

# **Journal of The Bromeliad Society**



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Cover photographs. Front: *Tillandsia multiflora* var. *tomensis*. L.B. Smith, 1930. Epiphytic in woods, 2,000–2,300 m. altitude. Ecuador, northern Peru. Back: *Guzmania lingulata* 'Fortuna'. Photo by H.E. Luther.

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# Happy Birthday To Us

**President Jack B. Grubb**

The Bromeliad Society was organized forty years ago this September the seventeenth, as we noted in the January–February issue of this volume. We are grateful to the enthusiastic group that worked hard to get the society started. We also remember that the activities of the society are a reflection of the enthusiasm of its present members.

We are a group of affiliated societies and members in more than fifty countries active in promoting and maintaining public and scientific interest in the bromeliads. We have many accomplishments including world conferences, the *Journal* and other publications, a group of judges, a seed fund and a cultivar register. We help to support The Bromeliad Identification Center, research projects, and conservation. We promote standard shows and good relations with affiliated societies. We have no central office and no full-time staff but a lively group of volunteers serving as officers, directors, and committee chairmen and women.

We need to do some things better and to add to our list of accomplishments. For example, we need to recruit members, to get more serious about educating members and the public, to contribute significant money to research and to our intern program. We should work toward agreed goals instead of individual objectives. We must remember always that this is an international society with a common language.

I wish to suggest to all Bromeliad Society members as a follow-up to my speech at the Houston World Conference in June, 1990: every member who is able should give a membership in The Bromeliad Society, Inc. to an interested friend. I hope that this generosity will encourage those new members to remain with us. What a boost this would be to the BSI. Let's do it!

*River Ridge, Louisiana*



## Success with *Abromeitiella*

The genus *Abromeitiella* was mentioned in volume one of the Bulletin and has been listed and described from time to time as shown in the accompanying bibliography. It seems, however, that no one has thought to tell others by writing to the Journal how to grow these plants even though a perfect mound of *A. brevifolia* was the supreme prize winner at the Los Angeles World Bromeliad Conference of 1984. So, when Max Cook's talk about his success with *abromeitiellas* was printed in the Bromeliad Newsletter of the Bromeliad Society of New South Wales, Inc.<sup>1</sup>, we asked him to tell us more. We asked others also with happy results as you will read.

Max Cook: The first reference that I found to these bromeliads was by Hermann Jacobsen [1960] in his *Handbook of Succulent Plants*. *Abromeitiellas* are terrestrials found in Argentina and Bolivia in high ranges. They grow on rocks and in the ground, being very hardy and are, therefore, suitable for rockeries.

Jacobsen describes three varieties, which he calls *brevifolia*, *chlorantha*, and *abstrusa*. The latter I have not seen in cultivation in Australia.



Max Cook

Fig. 1  
The plants in front labelled *Abromeitiella chlorantha* (*A. brevifolia*) appear to be identical while those in back, labelled *A. brevifolia* "minor" and "major" are, perhaps, small and large forms of *A. lorentziana*.<sup>2</sup>

The first we purchased was from the Huntington Gardens [California] in 1982 as "*Brevifolia minor*," which grows only to 2" high; then in 1983 from D. Grigsby in Vista [California] known as "*Brevifolia major*," which grows to 15" to 18" tall and branches very well at the top of the plant. We then imported two plants from Abbey Gardens, one *chlorantha*, which has many multiple rosette heads and is fairly quick to grow, and "*Minscula*," a single-headed, very compact, slow grower.

Propagation is by division. The taller-growing *brevifolia* I behead in the winter and leave it till spring, then pot into a very open potting mixture that includes the following ingredients: 4 buckets pine bark fines (or pine bark mulch treated with dolomite to reduce acidity—the mix should test 5.5–6.0 pH), 2 buckets coarse river sand, 1 bucket charcoal, 1 bucket peat moss, 1 bucket rice hulls, 1 bucket volcanic rock, and 850 grams Banana Special fertilizer<sup>3</sup> By using this in a mixture I have found there is sufficient plant food for 12 months.

In summer, I water every day but in the winter very little and I fertilize only twice a year during the growing season, which is spring and summer. Previously, I used slow release fertilizer but have found these contain too much nitrogen and induce too much lush growth. I have been experimenting with pelleted poultry manure which contains only 7% nitrogen.



Pamela I. Leaver

Fig. 2  
A perfectly grown display of *Abromeitiella brevifolia* exhibited at the Los Angeles World Bromeliad Conference of 1984 by Pamela Leaver won the best-of-show award. The plant was started from a single rosette and was 5½–6 years old at conference time. It was grown in Pamela's home in Lafayette, CA until 1987, then was moved to the greenhouse in Concord where it remains—in a bigger pot.

Some of my plants are grown outside and some in unheated glass houses. However, we get very few frosts so I am not sure how heavy frost would affect them. No insect pests such as scale and mealybugs seem to worry them. I am very interested in this genus and would appreciate any information available.

23 Short Street, Summer Hill, N.S.W. 2130  
Australia

Two other members of the NSW society contributed information: Edna Moore added the note about substituting pine bark mulch; Alice Williams said that both she and Max grow these plants not only at sea level, but that she lives right on the coast in full view of the Pacific. It is obvious, then, that this is an adaptable genus.

Dutch Vandervort, BSI director and specialist in dyckias and hechtias, also exhibited an award-winning *Abromeitiella brevifolia* at the 1984 conference. He reports: "I now have even larger mounds but none as perfect as the 1984 one. My growing mix is 2/3 commercial potting mix, 1/3 volcanic gravel (scoria) and a handful of Magamp 17-40-6 slow-release fertilizer per three cubic feet of mix. I occasionally apply whatever liquid fertilizer is handy.

"Typical vegetative propagation of *A. brevifolia* is 1 rosette = 5 rosettes in one year. After four years, I get a mound of 100-150 rosettes from a single start. I now grow *lorentziana*, *lotteae*, and *scapigera* as well. They are slower than *brevifolia*.

"All propagation is done with clumps that are about two or three years old or overflowing a 3" pot. I do not behead, rather I strip the stems away thus getting fibers of root tissue with nearly every rosette. I plant them deep and keep them evenly moist. Most rapid growth is during our winter and spring. Flowering is random with most occurring in spring and summer.

"Plants in the ground take full southern California sun, even away from the coast. Potted plants require light shade. All are hardy outdoors here at Ventura [a seaport city about 65 miles northwest of Los Angeles at about the same latitude, it so happens, as Sydney, near Max Cook's home]."

25 Encinal Place  
Ventura, CA 93001

Werner Rauh published descriptions of a third species, *Abromeitiella lotteae* in 1983 and a fourth species, *A. scapigera*, in 1989. His key to the species follows.

#### Key to the Species of *Abromeitiella*

1. Rosettes very small, 2-3 cm in diameter, thick. Leaves denticulate. Green flowers  
*Abromeitiella brevifolia* (Griseb.) Castellanos
- Rosettes larger than 3 cm in diameter 2
2. Leaves entire or sparsely dentate, gray lepidote. Green flowers  
*Abromeitiella lorentziana* (Mez) Castellanos
- Leaves heavily dentate 3
3. Inflorescence sessile. Brown flowers; leaves on the upper side green glabrous  
*Abromeitiella lotteae* Rauh
- Inflorescence petiolated, up to 4 cm long. Yellow flowers, green tipped. Leaves on upper side gray lepidote, rosettes very large, up to 15 cm in diameter  
*Abromeitiella scapigera* Rauh et L. Hromadnik

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- . 1983. *Abromeitiella lotteae*. Bromeliensstudien. XIII Mitteilung: 5-12.
- . 1989. *Abromeitiella scapigera*. Bromeliensstudien. XIX Mitteilung: 5-8.
- Smith, L.B.; Downs, R.J. 1974. Pitcairnioideae. Flora Neotropica, no. 14: 241-244.
- Varadarajan, G.S. 1987. Explorations for Pitcairnioideae in South America. J. Brom. Soc. 37:63, 66.

#### Notes:

1. Max Cook is president of the Bromeliad Society of New South Wales.
2. The Smith and Downs monograph lists *A. chlorantha* as a synonym of *A. brevifolia* and *A. abstrusa* as a synonym of *A. lorentziana*. Myron Kimnach says [1972] that the Huntington Gardens plants he calls *A. chlorantha* have rosettes only a third as wide as the *A. brevifolia* described in the monograph. He says also that *brevifolia* was damaged at about 27° F. and *chlorantha* withstood several degrees of freezing without damage.
3. The N.P.H. of Banana Special fertilizer is as follows:
 

Nitrogen	) as bone and offal	0.50%	
	) as ammonia	6.75%	= 7.25%
Phosphorous	) as water soluble	3.91%	
	) as citrate soluble	0.60%	
	) as citrate insoluble	0.57%	= 5.08%
Potassium	as chloride	5.00%	= 5.00%

 subject to tolerances of 0.2%



# *Tillandsia wülfinghoffii*, a New Species from Oaxaca

Renate Ehlers

Fig. 3

*Tillandsia wülfinghoffii* in bloom. Rudolph Wülfinghoff, the collector, took this picture at the type location in March 1990.



R. Ehlers

Fig. 4.

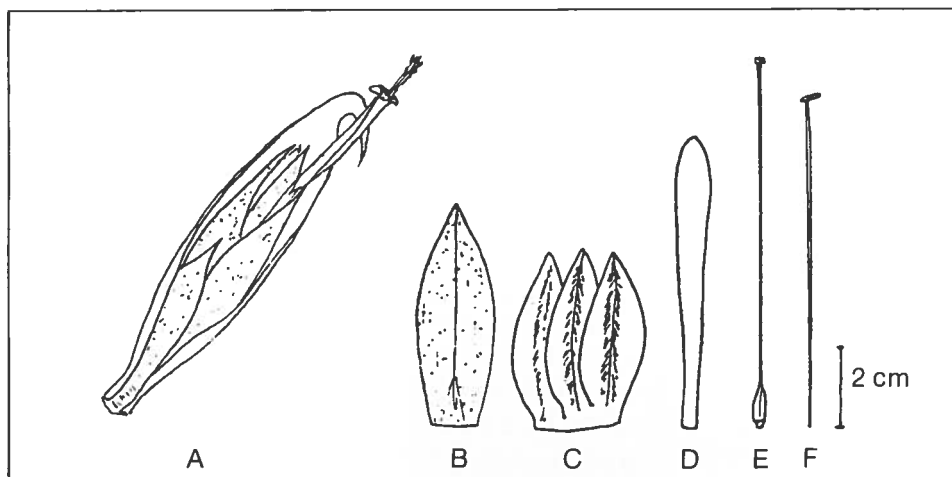
*Tillandsia wülfinghoffii* growing on a rock wall.

*Tillandsia wülfinghoffii* R. Ehlers, sp. nov.

