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Cover photographs. Front: *Tillandsia bulbosa* forma *alba* blooming in cultivation. Photograph by Hiroyuki Takizawa. Back: See captions and credits.

FEATURE ARTICLES

BROMELIAD SOCIETY BUSINESS AND NEWS

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Three New Albino Forms of *Tillandsia* from Honduras and Costa Rica

Hiroyuki Takizawa[1]

There are many tillandsias with beautiful flower color, purple being the most common, with desirable forms ranging from very dark to very pale. Forms such as "Alba" or "Semi Alba" with floral pigments suppressed or entirely lacking appear to be rather uncommon, and it is not easy to find them in a natural habitat. The following three albino form Tillandsias were discovered during the author's field trip to Honduras and Costa Rica.

Tillandsia bulbosa Hooker filius forma ***alba*** H.Takizawa, forma nov. **TYPE:** Costa Rica. Cartago: Along the road side, Humo to Pejibaye, GPS coordinates 09°45.46'N, 83°49.71'W, 1350 m, epiphyte, 16 Sep. 1999, *Hiroyuki Takizawa, Dennis Cathcart & Chester Skotak TH990916b* (Holotype: SEL).

> A typo differt characteribus sequentibus: inflorescentia, scapus, bracteis flavis, sepalis, petalis et staminibus alvissimis alba, pistillo albo et pollinibus flavis.

Plant stemless, flowering 7-12 cm high, often growing in a dense mass. ***Leaves*** 8-15, covered with fine, closely appressed, cinerous scales in a strong bulbous rosette, often exceeding the inflorescence. ***Leaf sheaths*** orbicular, abruptly contracted into the blades, greatly inflated, 2-5 cm long, forming a dense ovoid pseudobulb, green or greenish-white, without a narrow red or purple marginal band. ***Leaf blades*** involute-subulate, attenuate, contorted, spreading, and at least the outer ones making a sharp angle with the apex of the sheath, to 3 dm long, 2-7mm in diameter. ***Scape*** erect, appressed-lepidote. ***Scape bracts*** foliaceous in form with elongate blades exceeding the inflorescence, the upper ones bright yellow. ***Inflorescence*** 2-4 spikes, bright yellow. ***Primary bracts*** ovate, acute, much shorter than the axillary spikes but their foliaceous blades sometimes exceeding them. ***Branches*** spreading, lanceolate, acute, complanate, 2-4 cm long, 6-10mm wide, distichously 5-10 flowered, non fragrant. ***Floral bracts*** erect, imbricate, ovate, acute, 12 mm long, 7 mm wide, exceeding the sepals, 2-3 times as long as the internodes, subcartaceous, densely and finely appressed-lepidote, carinate, appressed-lepidote, bright yellow. ***Flowers*** sessile, opening during the day. ***Sepals*** oblong, apiculate, ca. 12 mm long, adaxial pair carinate connate, abaxial ecarinate, glabrous, slightly lepidote, whitish-yellow. ***Corolla*** tubular. ***Petals*** linear, acute, ca. 4 cm long, pure white. ***Stamens*** 3 of 35 mm long and 3 of 40 mm long, exserted, pollen grains yellow. ***Style*** 43 mm long, exserted.

[1] BSI Director, International.

Figure 1. *Tillandsia bulbosa* forma *alba*. Close-up of the inflorescence; note the bright yellow color.

Figure 2. Close-up of *Tillandsia bulbosa* forma *alba* flower. Impressive pure white petals.

Figure 3. *Tillandsia flexuosa* forma *alba* inflorescence, in cultivation.

Figure 4. *Tillandsia flexuosa* forma *alba* growing in mangrove forest.

Figure 5. Mangrove forest in the very bright beach side area of Gulfo Dulce, where *Tillandsia flexuousa* forma *alba* was found.

Overall, the floral characteristics of this new form lie within the normal size range of the type of *Tillandsia bulbosa*. But when in bloom, this new form has an unmistakable bright yellow inflorescence and pure white flower. It is a rare occurrence among plants of the type.

Habitat: The plant grows epiphytically in bright, open forest. In the same area, *Tillandsia anceps* Lodd., *T. leiboldiana* Schltdl, and *T. complanata* Benth. were observed as epiphytes.

Tillandsia pseudobaileyi C.S Gardner forma ***alba*** H.Takizawa, forma nov. **Type:** Honduras. Lempira: along the river from Las Flores to Gracias, 600 m, epiphyte, 11 May 1998, *H. Takizawa, Dennis Cathcart & Enrique Kamm TH980511p* (Holotype: SEL).

A typo differt characteribus sequentibus: inflorescentia alba, scapus albus, bracteis, sepalis, petalis et staminibus alvissimis, pistillo albo et pollinibus flavis.

Plant stemless, flowering 4-6 dm high, growing in a dense mass. ***Leaves*** several in a strong bulbous rosette, equaling or exceeding the inflorescence, appressed lepidote throughout, rather stiff. ***Leaf sheaths*** ovate, relatively small, forming an ovoid pseudobulb 5-7 cm long, passing gradually into the blades. ***Leaf blades*** contorted, linear, involute-subulate, attenuate, 5-7 mm in diameter at base. ***Scape*** erect or ascending, 4-5 mm in diameter, appressed-lepidote. ***Scape bracts*** foliaceous but smaller and with narrow sheaths which are often shorter than the upper internodes. ***Inflorescence*** 2-4 spikes, pale green. ***Primary bracts*** like the upper scape bracts, much shorter than the axillary spike. ***Branches*** narrowly lanceolate, 5-8 cm long, 9-11mm wide, distichously 5-11 flowered, non-fragrant. ***Floral bracts*** densely imbricate, ovate, acute, 20 mm long, 9 mm wide, exceeding the sepals, carinate, appressed-lepidote, pale green. ***Flowers*** sessile, opening during the day. ***Sepals*** lanceolate, acute, to ca. 17 mm long, adaxial pair carinate connate, abaxial ecarinate, chartaceous, slightly lepidote, nerved, pale green. ***Corolla*** tubular. ***Petals*** lingulate, 35 mm long, pure white. ***Stamens*** 3 of 38 mm long and 3 of 42 mm long, exserted, pollen grains yellow. ***Style*** 40 mm long, exserted.

Overall, the floral characteristics of this new form are within the normal size range of the type of *Tillandsia pseudobaileyi*. But when in bloom, this new form has a pure white flower. It is a rather rare occurrence among plants of the type.

Habitat: The plant grows in a sunny environment on low tree branches along the banks of a river between Las Flores and Gracias, Lempira, Honduras. *Tillandsia copanensis* Rauh & Rutschmann was observed growing on a riverside cliff in the same area.

Tillandsia flexuosa Swartz forma ***alba*** H.Takizawa, forma nov. **Type:** Costa Rica. Puntarenas: Epiphyte on mangrove forest of peninsula de Osa, GPS coordinates 08°32.40'N, 83°17.97'W, sea level, 14. Sep. 1999, *Hiroyuki Takizawa, Dennis Cathcart & Chester Skotak TH990914f* (Holotype: SEL).

A typo differt characteribus sequentibus: inflorescentia alba, scapus albus, bracteis, sepalis, petalis et staminibus alvissimis, pistillo albo et pollinibus flavis.

Plant stemless, flowering 5-8 dm high. ***Leaves*** 10-20, in a dense subbulbous rosette, 2-5 dm long, densely pale-appressed, lepidote, usually marked with broad white transverse stripes, the outer bladeless, squamiform, shorter than the inflorescence. ***Leaf sheaths*** ovate, very large but passing into the blade without clear distinction. ***Leaf blades*** narrowly triangular, ca. 25 mm wide, attenuate, then abruptly and pungently acute, stiff, curved. ***Scape*** erect, slender, glabrous. ***Scape bracts*** erect, tubular-involute, elliptic, acute, appressed lepidote, at least the upper ones shorter than the internodes. ***Inflorescence*** simple, 5-11 very laxly flowered, whitish-yellow. ***Floral bracts*** spreading with the flowers, elliptic, broadly acute, 3 cm long, 1 cm wide, equaling or shorter than the sepals, about equaling the internodes, ecarinate, chartaceous, prominently nerved, sparsely appressed-lepidote, whitish- yellow. ***Flowers*** pedicellate 5-7 mm, opening during the day. ***Sepals*** narrowly elliptic, acute, ca. 2 cm long, 7 mm wide, free, subchartaceous, prominently nerved, sparsely lepidote or glabrous, whitish-yellow. ***Corolla*** tubular. ***Petals*** linear, acute, 38 mm long, pure white. ***Stamens*** 3 of 40 mm long and 3 of 45 mm long, exserted, pollen grains yellow. ***Style*** 40 mm long, exserted.

Overall, the floral characteristics of this new form lie within the normal size range of the type of *Tillandsia flexuosa*. When in bloom, however, this new form has an unmistakable bright yellow inflorescence and pure white flower. It is rare among plants of this type.

Habitat: The plant grows in a very bright beach area of Gulfo Dulce where mangroves make a small forest. The plant has ants nesting in its pseudobulb and other insects were living nearby.

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Acknowledgment

I thank Harry E. Luther, Director of the Mulford B. Foster Bromeliad Identification Center at the Marie Selby Botanical Gardens for his assistance.

Figure 6. *Tillandsia pseudobaileyi* forma *alba* in cultivation.

Figure 7. *Tillandsia pseudobaileyi* forma *alba*. Close-up of the inflorescence. Petals are completely devoid of pigment.

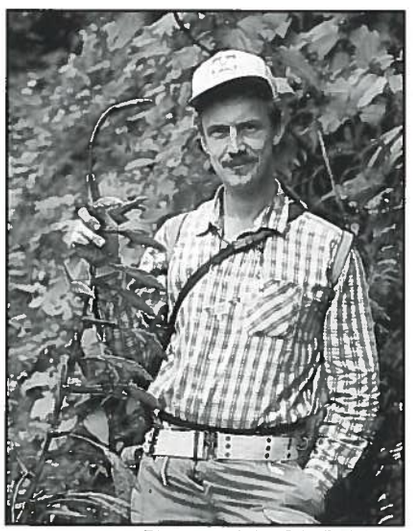
Tillandsia hoeijeri, a New Species of *Tillandsia* from the Andes of Ecuador.

Harry E. Luther[2]

Large broadleaf tillandsias are generally the most common and conspicuous bromeliads at moderate to high elevations on the wet slopes of the Andes. Because many are poorly known and many more are quite variable in overall morphology (i.e.: *Tillandsia fendleri, T. buseri, T. denudata*), I usually refrain from describing as new any of these, no matter how distinctive, until I have at least a couple of good specimens. Sometimes it takes awhile for the specimens to come together on my desk, hence the long period between collection and naming of this showy species.

