

# Smooth-leaved Bromeliaceae of BELIZE (excluding *Tillandsia*) <sup>1</sup>

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Photos by Cathie Aime (CA), Ella Baron (EB), Wade Collier (WC), Bruce Holst (BH), Elma Kay (EK), Jan Meerman (JM), Marvin Paredes (MP), Phil Nelson (PN) Support from the Marie Selby Botanical Gardens, Ian Anderson's Caves Branch Jungle Lodge, Environmental Resource Institute - University of Belize

[fieldguides.fieldmuseum.org] [1004] version 1 5/2018

Of the approx. 70 species of Bromeliaceae in Belize, the bulk belong to genera with smooth leaf margins known as the subfamily Tillandsioideae, or the “tillandsioids.” A previously published guide (Field Guide 964) presented the nearly 30 species of the genus *Tillandsia*. This guide presents the remaining genera with 23 species: *Catopsis* (10 spp.), *Guzmania* (3), *Lemeltonia* (1), *Pseudalcantarea* (1), *Racinaea* (1), *Vriesea* (1), and *Werauhia* (5), all epiphytic. It is not easy at times to distinguish *Tillandsia* from the genera. In general, *Tillandsia* species are heavily lepidote (covered with trichomes, or scales) and frequently have distichous (2-ranked) inflorescence branches. In contrast, these other genera tend to be glabrous (lacking trichomes) and have polystichous (many-ranked) inflorescence branches. The most commonly observed genera are *Catopsis*, *Vriesea*, and *Werauhia*; *Guzmania* and *Lemeltonia* are less common, and *Pseudalcantarea* and *Racinaea* have only been collected once each in Belize, deep in the Maya Mountains.

As in *Tillandsia*, seeds in this group have feathery appendages known as comas, and are dispersed by wind. Pollinators vary, with *Guzmania* being hummingbird-pollinated, *Catopsis* and *Lemeltonia* insect-pollinated, and the rest likely by bats. All of these species are predominantly epiphytic, with a few being able to grow on rock outcrops.

District Abbreviations: Belize (B), Cayo (Ca), Corozal (Co), Orange Walk (OW), Stann Creek (SC), Toledo (T).

## Identification Guide

### Group 1. Inflorescence brightly colored, at least in part, with red, orange, or yellow bracts (4 species)

Groups 2–4. Inflorescence with mostly green bracts (see page 2)

#### *Guzmania lingulata*

- Humid forests in southern Belize, B, Ca, SC, T; 15–850 m elev.
- Distinguished by the short inflorescence with brightly colored, spreading bracts and white-tipped petals.
- Plants form colonies of multiple individuals, and tend to grow lower in the forest, below the crown.



When in flower, often provides a bright spot of color in the forest (EB)



Leaves soft, light green and spreading, forming a well-shaped globose rosette (EB)



Inflorescence bracts can be pink, yellow, orange or red, the inner ones are white-tipped (BH, EB, EB)



Flowers have waxy petals that do not spread open at maturity, and are pollinated by hummingbirds (EB)

#### *Guzmania nicaraguensis*

- Restricted to humid, high elevation forests of the Maya Mountains, Ca, SC, T, 700–1100 m.
- The orange-red, erect bracts, unbranched and short inflorescence, and yellow flowers are distinct.
- Along with other guzmanias, the leaves are green and smooth.



Inflorescence unbranched, narrowly club-shaped and usually shorter than the leaves (EK)



Inflorescence spreading to nodding (pictured here a plant from Mexico in cultivation at Selby Gardens; PN)



Petals bright yellow, spreading at their tips, the anthers yellow. As with many colorful guzmanias, this species is likely hummingbird-pollinated (plant from Costa Rica in cultivation at Selby Gardens; PN)

# Smooth-leaved Bromeliaceae of BELIZE (excluding *Tillandsia*) 2

## *Guzmania* *scherzeriana*

- Known from humid forests in SC, T; 15–225 m elev.
- A distinctive species in flower with a large, branched, and brightly colored inflorescence, and leaves reddish below.
- Likely to be found at higher elevations in the future.



