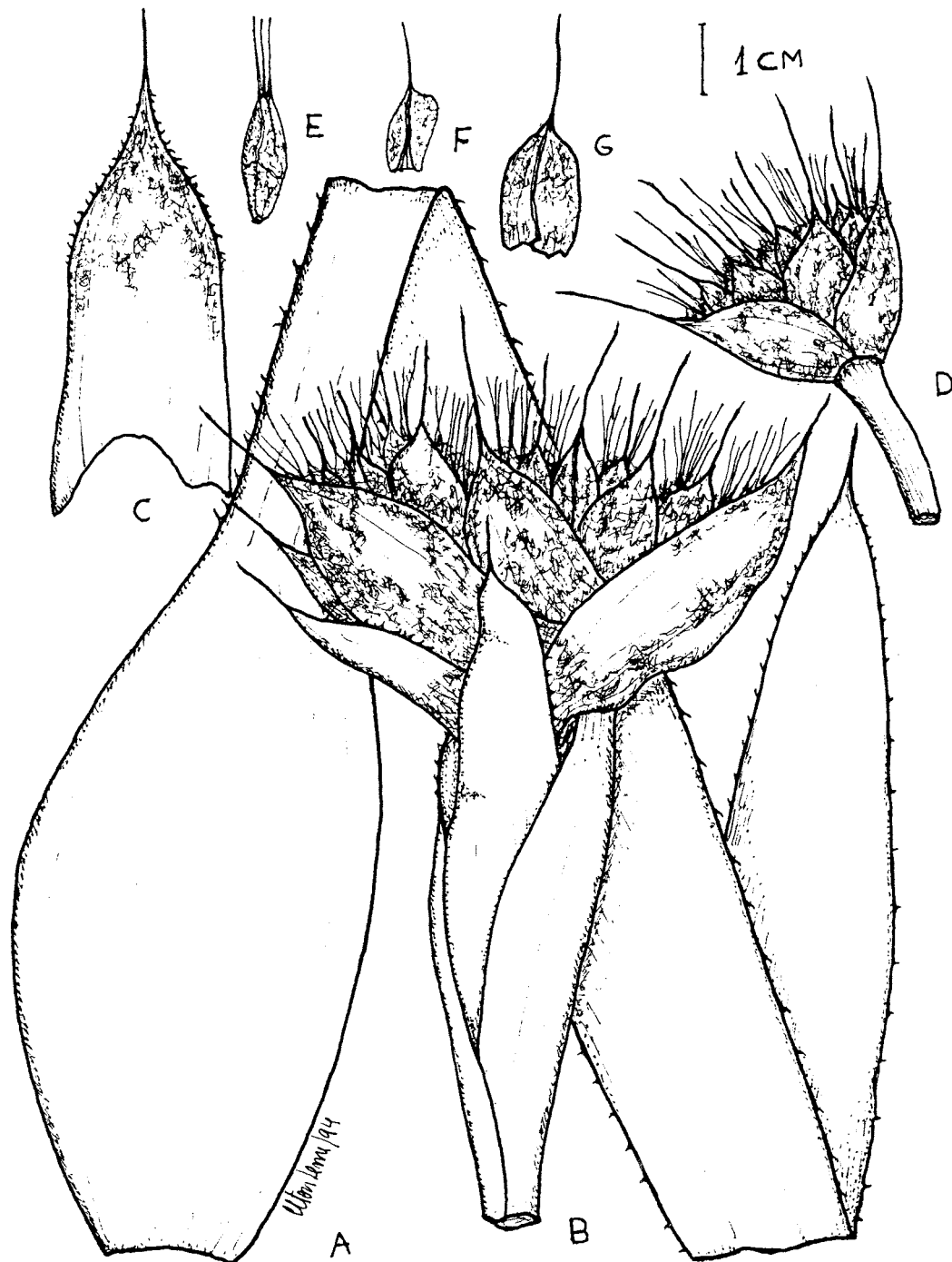


FIGURE 10. *Wittrockia echinata* Leme. A) leaf; B) inflorescence; C) primary bract; D) fascicle; E) flower; F) sepal; G) floral bract.

long), leaf-blades with 0.5–1.5 mm long spines, involucre bracts minutely but subdensely spinulose, inflorescence ca. 3 cm in diameter, and petals bearing subtire appendages at base. The *O. hatschbachii* is named after its collector, Gert Hatschbach, Director of the **Museu Botânico Municipal de Curitiba**, Paraná State, who has added several new records to the bromeliad flora of Brazil.