Tillandsia hoeijeri H. Luther, sp. nov. **Type:** Ecuador. Loja, south of Saraguro, wet scrub forest, 3000-3200 m, Feb. 1993, *Dalström, Höijer & Wanntorp 1872* (Holotype: SEL; Isotype: QCNE).

A *Tillandsia denudata* André, cui affinis, inflorescentia dense tripinnatus, bracteis florigeris, sepalis et petalis brevioribus differt.



Photograph by Stig Dalström

Figure 8. Thomas Höijer, Swedish horticulturist and explorer, with a specimen of *Tillandsia fendleri*.

Plant a terrestrial or lithophyte, flowering to at least 1 m tall. ***Leaves*** rosulate, 40-55 cm long, coriaceous, green suffused with purple. ***Leaf sheaths*** elliptic, 10-15 x 8-10 cm, densely punctate-lepidote, castaneous especially abaxially. ***Leaf blades*** ligulate, acute, apiculate, 4-6 cm wide, punctate-lepidote especially abaxially. ***Scape*** erect, 40-50 cm x 5-8 mm. ***Scape bracts*** erect, imbricate, the lowest subfoliaceous, the upper elliptic, acute and apiculate, all but the uppermost exceeding the internodes. ***Inflorescence*** densely tripinnate 30-50 x 10-25 cm. ***Primary bracts*** elliptic, acute and apiculate, 2-5 x 1-2 cm, mostly exceeding the bracteate, sterile peduncles but all much shorter than the ultimate fertile branches. ***Branches*** mostly secund spreading, the peduncle of the primary branches 1-4 cm long with 1 to 4 bracts; the secondary bracts like the floral bracts but larger; the secondary branches 3 to 8 in number, 3-15 x 1 cm, densely and distichously 10-30-flowered. ***Floral bracts*** ovate to broadly elliptic, acute and apiculate,

[2] Bromeliad Identification Center, The Marie Selby Botanical Gardens, Sarasota, FL, USA

12-14 x 12 mm, carinate, obscurely nerved, thin-coriaceous, sparsely lepidote, red. ***Flowers*** subsessile, spreading at ca. 45° from the axis at anthesis. ***Sepals*** elliptic, acute, 10-11 mm long, 1-2 mm basally connate; the adaxial pair carinate. ***Corolla*** spreading. ***Petals*** narrowly elliptic, rounded, pinched at the point of exsertion from the calyx, 15-17 mm long, concealing the stamens and pistil, lilac to deep bluish lilac. ***Fruit*** a dry capsule to 25 mm long.

Paratype: Ecuador. Zamora-Chinchipe: Loja-Zamora road at the pass, 2900 m, 12 Feb. 1985, *G. Harling & L. Anderson 21957* (GB).

This new species seems closely related to *Tillandsia denudata* (widespread from Venezuela to Peru) but differs by having a much more compact, densely tripinnate inflorescence with shorter floral bracts (12-14 vs. 15-25 mm), sepals (10-11 vs. 15-22 mm) and petals (15-17 vs. 20-25 mm).

The specific epithet honors Thomas Höijer of the Bergius Botanic Gardens in Stockholm, Sweden, discoverer and co-discoverer of many orchids and quite a few bromeliads.

Acknowledgments

I thank the collectors for bringing their specimens to my attention and to Stig Dalström for his drawing and photos.

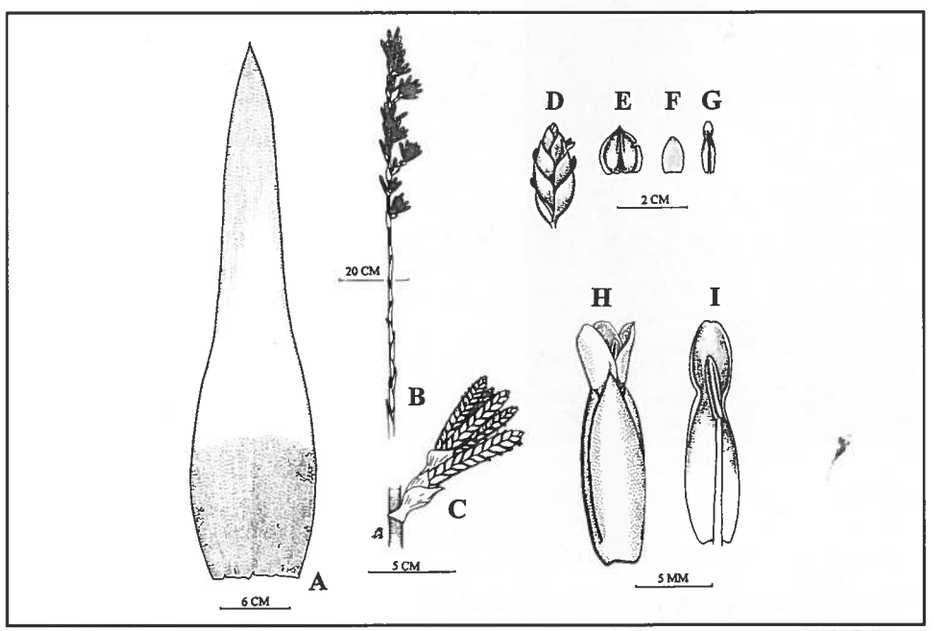


Figure 9. *Tillandsia hoeijeri*: A. Leaf, abaxial view. B. Inflorescence. C. Branch of inflorescence. D. Apex of ultimate branch. E. Floral bract. F. Abaxial sepal. G. Petal and single stamen. H. Flower. I. Petal and single stamen. (drawing by Stig Dalström)

Two New Small-sized Bromelioids from the Brazilian Atlantic Forest

Elton M. C. Leme[3]

During field expeditions to the coastal states of Espírito Santo and Bahia in 2000 and 2001, respectively, unusual and new-to-science bromeliad species were found in areas covered by preserved fragments of Atlantic forest. Among them, two small-sized bromelioids are highlighted below.

Neoregelia guttata Leme, sp. nov. **Type:** Espírito Santo, Santa Teresa, Reserva Santa Lúcia, between Mata de Areia and Ruschi Memorial, about 900 m altitude, 27 Apr. 2000, *E. Leme 4893, B. R. Silva, C. Nicoletti, E. Colnago, M. Zannoni & K. Green,* fl. cult. Dec. 2001. (Holotype: HB; Isotype: MBML).

> Species nova a *Neoregelia zaslawskyi* E. Pereira & Leme, cui affinis, foliis utrimque manifeste vinaceo-guttatis, sepalis brevioribus, apice obtusis, petalis brevioribus sed latioribus, basi 10-12 mm connatis, prope apicem atropurpureis differt; a *N. chlorosticta* (Baker) L. B. Sm., cui proxima, foliis viridibus sed utrimque manifeste vinaceo-guttatis, bracteis scapalibus supernis distincte angustioribus (ca. 12 mm vs. 20 mm), sepalis viridibus sed apicem versus vinaceo-maculatis, laminis petalorum longioribus, prope apicem atropurpureis differt; a *N. amandae* Weber, affinis, sed foliis utrimque manifeste vinaceo-guttatis, sepalis obtusis, basi ca. 4 mm connatis, petalis longioribus, basin versus albis sed prope apicem atropurpureis differt; a *N. punctatissima* (Ruschi) Ruschi, affinis, foliis utrimque manifeste vinaceo-guttatis, bracteis floriferis triplo longioribus, sepalis obtusis differt.

Plant epiphytic, propagating by basal stolons ca. 3 cm long, ca. 0.5 cm in diameter. ***Leaves*** 6 to 9 in number, at anthesis, forming a narrowly ellipsoid, subdense rosette at base and suberect above; ***sheaths*** elliptic, 9 x 4.5-5.5 cm, densely and inconspicuously pale-lepidote on both sides, wine colored inside and toward apex, greenish elsewhere with large, dense, purplish-wine spots; ***blades*** linear to sublinear, very inconspicuously when narrowed at base, green with large, dense, wine colored spots on both sides, thinly coriaceous in texture, subdensely and inconspicuously white-lepidote adaxially, densely white lepidote abaxially with trichomes sometimes forming inconspicuous, transversal crossbands, the inner ones 6-8 x 2.7-3.2 cm, margins densely to subdensely and inconspicuously spinulose, spines slightly antrorse, less than 0.5 mm, 3-5 mm apart, apex obtuse to subrounded and apiculate, apiculous ca. 3 mm long, the outer ones 15-20 x 2-2.6 cm, margins sudensely to laxly and inconspicuously spinulose, spines slightly antrorse, less than 0.5 mm, 5-15 mm apart, apex subacute to acute and apiculate, apiculous ca. 2 mm long; ***scape*** ca. 4 cm long, ca. 0.7 cm in diameter, glabrous, white; ***scape bracts*** broadly ovate, acute and distinctly apiculate, entire to crenulate at apex, membranaceous, glabrescent, the upper ones (involucral bracts) oblong-ovate, ca. 25 x 12 mm, about equaling

[3] Herbarium Bradeanum, Rio de Janeiro - RJ. E-mail: leme@tj.rj.gov.br

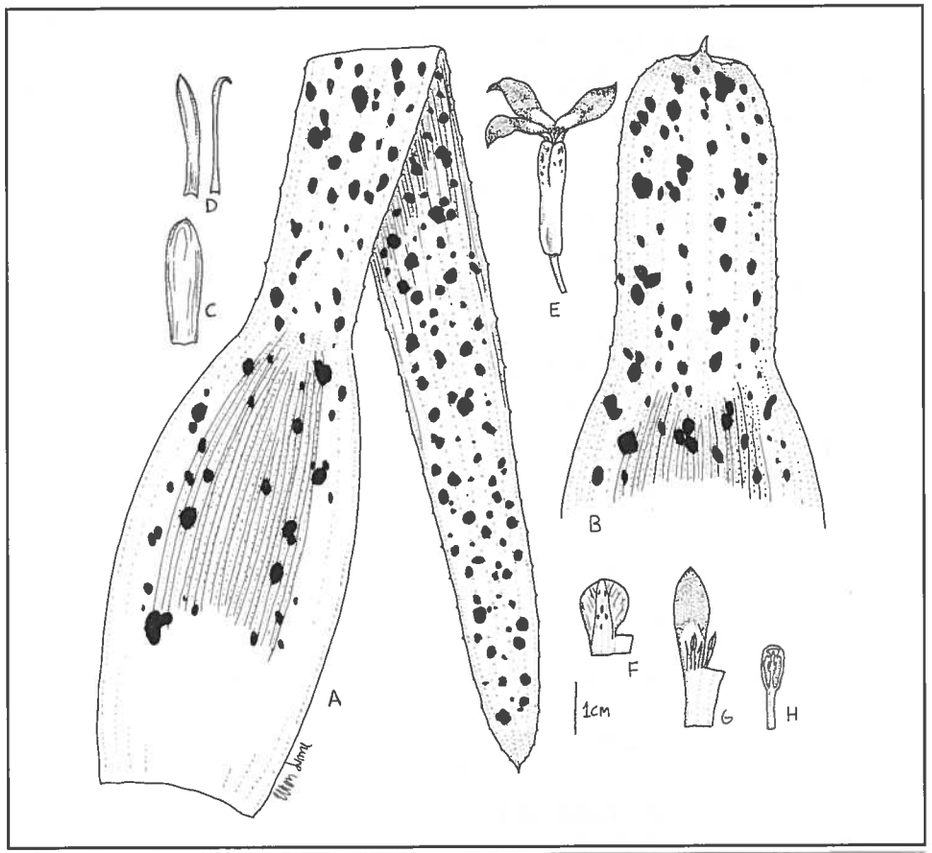


Figure 10. *Neoregelia guttata*: A. Outer leaf. B. Distal part of the inner leaf. C. Outer floral bract. D. Inner floral bracts. E. Flower. F. Sepal. G. Petal. H. Cross-section of ovary. (drawing by E. Leme)