Plant just prior to full bloom, in cultivation at Selby Gardens (PN)



Leaves either generally reddish or with distinctive lines on the lower surface (EB)



Inflorescence branched at maturity, with all-red bracts in the flower cluster, and greenish flowers (PN)



Flowers at maturity tubular, with the yellow petals slightly exceeding the similarly colored sepals (PN)

## *Vriesea heliconioides*

- Known from humid forests in southern Belize, in Ca, OW, SC, T; 80–700 m elev.
- Easily distinguished by the unbranched inflorescence, broadly spreading, colored bracts, and white flowers.



Plants are relatively small and found in the understory, in similar habitats as *Guzmania lingulata* (EB)



Floral bracts large and spread. They can be all green to all red; flowers appear one at a time (EB)



Inflorescence unbranched, with bracts either in one plane or in whorls as pictured here (WC)



Petals bright white, with their tips spreading (EB)

### Group 2. Inflorescence simple (unbranched), the bracts mostly green (5 species)

Groups 3, 4. Inflorescence compound (branched), the bracts mostly green (see page 3)

## *Catopsis nutans*

- Known commonly from citrus orchards in Ca and SC; 80–550 m elev.
- In flower, easily distinguished by the orange flower petals that spread open at night.
- Leaves lightly white-waxy below.
- A diminutive plant, with simple inflorescences, rarely with compound inflorescences in Belize.



The inflorescence is pendent, with a long scape that has few bracts (MP)



Plants are relatively small and few-flowered (EB)



Leaves are few per rosette, smooth, semisucculent, and brittle (MP)



Flowers distinctly light orange and the petals are spreading (EB)

## *Lemeltonia* *monadelpha*

- Known from central to southern Belize in B, Ca, SC, T; 15–750 m elev.
- Distinguished by the ladder-like inflorescence, white flowers with spreading petals, and soft, light green spreading leaves.
- Known in most literature as *Tillandsia monadelpha*



Leaves slender, soft, and light green, or can also be bronze-colored in bright light (EB)



The plant is equally at home on the ground in leaf litter, as growing as an epiphyte (BH)



Inflorescence simple, floral bracts and sepals are green; the petals are white (MP)



Broadly spreading fruiting capsules are arranged ladder-like (MP)

# Smooth-leaved Bromeliaceae of BELIZE (excluding *Tillandsia*) 3

## *Werauhia gladioliflora*

- Common, large epiphyte known from broadleaf evergreen moist forests in **B, Ca, OW, T**; 5–215 (–570) m elev.
- Distinct, all-green plant with sturdy, erect inflorescences and bat-pollinated flowers that open at night, and only grow from one side of the inflorescence.



The rosette is broadly spreading and the inflorescence greatly exceeds the leaves in length (BH)



Leaves abruptly narrowed at the tip and with fine tessellation (faint to distinct horizontal markings) (EB)



Resembling beetles marching in rows, the fruits are dark brown and shiny, and the bracts spreading (EB)



Petals green to bronzy, spreading; usually opening one at a time at night and closing in the morning (EB)

## *Werauhia noctiflorens*

- Rare, found only on the high ridges of the Maya Mountains, **Ca, SC, T**; 700–1000 m elev.
- Similar to above, but with a narrow inflorescence, bracts less densely arranged.
- Only recently discovered and described for science (2007)



Leaf width can vary from narrow (above) to broadly strap-shaped; inflorescence erect or arching (BH)



Plant with developing inflorescence and broad leaves (BH)



Young flower with bronzy petals; note rachis is visible, compared to not visible in above right (BH)



The flowers turn away from the rachis at maturity; note anthers at upper part of flower (JM)

## *Werauhia vittata*

- Another rare epiphyte known only from high Maya Mountain ridges in **SC and T**; 600–900 m elev.
- Easily distinguished by the colored banding on the leaves, and relatively few flowers on the erect inflorescence.
- Few photos exist for the species throughout its range.