A *T. prodigiosa* (Lemaire) Baker, cui similis, foliis rigidioribus, scape tantum recurve, non decurve, spicis perpatentibus subpolystichis sublancoatis, bracteis florigeris longioribus angustioribusque lepidotis, sepalis longioribus ovatis lepidotis et petalis longioribus differt.

*Plant* stemless, flowering to 60 cm high, growing in big, saxicolous clusters, forming many offsets. *Leaves* 15–20 in an erect, funnellform rosette, thick, coriaceous, to 45 cm long. *Sheaths* elliptic, to 11 cm long and 5–8 cm wide, distinct, adaxial dark brown, abaxial brown, becoming grey-green towards blade, on both sides densely fine adpressed lepidote. *Blade* to 35 cm long, 4 cm wide above the sheath, triangular, canaliculate, acuminate, erect (the tips slightly recurved), adaxial finely adpressed lepidote, slightly nerved, green; abaxial prominently nerved and densely adpressed grey lepidote. *Scape* elongate, shorter than the leaves, stout, deflexed, concealed by the imbricate, foliaceous, erect scape bracts, the short, laminate blades slightly decurved. *Inflorescence* laxly bipinnate, decurved, 30–40 cm long, to 20 cm wide, 8–15 branches, internodes of the lower branches 3–4 cm, near apex 1 cm, the lower ones spreading 90°, apical to 50°, sheaths of primary bracts exceeding the lower, equaling the apical spikes, enfolding them with the elliptic sheath, the short, laminate (towards the apex only acute) blade recurved, rose lepidote outside, adaxial strongly nerved and sparsely lepidote, axis slightly flexuous, stout, sparsely lepidote. *Spikes* 5–8 cm long, 1.7–2.5 cm wide, elliptic-lanceolate, not strongly compressed, the apical one polystichous, 10 mm stout stipitate, 2–6 subsessile, not fragrant flowers, subclax but concealing the slightly geniculate rachis at anthesis. *Floral bracts* elliptic, acute, convex, coriaceous, carinate, equaling or slightly exceeding the sepals, 3.5–5.9 cm long, to 2 cm wide, adaxial green, sparsely lepidote, strongly nerved; abaxial rose, densely lepidote, nerved when dry, hyaline margins. *Sepals* ovate, acute, 3.8–4.5 cm long, 1.3–1.5 cm wide, pale green, adpressed lepidote towards apex, membranous with hyaline margins, with thick, red midrib, the posterior ones ± alate-keeled, becoming very thick-fleshy at base, the anterior one to 2 mm, the posterior ones 3–5 mm connate. *Petals* ligulate, forming an erect tube with recurved apices, twisting apically at anthesis, forming a lateral aperture, 5.9–7.2 cm long, 7 mm wide (5 mm at base), apex #44 lilac, middle #45 mauve, base white. *Stamens* exceeding the petals to 2 cm concolorous with the petals. *Style* longer than the stamens, 0.8 mm in cross section, tapering slightly to base, white, apical 3 cm lilac, *stigma* small, lobes erect, loosely twisted, subpapillose. *Filaments* concolorous with the petals, in two sets of unequal length, broadened near apex, *anthers* elliptic, erect, 3 mm long, 1 mm wide, light brown, attachment dorsifixed ¼ from base, reflexed locules clasp filament apex, *pollen* dark yellow. *Ovary* 9 mm long, 3.5 mm wide, elliptic, green.

**Flowering time:** February–April.



drawing by the author

Fig. 5

*Tillandsia wülfinghoffii*. A. spike; B. floral bract; C. sepals; D. petal; E. style; F. filament.

**Type:** Mexico. Oaxaca: near Guelatao de Juarez, 1800–1900 m, saxicolous on basalt rock walls, *Rudolf Wülfinghoff* no. 86-209, Dec. 1986 (holotype WU).

**Distribution:** Southern Mexico. Oaxaca: on steep basalt rock walls near Guelatao de Juarez, 1800–1900 m and near Huajuapam de Leon. Growing in both places with *T. rodriguesiana* Mez.

**Other material collected:** Dr. Jürg Rutschmann, RUM 69115, Oct. 1969; *Günther & Reinhold Noller, s.n.*, 1980; *Klaus & Renate Ehlers EM 881601 (WU)*.

*Tillandsia wülfinghoffii* is dedicated to Rudolf Wülfinghoff, Pforzheim, a German amateur botanist who has made intensive field studies in Mexico for many years and who collected the holotype.

This plant seems to be related to *Tillandsia prodigiosa* (Lemaire) Baker, but is different in that it is saxicolous with many offsets, leaves are erect, funnelform, more rigid, scape recurved not decurved, spikes spreading at right angles, distinctly and stoutly stipitate, not strongly complanate, sub lanceolate, internodes of the spikes much longer, floral bracts much longer but less wide and distinctly lepidote, sepals much longer, not lanceolate and lepidote; petals longer.

#### Acknowledgement:

We thank Dr. Walter Till, University of Vienna, for his cooperation and for the Latin diagnosis.

#### References:

- Gardner, C.S. 1986. Preliminary classification of *Tillandsia* based on floral characters. *Selbyana* 9:130–146.
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Stuttgart, West Germany

## A New Weevil Pest of *Tillandsia* in South Florida

C.W. O'Brien,<sup>1</sup> M.C. Thomas,<sup>2</sup> and J.H. Frank<sup>3</sup>

A Neotropical weevil with considerable pest potential to both wild and cultivated bromeliads has become established in South Florida. *Metamasius callizona* (Chevrolat), a native of Mexico and Central America, was first discovered in Florida late last year.

The weevil genus *Metamasius* Horn is composed of approximately 100 Neotropical species, one of which naturally occurs in South Florida. These medium-sized, often brightly colored weevils generally breed in palms, orchids, bananas and plantains, sugar cane, and bromeliads, including pineapples. The species of *Metamasius* recorded from bromeliads and their known distributions are listed in Table 1.

*Metamasius callizona* (Chevrolat) was described from Mexico, and ranges from Mexico south through Guatemala to western Panama (Vaurie 1966). The first Florida specimen of this species was collected at a bromeliad nursery in Fort Lauderdale on 15-XI-1989. The nursery was treated and no other specimens were found. Within two months, however, continued surveying produced specimens of *M. callizona* from scattered localities in central and northern Broward County and southern Palm Beach County and it appears to be established.

Weevils have been collected only from native *Tillandsia* in both residential and natural areas, especially on plants growing on old cypress trees. Weevils also have been intercepted on an exotic species of *Tillandsia*, and it may be that *M. callizona* is restricted to bromeliads of the genus *Tillandsia*.

The native Florida species, *Metamasius mosieri* Barber, was described from five specimens collected in Cuba and Florida (Barber 1920). Vaurie (1966) saw only seven specimens when she revised the genus. It remains a rarely collected insect with only five specimens in the Florida State Collection of Arthropods.

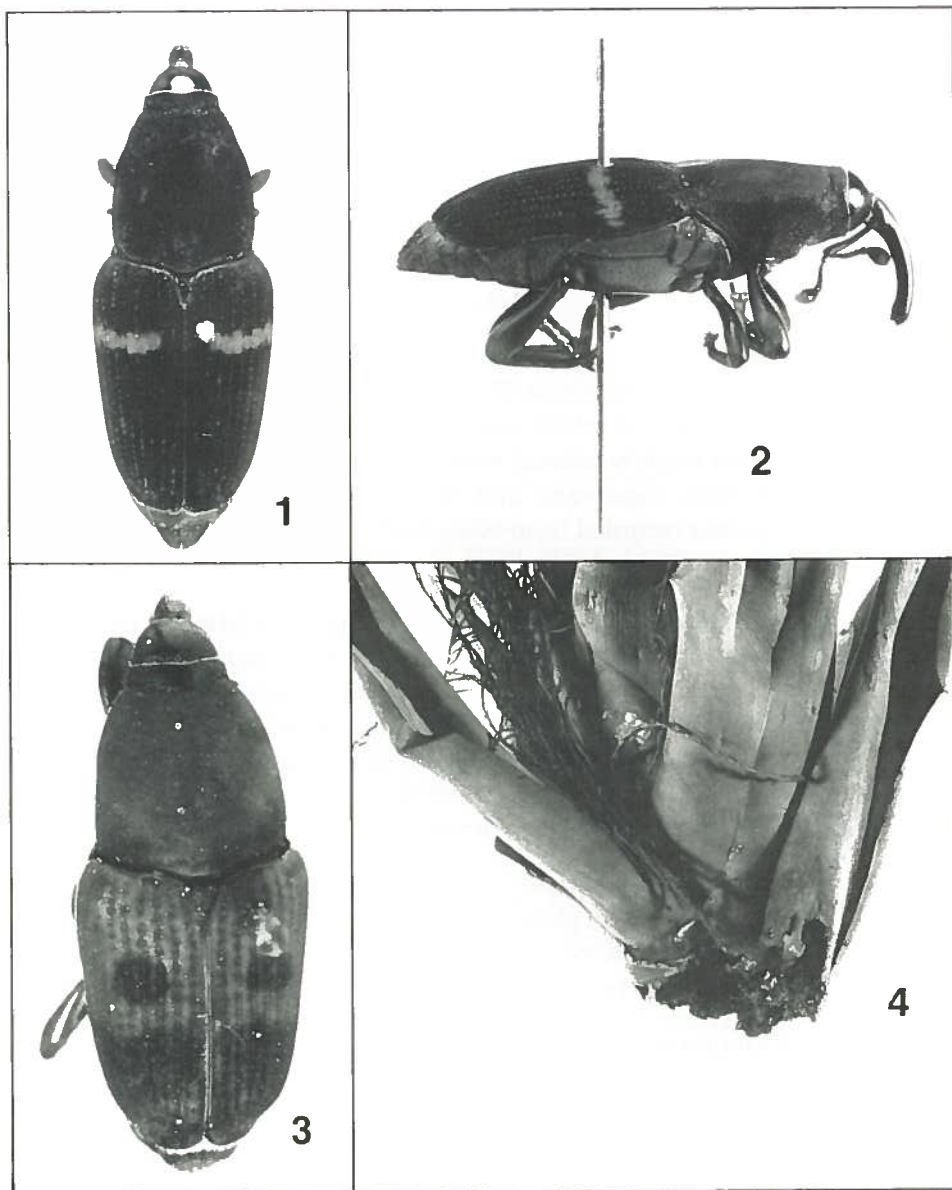
Although *Metamasius* is taxonomically difficult because of the large number of species, the two species found in *Tillandsia* in Florida are distinguished easily by size and color pattern. *Metamasius callizona* (11–16 mm long) is black except for a transverse band of yellow or orange just before the midpoint of the elytra (Fig. 6-1 and 6-2). *Metamasius mosieri* Barber is smaller (6–9 mm long). It is red and black with two black spots on the Elytra (Fig. 6-3).