the ovaries. ***Inflorescence*** subcylindric-capitate, simple, umbellate, sunk in the center of the rosette and about equaling the apex of the leaf sheaths, ca. 35 mm long (excluding the petals), ca. 20 mm in diameter, densely flowered; ***floral bracts*** membranaceous, hyaline, glabrescent, cymbiform but ecarinate, entire to minutely crenulate at apex, about equaling 1/3 to 1/2 of the sepals length, 23-25 x 2-7 mm, the outer ones suboblong, subobtuse and minutely apiculate, the inner ones linear to filiform, apex acute and strongly incurved. ***Flowers*** ca. 15 in number, ca. 47 mm long (with petals extended), slightly fragrant, pedicels 6-10 mm long, ca. 1.5 mm in diameter, white, glabrous, subterete; ***sepals*** asymmetric, broadly subspatulate, obtuse, ca. 15 x 10 mm, connate at base for ca. 4 mm, entire, ecarinate, green toward apex with reddish-wine sparse spots, glabrous; ***petals*** lanceolate, acute, 30-32 x 6-6.5 mm, connate at base for 10-12 mm, spreading-recurved at anthesis, white

except for the dark purple apex, bearing 2 longitudinal callosities exceeding the filaments but shorter than the anthers; ***filaments*** adnate to the petal tube and free for ca. 4 mm above it; ***anthers*** oblong-ovate, ca. 2.5 mm long, fixed at 1/4 of their length above the base, base sagittate, apex acute; ***stigma*** conduplicate-spiral, ellipsoid, blades ca. 3.5 mm long, white, margins shortly fimbriate; ***ovary*** oblong, 7-8 mm long, ca. 4 mm in diameter, glabrous, white; placentation from median to subapical; ovules many, obtuse; epigynous tube ca. 1.5 mm long. ***Fruits*** unknown.

According to Luther (2002), the genus *Neoregelia* includes 118 different taxa (109 species, 1 subspecies, 7 varieties, and 1 form), with numerous species yet poorly known. However, the only available key for the identification of species of the typical subgenus, to which this new species belongs, was published in Smith & Downs monograph (1979), when the genus had only 78 taxa (71 species, 3 varieties, and 4 forms). For this reason, the study of the genus has gradually become more difficult, especially when it involves the classification of new taxa. Sometimes it is not an easy task to determine close relatives of a given species and to decide which set of morphological characters are consistent enough for diagnostic purposes.

An apparent close relative of *Neoregelia guttata* is *N. zaslawskyi*, which also grows in Espírito Santo State. However, the new species differs from it by the leaves densely ornamented by wine colored spots on both, shorter sepals (ca. 15 mm vs. ca. 20 mm) with obtuse apex, which is not apiculate, petals shorter and broader (30-32 x 6-6.5 mm vs. ca. 40 x 5 mm), connate at base for 10-12 mm only (vs. 18 mm), and dark purple near the apex (vs. sky blue colored).

Three other species show some morphological similarities to this new species. *Neoregelia guttata* can be distinguished from *N. chlorosticta*, by the leaves densely ornamented by wine colored spots on both (vs. reddish toward apex with green spots), the upper scape bracts narrower (ca. 12 mm vs. 20 mm), sepals green with wine spots toward apex (vs. purplish-red), petals with longer blades (ca. 20 mm vs. 10-15 mm), dark purple neat the apex. It differs from *N. amandae* by leaves densely ornamented by wine colored spots on both, sepals obtuse (vs. acute), connate at base for ca. 4 mm (vs. connnate for ca. 1 mm), petals longer (30-32 mm vs. 25 mm), white toward base and dark purpe near the apex (vs. green in its central portion). With *N. punctatissima*, the differences are leaves densely ornamented by wine colored spots on both (vs. bearing wine spots organized in transversal bands), floral bracts three time longer (23-25 mm vs. ca. 7 mm), and sepals obtuse (vs. acute).

Neoregelia guttata was found at the same place where the recently described *N. ruschii* Leme & B. R. Silva was collected, in a well preserved area inside the limits of the Santa Lúcia ecological reserve, Espírito Santo

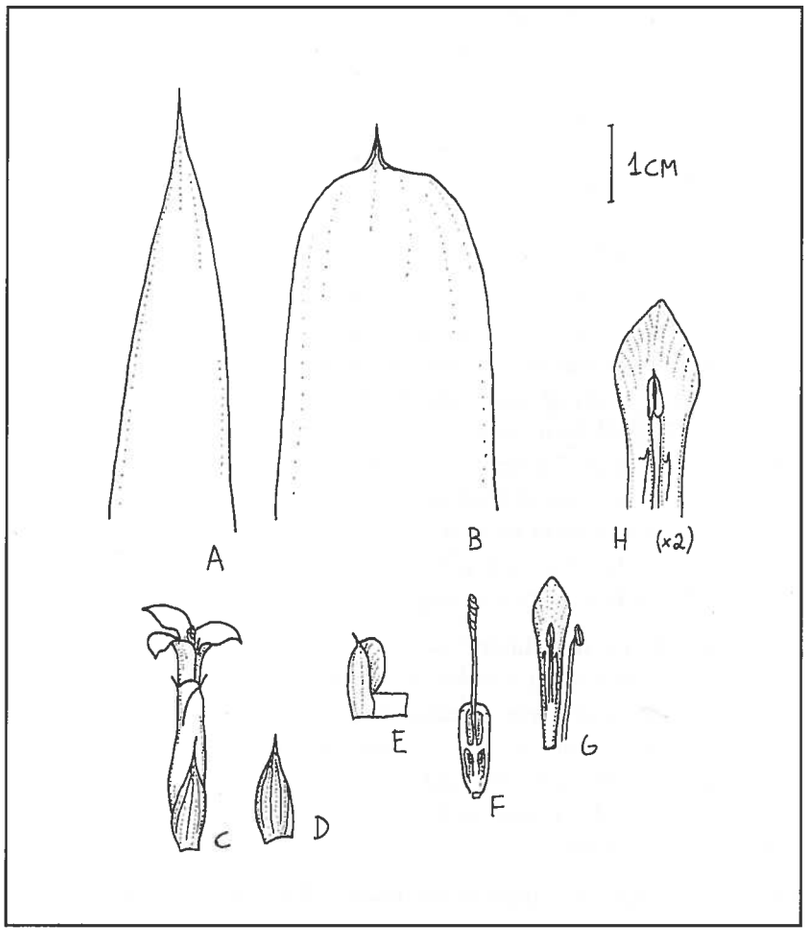


Figure 11. *Ronnbergia silvana*: A. Outer leaf apex. B. Inner leaf apex. C. Flower. D. Floral bract. E. Sepal. F. Cross section of the ovary and style. G. Petal and stamens. H. Distal part of the petal. (drawing by E. Leme)

State. Unlike *N. ruschii*, this new species was found on fallen tree branches, as it grows epiphytically on the upper and better illuminated parts of the taller trees of the Atlantic forest of that site.

Ronnbergia silvana Leme, sp. nov. **Type:** Brazil, State of Bahia, Nova Canaã, Serra da Boa Vista (Oricana), 15 Aug. 2001, *E. Leme 5305, R. F. Reis Júnior, J. C. Martinez Falcon & Edmundo Silva,* fl. cult Dec. 2001. (Holotype: HB; Isotype: CEPEC).

Species nova a *Ronnbergia neoregelioides* Leme, affinis, sed inflorescentia elongata, foliis longioribus, basin versus leviter obtuse carinatis, bracteis scapalibus supernis haud involucratis, sepalis longioribus, petalis liberis, tubo epigyno 3-4 mm longo differt.

Plant epiphytic or saxicolous, propagating by slender stolons 10-15 x 0.3-0.4 cm. ***Leaves*** ca. 10, suberect, subchartaceous, usually slightly obtusely carinate toward base, forming at base a subtubular rosette; ***sheaths*** inconspicuous, oblong-elliptic to sublinear, 9-15 x 3.5-5.5 cm, subdensely and inconspicuously pale-lepidote, greenish to wine colored inside; ***blades*** subdensely and very inconspicuously white lepidote mainly abaxially, green to reddish, finely nerved, entire, not narrowed toward base, the outer ones usually narrowly sublinear-lanceolate, 20-40 x 1.5-3 cm, attenuate-caudate to acuminate-caudate, the inner ones usually linear, 13-30 x 3-3.7 cm, subacute to rounded and distinctly apiculate, apiculus 0.5-0.7 cm long, ***scape*** erect, 13-17 cm long, 0.2-0.4 cm in diameter, whitish to pale green, sparsely white-lanate to glabrescent; ***scape bracts*** lanceolate, acuminate, submembranaceous, pale-green, 23-45 x 8-12 mm, inconspicuously white-lanate at base, glabrescent toward apex, entire, nerved, erect and exceeding the internodes but in part exposing the scape, the upper ones suberect, not involucrate. ***Inflorescence*** subcylindrical-capitate, simple, distinctly elongate, slightly surpassing the leaf-sheaths, but distinctly shorter than the leaves, ca. 60 mm long (including the petals), ca. 20 mm in diameter, rachis 2-3 mm in diameter, green, sparsely white-lanate, internodes 3-5 mm long; ***floral bracts*** narrowly ovate-lanceolate, acuminate-caudate, 10-25 x 4-6 mm, ecarinate, membranaceous, entire, greenish, inconspicuously white-lanate toward apex, erect, the basal ones about equaling the sepals, the upper ones about equaling the ovary. ***Flowers*** 11-17, 35-36 mm long, densely and polystichously arranged at anthesis, very slightly fragrant, subsessile, suberect; ***sepals*** strongly asymmetrical, bearing a large rounded membranaceous lateral wing, 12 x 4.5-5 mm, apex slenderly filiform-mucronulate, mucro 2-2.5 mm long, connate at base for 3-4 mm, entire, ecarinate, dark green, sparsely white-lanate at anthesis; ***petals*** subspatulate, acute, 22-25 x 4-5 mm, free, spreading to slightly recurved near the apex at anthesis, whitish toward base, the apical half rose-lilac, naked but bearing 2 conspicuous longitudinal callosities along the filaments with irregular fingerlike ornamentations at apex; ***filaments*** the antepetalous ones adnate to the petals for 6-10 mm, the antesepalous free; ***anthers*** narrowly elliptic, 2.5-3.5 mm long, fixed about 1/3 of its length above the base, base sagittate, apex distinctly apiculate-caudate; ***stigma*** subcylindrical, 4-5 mm long, ca. 1.5 mm in diameter, conduplicate-spiral, rose-lilac, blades shortly fimbriate; ***ovary*** suboblong, subterete, ca. 11 mm long, 4-5 mm in diameter, sparsely white-lanate at anthesis, dark green, epigynous tube narrowly funnelform, 3-4 mm long; placentation apical; ovules subobtuse. ***Fruits*** unknown.