A medium-sized plant with a simple, erect inflorescence with rather few flowers (MP)



The strong lateral leaf banding, especially noticeable below, helps to distinguish this species (MP)



Leaves broadly strap-shaped, lustrous, and abruptly narrowed at the apex to a fine point (MP)



Inflorescence erect, unbranched, with few, widely spaced flowers; not pictured, but petals are green (MP)

### Group 3. Leaves narrowing along their length to a point; inflorescence branched, the bracts mostly green (2 species)

### Group 4. Leaves broad and with margins parallel along most of their length (“strap-shaped”); inflorescence branched, the bracts mostly green

## *Catopsis floribunda*

- An uncommon species in Belize, known only from Mt. Pine Ridge in **Ca**; 450–750 m elev.
- Distinguished by the broadly paniculate inflorescence well exceeding the leaves, and the tough, narrowly triangular, grayish leaves.



Leaf sheaths broad compared to the arching, spreading blades; overall color yellow-green (BH)



Plant silhouettes in the Mountain Pine Ridge; young plants are vase-shaped, and spread out when flowering (BH)



Inflorescence branching several times, with greenish to yellowish bracts (EB)



Flowers small, the white petals scarcely exceeding the yellow-green sepals; anthers included within the petals (EB)

# Smooth-leaved Bromeliaceae of BELIZE (excluding *Tillandsia*) 4

## *Catopsis juncifolia*

- Relatively rare in Belize, known from the Mountain Pine Ridge in CA; 450–500 m elev.
- Plants small and with narrow leaves and delicate inflorescence.
- Photos here of a plant from Costa Rica cultivated at Selby Gardens.



Plants small, with inflorescence greatly exceeding the leaf length; leaves narrow and soft (WC)



As with all species in *Catopsis*, the capsules are broad and short, and contain seeds with a coma (PN)



Inflorescence all-green except for whitish petals (not seen here) (PN)

## *Catopsis sessiliflora*

- Common in citrus orchards, though rare in natural forests, CA, SC, T; 0–680 m elev.
- Similar to *C. nutans*, but has branched inflorescences (versus simple) and white petals (versus orange)
- Male and female flowers are found on different plants (found on same plant in *C. nutans*).



Plants have relatively few, broad, triangular leaves tapering to a point, and pendent inflorescences (MP)



Inflorescence varies from compound (above) to simple, depending on plant size at flowering (MP)



Plant in bud; leaves glossy above, with powdery coating on the lower surface toward the base (EB)



View of male flower with anthers releasing pollen (MP)

## Group 4. Leaves broad and with margins parallel along most of their length (“strap-shaped”); inflorescence branched, the bracts mostly green (6 species)

## *Catopsis berteroniana*

- Widespread epiphyte in Belize in many habitats from B, Ca, Co, SC, T; 10–580 m elev.
- Distinguished by its vase-shape, heavy powdery coating at leaf base, and erect inflorescence.
- Plant shape/color adapted to attract, and trap small animals to supplement nutrition



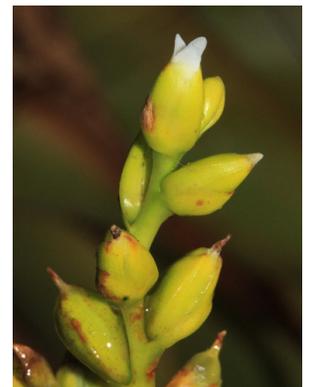
Notable for its light green leaves, vase shape, and heavy waxy covering on leaf bases (BH)



Closeup of leaf base within, also with heavy waxy bloom (EB)



Inflorescences erect, typically branched but can also be simple; primary bracts small (EB)



Flowers similar to *C. sessiliflora*, but the petals are smaller (EB)

## *Catopsis hahnii*

- A rare, high-elevation species, known from Maya Mountain and Mountain Pine Ridges in CA and T; 760–1000 m elev.
- The most “powdery” of the *Catopsis* spp., with whitish, waxy powder found on many parts of the leaves and inflorescence.