1. Entomology-Biological Control, Florida A&M University, Tallahassee, FL 32307.

2. Florida State Collection of Arthropods, P.O. Box 1269, Gainesville, FL 32602.

3. Department of Entomology and Nematology, University of Florida, Gainesville, FL 32611.





DPI Photographs by Jeffrey W. Lotz

Fig. 6

1) *Metamasius callizona* Chevrolat, dorsal view (length, 11–16mm); 2) *Metamasius callizona*, lateral view; 3) *Metamasius mosieri* Barber, dorsal view (length, 6–9mm); 4) larval damage to *Tillandsia fasciculata* Sw.

The biology of both species is basically unknown. Of *Metamasius mosieri*, Barber (1920) wrote: "One of the specimens was beaten from a fern growth near the crown of a cabbage palmetto, and another was found high in an oak tree. The multitude of orchids, bromeliads, and other epiphytic plants on the branches of

the hammock trees offers a difficult problem in the determination of the breeding habits of this beautiful little species, and all our attempts were futile with the possible exception that the old dead basal core of one of the large bromeliads (probably *Tillandsia utriculata*) was found displaying such exit hole and larval gallery as should be expected for this species. . . ."

There is a specimen in the Florida State Collection of Arthropods reared from a bromeliad, which unfortunately was not identified. It was also intercepted in Gainesville in a shipment of native bromeliads destined for Canada.

Vaurie (1966) recorded *Metamasius callizona* from bromeliads, pineapple plants, and "banana debris." Vaurie (1966) indicated doubt as to the identity of the "pineapple plants," which may not refer to *Ananas comosus*. In Florida, *M. callizona* has been collected from *Tillandsia fasciculata* Sw. and *T. utriculata* L. Adults, larvae, and pupae often are present in the same plant. Larval damage is restricted mainly to the base of the plant, although sometimes it extends up in the inflorescence.

At Easterlin County Park in Broward County a heavy infestation in February was marked by numerous seemingly healthy plants littering the ground. Closer inspection revealed extensive damage to the base of the plants (Fig. 6-4), so that they had broken away from the tree branches. The life cycle of the weevil seems to be fairly rapid, as pupae have been found in extensively mined but still green and apparently healthy plants. Obviously distressed plants rarely yield anything except empty pupal cases. A second survey of Easterlin Park in late April found the weevil still present in all developmental stages.

Also in late April, a Sarasota bromeliad nursery received (by way of a California distributor) a shipment of 5,000 Mexican *Tillandsia* that were infested with *M. callizona*.

Both species apparently pupate in the host, constructing a fibrous cell similar to that of the "giant palm weevil" (*Rhynchophorus cruentatus* [Fabricius]) (Woodruff 1967).

Florida records by county represented in the FSCA: *Metamasius mosieri*: Collier, Corkscrew Swamp; Glades, Fisheating Creek; Hendry, LaBelle; Sarasota, Laurel. *Metamasius callizona*: Broward, Fort Lauderdale, North Lauderdale, Oakland Park, Parkland, and Wilton Manors; Palm Beach, Boca Raton. Its distribution suggests that it was introduced and established well before the first specimen was discovered.

*Metamasius mosieri* is of no known economic importance and is apparently too uncommon in nature to impact the native bromeliad flora. *Metamasius callizona*, on the other hand, has already shown that it has pest potential in nurseries specializing in bromeliads, and could pose a threat to the native *Tillandsia* species in the state. Of special concern are the two threatened species of the genus in Florida, *T. flexuosa* Sw., which occurs within the current Florida range of *M. callizona*, and *T. pruinosa* Sw. (Ward 1981).

[continued on page 222]

## Miscellaneous New Taxa of Bromeliaceae (VII)

Harry E. Luther

Drawings by Barbara N. Culbertson

*This paper is the result of work done in the winter and spring of 1983 when the late Dr. Amy Jean Gilmartin and I initiated our collaborative work toward the treating of Bromeliaceae for the Flora of Ecuador. Numerous other projects have intervened in the following six years and, unfortunately, these notes could not be published until now. "Miscellaneous New Taxa of Bromeliaceae (VII)" is respectfully dedicated to her memory.—H.E.L.*

### ECUADOR

*Ronnbergia campanulata* Gilmartin & Luther, sp. nov. (Fig. 7).

A *R. morreniana* Linden & André similis sed foliorum laminis emaculatis, bracteis florigeris serratis, calyce campaniformi et sepalis majoribus differt.

*Plant* flowering to 25 cm tall, epiphytic. *Leaves* 32 cm long, petiolate; blades 15–18 cm long, 7 cm wide, lanceolate, acuminate, adaxially green, abaxially pale lepidote, appearing silver, apically minutely serrate; petioles serrate; *sheaths* to 4 cm, pale, entire. *Scape* to 4 mm in diameter, much shorter than the leaves, erect; *scape bracts* erect, densely imbricate and concealing the peduncle, elliptic, serrate, the upper bracts apically dark blue. *Inflorescence* ca. 5 cm long, 4.5 cm wide, simple, densely flowered. *Floral bracts* 2–3 cm long, ovate, erect, the lowest exceeding the sepals, thin, nerved, serrate, dark blue. *Calyx* campanulate. *Sepals* 1.5 cm long, ca. 9 mm wide, very asymmetrical, 1/3 connate, nerved, mucronate, dark blue. *Petals* ca. 1.2 cm long, blades elliptic, obtuse, white. *Ovary* globose, 4 mm long.

**Type:** Ecuador. Morona-Santiago: NW range of Cordillera del Condor, trail from crest or ridge to base camp overlooking Río Zamora, elev. ca. 1950 m, 4 January 1972, B. MacBryde 954 (Holotype:US).

*Ronnbergia campanulata* resembles *R. morreniana* Linden & André but is distinguished by its unspotted leaf blades, serrate floral bracts, white corolla and campanulate calyx. This latter feature also serves to separate it from all other species of *Ronnbergia*.

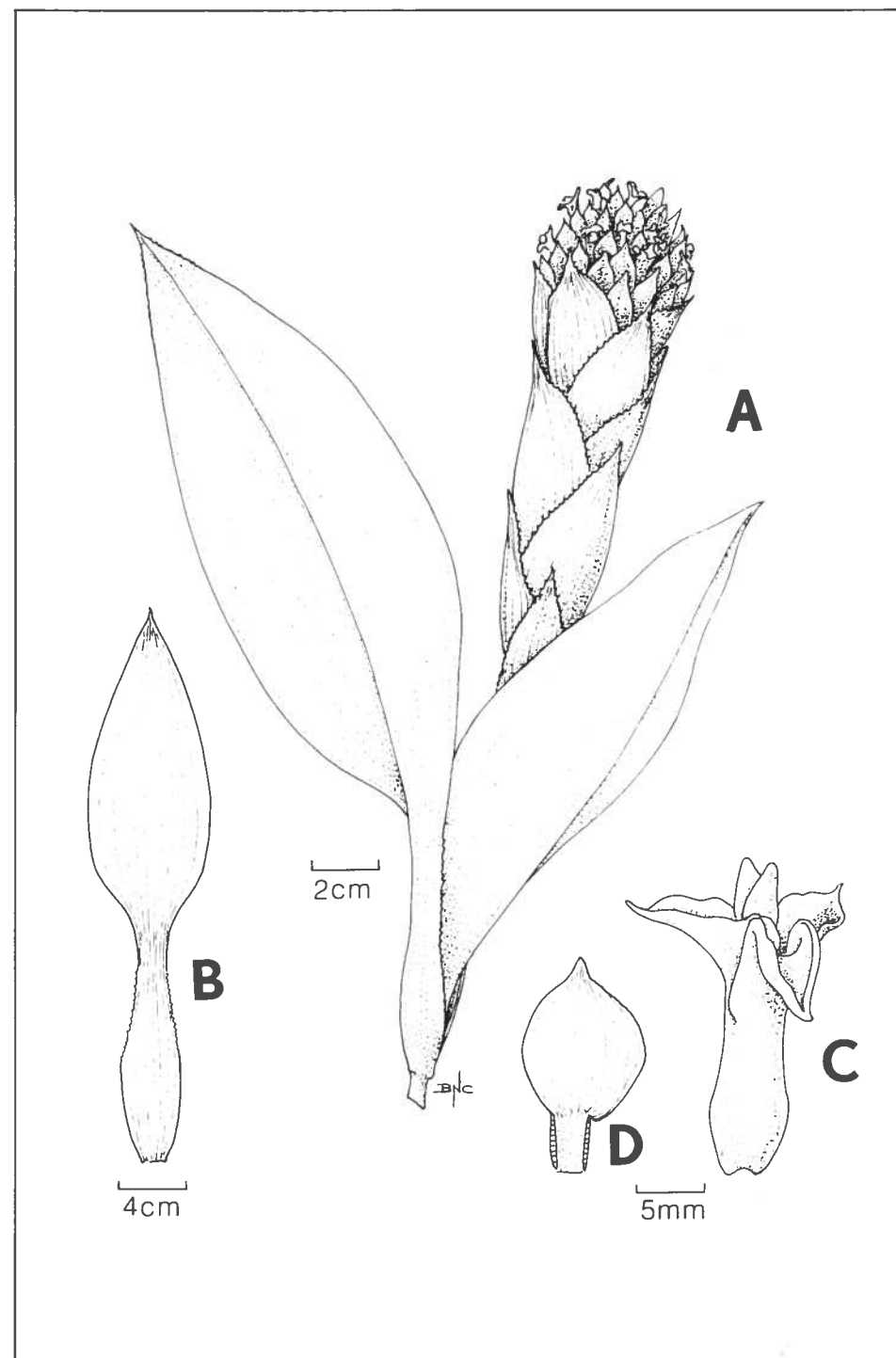


Fig. 7  
*Ronnbergia campanulata*. A) habit; B) leaf; C) flower; and D) sepal.



***Streptocalyx lugoi* Gilmartin & Luther, sp. nov. (Fig. 8)**

A *S. brachystachys* Harms similis sed foliis latioribus, bracteis florigeris spinoso-serratis et sepalis majoribus differt.

*Plant* flowering to ca. 40 cm tall. *Leaves* rosulate, ca. 90 cm long. *Leaf sheaths* broadly elliptic, 12–15 cm long, 8 cm wide, appressed lepidote dark castaneous toward the base. *Leaf blades* linear, attenuate, pungent, to 3 cm wide, spinose-serrate with dark, antrorse spines 1–3 mm long, appressed lepidote. *Scape* erect, about equaling the leaf sheaths. *Scape bracts* foliaceous, densely imbricate. *Inflorescence* densely bipinnate, subcapitate, ca. 13 cm in diameter. *Primary bracts* elliptic to lance-ovate, acute, pungent, to 9 cm long, 4.5 cm wide, spinose-serrate, concealing the spikes except for the petals, color unknown. *Spikes* two-flowered. *Floral bracts* ca. 15 mm long, broadly ovate, carinate and apically serrate and floccose. *Sepals* asymmetrical, ca. 20–24 mm long, carinate, apically floccose and minutely serrate. *Petals* naked, at least 36 mm long, violet (Lugo!). *Ovary* ca. 1 cm long.