Wittrockia echinata Leme sp. nov. FIGURE 10.

TYPE. Brazil: Bahia State, Uruçuca, road Serra Grande to Itacaré, Faz. Lagoa; July 1 to 12, 1991, *André M. de Carvalho, W.W.Thomas, T.S.dos Santos et.al. 3360* (CEPEC, holotype).

A *W. paradoxa* Leme, cui affinis, laminis foliorum angustioribus, inflorescentia manifeste echinata, bracteis primariis suboblongis, prope apicem distincte spinuloso-uncinatis, pedunculis ramulorum longioribus, bracteis floriferis et sepalis apice perlonge mucronatis differt.

PLANT terrestrial. **LEAVES** rosulate, suberect, forming a funnellform rosette; **LEAF SHEATHS** elliptic, 10 × 5.5 cm, densely brown-lepidote on both sides, pale-colored, nerved; **LEAF BLADES** sublinear, narrowed at base, apex acute to acuminate and distinctly apiculate, 30–60 × 3–4 cm, glabrescent, laxly to subdensely spinulose, spines dark brown, strongly antrorse, ca. 1 mm long; **SCAPE** ca. 7 cm long, ca. 0.5 cm in diameter; **SCAPE BRACTS** foliaceous, shorter than the inflorescence. **INFLORESCENCE** densely corymbose, subglobose, distinctly echinate at apex, tripinnate, slightly exceeding the leaf-sheaths, ca. 5 cm long, ca. 8 cm in diameter, many-flowered, densely lanate with exception of the petals; **PRIMARY BRACTS** suboblong, apex acute, ending in a 1.5 cm long

apiculous, the outer ones 6 × 2.5 cm, red (Carvalho!) densely spinulose-uncinate near the apex, spines irregularly curved; **FASCICLES** ca. 8 in number, pulvinate, subflabellate, the outer ones 6 × 3 cm, including the 2.5 × 0.5 cm complanate peduncle, with ca. 15 flowers, bearing 4–5 very short and inconspicuous secondary branches; **SECONDARY BRACTS** resembling the floral bracts but bigger; **FLORAL BRACTS** oblong-elliptic, broadly acute and conspicuously spinose-mucronate, navicular, strongly carinate, spinulose at apex, 3.5 × 1 cm including the 1.5 cm long terminal spine, slightly surpassing the sepals. **FLOWERS** ca. 30 mm long (excluding the petals), sessile; **SEPALs** strongly asymmetric, suboblong, apex subobtuse and conspicuously spinose-mucronate, free, 22 × 6 mm, including the 11 mm long terminal spine, the posterior ones alate-carinate; **PETALS** known from fragments (holotype) or immature (paratype), acuminate; **ANTHERS** ca. 6 mm long, apex distinctly apiculate, fixed near middle; **STIGMA** conduplicate-spiral, lobes with lacerate margins; **OVARY** ca. 8 mm long, ca. 5 mm in diameter; **PLACENTAE** apical; **OVULES** obtuse; **EPIGYNOUS TUBE** ca. 1.5 mm.

PARATYPE. Brazil, Bahia State, Itacaré, road Itacaré to Ubaitaba; about 60 m, April 28, 1987, *L.A.Mattos Silva 2187, T.S. Santos & M.E.Souares* (CEPEC).

Despite the quite uncertain generic position of this unusual new species (fragmentary or immature petals), it fits near *W. paradoxa*, differing by the narrower leaf blades, striking long-spinose inflorescence (which is the basis for its specific name), primary bracts sub-oblong with spinulose-uncinate apex, fascicles with longer peduncles, and by floral bracts and sepals with conspicuously long-spinose apex.