Plants mostly solitary, usually producing a single offset; leaves bronzy in sun, greenish in shade (JM)



Green, shade form of the species, with pronounced waxy coating; note leaves inrolled at tip (BH)



Primary bracts are often also coated with white wax, and lateral branches are short (BH)



Petals yellow-white, barely exceeding the sepals in length (PN)

# Smooth-leaved Bromeliaceae of BELIZE (excluding *Tillandsia*) 5

## *Catopsis morreniana*

- Common in Belize in Ca, OW, SC, T; 80–680 m elev.
- Distinguished by the soft, spreading, strap-shaped leaves, powdery coating, prominent scape bracts, and erect, branched inflorescence.
- Equally at home growing on trees as on rocks in well lit and ventilated areas, such as exposed limestone walls.



Plants are rather small with soft, pliable, strap-shaped leaves, and prominent scape bracts (MP)



Leaves with a waxy, powdery coating especially notable on the lower surfaces (WC)



Inflorescence erect, with ascending branches; male and female flowers on different plants (WC)



Petals scarcely exceeding the sepals, bright white (WC)

## *Catopsis nitida*

- A rare bromeliad in Belize, only known from a single collection from the Maya Mountain Divide in Ca (border with T); 1000 m elev.
- Distinctive because of the long tubular growth form and smooth, lustrous, strap-shaped leaves.



*Catopsis nitida* (top); note tubular form of rosette (an inflorescence of *C. hahnii* is in the photo, below;(CA)



First collected in Belize in 2007 during an expedition to Doyle's Delight, Maya Mountains, the highest point in Belize (BH)



The inflorescence is poorly known in the photographic record; fairly delicate compared to other species (BH)

## *Pseudalcantarea viridiflora*

- A rare species documented only once in Belize, in T; 825 m elev.
- Distinguished by the large size (to 1.8 m tall) in flower, large greenish flowers, and soft leaves.
- Photos shown here are from a plant from Veracruz, Mexico, in cultivation at Selby Gardens.



Foliage is all green, the petals and stamens persist after flowering (PN)



The only known documentation of the species in Belize was made at a remote camp during the British Honduras-Guatemala Border Survey of 1934, by Australian collector William A. Schipp (PN)



The calyx and stigma are dark green, and petals, stamens, and style light green (PN)

## *Werauhia hygrometrica*

- Another rare bromeliad in Belize, known from a single collection along the Ca-T border on the Maya Mountain Divide; 1000 m elev.
- Distinguished by the long scape, spreading green bracts, and horizontally lined leaves and reddish leaf sheath.



All parts of plant are green except for lower portion of leaves and whitish flowers (BH)



The curious horizontal banding is distinct; the leaves are shiny and medium green (BH)



Inflorescence branched, though the short branches are hidden among the reflexed primary bracts (BH)



Flowers two per branch, white (not seen here); a clear gelatinous exudate is produced among the bracts (BH)

# Smooth-leaved Bromeliaceae of BELIZE (excluding *Tillandsia*) 6

## *Werauhia werckleana*

- Bromeliad species diversity reaches its peak at high elevations of the Maya Mountains; this species is known from a handful of collections in Ca and T; 900–1000 m elev.
- The large plant size, tall, few-branched inflorescence, and green flowers that open at night are distinct.



Inflorescence greatly exceeding the leaves, few-branched; flowers open on one side of the spikes (origin unknown; Selby BG archives)



Broad strap-shaped leaves can become colorful in direct sunlight; the plants reach more than 1 m across and are similar in size to *Androlepis skinneri*, but lack leaf spines (JM)



A plant with an old inflorescence, and all-green leaves (BH)

**Group 5. Poorly known species; these three species would belong to Groups 3 or 4 ; they all have branched inflorescences and mostly green bracts. Images of dried, pressed plants/illustrations courtesy of the Nat. Museum of Natural History, Smithsonian**

## *Catopsis paniculata* (left)

- One specimen known from “Little Pine Ridge,” Ca; elev. unknown.
- Similar to *C. hahnii* but inflorescence branches more elongate.