Paratype: leg. *Edmundo Silva s. n.,* fl. cult. Aug. 2001, *E. Leme 5131* (HB).

The general aspect of *Ronnbergia silvana* resembles *R. carvalhoi*, with similar leaf conformation in shape, size and color. In its habitat, the new species varies according to light availability, sometimes with longer and attenuate-caudate leaves prevailing, or with shorter, rounded and apiculate

leaves. However, in floral details, it is more closely related to *R. neoregelioides* but differs from it mainly by the distinctly elongate inflorescence, the longer leaves usually obtusely carinate toward base, as well as by the upper scape bracts not involucrate, longer sepals, free petals, and by the epigynous tube ca. 3 mm long only.

The slightly elongate inflorescence of *Ronnbergia. silvana*, which is distinctly longer than the leaf sheaths, as well as the presence of smaller bracts and subdensely arranged flowers, not concealing the rachis, suggests its somewhat intermediate taxonomical position between, on one side *R. brasiliensis*, and on the other side *R. neoregelioides* and *R. carvalhoi*.

Ronnbergia silvana also bears some resemblance to *Aechmea canaliculata* Leme & H. Luther. Even taking into consideration that its petals are known from fragments only, Leme & Luther (1998) highlighted in the protologue of *A. canaliculata* its morphological affinity with *Ronnbergia brasiliensis*, due to leaves and inflorescence structure, and the absence of a closer relationship with the already known species of *Aechmea*, unless it is with the complex of species containing *A. lingulata, A. bicolor,* and *A. amorimii*. However, *R. silvana* differs from *A. canaliculata* by leaf sheaths covered by subdensely pale colored minute trichomes (vs. densely brown trichomes slightly fused and forming a membrane), leaf blades not strongly canaliculate and the inner ones with apex to rounded and distinctly apiculate (vs. blades strongly canaliculate toward base and apex acuminate-caudate), scape shorter (13-17 cm vs. ca. 25 cm long), inflorescence slightly surpassing the leaf sheaths to slightly elevated above the rosette (vs. distinctly surpassing the leaf-sheaths and well elevated above the rosette), and sepals with a narrower lateral wing, white-lanate (vs. glabrous).

An identification key for the four Brazilian species of *Ronnbergia* is presented below.

Key to the Brazilian *Ronnbergia*

1. Inflorescence ca. 4 cm long, not distinctly elevated above the leaf-rosette, subcapitate or subellipsoid-capitate 2
1. Inflorescence 5-10 cm long, distinctly elevated above the leaf-rosette, laxly to densely spicate 3
2. Leaves 13-25 cm long, ecarinate; flowers ca. 6 in number; petals connate for ca. 4 mm, acute, lilac at apex.. . . . . *R. neoregelioides*
2. Leaves 31-51 cm long, obtusely carinate toward base; flowers ca. 20 in number; petals free or nearly so, obtuse-emarginate, white . . . *R. carvalhoi*
3. Flowers ca. 20 mm long, laxly arranged; petals ca. 14 mm long; ovary ca. 4 mm long . . . . . *R. brasiliensis*
3. Flowers 28-36 mm long, densely arranged; petals 20-25 mm long; ovary 8-11 mm long 4

4. Leaf sheaths with densely arranged trichomes slightly fused and forming a membrane; inner leaf blades acuminate-caudate; scape ca. 25 cm long; sepals glabrous . . . . . *Aechmea canaliculata*
4. Leaf sheaths with trichomes subdensely arranged and not fused nor forming any membrane; inner leaf blades with apex to rounded and distinctly apiculate; scape 13-17 cm long; sepals sparsely white-lanate . . . . . *R. silvana*

Ronnbergia silvana was found in a remaining Atlantic Forest at an altitude of 600-700 m, where it grows predominantly as an epiphyte on the lower parts of the tree trunks, forming small to large clumps together with *Vriesea noblickii* Martinelli & Leme and *Vriesea* aff. *ruschii* ssp. *leonii* Leme, to name few. Sometimes, it thrives on shaded rocks, side by side with other delicate bromelioids, like *Nidularium longiflorum* Ule and *N. bicolor* (E. Pereira) Leme, as well as a *Neoregelia* sp. closely related to *N. kerryi* Leme.

This new species honors the orchid grower and bromeliad enthusiast, Edmundo Ferreira Silva who has greatly contributed to the study of the flora of the State of Bahia, which includes Bromeliaceae.

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photograph by E. Leme

Figure 12. Deforestation process and habitat fragmentation in the area where Ronnbergia silvana was found in Serra da Boa Vista (Oricana), Nova Cana, Bahia.

Figure 13. Flowering specimen of *Neoregelia guttata* in cultivation.

photograph by E. Leme

Figure 14. Close-up of *Ronnbergia silvana* which flowered in cultivation.

photograph by E. Leme

A Possible Variation of *Tillandsia lampropoda* from Chiapas, Mexico

Robert Guess and Virginia Guess[4] **Photographs by Robert Guess**

So little is known about *Tillandsia lampropoda* L.B. Sm. var. *major* L.B. Sm., that J.F. Utley (1994) includes it in a list of questionable tillandsias reported from Mesoamerica. He places it in this dubious category because the original description of the variety was made on cultivated material known only from a single plant. Thus was our amazement when a long-time Maya associate presented us with an unusual tillandsia a few days before Christmas 2002. Recognizing it as different from any bromeliad he had ever seen in the forests, he was as proud of this beautiful flowering plant as we were pleased to see it.

Figure 15. A possible candidate for *Tillandsia lampropoda* var. *major* from Chiapas, Mexico, stands 90 cm in flower.

Figure 16. Both sides of the sheaths of *Tillandsia lampropoda* var. *major* display a strong, aubergine purple color.

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He came upon it during an annual trek he makes with his compañeros to gather *Tillandsia eizii* L.B. Sm. for ceremonial use in the indigenous highland community of San Juan Chamula. Each year these Maya search the forests for this endemic bromeliad they prize above most others to decorate the altars of their santos during the Christmas season. On this particular day, in addition to finding the prescribed numbers of *T. eizii*, our associate collected two unusual tillandsias growing side by side in an oak tree: one in full flower and the other a maturing plant. After carefully examining the tillandsia, we conclude that it could well be the relatively unknown, "white flowered" *T. lampropoda* var. *major*.

Although the body of this epiphytic plant resembles *Tillandsia lampropoda* L.B. Sm., it markedly contrasts with it in overall size, as well as in the shape and the color of the inflorescence and flowers. Like *T. lampropoda*, the narrow, triangular leaves form an upright rosette, and end in graceful arching tips similar to the long foliaceous scape bracts. It measures 90 cm in flower, with leaves up to 70 cm long. One of the most striking characteristics is the rich, aubergine purple color of the sheaths, both adaxially and abaxially. The red inflorescence is digitate with six spikes ranging in size from 13 to 20 cm long and 5 cm wide. The flowers, erect with pedicels measuring 0.6 cm, produce copious exudate, have yellow-white petals that are 8 cm long with bluish hues on the edges. The stamens are exserted. Because of the scanty descriptive material available on this variety, we can only surmise that the plant could well be *T. lampropoda* var. *major* first reported from Guatemala in 1964 (Smith and Downs 1977).

It is quite feasible for this variety of *Tillandsia lampropoda* to occur in Chiapas, as the topography and physical environment of the state are closely related to that of Guatemala (West 1964). Since Chiapas was a province of Guatemala during the colonial era that ended with independence from Spain in 1821, the border that separates the two regions today is more political than natural. The limestone Central Plateau that begins near San Cristobal de Las Casas, Chiapas, is part of the highlands of Northern Central America, a continuous strand of mountains that extends into central Guatemala including the Altos Cuchumatanes and the mountain ranges of Alta Verapaz. Large stands of oak and pine trees comprise the typical vegetation at elevations between 1000 and 2000 m with evergreen hardwood cloud forests above the 2000 m level. Although vast sections of the forests in Guatemala near the border with Chiapas have been destroyed, some still remain in Chiapas.

The collection site of the plant described here, in oak-pine forests 10 km west-southwest of Chanal, was at 2050 m in elevation and some 60 km from San Cristobal in the Central Plateau of Chiapas. Although this region is still sparsely populated, small hamlets, agricultural plots, and lumbering projects are slowly infringing on the once dense forests. Upon our own

investigation of the area, we were unable to locate other flowering examples of the described variety. The forest, however, does support populations of *Tillandsia eizii*, *T. lampropoda* L.B. Sm., *T. carlsoniae* L.B. Sm., *T. butzii* Mez, *T. seleriana* Mez, and *T. vicentina* Standley var. *glabra*, which, according to Luther (2002), is synonymous with *T. vicentina* Standley var. *wuelfinghoffii*. The plant herein noted, however, does not appear to be a natural hybrid of any of these species.