**Type:** Ecuador. Pastaza: Mera, 11 January 1957, *Manuel Lugo 308* (Holotype: S; Isotype: MO).

*Streptocalyx lugoi* resembles *S. brachystachys* Harms by having a subcapitate inflorescence, strongly asymmetrical sepals and floral bracts that much exceed the ovary but differs from this species by having longer sepals, serrulate floral bracts and broader leaf blades.

*There are two other new taxa described in this report, Tillandsia nervibractea Gilmartin & Luther and Tillandsia pseudotetrantha Gilmartin & Luther. In order to reproduce the drawings nearly full size we shall publish those descriptions next issue.—Ed.*

## Anniversary

Forty years of work by The Bromeliad Society, Inc. have helped to increase interest in these lovely plants. Famous authors have contributed important scientific works; descriptions of new species have been published.

We own all of the issues since 1951 and have watched with great interest the improvement of the *Journal* over the years. I am proud to be a life member of the society and happy to have the chance to write for the *Journal* from time to time.

Congratulations to the society and to the staff members from Klaus and Renate Ehlers and the members of the German Bromeliad Society.

Stuttgart, West Germany

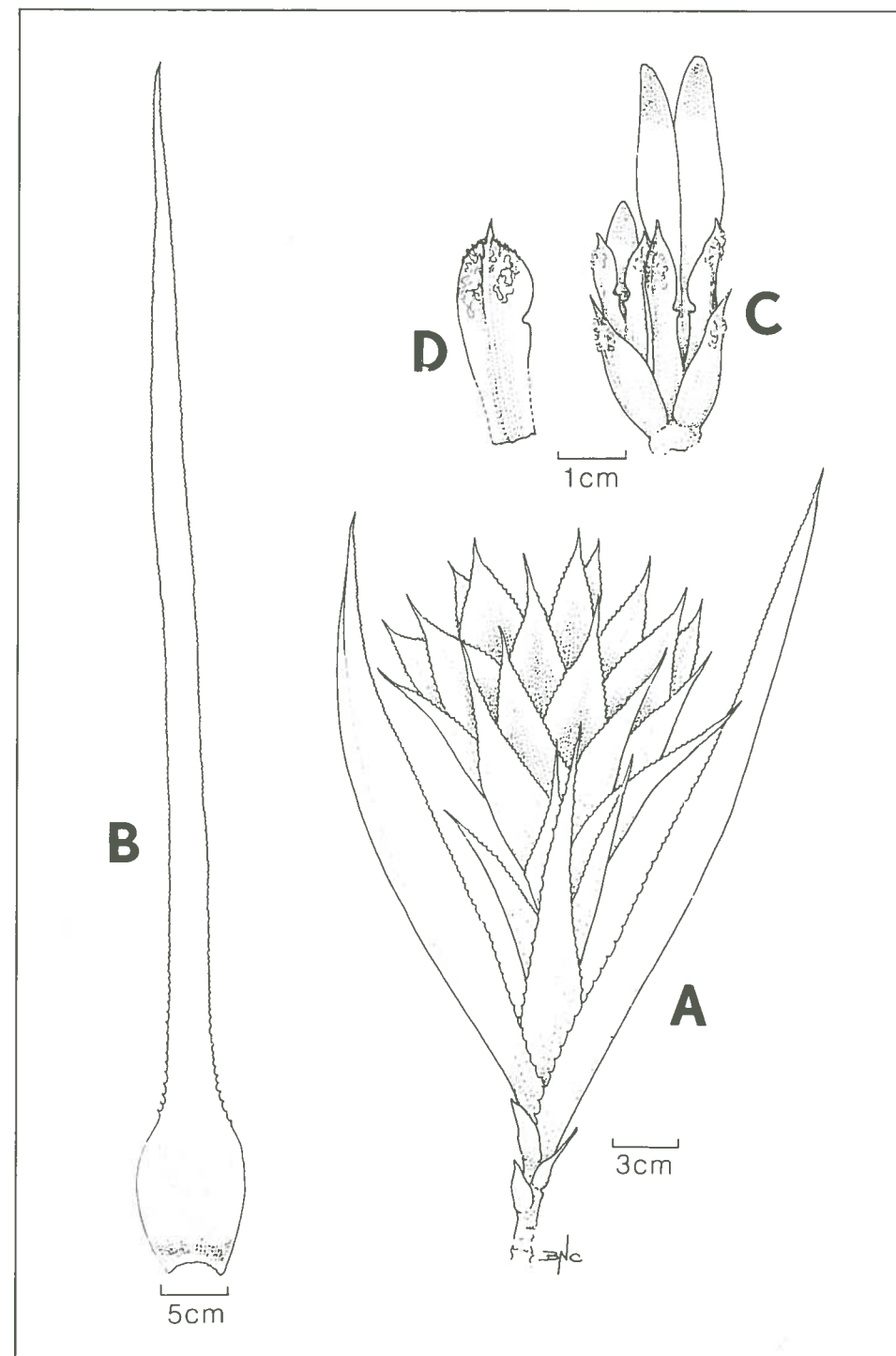


Fig. 8  
*Streptocalyx lugoi*. A) habit; B) leaf; C) branch of inflorescence; and D) sepal.

## Atypical Pupping Habit of *Tillandsia ionantha*

Louis F. Wilson

Many species of tillandsias normally reproduce asexually from vegetative buds located in the leaf axils near the base of the plant. *T. ionantha* var. *ionantha* typically produces one to three offshoots in the normal way after flowering. However, two plants out of a large shipment that I received from Guatemala in 1987 each atypically sent forth a solitary terminal offshoot after flowering (Fig. 9). These apical offspring grew normally, and then in 1989 when about three-fourths the size of the parents, they flowered. The next generation was not eccentric, however, as each offspring reproduced a single pup in the normal way from the base, and one also produced a second pup midway up the plant. Then, surprisingly, one and five pups also emerged from the bases of each of the original parent plants concurrently with the development of their offsprings' pups, thus producing a second generation of offshoots.

A few tillandsias have variants that consistently reproduce differently from the norm. For example *T. balbisiana*, *T. flexuosa*, and *T. paucifolia* have forms that reproduce from buds on the scapes of their inflorescences. Although variable in many ways, such as size and form, *T. ionantha* has no known forms that consistently reproduce from the scape or apex. My *T. ionantha* plants are obviously not a new form that will consistently reproduce in a new way, but for at least one generation they were anomalous in their reproductive habits.

East Lansing, Michigan



Author

Fig. 9

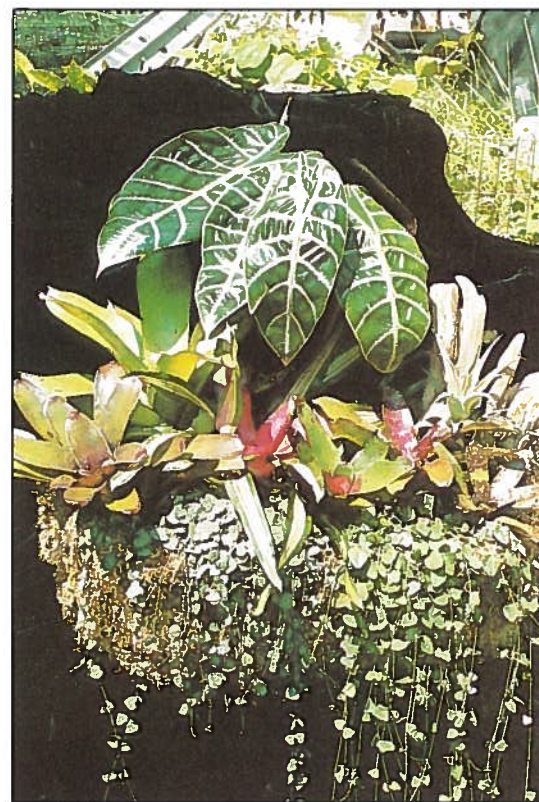
Instead of the usual offshoot from a bud near the base, this *Tillandsia ionantha* produced a single terminal offshoot.

## Bromeliads in Window Boxes

We are always delighted to receive letters from members such as the following from Judy Showers, 1322 Spring Road, Carlisle, PA:

Dear Editor:

Last year, when the Victory Garden had its window box contest, I put together a window box with bromeliads and alocasia and I was one of the 50 semifinalists. I would have been picked for one of the five finalists but we had not planted the lawn yet and they like to photograph the entries in the contestants' yards. My husband thinks that they should have judged the window box and not the yard, but I guess that's TV for you. Anyway, hope you can use the photo for the *Journal*.



J. Showers

Fig. 10

Judy Showers' prize-winning window box. Left to right: Neoregelia 'Monterrey', *N. melanodanta* hybrid, *Ceropegia woodii*, *N. 'Perfecta Tricolor'*, *Alocasia chelonii*, *N. olens* 696, *Aechmea Foster's Favorite*, *Ceropegia cafferorum*, *N. 'Painted Fire'*, *Tillandsia ionantha*, *T. paucifolia*, *T. ionantha*, *N. Hojo Rojo* x *N. ampullacea* var. *tigrina*.

## Bromeliads in Space; The Houston 1990 World Bromeliad Conference

Clyde Jackson, General Chairman

The 1990 World Bromeliad Conference hosted by the Bromeliad Society/Houston was in every way an overwhelming success. There were more than 400 registrants and 725 entries in the show. There were registrants from 13 countries and 26 states of the United States.

The many seminars covered a wide range of topics and the educational opportunities were outstanding. The slide programs were not only educational but entertaining as well. A new program, "Worldwide Show and Tell" was introduced and we look forward to having it a regular part of future conference proceedings.

Thanks to a lot of very generous growers and some rather spirited bidding, the rare plant auction was a rousing success. The net proceeds of \$14,357 have been deposited in the special accounts maintained by the BSI treasurer: \$11,857 in the Bromeliad Identification Center Special Fund and \$2,500 in the Padilla Research Fund. These funds are disbursed by the treasurer on request of the BIC director and the chairman of the Research Grant Committee.

We wish to thank all of you who attended the conference and who made it a success by your participation. We hope that you enjoyed your visit in Houston and look forward to seeing you again soon.

The 1992 conference plans are already on the drawing board so start making your plans now to attend. The host city will be Tampa, Florida. Tom Wolfe, the general chairman, and his committees will make it one of the best ever.