## *Catopsis wawraea* (center)

- One specimen known from “Chalillo Crossing,” Ca.; elev. unknown.
- Distinct from other species of *Catopsis* with long, narrow leaf sheaths and floral bracts with marked venation.

## *Racinaea rothschuhiana* (right)

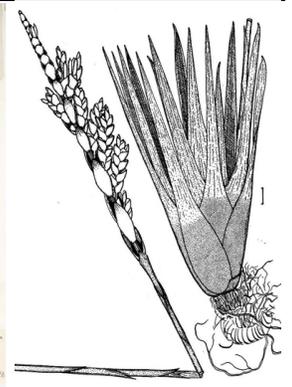
- Two specimens known from T; approx. 700–750 m elev.
- Genus most similar to *Catopsis*, but lacking waxy coating, and has sepals that are not similar in size.



*Catopsis paniculata*. Inflorescence with prominent primary bracts and slender branches (Source: <http://plants.jstor.org/stable/pdf/10.5555/al.ap.specimen.us00091326>)



*Catopsis wawraea*. Inflorescence short, floral bracts prominently veined; leaf sheaths elongate. (Source: <http://plants.jstor.org/stable/pdf/10.5555/al.ap.specimen.ma606719>)



*Racinaea rothschuhiana*. Inflorescence slender, lateral branches short, flowers crowded. [Source: Fl. Neotropica (Tillandsioideae) Bromel. 14(2): 1977. Fig. 333 Smith, Lyman B. and Downs, Robert J. Collection: Schipp S-813. 1930]

## Illustrated Glossary

**Floral bract:** modified leaf subtending a flower, which can be longer than, and obscure the calyx from view.

**Flower (H):** consisting of the sepals (together called calyx), the petals (together called corolla) the androecium (the male part of the flower, or stamen, consisting of the filament and the anther), and the gynoecium (the female part of the flower, or pistil, consisting of the ovary, style, and stigma).

**Flower cluster (B):** the portion of the inflorescence consisting of the flowering region of the inflorescence, including the associated primary and floral bracts, the axes bearing flowers, and the flowers themselves.

**Habit:** General shape and growth form of a plant.

**Inflorescence (A):** the flowering portion of the plant, which consists of the scape and flower cluster.

**Inflorescence type:** bromeliad inflorescences are simple (unbranched; see left-side of adjacent illustration, or *Lemeltonia monadelpha*) or compound (branched; see right-side of adjacent illustration, or *Catopsis floribunda*, below). When compound, the branches can be short (e.g., *C. hahnii*), or elongate and spreading (e.g., *C. sessiliflora*).

**Leaf:** The vegetative portion of the plant, including the broad basal leaf sheath (C) and the usually narrower blade, or lamina (D).

**Primary bract (G):** the modified leaf at the base of an inflorescence branch; it can be colorful (e.g., *Guzmania lingulata*), or small and green, and inconspicuous (e.g., *Catopsis juncifolia*)

**Scale** (see “Trichome” below).

**Scape (E):** the stalk that connects the vegetative portion of the plant to the flower cluster; the scape may be short and hidden among the leaves and bracts (e.g., *Guzmania lingulata*), or elongate and evident (e.g., *Werauhia vittata*). Note, the term “peduncle” is used for the same structure in many other plant families.

**Scape bract (F):** modified leaf borne along the nodes of the scape that can be from scale-like to leaf-like.

**Trichome:** minute structures analogous to plant “hairs” and often called scales, that cover the leaves of many bromeliads (seen as a gray cover on many tillandsias). Trichomes in bromeliads are often scale-like and have an elegant “mosaic-window” appearance. They help to facilitate the movement of water and nutrients into the plant, as well as to help regulate water loss.