Such serendipitous discoveries verify the potential that remains in Chiapas for more long-term study of Bromeliaceae. At least fifteen genera are now known to grow in Chiapas including several species of *Werauhia* and *Racinaea*. In 1974, Beutelspacher and Beutelspacher added 37 species to the 52 previously documented by Eizi Matuda in 1952. Since then, several new species of tillandsias have been identified. Perhaps this report of what might be *Tillandsia lampropoda* var. *major* may lure a few investigators to either confirm our conclusion, describe it as another variety, or determine it to be a new species of *Tillandsia*.[5]

Acknowledgment

As always, our recognition extends to Manuel Hernandez Gomez, our Tzotzil-speaking associate, who possesses an innate appreciation for the plants he calls "'ech" and we know as Bromeliaceae. His knowledge of this group of plants comes from his keen observations of the natural environment in which he lives and works.

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[5] Harry Luther, of the Bromeliad Identification Center, suggests that the plant in question may be a natural hybrid between *Tillandsia lampropoda* and *T. vicentina*.

Figure 17. Subinflated and foliaceous scape bracts are distinctive features of *Tillandsia lampropoda* var. *major*.

Figure 18. A digitate inflorescence with multiple spikes is one characteristic of *Tillandsia lampropoda* var. *major*.

Figure 19. The fully developed flower of *Tillandsia lampropoda* var. *major* contrasts with its bright red, complanate spike.

× *Hohenmea*, a New Natural Intergeneric Hybrid in the Bromelioideae

Leandro de O. Furtado de Sousa[6], Bruno Rezende Silva[7] & Rosângela Cristina Occhi Sampaio de Sousa[8]

Abstract

The authors describe a new nothogenus, ×*Hohenmea*, comprising a bigeneric hybrid between *Aechmea ramosa* and *Hohenbergia augusta* found growing in the same region of Tiririca Mountains State Park, Rio de Janeiro, Brazil.

Introduction

With the establishment of barriers blocking gene flow between populations, a process of genetic differentiation is triggered, culminating in speciation (Futuyma 1986). Such a process involves mechanisms favoring reproductive isolation that may be pre-zygotic, avoiding the formation of the embryo, or post-zygotic, generating unviable or sterile hybrids (Stace 1980). Reproductive isolation and consequent speciation have as advantages the optimization of the reproductive potential of a species and the maintenance of its genetic integrity (Mayr 1977).

Species of the same genus frequently share the same pollinator (Sazima et. al. 2000), allowing events of interspecific pollination in the case of sympatric species. In many families such as Onagraceae (Ormond et. al. 1979), Cyperaceae (Standley 1990), and Liliaceae (Chung et. al. 1991), the barriers of reproductive isolation are partial, permitting the occasional formation of fertile hybrids. In the Bromeliaceae, Gardner (1984) found natural hybrids of the genus *Tillandsia* with pollen viabilities up to 50%. In the Heliconiaceae, the mechanisms of pre-zygotic isolation are quite pronounced, avoiding the formation of the pollen tube at the stigmatic surface or aborting its development (Kress 1983). These barriers, nevertheless, are by no means absolute, permitting the formation of natural and horticultural hybrids (Berry & Kress 1991).

In November of 2000, as part of a bromeliad study of the Tiririca Mountains State Park conducted by the first author, a specimen of difficult identification was collected. By analyzing vegetative and reproductive aspects of the specimen, we verified that it was intermediate between two species already registered for the area, a fact that raised the question of whether it was actually a hybrid between these taxa.

[6] UERJ / FFP - DCIEN
[7] Rio de Janeiro Botanic Gardens (JBRJ)/Neotropicum Botanical Gardens.
[8] UNIRIO

The Tiririca Mountains State Park is located at the Metropolitan area of Rio de Janeiro, between the counties of Niterói and Maricá (22°48'-23°00'S, 42°57'-43°02'W). The park encompasses an area of 2400 hectares including areas of Atlantic Rain Forest and vegetation on rock outcrops.

Materials and Methods

For this study, a specimen each of *Aechmea ramosa* Mart. & Schult. f., *Hohenbergia augustae* (Vell.) E. Morren and of the unknown taxon were collected at blooming stage in the area of study. All these specimens are under registered cultivation at the Neotropicum Botanical Gardens and vouchers have been deposited at the Herbarium Bradeanum (HB) and FFP.

The technique of Beçak and Paulette (1976) was followed in order to determine the pollen viability of the studied specimens, through the coloration with acetic carmine. In order to avoid sampling errors, for each specimen, pollen grains from various flowers were extracted and placed on a microscope slide. After the application of the dye, the material was left to rest for ca. 30 minutes. Observations were performed using a Zeiss light microscope to determine the percentage of dyed (viable) grains. The magnification used was 100x, and counting was done by randomly changing the field of view until a total of 500 grains were analyzed.

Results

Both species tested showed very high pollen viabilities, *Aechmea ramosa* (98%) and *Hohenbergia augustae* (96%), while the unknown specimen presented only 4% pollen viability. In Bromeliaceae, taxa with doubtful natural origin and suspected of hybrid origin, showed pollen viabilities between 28 and 52% (Souza and Leme 2000). Additionally, the fact that the doubtful specimen has shriveled ovules reinforces the hypothesis of hybrid origin. As indicated in Table 1, the specimen in question shows many vegetative and floral characteristics intermediate between the parental species.

Discussion and Conclusion

In this case, a reduction of hybrid fitness, manifested by reduced reproductive potential was observed. However, hybridization does not always cause a reduction of fitness (Arnold et al. 2001). Hybrids of the genus *Iris* (Iridaceae) showed greater fitness than parental species when submitted to reciprocal transplant experiments in diverse natural habitats (Emms and Arnold 1997).

In the Bromeliaceae, the artificial intergeneric hybrid of *Nidularium innocentii* and *Neoregelia compacta* presented pollen viability values of 26.39% and 46.02% in two samples from the same clone. The artificial hybrid of *Nidularium innocentii* and *Neoregelia cruenta* presented values of 61.73% and 70.01%. The presumed natural hybrid of *Neoregelia bahiana* and *Nidularium bicolor* (*Nidularium linehamii*) showed values of pollen viability between 23.74% and 95.22% (Souza and Leme 2000). Such results demonstrate that in Bromeliaceae, intergeneric hybrids show a reduction and a greater instability of pollen viability.

Considering the intermediate vegetative and floral characteristics between the two species and the extremely low pollen viability, we conclude that the taxon is an intergeneric hybrid that resulted from an isolated event where the reproductive isolation between the species was broken. The fact that it was an isolated event can be inferred from the fact that the whole area was investigated during the floristic study and only a single clone of the taxon was found.

Table 1. Comparison of morphological features.

	Aechmea ramosa	× *Hohenmea itaipuana*	*Hohenbergia augustae*
Foliar blade	Green, apex attenuate and acuminate	Light green with dark green spots, apex rounded-attenuate, apiculate	Light green with dark green spots, apex rounded, apiculate
Spines of foliar blade	3 mm long (average)	2 mm long (average)	1 mm long (average)
Inflorescence	Tripinnate, laxly flowered	Quadripinnate at the basal branches and tripinnate towards apex, subdensely flowered.	Totally quadripinnate, very densely flowered, forming subglobose terminal branches
Inflorescence Indumentum	Inconspicuously lepidote (scape, primary and scape bracts)	Scape and rachis subdensely lanate. Scape and primary bracts from subdensely lanate to subglabrous towards apex	Scape, rachis and bracts densely lanate
Color of the scape and primary bracts	Bright red	Pale rose	Whitish or light castaneous

Taxonomic Treatment

× ***Hohenmea itaipuana*** B.R. Silva & L.F. Sousa, nothogen. and nothosp. nov. **Type:** Brazil. Rio de Janeiro: Niterói, Itaipu, Serra da Tiririca State Park, Morro das Andorinhas, 11 Nov. 2000, *Leandro Sousa 347, Bruno Rezende Silva 397 & Jeanii Coutinho*. (Holotype, HB; Isotype, FFP).

> Hibrida inter *Aechmea ramosa* Mart. & Schult. f. et *Hohenbergia augustae* (Velloso) E. Morren. characteribus vegetativis et floralibus admodum variabilibus inter manifestis parentibus.

Plant terrestrial, propagating by stout basal shoots, flowering to 1.2 m high. ***Leaves*** ca. 15 in number, suberect to arching, chartaceous, canaliculate

at base, forming a wide and subdensely crateriform rosette; ***sheaths*** elliptic, entire, 20-25 cm long, 10-13 cm wide, whitish proximally, green distally, densely covered by castaneous appressed scales on both sides; ***blades*** ligulate, broadly acute and apiculate, apicula 5 mm long, subdensely punctate-lepidote adaxially, densely punctate lepidote abaxially, 40-80 cm long, 5-7 cm wide, serrate, dark straight to retrorse 2-3 mm long spines on lower third, dark antrorse or retrorse 1.0-1.5 mm long spines on upper two thirds, green with dark-green irregular spots throughout. ***Scape*** suberect, 40-50 cm long, 18 mm in diameter, densely lanuginose, castaneous white; the ***bracts*** erect, elliptical, apiculate at apex, apicula 5-7 mm long, membranous, nerved, imbricate, exceeding the internodes and almost completely covering the scape, entire except for a few inconspicuous 1 mm long spines, densely appressed lepidote abaxially, subglabrous adaxially, abaxially castaneous white tinged wine at the middle, adaxially castaneous white. ***Inflorescence*** conical, quadripinnate at the base of the primary branches, tripinnate towards apex of the primary branches, 70-80 cm long, 40-50 cm wide near the base; ***rachis*** straight, cylindrical, densely lanuginose, light rose, 15 mm in diameter at base, 5 mm in diameter at apex, internodes 3-7 cm long; ***primary bracts*** lanceolate, acuminate, exceeding the sterile base of the branches, patent sometimes with the apex reflexed, 6-11 cm long, 2-3 cm wide, membranous, nerved, densely appressed lepidote abaxially, subglabrous adaxially, entire, castaneous adaxially, castaneous white tinged wine at the middle abaxially; ***primary branches*** polystichously arranged, with a 1-7 cm long sterile dorsiventrally compressed base, spreading 45°-80° from the rachis, curved and ascending, 15-30 cm long, subdensely lanuginose, light rose; ***secondary bracts*** lanceolate, acuminate, membranous, nerved, subdensely lanuginose abaxially, subglabrous adaxially, 15-20 mm long, 3-5 mm wide at base, castaneous; ***secondary branches*** with a 3-5 mm long, 4-5 mm wide, green, dorsiventrally compressed sterile base, polystichously arranged, spreading 45°-60° from the primary branches, 3-4 cm long, ca. 1 cm wide, polystichously 6-10-flowered; ***tertiary branches*** like the secondary branches. ***Floral bracts*** ovate, partially enfolding the ovary, mucronate, 8-9 mm long including the 3 mm long brown mucro, 8-9 mm wide reaching the apex of the sepals, nervate, inconspicuously carinate, chartaceous, with a few verrucose protuberances, glabrous except for a few scales near the borders, greenish. ***Flowers*** sessile, subdensely and polystichously arranged, ca. 15 mm long. ***Sepals*** triangular elliptic, apex rounded and mucronate, highly asymmetric, 6 mm long including the 1 mm long mucro, 4-5 mm wide at base, connate for ca. 0.5 mm, greenish, chartaceous, with a few verrucose protuberances, glabrous except for a few scales near the borders, wing hyaline and membranaceous, reaching the middle of the mucro. ***Petals*** ligulate, apex attenuate and rounded, free, 13-15 mm long, 3-4 mm wide, white at base to rose at apex, spreading at anthesis, bearing two basal longitudinal l8 mm long callosities. ***Filaments*** hyaline, ca. 11 mm long, the antepetalous not concealed by callosities, adnate to petal

Figure 20. × *Hohenmea itaipuana* blooming in nature.