*Houston, Texas*



## Planting Media for Bromeliad Seeds, Part III

Kenneth Quinn

In two previous articles<sup>1</sup> I discussed my experiences with planting media for bromeliad seeds. Since that time, I have tried a new substance that I have seen only on the west coast. It is "green moss," which comes from Washington State and is similar to long-fiber peat moss. It differs, however, in not being completely dead and sterile. When placed in a moist environment, parts of the moss often start to grow, and after a few weeks you frequently find the shield-shaped prothalli of young ferns, followed by their lacy fronds. This material has become my favorite planting medium. The development of fungus appears to be less common on this substance, and the seedlings seem to appreciate the air around their roots. That this moss is a good medium should be no surprise. Photos of bromeliads in the wild often show them growing on moss-covered branches. When I tried moss collected from trees in southern Georgia, it harbored insects that quickly ate the seedlings. For that reason, I do not recommend using moss that you collect yourself. I have not tried the New Zealand moss now popular with orchid growers, but I suspect it would also be very good.

Using moss as a germinating medium has another advantage. At transplanting time, there is a minimum of root disturbance. If one tugs (very gently!) at the base of the plant, the strands of moss usually untangle and can be incorporated into the new planting medium. There is no big hurry to do this; I have had seedlings in moss for over a year with no apparent harmful effects. Indeed, the plants seem to appreciate the moss perhaps because it offers a beneficial amount of aeration to the roots.

In my earlier articles, I mentioned difficulty in growing pitcairnioid seeds. Since that time, I learned from Carol Johnson of Pineapple Place that in nature the roots of even the xerophytic species are often in moist areas. I accordingly tried growing seeds of dyckia and puya on moist "green moss" and have been rewarded by good growth. Even the species with very thick, succulent leaves seem to enjoy the very moist environment.

A little over a year ago, I attempted to sprout some hohenbergia seeds on peat pellets. Germination rates were poor, and the seedlings were not thriving at all. At the same time, I had several hundred seeds of *Rhipsalis cassutha*, an epiphytic cactus. As an experiment, I scattered the seeds thickly on the peat pellets. The seed was very fresh, and practically all the seeds germinated, resulting in a very thick growth of seedlings. At present, the cacti are about an inch high—and are dwarfed by the hohenbergia seedlings! The thick growth of *rhipsalis* had a definitely beneficial effect on the hohenbergia plants, though I cannot

*[continued on page 221]*

1. Volumes 33:270 and 35:13-15.



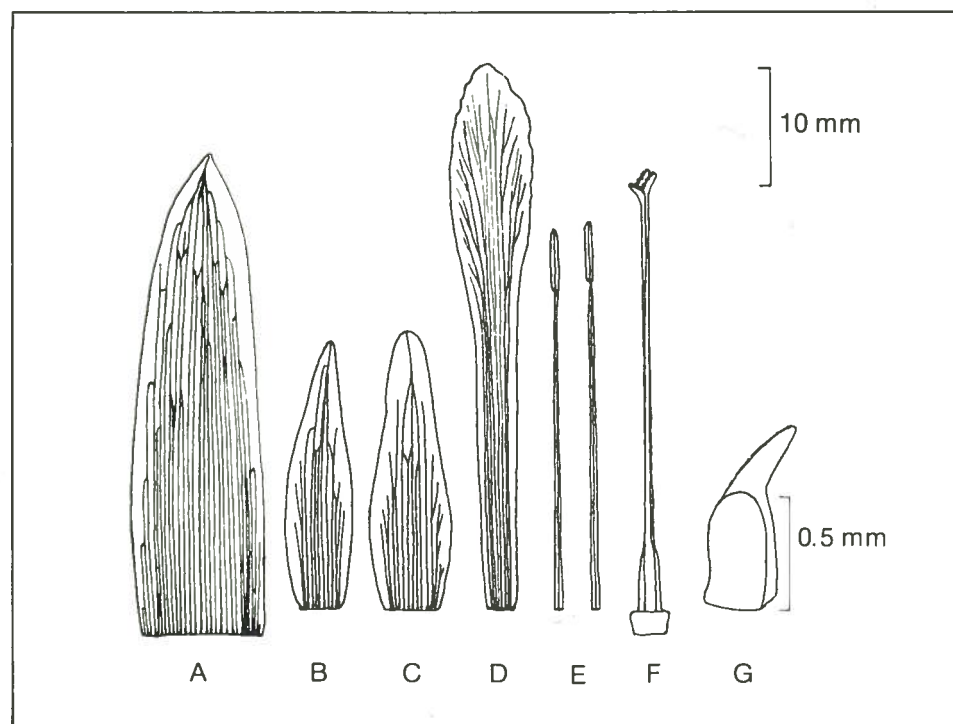
# *Tillandsia yuncharaensis*, a New Species from Bolivia

Walter Till

During a five-week journey through central and south Bolivia in 1982 with Dr. Helmut Hromadnik (Kritzendorf, Austria) and Erich Haugg (Muhldorf, German Federal Republic) we collected a long-stemmed tillandsia growing on rocks that at first glance we thought to be a remarkable form of the widespread *Tillandsia xiphioides* Ker-Gawler. When the plant flowered in our greenhouses it became evident that we had discovered a novelty, which is presented here and described as a new species.

## *Tillandsia yuncharaensis* W. Till, sp. nov.

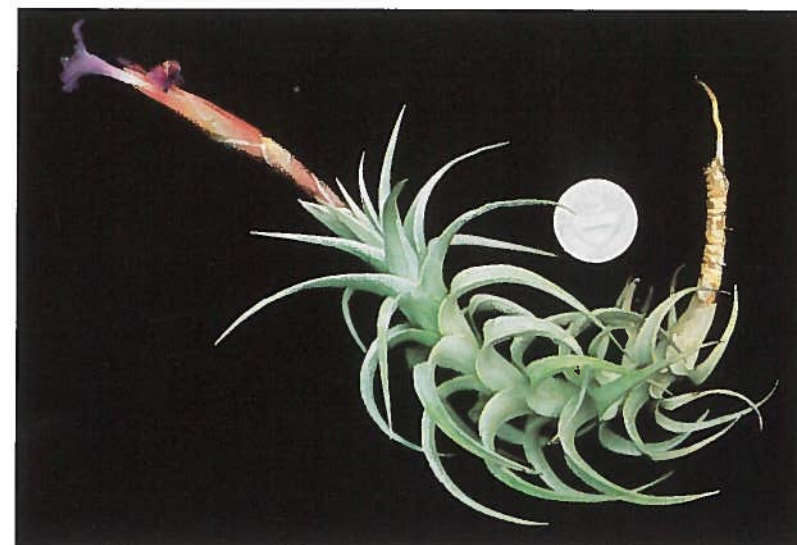
A *Tillandsia xiphioides* Ker-Gawler et eia varietatibus caule longo, foliis brevioribus recurvatisque, bracteis florigeris rubro suffusis, sepalis sub obtusis et petalis minoribus violaceis differt.



Author

Fig. 11

*Tillandsia yuncharaensis*. Drawings of floral details: A-D, ventral view; A, floral bract; B, anterior sepal; C, posterior sepal; D, petal; E, stamens, one of each series; F, gynoecium (ovary, style and stigma); G, ovule.



Author

Fig. 12

*Tillandsia yuncharaensis*, a new species from Bolivia. Habit of the type specimen.

**Typus:** Bolivia. Dept. Tarija: prope viam ad Yunchará, 12 km ad occidentem pagi Yunchará, 3000 m.s.m., 13. 07. 1982, saxicola, caespitosa, leg. W. Till, H. Hromadnik & E. Haugg sub #WT55 (holotypus WU).

*Plant* distinctly caulescent to 30 cm long, the flowering axis curved upwards and c. 15 cm long. *Leaves* spirally arranged, not secund; *sheaths* c. 7×18 mm, broadly triangular, clasping the stem, glabrous in most parts, brownish, merging into the blades; *blades* to 5 cm long, c. 1 cm wide at base, spreading and recurved, more or less appressed, densely grey-white lepidote, channeled above, nerved when dry, tapering into an acute apex, with subciliate scales at margin. *Scape* very short, 2–3 cm long, 2 mm in diameter, glabrous, angled when dry, completely concealed by 3–4 lepidote, reddish, broadly acute or acuminate, nerved scape bracts that exceed the scape internodes. *Inflorescence* simple, narrowly lanceolate, acute, 5.5–6.5 cm long, c. 8 mm wide, 1–3 (mostly 2)-flowered slightly complanate. *Flowers* distichous 37–40 mm long, very fragrant; pedicels stout, c. 2 mm long. *Floral bracts* carmine with greenish hyaline margins, ecarinate, smooth, glabrous, acute, in part with very few scales near the apex, 35–42 mm long, 11–12 mm wide, completely concealing the glabrous rachis and sepals. *Sepals* ovate-lanceolate, widest below the middle, subobtuse, glabrous, smooth, 23–24 mm long and 6–7 mm wide, equally c. 1 mm connate, the anterior ones ecarinate, the posterior ones very obtusely carinate and subulate only at the apex. *Petals* violet, c. 47 mm long, claw c. 30 mm long and 3–3.5 mm wide, blades c. 17 mm long, 7 mm wide, curved spreading with undulate, crisped margins. *Stamens* in two series of slightly different lengths, the inner ones exceeding the outer

ones by 1 mm; *filaments* white, flattened, filamentous, straight and not at all plicate, 27.5–28.5 mm long and 1 mm wide at base; *anthers* about reaching the throat of the corolla, yellow, subbasifixed, introrse, 5 mm long and 0.5 mm wide. *Ovary* conic-cylindric, 5 mm long and 2 mm in diameter; *style* with stigma 33 mm long and 0.6–0.7 mm in diameter, slender, slightly surpassing the throat of the corolla, *stigma lobes* spreading, stigma of the conduplicate (-spiral) type;<sup>1</sup> *ovules* sessile, caudate, the tail about as long as the ovule; *placenta* elongated, as long as the locules.

*Tillandsia yuncharaensis* is restricted to a small area in southernmost Bolivia where it grows in groups on rocks. It is easily recognized by its long stems, which are covered with dead leaves at the base, and by its violet petals. Within the *T. xiphioides* alliance, it occupies very high elevations (3000–3100 m) while typical *T. xiphioides* is found normally at 600–1100 m in its lower range to 2100–2650 m in its upper range and usually grows as an epiphyte.

It is distinguished from *Tillandsia muhrrii* Rauh<sup>2</sup> by its habit, flower shape, and fragrance. The flowers of *T. muhrrii* are not fragrant.<sup>3</sup> The related *T. xiphioides* var. *tafiensis* L.B. Smith has densely pruinose leaves, short stems and pale blue petals.<sup>4</sup>

There may be some affinity with *Tillandsia diaguitensis* Castellanos and *T. muhrae* W. Weber,<sup>5</sup> both growing at lower elevations (c. 2000–2350 m) in Jujuy, Argentina, and having white flowers. In *T. diaguitensis* they are fragrant, in *T. muhrae* no information concerning fragrance is given in the protologue.

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Rennweg 14, A-1030  
Vienna, Austria

#### Notes:

1. Brown, G.K.; Gilmartin, A.J. 1989. Stigma types in Bromeliaceae—a systematic survey. *Sys. Bot.* 14:110–132.
2. Rauh, W. 1986. *Tillandsia muhrrii* Rauh spec. nov. *Die Bromelie* 1/86:1–2.
3. ———. 1987. Personal communication to author.
4. Smith, L.B.; Downs, R.J. 1977. *Tillandsioideae*. *Flora Neotropica* 14 (2). New York: Hafner Press: 817.
5. Weber, W. 1986. *Species novae Bromeliacearum* V. Feddes Repertorium 97:101–103.

#### Correction for *Journal*, volume 40, no. 4

Page 173 and back cover. Mr. Spivey's name is Robert C., not Richard. The photo on the back cover was taken by Harvey C. Beltz.

## *Orthophytum supthutii*, a Striking New Bromeliad

Elvira Gross and Wilhelm Barthlott

In course of a journey in February 1988 through the state of Minas Gerais, a remarkable dwarf terrestrial (epilithic) bromeliad was observed. Slides and a description of the plant were subsequently sent to Elton M.C. Leme (Rio de Janeiro), the specialist in Brazilian bromeliads. He informed us: "... it is really different from everything I have ever seen. As far as my knowledge is concerned, it is not closely related to any other known species because of its petal features."

On the advice of E.M.C. Leme and W. Rauh (Heidelberg), we decided to describe this new species:

### *Orthophytum supthutii* E. Gross & W. Barthlott<sup>1</sup>

*Plant* stemless or very short caulescent, flowering up to 6 cm high, propagating by basal stolons. *Leaves* numerous, forming a flat rosette of 15–20 cm in diameter. *Sheaths* more or less conspicuous, membranaceous, white, glabrous, minutely serrulate, 1.5–2 cm wide, 1 cm high. *Blades* small triangular, long attenuate, up to 13–15 cm long, 12 mm wide above the sheath, on the upper side glabrous, dark green, lustrous, beneath very densely white lepidote, nerved, pungent, serrulate; teeth 2–3 mm distant one from the other, antrorse. *Inflorescence* rich flowering, sunk in the center of the rosette, capitate, bipinnate. Basal *spikes* in the axils of normal rosette leaves, the upper ones in the axils of smaller, subfoliate bracts, sessile, 1 cm long (without flowers), distichous, 2-flowered. *Floral bracts* lanceolate, long attenuate, 10–15 mm long, membranaceous, sharply carinate, at the apex wooly, white, serrulate at the margin, shorter than the *sepals*; these up to 20 mm long, free, sharply carinate, glabrous, white lepidote only on the keel, membranaceous, small triangular-attenuate. *Flowers* sessile. *Petals* bright orange-yellow, lanceolate, 2.5–3 cm long, spatulate, very thin, 7 mm wide at the apex, spreading, at the base with two 5 mm-long fimbriate scales. *Stamens* included, only the style with the three free pistils somewhat exerted. *Filaments* very thin, yellow, with small, subdorsifixed *anthers*; inner *stamens* short adnate to the petals. *Epigynous tube* almost none. *Ovary* flat, more or less triangular, 10 mm long, 4 mm wide. Placentation central. *Ovules* more or less numerous, obtuse.

**Holotype:** W. Barthlott & D. Supthut No. 10315 (=B.G.H. 70610) (Febr. 1988), in Herb. Bradeanum, Rio de Janeiro (HB); isotype: in Herb. Inst. System. Bot. Univ. Heidelberg (HEID).

**Locality and distribution:** on vertical rock walls in a deciduous forest, 50 km north of Chapão do Sol, Minas Gerais, Brazil. The plants form dense mats and grow in association with *Acanthostachys strobilacea* and *Barbacenia* (Velloziaceae).



Fig. 13  
*Orthophytum supthutii* in  
the type locality, growing  
on vertical rock walls.

Photos by W. Barthlott

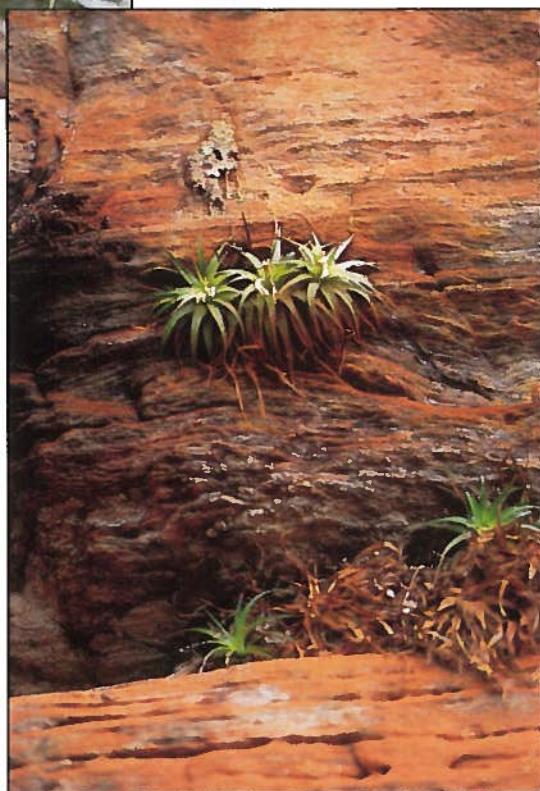


Fig. 14  
Flowering plant of *Orthophytum  
supthutii* with the lustrous, dark  
green leaves.

*Orthophytum supthutii* is a striking new species that seems to have an isolated position within the genus *Orthophytum*. The determination, with help of the key in L.B. Smith and R.J. Downs (*Flora Neotropica* 14/3, 1979), leads to *O. navioides* (L.B. Smith) L.B. Smith but that species is quite different from *O. supthutii*. The latter differs from *O. navioides* in the following characteristics: Leaves only 15 cm long, beneath very densely white lepidote, above green, not 30 cm long, obscurely lepidote and reddish. Inflorescence with many flowers, not few-flowering. Sepals only 2 cm long, not 3 cm. Petals bright orange-yellow, not white. Ovary up to 10 mm long, not 5 mm. Further collections must show if we have to erect an own subgenus for *O. supthutii*.

#### Acknowledgement:

We thank W. Rauh for his useful advice and M.C. Leme for his collaboration.

#### Note:

1. The plant is dedicated to D. Supthut, director of the Städtische Sukkulentensammlung, Zürich (Switzerland), who is very interested in xerophytic bromeliads.
2. The Latin diagnosis appears in Bromelienstudien, 21. Mitteilung. (Trop. subtrop. Pfl., 1990).

Heidelberg  
Bonn, West Germany

**THE MULFORD B. FOSTER BROMELIAD CENTER** located at the Marie Selby Botanical Gardens in Sarasota, Florida, and directed by Harry E. Luther is a valuable asset available to all BSI members. Whether newly collected from the wilds or wildly growing in your apartment or greenhouse, bromeliads deserve being accurately named and this is the place to get it done. Why assume that a plant tag is accurate when for \$5.00 you can find out? The method is: (1) send the entire plant if it is small, or (2) send an entire leaf plus sheath, and the inflorescence including a fresh flower. If the inflorescence is very large, send a color slide with a branch of the inflorescence. A drawing of the plant would be helpful. Add your observations about the growing conditions even of your greenhouse. Wait until the danger of freezing is past before sending through the mail. Harry will reply. Send to: M.B. Foster Bromeliad Identification Center, Marie Selby Botanical Gardens, 811 South Palm Ave., Sarasota, FL 34236.



## New Zealand Moss

Kathy Dorr

I have been using the New Zealand moss for over a year now and am very pleased with the results I have had growing from seed. *Orthophytum navioides*, for example, has always been troublesome. Late in February, 1989, I planted the seed on the moss and now have over a hundred half-grown plants. Vriesea hybrids have progressed beyond my expectations. I also have some *Tillandsia ionantha* growing very happily on it. I intend to experiment with many more tillandsias. The seedlings of a billbergia hybrid I made have grown on the moss to be three to four times the size of the others and are so much healthier looking. They are a nice dark, glowy green, making the ones in the mix look almost sick. In June of last year, I transplanted some billbergia hybrid seedlings to pot—half with mix and half in the moss. I wish you could see the difference. Those grown in moss are, again, a dark, glowy green and two to three times the size of the others.

When transplanting from the mother container, I put seedlings in thumb pots in the moss and then when they are ready for a larger pot I just transplant the whole thing, not disturbing the roots.

I have been told that this moss is very acid but that it lasts only for about a year and anything growing in it should be transplanted every year for good growth.

I have also used the moss for plants that are sickly and nothing I did seemed to do any good. I have had excellent response in most instances. You know the kind of plants I am referring to: those that just won't die but won't do anything else either and finally, after several years, fall over dead. I never have the heart to throw them out and keep thinking that something can be done. Now, I have found something that can be done.

I don't have a greenhouse, so you can see that I grow seedlings by the seat-of-the-pants method and I am now completely sold on this moss for this purpose. The moss has the propensity to hold moisture, but not too much. It does not dry out as quickly as sphagnum and when it does dry out, it will very quickly take up the water again—unless you pack it very tightly as one person did. I appreciate this because I never had success with sphagnum. It certainly didn't give the growth this moss does, as well as drying out quickly and being difficult to get wet again. The New Zealand moss is not cheap. I pay nearly sixty dollars a bale, but a bale goes a long way, and I feel that it is worth it. Will continue to experiment with it.

Lakewood, California

Two catalogs at hand list New Zealand moss and there are probably many other sources: Teas Nursery Co., Inc., P.O. Box 1603, Bellaire, TX 77402-1603, and OFE International, Inc., P.O. Box 164402, Miami, FL 33316.—Ed.

## Planting Media for Bromeliad Seeds, Part III

[continued from page 213]

explain why. In a similar fashion, the growth of moss and ferns in the green moss seems to have no harmful effect on bromeliad seedlings; if anything, the opposite is true. It may simply be that the conditions good for ferns and mosses are also good for young bromeliads. On the other hand, perhaps there are substances released by those plants that the bromeliads find beneficial.

Los Alamos, New Mexico

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## Great Minds Department

Klaus von Bismark wrote in volume 40, number 3 (1990) of the *Journal* about bromeliads in Peruvian pre-Columbian art and suggested that members visit museums having collections of such materials to search them for evidence of bromeliads. We just didn't know how many other people are interested in the same art.