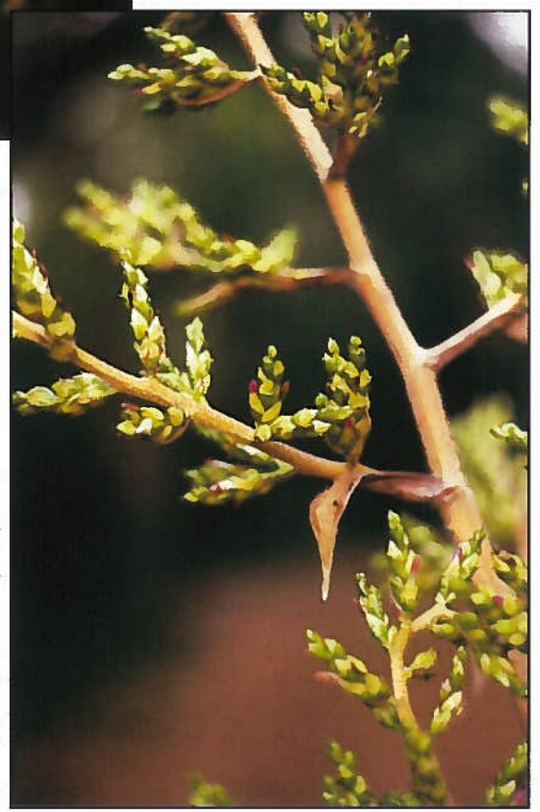

Figure 21. × *Hohenmea itaipuana*.

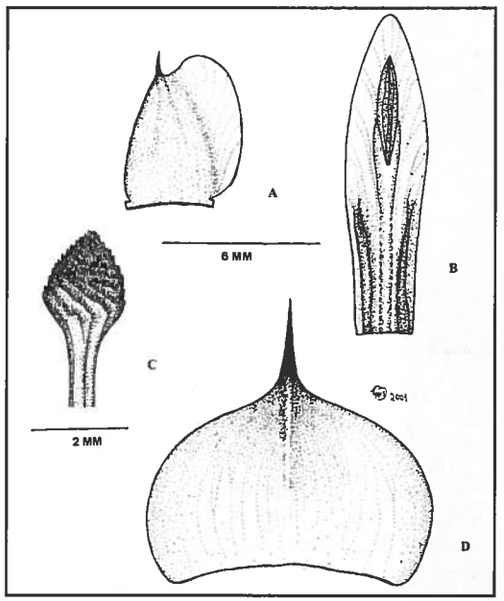

Figure 22. Floral details of × *Hohenmea itaipuana*: A. Sepal. B. Petal. C. Stigma. D. Floral bract. (drawing by B. R. Silva)

for ca. 6 mm, the antesepalous free. ***Anthers*** dorsifixed slightly below the middle, base and apex attenuate, ca. 3 mm long, light yellow. ***Style*** cylindrical, whitish, ca. 6 mm long. ***Stigma*** conduplicate-spiraled, pyramidal, ca. 2 mm long, lobes twisted, papillae conspicuous, cylindrical. ***Ovary*** ellipsoid, ca. 4 mm long, ca. 4 mm wide. ***Ovules*** very small, aborted. ***Epigynous tube*** infundibuliform, ca. 3 mm long.

Clonotype: cultivated at the Neotropicum Botanical Gardens (JBN 397).

Acknowledgments

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Bromeliads of Norway

Tom Koerber[9]

Last September I visited northern Norway. While there, I was surprised to see bromeliad plants offered for sale in flower shops. In Kirkenes, about 220 miles north of the Arctic Circle, the local florist was selling *Tillandsia cyanea, Vriesia splendens,* and a *Guzmania* cultivar that looked like 'Orangeade'. In Hammerfest, about 280 miles north of the Arctic Circle, a shop offered *T. cyanea, V. splendens* and three *Guzmania* cultivars. All the plants were in bloom and looking very nice.

I interviewed the clerk in the shop in Hammerfest, asking her how tropical bromeliads came to be offered for sale in northern Norway. She explained that the country north of the Arctic Circle, famous in summer as the land of the midnight sun, in winter becomes the land of the noonday dark. The sun does not rise above the horizon for many weeks, and any plants one keeps must survive under artificial light. Bromeliads do well, maintaining their color and form under ordinary light bulbs. She said the plants were obtained from a wholesale florist in Oslo and believed they were actually produced in Belgium. Perhaps the Deroose Company deserves thanks for brightening the long winter night in Norway.

[9] Box 992, Berkeley, CA 94701

John Anderson
Obituary[10]

John Anderson, 74, passed away on April 6, 2003 at his home in Corpus Christi, Texas. John was a tower of strength and affection for his family, a wise and devoted friend and companion, a tireless contributor to the community, and a darn good bromeliad grower. His passion of the last twenty years was his bromeliad collection, housed in eight greenhouses at the Epiphitimy Extension Station, which won numerous international competitions. His collecting expeditions to Ecuador, Costa Rica, Brazil, and Mexico were memorable adventures and resulted in discovering many new species of bromeliads, including *Aechmea andersonii* [see 53(1):3-9]. His other passions included inventing, for which he received several patents, building and fixing anything, driving race cars, hunting, gardening, and fire building.

John earned a Mechanical Engineering degree from Southern Methodist University in 1950. He worked for Renwar Oil Corporation, and in 1987 founded Anderson Machinists, specializing in oilfield repair work, and design and development of hydraulic motors. He was a founding member of the Corpus Christi Botanical Gardens for which he and his wife Nelwyn were recently honored at the Botanica 2003 Gala. John also served on the Board of the Bromeliad Society International, Rineer Hydraulics and the Corpus Christi Town Club.

John has auctioneered at World Bromeliad Conference rare plant auctions, which raised nearly $150,000 for the Bromeliad Identification Center (BIC) in Sarasota, Florida. His request was that honorariums be made to the BIC, in care of Selby Botanical Gardens, 811 S. Palm Ave., Sarasota, FL 34236.

John is survived by Nelwyn, his wife of 27 years, six children, and 14 grandchildren. His passion for life and the bromeliad family was an inspiration to all of us. He will be greatly missed.

Figure 23. John Anderson. Photograph from cover of program for Corpus Christi Botanical Gardens' Botanica 2003 Gala, at which John and his wife, Nelwyn were recently honored.

[10] Reprinted in part from an obituary notice prepared by the Anderson family.

Getting to Know the BSI
Susan Murphy[11]

With the position of Journal Editor, came the responsibility of caring for the BSI Library. A pallet of 27 boxes arrived in Sarasota early this year, and luckily, Selby Gardens is storing much of the material for us in their library. When the boxes arrived, we made a family project of sorting through the collection and boxing up the items we need at home for reference. Other boxes were repacked for storage at Selby, until the items can be put out for use in the library. Our two children then gleefully pushed the storage boxes to a far end of the room (the dusty floor made for easy transport), where Bruce hefted the boxes to the top of the shelves. When we realized it was way past the children's bedtime, we loaded the back of the car with journals, books, and slides and headed home. Bruce put the kids to bed while I filled the shelves with our new acquisitions. I had to move all of the cookbooks, but then there will be no time for cooking until we get caught up with the Journal!

photograph: BSI Library

Figure 24. Mrs. Ella Kelley receiving an Honorary Membership Award, July 15, 1990. BSI President at the time was Carol Johnson.

There is still much organizing to do, and a volunteer at Selby will help us with some of it. Meanwhile, I have had a chance to look through some of the old issues of the Journal of the Bromeliad Society, and what often interests me the most are the articles on the people of the BSI. Such a passion for bromeliads as well as fellowship among the members is evident in every issue. Reading the obituaries of well-loved members reveals friendships forged during many meetings and field trips where wonderful times were had while furthering the knowledge of plants. It took me back to my moss foray days and the fun we had in the bogs. Though I am not an official member of the BSI (yet!), I can see what brings you together, and you have my respect and wishes for many good years of comaraderie and learning about your favorite plants.

Besides books and journals, there are several boxes of old photographs of BSI members and events. If any of you make it to Sarasota and want to sort through these, we would love the help–we might even feed you (that is, if I can find the cookbooks!). The above picture landed in my hands and I wanted to share it with you. A note on the back reads, "this small gesture made this fine lady so very, very happy." Just seeing the picture made me happy.

[11] Journal of the Bromeliad Society, Co-editor

Deceased Honorary Trustees of the Bromeliad Society, Incorporated

The classification of honorary trustee was established to recognize individuals whose distinguished contributions have advanced the purposes of the Bromeliad Society. Living honorary trustees are listed inside the back cover of every edition of the Journal; deceased honorary trustees will be printed annually.

The following list was compiled from Journal article 42:33-35, and from subsequent issues, to date. Omissions, changes, or errors should be reported promptly to the editor.