The magazine *Arts & Antiques* for May 1990 contains a long article by Carl Nagin, "The Peruvian Gold Rush; how the plundered treasure from the greatest archaeological discovery ever made in the America—the graves of the Lords of Spain—was smuggled onto the international art market." In our ignorance, we thought that the subject was interesting textiles and pottery.

The *National Geographic* followed in June with Walter Alva, director, Bruning Archeological Museum, Lambayeque, Peru, writing about "The Moche of Ancient Peru: New Tomb of Royal Splendor." In the same issue, Christopher B. Donnan, director, Museum of Cultural History, University of California, Los Angeles describes "Masterworks of Art Reveal a Remarkable Pre-Inca World."

If you do not subscribe to these periodicals, rush to the nearest library to learn about the Moche and huacos and emeralds and gold and serious archaeology. We may yet learn more about drawings of bromeliads on ancient pottery.—TUL

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## Notice

The minutes of the 1990 BSI board meeting will be published in the November-December issue of the *Journal*.

The Board of Directors approved a complete revision of the bylaws of the society at the June 1990 meeting. The bylaws will be distributed as soon as possible with one copy to: each director, standing committee chairman, special committee chairman, and the president of each affiliated society. The cost of copies to individual members will be announced.—Ed.

## A New Weevil Pest of *Tillandsia* in South Florida

[continued from page 205]

**Table 1. Species of *Metamasius* recorded from bromeliads.**

<i>Metamasius ritchiei</i> Marshall	Jamaica
<i>Metamasius alveolus</i> Vaurie	Costa Rica
<i>Metamasius callizona</i> (Chevrolat)	Guatemala, Mexico, Panama
<i>Metamasius fasciatus</i> (Olivier)	Costa Rica, Panama, South America
<i>Metamasius flavopictus</i> (Champion)	Mexico
<i>Metamasius sellatus</i> Champion	Mexico, Belize, Nicaragua, Costa Rica, Panama
<i>Metamasius nudiventris</i> Champion	Mexico, Nicaragua, Costa Rica, Panama
<i>Metamasius bromeliadicola</i> Champion	Costa Rica
<i>Metamasius quadrilineatus</i> Champion	Mexico, Guatemala, El Salvador
<i>Metamasius cincinnatus</i> Champion	Nicaragua, Costa Rica, Panama, Ecuador
<i>Metamasius dimidiatipennis</i> (Jekel)	Mexico, Guatemala, Costa Rica, Panama, Colombia, Ecuador, Peru, Brazil, Java
<i>Metamasius quadrisignatus</i> (Gyllenhal)	Montserrat, Guadeloupe, Dominica, Martinique, Panama
<i>Metamasius mosieri</i> Barber	Florida, Cuba, Dominican Republic
<i>Metamasius rugipectus</i> (Champion)	Mexico, Costa Rica, Panama
<i>Metamasius hebetatus</i> (Gyllenhal)	Nicaragua, Costa Rica, Panama, Colombia, Peru, Bolivia, Venezuela, Ecuador, Guiana

We thank Division of Plant Industry inspectors Dennis Clinton, Susan Marsicano, Matthew Wittek, Debra Chalot, Donna Leone, Jack McCluskie, and Keith Harris for their untiring efforts in tracking down populations of *M. callizona*.

### References:

- Barber, H.S. 1920. A new tropical weevil from Florida and Cuba. Proc. Ent. Soc. Washington 22:150-152, pl. 8.
- Vaurie, P. 1966. A revision of the Neotropical genus *Metamasius* (Coleoptera, Curculionidae, Rhynchophorinae). Species groups I and II. American Mus. Natur. Hist. Bull. 131(3): 213-337, 119 fig.
- Ward, D.B. 1979. Rare and endangered biota of Florida. Volume Five. Plants. University Presses of Florida. Gainesville. xxix +175 pp., illus.
- Woodruff, E.R. 1967. A giant palm weevil, *Rynchophorus cruentatus* (Fab), in Florida (Coleoptera: Curculionidae). Florida Dept. Agric., Div. Plant Ind., Ent. circ. 63:1-2.



## Regional Reflections

### A Post-Conference Vision of the Future

Linda Whipkey

The World Conference is over. Many will take this time to evaluate its success. Well, the conference is part of the past. And, since hindsight is 20/20, it will be easy to see what worked and what didn't—where we went wrong and where we were right. That's not what this article intends to do.

I want to take a look at the future—the future of the Bromeliad Society of Houston. On this sight-seeing tour I've got several thoughts in mind: a) the conference could be a wedge that splits our society apart; b) the objectives of our society include a dedication to the dissemination of information about bromeliads.

The first thing I see in my vision is *service to the community*. We could be a vehicle for getting plants out there for people to see and enjoy. No, I'm not talking about more plant sales! I'm talking about bringing joy into peoples' lives, people who are in need of some joy: the sick, the elderly, the disabled. The world's largest medical center is just down the street and I'm sure many patients would appreciate not only a colorful bromeliad but some simple conversation. The elderly, who are often so lonely in retirement homes, get lots of attention around Christmas and Thanksgiving, but what about August? Their existence could be brightened by not only the beauty of the plants that we love so much, but also by our caring and consideration. We could share extra plants and a little time. And, no, the plants may not get the attention that we give them in our cozy greenhouses, but the recipients will feel the benefit of our kindness.

We, as a society, must grow just as our plants do. The best way to do that is to give of ourselves. Without giving, we can stagnate.

The vision also includes a component dedicated to *education*. This can be in the form of seminars given at other garden clubs or the Arboretum (Houston or Mercer). But, this effort would not be just from one person to even a group of people. It would be a joint effort bringing together many members—members with different skills, interests and approaches. There are many places where this could be implemented for people of all ages and socio-economic levels.

Our bylaws include the encouragement of *study and research*. We could sponsor a forum where issues like pollution, global warming, and the disappearance of equatorial jungles are discussed openly. We could take a prospective position rather than just sitting back and watching. My vision is one that includes *action and commitment* by all of our members. Whatever your opinion on these issues, couldn't you learn just a little bit more about them?

Sometimes I think that we are missing the point of our plants. They are wonders of nature as well as hybridizing. We can make a real difference by calling attention to the "nature" that is disappearing from our earth.

My vision also includes members *having fun*—picnics and outings for fun, not to raise money, not to get an award. Competition is very important in any plant society, but we cannot forget family and friends.

At our conference, I think that a lot of miscommunication and stressful times were generated by fear. Fear of not being the best, fear of failure, fear of getting that ego bruised. That's a human characteristic. We can't change that. But, we can assure one another that our common interest in bromeliads can bring us together for good times.

Another problem that must be faced in the future is money. The society seems to be obsessed with money lately. Furthermore, the money has to come from members. This can destroy our society, too. Hobbies are expensive. Most of us are fortunate to have enough time and money to spend on bromeliads. I see a future society where money is budgeted wisely and costs are cut. A small fee is charged to cover the costs of refreshments. Plant sales are not held at every meeting. The raffle table is set up for special occasions. The Christmas meeting is held for the spirit of the holiday season, not for the bar bill.

That's what I see in our future. My crystal ball may be really foggy, what does yours show? The same society that has existed for the last few years? A better one? One whose numbers dwindle every year?

I will end with a line from *Julius Caesar*:

"Our fate, dear Brutus, lies not in our stars but in ourselves."

*Reprinted from The Bulletin of the Bromeliad Society/ Houston, Inc., July 1990.*

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## Propagation of Caulescent Tillandsias

Peter Paroz

When I first started growing caulescent tillandsias, I was sure that there would be some way of using the long stem to get a lot of offsets. After experimenting for some years, I find there is no general rule. Some plants offset freely, others very sparingly; some respond to sectioning, others do not. The following is a summary of my observations and I hope these will be of some use to the newer growers.

- *Tillandsia latifolia* var. *divaricata* (large and small forms) and *T. duratii* var. *saxatilis*. These plants do not offset freely and I have not been able to force offsetting by cutting off sections of the old stem, even sections with functioning leaves. Close inspection of the leaf axils shows that the dormant eyes looked dry and dead. Application of an auxin cream failed to produce any results.
- *T. albida* offsets freely from the base of the flower spike and will produce additional offsets from sections of stem (150 mm long).
- *T. edithae* and *T. funckiana* offset from the base of the flower spike and occasionally from the oldest (leafless) part of the stem. *T. funckiana* offsets have a

very soft attachment to the plant while small are easily dislodged. While I don't recommend removing these very small plants, I have saved ones only 15 mm long and accidentally knocked off by allowing the base to dry and treating them as small seedlings.

- *T. heteromorpha* offsets freely along the length of the live stem. Since the stem is small and thin, I have not tried to cut it.
- *T. paleaceae* offsets sparingly from the older part of the stem. I have not flowered this plant nor tried to section it.
- *T. tenuifolia* seems to offset only from the base of the spike and sectioning the old stem has done no more than dry it up.
- *T. incarnata* offsets very freely at maturity along the part of the stem which has functioning leaves.
- *T. purpurea* has not flowered or produced any offsets and as the plant is not large, I have not experimented with it.
- *T. araujei* offsets sparingly from the base of the flower spike. Sectioning has not been successful.

Adequate nutrition is essential for good offset production. Plants that do not have a good reserve of nutrients cannot support a large number of offsets.

*Reprinted from Bromeliaceae, Bromeliad Society of Queensland, Sept.-Oct. 1989*

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## Frost Injury

K. W. Allen

We often hear people say they have lost plants due to frost damage, but is this really the reason?

Before we can safely say a plant has been damaged by frost, we must first ascertain what frost is. It is quite possible that our plants may have only been injured by very low or near-to-freezing temperatures, or by very cold winds.

The damage done to plants by freezing temperatures depends upon the nature of the plant, its stage of growth, the conditions under which it is or has been growing, and the speed and severity of freezing. Because of all these varying conditions, it is impossible to state that a certain plant will withstand a predetermined degree of freezing.

In early spring, a plant might be severely damaged by freezing temperatures when two or three weeks earlier it might have escaped unscathed. It is quite a common occurrence for a plant to survive two or three very hard frosts in the winter months and yet in the spring be badly damaged or even killed by a comparatively light frost or sudden spell of cold weather.

It is important to understand that there are two main types of frost.

*First* is the familiar air frost of winter, which is caused by a mass of polar air covering a large area, the temperature of which is very low. This mass of cold air



may sometimes occur quite late in spring, after a period of mild weather. This mild weather would have started plants into growth, and consequently, under these circumstances, there can be wide and extensive damage.

The *second* type of frost is associated with a clear, sunny day, where the surface of the earth and surrounding vegetation is heated by the direct rays of the sun, but the air, being transparent as far as the sun's heat rays are concerned, does not warm up to the same extent. The air that is in contact with the ground, however, is easily heated by conduction, and being warm is lighter, hence it begins to rise, replaced by cold air. The warm air, when it rises, cools by expansion and sinks back to the surface again; this gives us a continuous circular motion.