Name	Country	Year elected	Date of death	*Journal* reference of election and death
Alberto Castellanos	Argentina	1951	5 Sept. 1968	1:3; 9:123-126
Jules Chantrier	France	1951	*	1:3
Charles Chevalier	Belgium	1951	*	1:3
David Fairchild	USA	1951	6 Aug. 1954	1:4
F.C. Hoehne	Brazil	1951	*	1:3
Charles G. Hodgson	Australia	1951	1969	1:3; 19:53
Charles K. Lankester	England	1951	8 July 1969	1:3; 19:127; 20:8-10
Henry Teuscher	Canada	1951	*	1:4
Muriel Waterman	New Zealand	1951	1985?	1:3; 35:225
Raulino Reitz	Brazil	1954	20 Nov. 1990	41:58
Walter Richter	Germany	1960	10 Feb. 1997	10:2; 47:226-227
Lyman B.Smith	USA	1960	4 May 1997	10:2; 47:199-210
Adda Abendroth	Brazil	1962	23 Nov. 1981	12:2; 32:79
Mulford B. Foster	USA	1962	28 Aug. 1978	12:2; 28:243-244
W.B. Charley	Australia	1963	1976	13:74; 26:123
Richard Oeser	Germany	1963	1980?	13:2
Werner Rauh	Germany	1969	7 Apr. 2000	19:26; 50:122-24
Luis Ariza-Julia	Dominican Republic	1970	24 Sep. 1989	20:98; 40:10
Julien Marnier-Lapostolle	France	1970	18 Feb. 1976	20:122; 26:93
Robert G. Wilson	Costa Rica	1970	8 Apr. 1989	20:98; 39:205
David Barry, Jr.	USA	1972	1 Feb. 1978	22:74; 28:115-116
William W.G. Moir	USA	1980	21 Feb. 1985	30:98; 35:158
Roberto Burle Marx	Brazil	1982	1993	32:3-11
Victoria Padilla	USA	1982	16 Sep. 1986	32:2; 37:3-7
WilliamWeber	Germany	1984	30 Jul. 1986	36:264-265
Racine Sarasy Foster	USA	1985	21 Mar. 1991	35:191; 41:109
Ed Hummel	USA	1991	29 Nov. 1979	30:23; 42:33
Charles A. Wiley	USA	1991	30 May 1980	30:227-228; 41:219; 42:33

** unable to determine*

The Bromeliad Bandits

Tammy Marks[12]

People will tell you that bromeliads are very easy to grow and that they're very forgiving. You fill the tanks with water and they'll water themselves. You go away on vacation, and find five more when you return. You can put the plants in full sun...you can put the plants in full shade. Whatever you do, they'll outsmart you and grow anyway. You know, of course, that is not quite the whole story.

First there are the raccoons. The nasty things will waddle into your yard and rip through a bed of bromeliads like they were tossing salads. Don't let those cute black masks fool you- they have the heart of a salad shooter. Some people have problems with snails, but luckily I don't...yet. When I did have snail problems in my other house, I left trays of beer out for them and they partied to death. All in all, not a bad way to go.

Then there is the ubiquitous Evil Weevil (always spelled with a capital E and a capital W, but I'm told the proper name is now the Mexican Bromeliad Weevil). Somehow, Evil Weevil sounds so much more ominous. But,...the poor things are just doing their proper normal everyday weevil things. Find a nice neighborhood, get a home, drill a hole in it and stuff it full of baby weevils. Unfortunately, it's our yards and our bromeliads, but it's not their fault they've been "relocated" into south Florida.

No, I'm talking about something even more devious then raccoons and snails and weevils. It's the Bromeliad Bandits! My husband Ken had been noticing for some time now that some bromeliads appear to be taking a hike and not returning. One after another, there'll be a little hole in the ground and sometimes the tags will be left behind and sometimes the tags will tag along, I guess, and disappear with the bromeliad.

Of course, the first culprits we thought of were kids romping through our yard and picking up lovely bromeliads perhaps to give to their teachers (shows how much we know about kids). Well we didn't say anything because the plants would disappear one or two at a time and how can you call the sheriff's department to report a missing plant? Didn't we have to wait 48 hours or something and see if they'll return on their own volition? Perhaps we've been bad growers and they just liked someone else's yard better.

So about 10 or 15 plants wandered away. Some of them were quite nice too, but we hoped they found a good home. If someone was desperate enough to steal a plant they must really need it. However, we've finally max'ed out our easy going ways and were ready to shoot the bromeliad-stealing varmint.

[12] 22690 Lemon Tree Ln., Boca Raton, FL 33428

Upon returning from our Thanksgiving trip, a tour of the yard revealed no less than 50 missing bromeliads, some bananas, a few orchids ripped from their trees and our only *Amorphophallus* was gone! It looked like someone had a yard sale and took most of our yard! To have so many missing plants, someone took their time and knew we weren't home. Perhaps they even made three or four trips.

Of course I called security, but I still didn't call the sheriff (I'd hate to tie up a sheriff with *The Case of the Missing Plants*, when he can be chasing down some desperado speeding down Interstate 95). Wackenhut security showed up and promptly (to our surprise) said, "Oh yeah, last Tuesday or Wednesday night, there was a car parked along the roadway real close to your hedge." Wackenhut security thought it was a broken down car but was a bit suspicious because of its close proximity to the house. The two security guys stopped to check and found a mother and daughter (shades of Thelma and Louise!). With spade in hand they claimed they were looking for a missing cat (I would be missing too if someone was looking for me with a spade), but Wackenhut security shined their flashlights into the car and found it stuffed full of bromys in the back seat! Then, when they walked around the car, there was a line of bromys on the ground!

Can you imagine that? A secret ring of bromeliad dealers... and in our own back yard (literally and figuratively speaking)! What is the world coming to? Much to our surprise, Wackenhut called the Sheriff, and the Sheriff came by and arrested the perpetrators. There's a case number and a hearing will be called. I'm sure they'll get at least 10 years for being such dastardly evil-doers.

Post script to this sad tale of bromeliad-napping: The attorney general had not decided, to prosecute, since this is such a minor offense (no bromeliads were hacked to death in a wild orgy of passion). Since possession is 9/10ths of the law, we cannot forcefully reabduct our bromeliadss either. We hope they've found a good home. A quasi happy ending is that a part of the tuber must have broken off during the heist, and, in the Spring, an *Amorphophallus* tip popped through the mulch.




Mail-Order Bromeliads

R.W. Reilly[13]

Most bromeliads are purchased "over the counter" at venues such as nurseries and monthly meetings of bromeliad societies. However, some people have difficulty in getting to such venues, and some of the rarer bromeliads may not be readily available through them. In both cases, the solution may be to purchase them through mail order.

[13] 66 Agnes St., Toowong, Queensland, 4066, Australia

When deciding from whom to buy mail-order plants, the following points may help.

- The closer the source is to your location, then the more likely it is that the plants will have been grown in conditions similar to yours. In turn, this helps minimize setbacks to the plant's growth.
- It always pays to check the conditions under which the plant has been grown. For example, if they have been grown in a heated glasshouse, and you only have a shadehouse, then the plants are likely to experience a shock (possibly a fatal one), if you buy them in the middle of winter.
- Transit time is (usually) reduced the closer you are located to the source. Ideally, transit times should not exceed two to three days.
- It may be useful to buy from someone who specializes in the particular group of plants you wish to buy; for example, guzmanias. Such specialized dealers are more likely to have a wider range of plants and be in a better position to provide you with detailed advice on growing them.
- Buy plants from people who regularly sell by mail order as they are more likely to know the best way to pack plants, special permit requirements, and the fastest way of transporting them to your location.
- For international and even cross-country purchases, find out if there are any government restrictions aimed at minimizing the spread of pests and diseases. Please comply with these for everyone's benefit.

Once you've decided upon your source, you need to ensure, wherever practical, that the plant you are buying is actually the one you want. Ways of achieving this include:

- checking the plant's description in a catalogue, or even better a photograph (although the colours in a photograph may not always accurately reflect those of the actual plant), against the appearance of the plant you are seeking,
- asking the person providing the mail order plants for their advice, and,
- checking that the name of the plant you want to buy is accurate. Plant names may change over time due to reclassifications by botanists, but names can also be misspelled. As the names of some plants are very similar, a misspelled name may result in obtaining an unwanted plant.

Confirm all details with the person you are obtaining the plants from.

- Buy plants when they are actively growing, and conditions at your home favour continued growth.

- Avoid buying flowering plants, as immature ones are more likely to adapt to your conditions
- Minimize the time in transit as much as possible. Some strategies to help achieve this outcome are:
- consider using the "faster" forms of postage. While you will pay more, the plants' value may make the expense worthwhile.
- Having the plants mailed on a Monday may enable you to avoid having the plants sitting around in a warehouse over the weekend

When the plants arrive, take the package out of the sun immediately. Unpack the plants and leave them immersed in a container of water (while making sure any labels are waterproof and securely attached to the right plants) for 12 to 24 hours. It can help to add a liquid fertilizer such as Phostrogen (I use 1 teaspoonful to 10 litres of water). The immersion process helps the plant to absorb water and thus recover from the shock of transportation.

After soaking the plants, pot them in your preferred mixture (or mount them in the case of certain tillandsias).

By following the steps outlined above, you stand a good chance of obtaining the correct plants, and in a condition which will likely result in their survival.

Water-holding Bromeliads as a Keystone Resource for a Gecko (*Briba brasiliana* Amaral 1935; Sauria, Gekkonidae) in Restinga Habitats in Northeastern Brazil.

Roberto Lima Santos, Maria das Graças Almeida and José Valmar Nunes[14]

Restinga vegetation is a broad category that encompasses a variety of plant communities that grow on Quaternary coastal sandy deposits, and includes beach halophytes, coastal sclerophyllous thickets, coastal swamp forests and lagoon hydrophytes (Suguio and Tessler 1984, Araújo 1992, Rizzini 1997).

Besides Cactaceae and Myrtaceae, Bromeliaceae are characteristic of restinga vegetation. The bromeliad genera *Aechmea, Areococcus, Billbergia, Bromelia, Catopsis, Cryptanthus, Hohenbergia, Neoregelia, Vriesea,* and *Tillandsia* have been recorded in restinga habitats in Brazil (Araújo and Henriques 1984, Pinto et al. 1984, Freire 1990, Araújo 1992, Leme and Marigo 1993). Some restinga bromeliads have imbricate foliage architecture that enable the plant to impound rainwater, thus forming a water holding tank or

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phytotelm (Leme and Marigo 1993, Benzing 2000). This reservoir compensates for the intermittent water supply found in drought-prone environments (Zotz and Thomas 1999).

On the eastern coast of Rio Grande do Norte State, Brazil, restinga areas are often associated with extensive coastal sand dune systems contain diverse vegetation types, including psammophytes and species from the Brazilian Coastal Atlantic rainforest and the xeric cerrado and caatinga scrublands (Freire 1990, Rizzini 1997, Varela-Freire 1997). The climate of the eastern coast of Rio Grande do Norte State is subhumid in Thorntwaite's classification with a mean yearly temperature of 26°C, average rainfall of 1455mm/year with marked seasonality, and mean yearly relative humidity of 76%. Southeast tradewinds predominate (IDEC 1994).

In such conditions, locally occurring phytotelm bromeliads such as *Aechmea aquilega* (Salisbury) Grisebach and *Hohenbergia ramageana* Mez, with their thorny and overlapping leafblades, provide shelter against exposure and predation by large animals, while the impounded reservoir functions as a relevant source of drinking water, and breeding and nursery areas for insects and amphibians, especially during the dry season (Leme and Marigo 1993, Freire 1996, Santos and Almeida 1998). Bromeliad leaf crown habitat has also been shown to be paramount for the survival of Cochran's dwarf gecko, *Sphaerodactylus cochranae* (Gekkonidae, Sphaerodactylinae) endemic to the Los Haitises region in the Dominican Republic (Canon Inc. 2001).