When the sun goes down, the air nearest to the ground is warmest, and gradually becomes colder the higher one goes. If the night were to remain clear without a cloud in the sky, the surface of the ground would radiate heat into space and its temperature would fall rapidly. Naturally, when this occurs the air in contact with the ground becomes very cold and heavy and will not move.

If the night is long, the heat loss by radiation from the surface may be enough to drop the temperature below freezing point, causing the moisture in the cold layer of air to be deposited as ground frost. This layer of freezing air will gradually deepen on level ground and drift down into hollow and low-lying areas and accumulate, especially where it becomes blocked by the terrain of the surrounding countryside. When this happens, it can build up into what appears to be a "sea" or "cloud" of freezing air, covering up plants and even trees.

The movement of dense cold air is likened to that of water, where it finds its own level, can be diverted or even stopped by a natural or man-made barrier being placed across the sloping terrain, i.e., a hedge, brick wall or some other such barrier.

The presence of an expanse of water tends to modify the extent of the frost and to equalize the temperature.

Radiation frosts generally cause damage to low growing plants first, and as the freezing air deepens by prolonged radiation or by drifting colder layers, starts to affect shrubs and finally trees. They may occur at any time during the year, but during the summer months the nights are short and the soil is too warm for the temperature to fall to a freezing level.

Cloud during the night can act as a blanket, preventing radiation and sudden falls in temperature.

Both types of frost can occur together, and if this happens, particularly when spring growth has started, there may be considerable damage caused by the temperature dropping very fast and severely.

*Reprinted from Potpourri, March 1988, Greater New Orleans Bromeliad Society*

## Pups and Potting

Tom Alton

*[Précis of a talk given by Tom at the January Meeting].*

Firstly, I'm no expert (is there one?) but I will endeavour to speak about taking offshoots and potting, and how I do it. I don't intend to tell you what to do, but what I do to achieve good results.

It is widely believed that there is only a certain time of the year that you can take offsets; with me I seem to be potting all the year around. There is an exception, and that is cryptanthus, which seem to like the warmer months for the operation. By the way, I don't cultivate tillandsias, my wife Pat takes care of them.

Now, a potting mix is a very individual thing; taking material available, and cost, can be very variable. However, here is my basic mix consisting of: 2 parts peat moss, 1 part coarse sand, 1 part cheap potting mix, ¼ part old cow manure, handful of crushed charcoal, and ½ part of any inert material, such as vermiculite or crushed polystyrene. To a bucket of this mix I add a dessert spoon of blood and bone and the same amount of dolomite. All this is thoroughly dampened when mixed and let stand for three or four weeks.

Of course, this mix can be varied with fine pine-bark or pine needles. Experimentation is the best way to go, but keep records of what you do. Don't trust your memory!

Now, do not be in a hurry to take your pups off. Let them grow to a reasonable size, say a third of the size of the parent plant. There are some who just break them off. I don't. I like to use an old, serrated kitchen knife. *Always* de-pot the plant first. Scrape a little of the mix away from the crown of the plant so that you can see the pups better before you take them off. Cut very close to the parent, indeed take a little of the stem of the parent plant if you can, clean the base of the pup, i.e. any dead leaves, etc., taking care not to break any of already developed roots.

I find the smaller the pot the better for pups. I can get them really firm in small pots. The potting mix must be firmed down well, no use having the pup flopping about all over the place. Gently spray pups after planting, don't drown them. The mix must not be too wet or rot will set in. I don't use striking powder, and I don't let the ends dry out. If anything I dip the cut ends into crushed or powdered charcoal, then plant. Don't forget to label each pup correctly and include the date.

When I have had a pot full of roots in three months from planting, then it's time to repot, or pot on. Some bromeliads I repot every six months, or at least every 12 months. If you are going to coddle a special plant for the show bench, why not coddle a few extra, just in case of accidents?

Stoloniferous plants are a little different. Cut as close to the parent plant as usual, then sometimes you have to cut some of the stolon off to get it into the pot. Remember new roots come from the base of the cup, not the cut.

Now, what you do with the old parent plant? Well, if you want more pups, replant the old parent plant in fresh mix and fertilize; mothers need food. I find

the first generation of pups is always the best, so don't be greedy, put it through the "Muncher" (a good Neo' will throw six good pups anyway).

When I'm potting on into larger pots, I sometimes sprinkle a small amount of slow-release pellets into the mix, not on top (about ½ teaspoon to a 3 inch pot is quite enough). Liquid fertilize if you like, but remember very weak, weekly. Don't overdo it, too much can affect the plants the wrong way; variegated plants turn green, and nice little plants will go "strappy." Knowledge of the elements of fertilizers is not my field, I leave that to the experts. But what I have said works for me.

*Reprinted from Bromeleter, March/April 1990, The Bromeliad Society of Australia, Inc.*

## Questions & Answers

### Conducted by Derek Butcher

*All readers are invited to send their questions and observations about growing bromeliads as a hobby to the editor. Answers will be sent directly to you and some questions will be published.*

**Q. What should I use as a potting mix? Everyone I ask gives me a different answer.**

A. It appears that you have been speaking to the same people I speak to. I have seen bromeliads grown successfully (by others) in mud, clay, water, rocks, any old wood chips. For the beginner, we recommend mixing commercial potting mix with commercial orchid mix. If you come from a wet, warm area then put in more of the orchid mix. If from a dry, warm area then put in less of the orchid mix.

The mix needs to be varied for the kind of plant. For example, true terrestrial plants such as puyas, dyckias, and hechtias need a heavier mix. Most epiphytic plants, which have grey, silvery leaves, such as most tillandsias and some vrieses, need to be kept away from potting mixes. All other bromeliads come in between with various preferences.

Remember, we are trying to give optimum conditions in the growing period so take care if you have cold, wet winters.

The really keen bromeliad collector generally spends much more money on new plants than on potting mixes and generally spends a great deal of time checking on what favourite materials can be bought locally at the cheapest rate.

If you are still not sure, then join the nearest bromeliad society and see for yourself. As you become more experienced, you, too, will be recommending your own favourite mix and growing your plants in mud, clay, water, rocks, and any old wood chips!

The key elements to remember are:

- Learn where the plant originated and think how you can provide similar conditions. At least, did it grow on the ground, on rocks, or as an air plant? If a rock grower, consider that it may have enjoyed a steady seepage of moisture around its roots.
- Most bromeliads prefer a fresh, good-smelling mix even if they can't smell.
- Pups should be given enough support to hold them firmly in the potting mix or on the bark or tree fern that you use for mounting tillandsias.


**Q. How long have bromeliads been cultivated?**

A. The pineapple was nurtured in the central Americas for perhaps hundreds of years before Christopher Columbus discovered the New World. Whilst the New World was being colonized there seemed little time to spend on cultivating bromeliads. However, there was a craze for exotic plants in Europe and we know that in 1776 *Guzmania lingulata* was available. This was followed by *Cryptanthus undulatus* in 1827, *Aechmea fasciata* in 1828, and *Vriesea splendens* in the 1840s. By the 1890s over 300 kinds of bromeliads were in cultivation. There was a flurry of hybridization through the turn of the 20th century but bromeliad growing remained a mainly European pastime. The formation of this society in 1950 seemed to act as a catalyst for a phenomenal increase in interest in this plant family.

So, some bromeliads have been around for many years. Perhaps it would be worthwhile trying to trace the oldest surviving clone. Perhaps botanical gardens would inspect their records and write to us.

**Q. Is *Dyckia* both a succulent and a bromeliad?**

A. *Dyckia* certainly has succulent leaves in the same way that a steak can be succulent—nice and juicy inside. Succulent is, however, an adjective with no botanical reference, whereas bromeliad is a noun based on the botanical word Bromeliaceae. So a dyckia can be called a succulent bromeliad.

There are a few bromeliads that conserve moisture within the leaf, whereas many have evolved the cup formation of leaves to conserve moisture within the plant. Bromeliads that are accepted as being succulent are all terrestrial. *Dyckia* and *Hechtia* are the main examples. Needless to say, you would grow these plants as you would members of the cactus family. To finish on a provocative note, I have had the misfortune to knock off leaf tips of tillandsias such as *T. ixioides* and would consider those leaves to be quite succulent. 

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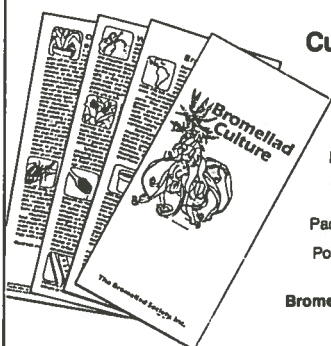
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The purpose of this nonprofit corporation is to promote and maintain public and scientific interest in the research, development, preservation, and distribution of bromeliads, both natural and hybrid, throughout the world. You are invited to join.

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H.E. Luther

*Guzmania lingulata* 'Fortuna'. This exceptional clone of *Guzmania lingulata* was the star auction plant at the 1990 World Bromeliad Conference in Houston, Texas. It was collected originally in northwestern Panama by H. Luther, W.J. Kress, J. Halton, and L. Besse. The rare plant auction has become an established attraction of world bromeliad conferences with the money helping to support bromeliad identification and research. Please see page 212 for a review of the 1990 conference.

## Calendar of Shows

- |                 |  |
|-----------------|--|
| 8 September     | Southwest Bromeliad Guild Semiannual Meeting. 2 p.m. Tulsa Garden Center, 2435 S. Peoria, Tulsa, OK.   |
| 8-9 September   | Sooner State Bromeliad Study Group Show and Sale. Tulsa Garden Center, 2435 S. Peoria, Tulsa, OK. Georgia Waggoner 918-733-4602.   |
| 15-16 September | San Diego Bromeliad Society annual show, "Silver Anniversary Jubilee" and sale. Balboa Park, Casa del Prado, room 101, San Diego, CA. Saturday 1 p.m. to 5 p.m., Sunday 10 a.m. to 5 p.m. Kenneth T. Sanders, 619-724-1893.                                |
| 11-14 October   | Sarasota Bromeliad Society Annual Show and Sale. Selby Botanical Gardens, 811 South Palm Ave., Sarasota, FL Plant entries, 11 Oct.; judging 12 Oct.; Show and sale: Saturday, 10 a.m. to 5 p.m.; Sunday, 10 a.m. to 4 p.m. George M. Cooley, 813-924-8545. |
| 10-11 November  | Caloosahatchee Bromeliad Society exhibition and plant sale. Fort Myers-Lee Co. Garden Council Bldg., 2646 Cleveland Ave., Fort Myers, FL. Saturday, 9 a.m. - 5 p.m.; Sunday, 10 a.m. - 4 p.m. Betty Ann Prevatt, 813-334-0242.                             |