Phytotelm bromeliads, therefore, fit into the concept of keystone ecological engineers. The bromeliad's thorny foliage and impounded phytotelm creates habitat conditions that benefit other native organisms and thus promote the conservation of local biodiversity (Meffe and Carroll 1994, Jeffries 1997, Richardson 1999). In addition, nitrogen derived from the excreta and prey remains left by inquiline organisms may represent an important addition to the nutrient pool of the host bromeliad's phytotelm, especially in areas where leaf litter buildup within the leaf cistern is scarce (Benzing 2000, Nievola et al. 2001).

Gekkonid lizards are often recorded from phytotelm bromeliads in restinga and forested areas in coastal Brazil (Araujo 1984, Freire 1996). In a restinga area near Pitangui beach, on the northeastern coast of Rio Grande do Norte State, the authors recorded the presence of the gekkonids *Briba brasiliana* Amaral (1935), *Gymnodactylus geckoides* Spix (1825) and *Hemidactylus mabouia* Moreau de Jonnès (1818) in association with *Aechmea aquilega* growing in full sun. Specimens of *B. brasiliana* and *H. mabouia* were found inside the bromeliad leaf crown (Figure 25), and *G. geckoides* was observed among dry bromeliad leafblades (Figure 26).

One specimen of *Briba brasiliana* was observed sharing the bromeliad with *Pachistopelma rufonigrum* Pocock (1901) (Theraphosidae), a tarantula so far found only in association with phytotelm bromeliads in eastern Rio Grande do Norte State (Varela-Freire 1997, Santos et al. 2002).

In restinga areas in the Parque Estadual das Dunas do Natal (PEDN, Natal Dune State Park) in Natal, capital city of Rio Grande do Norte State, Freire (1996) collected *Hemidactylus mabouia* and *Gymnodactylus geckoides* in different microhabitats other than bromeliads, such as rotting logs, leaf litter, tree trunks, herbaceous vegetation and under stones. However, all specimens of *Briba brasiliana* collected were found only in association with *Hohenbergia ramageana*.

Briba brasiliana was formerly known only from inland caatinga and cerrado scrublands in northeastern Brazil, from Piauí State to the São Francisco River Valley in Minas Gerais State (Freire 1996). This was the first record of the occurrence of *B. brasiliana* in a coastal locality in Brazil, which may be due to the geographic proximity of the caatinga biome to coastal areas in Rio Grande do Norte State (Freire 1996). *Gymnodactylus geckoides* occurs in caatinga areas from Bahia to Rio Grande do Norte State in northeastern Brazil (Freire 1996). *Hemidactylus mabouia* is an exotic species introduced from Africa and has been recorded in caatinga and cerrado scrublands (Araújo 1984, Freire 1996). *Hemidactylus mabouia* and *Gymnodactylus darwini* Gray (1845) were the only gekkonid lizards observed in bromeliads in Maricá restinga in Rio de Janeiro State, southeastern Brazil (Araújo 1984, 1991).

Based on the evidence that specimens of *Briba brasiliana* have so far been found only in association with phytotelm bromeliads, such as *Aechmea aquilega* and *Hohenbergia ramageana*, in restingas of eastern Rio Grande do Norte State, the authors hypothesize that this gekkonid lizard is a bromeliad endemic in these locations and that phytotelm bromeliad species thus represent a keystone resource for the conservation of viable populations of *B. brasiliana* in these areas.

As restinga biodiversity is increasingly threatened by unsustainable extrativism and habitat loss caused by agricultural development and urban sprawl (Araújo and Lacerda 1987, Seeliger 1992, Leme and Marigo 1993, Freire 1996, Souza and Couto 2001), preserving wild populations of phytotelm bromeliad species is necessary for the conservation of gekkonid lizard diversity in restinga habitats in eastern Rio Grande do Norte and probably in other restinga areas in northeastern Brazil as well.

Acknowledgments

The authors wish to thank the herpetologist Dr. Eliza Maria Xavier Freire for the identification of the gekkonid species.

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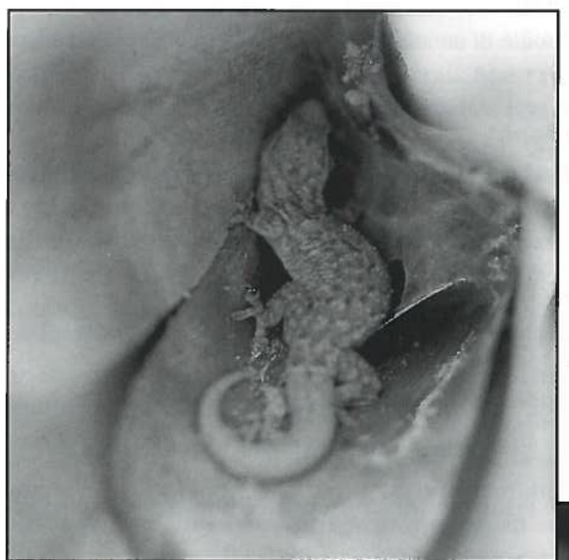


photograph by Roberto Limo Santos

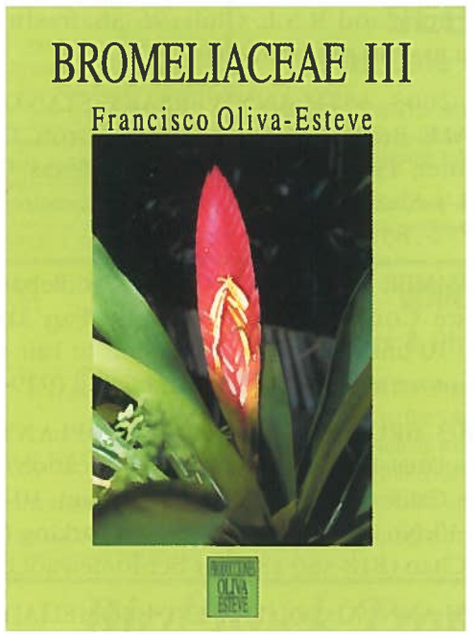
Figure 25. Adult specimen of *Briba brasiliana* inside leaf crown of *Aechmea aquilega* in Pitangui restinga. Note the tent-like web of the tarantula *Pachistopelma rufonigrum* near the gecko.

photograph by Roberto Limo Santos

Figure 26. Juvenile specimen of *Gymnodactylus geckoides* on dry leafblade of *Aechmea aquilega* in Pitangui restinga (RN, Brazil).

"Bromeliaceae III"

By: Francisco Oliva-Esteve



This handsome new book on bromeliads, published by Producciones Oliva-Esteve in Venezuela, is richly illustrated and printed on high-quality coated paper. 9 1/4 x 13 inches (32 x 25 cm). Photos, 564 in color. Hard Cover. 275 pp. English and Spanish editions available. ISBN 980-07-7310-X.

The opening chapter, "A Short Venezuelan Historical Review of the First Explorers," is followed by text and color photographs describing 29 genera. Among these are 108 species of *Tillandsia*, 38 of *Guzmania*, 34 of *Aechmea*, 17 *Pitcairnia*, and 15 *Vriesea*. This books adds new species to those covered in Oliva-Esteve's previous works.

Bromeliaceae III is priced $95 plus shipping and handling and applicable sales tax (Florida 7%). To order a copy, send check in US Dollars and made to SBG Press to:

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Events Calendar

May 24,25, 2003. AUTUMN SHOW, Show and Sale. The Bromeliad Society of Australia, Inc. Burwood R.S.L. Club, 96 Shaftesbury Rd., Burwood, Australia. 10 am to 4:30 pm both days.

May 30 to June 1, 2003. 35TH ANNIVERSARY STANDARD BROMELIAD SHOW AND SALE. Bromeliad Society of Houston. Houston Arboretum and Nature Center, 4501 Woodway, Houston, Texas, USA. Sales: Fri. 12-6, Sat. 9-5, Sun. 11-4. Show: Sat. 2-5, Sun. 11-4. For more info., contact Allyn Perlman (713-772-7831 or deliboys@ev1.net).

July 24-27, 2003. SUMMER BROMELIAD FIESTA. Saddleback Valley Bromeliad Society. Orange County Fairgrounds, 88 Fair Drive, Costa Mesa, California, USA. 10 until midnight. Admission to Fair required: Adults $7, Seniors $6. For more info., contact George Long (949-837-2111).

Aug. 2,3 2003. 2003 BROMELIAD SHOW AND PLANT SALE. South Bay Bromeliad Associates. Rainforest Flora (new location), 19121 Hawthorne Blvd., Torrence, California, USA. Sales: Sat. & Sun. 10-4:30. Show: Sat. 12-4:30, Sun. 10-4:30. No charge, admission and parking free. For more info., contact Bryan Chan (818-366-1858 or bcbrome@aol.com).

Sept. 5-7, 2003. 29TH ANNUAL SOUTHWEST BROMELIAD SHOW AND SALE. Shreveport Bromeliad Society. Barnwell Garden & Art Center, 601 Clyde Fant Parkway, Shreveport, Louisiana 71101, USA. For more info., contact Harvey Beltz (318-635-4980).

Sept. 11-14, 2003. CENTRAL COAST NSW BROMELIAD SOCIETY SHOW. Central Coast New South Wales Bromeliad Society. Australia.

Sept. 20,21, 2003. FALL ARBORETUM SALE. Bromeliad Society of Houston. Houston Arboretum and Nature Center, 4501 Woodway, Houston, Texas, USA. Sale hours: Sat. 9-5, Sun. 11-4. For more info., contact Allyn Perlman (713-772-7831 or deliboys@ev1.net).

July 26 to August 2, 2004. WORLD BROMELIAD CONFERENCE. Bromeliad Society International/Bromeliad Society of Greater Chicago. Rosemont, Illinois, USA.

The Bromeliad Society International

The purpose of this nonprofit corporation is to promote and maintain public and scientific interest in the research, development, preservation, and distribution of bromeliads, both natural and hybrid, throughout the world. You are invited to join.

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photograph by Vern Sawyer

Guzmania bergii H. Luther from southeast Ecuador. This species was named for one of its collectors, the late Wally Berg, who was an enthusiastic supporter of the BSI. He assembled one of the finest, and most complete private collections of bromeliads in the world.

Guzmania rauhiana H. Luther. A Colombian form from the collection of J. Kent. The species was named in 1988 in honor of the late Dr. Werner Rauh, an Honorary Trustee of the BSI.

photograph by Sandra Williamson