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Introduction:

Epiphytic bromeliads grow on the bark or nestle in the branches of a tree. They may be attached by wrapping their roots in a bit of moist moss and then securing with a piece of fishing wire or piece of rope. Try to select natural crevices or the crotch at the attachment of major branches for the placement of bromeliads. Avoid full sunlight and place the plants on the north or east side of trees for best results. Once a bromeliad blossoms, the plant slowly dies but produces shoots or pups at its base. They come in a wide variety of colors and shapes. The leaves may be completely symmetrical or uniquely twisted and curled into bizarre shapes. The foliage ranges in color from various shades of solid green to brightly spotted or banded patterns. The flowers often boast dazzling color combinations and fantastic forms. There are more than 2500 species of bromeliads. Over half of the bromeliad species are epiphytes, plants that live on trees or rocks without the benefit of soil. The balance is terrestrials that grow in the ground. The root systems of most epiphytic bromeliads are quite small and serve only to anchor the plants to their host. The leaves have been modified to fulfill the water and nutrient absorbing functions normally performed by the roots.

Tillandsia caput-medusae is an attractive epiphytic bromeliad native to Central America and Mexico. The thick, channeled, tapering and twisting leaves are up to ten inches (25 centimeters) long and are covered in small gray hairs. The rosette of leaves arise from an inflated pseudobulb. As with all Tillandsias they are very easy to grow. The plants can bloom from spring to early summer. The red inflorescences are usually un-branched. Bright violet flowers are about 3.2 centimeters long with the stamens exerted. They need high humidity. The plants get all their nutrients from the water and air. The plants in nature are extremely drought tolerant. Tillandsia caput-medusae is easily propagated by removal of offsets at any time of the year.

Rosettes of few, thick, stiff, twisted, white-lepidote leaves that are slightly inflated at the proximal end to form a bulbous base. Branched inflorescences have green or sometimes pinkish bracts and lavender flowers that are visited by hummingbirds. Flowering is in spring and summer. Widely-scattered small populations typically occur in tropical, humid areas. The species ranges in the southern United States to Central America. Tillandsia caput-medusae, like most species in the genus, belongs to a specialized life form called an atmospheric epiphyte, colloquially called an air plant. The roots of atmospheric epiphytes are few and function mainly to anchor the pant to the substrate tree or rock. Water and nutrient absorption is performed mostly by the leaves. The leaf surfaces are covered with extremely hygroscopic peltate

trichomes (“scales” shaped like inverted umbrellas). When dry, the trichomes of many species are folded up, allowing maximum light to the leaf surface. They absorb droplets of fog or rain almost instantly, unfold flat against the leaf, and hold the water between the underside of the scale and the leaf surface. The water is absorbed into the leaf over the next several hours. The leaves also absorb nutrients in the rainwater, dissolved from atmospheric dust, bird droppings, and other debris that settles on the plants. They are characterized by long-tubular flowers which emerge form colored bracts that attract hummingbird pollinators. This subgenus usually sports brightly-colored green, pink, or red bracts and lavender flowers.

Rapid habitat destruction and alteration threaten epiphytes. Forest transformation increases open and border-type vegetation, characterized by drier conditions than those prevailing deeper in the forest.

I want to know if the direction of the bromeliads placement on trees has an effect on their inflorescences. I hypothesize that the northern and eastern sides of trees result in a higher number of *Tillandsia caput-medusae.*

Materials:

- Notebook
- Writing utensil
- Compass
- Calculator
- Camera (optional)
- Memory card (optional)

Methods:

1. Go to the Sibun Citrus grove, and to the grove where the orchid relocation begins.
2. Make a table with the headings of Tree #, # of Bromeliads, Inflorescences, Direction, and Grove.
3. Go in rows in order to collect accurate data.
4. Look on all branches of the tree to find *Tillandsia caput-medusae* bromeliads.
5. In the data table, write down the tree number (i.e. the first tree used for collecting data would be Tree # 1). Make sure to count the number of *Tillandsia caput-medusae* bromeliads bulbs and inflorescences.
6. For each cluster of the bromeliads, note the direction in which it is placed on the tree using the compass for accurate data.
7. Repeat these steps for as many trees as you can for the selected bromeliads.
8. Once all the data is collected, calculate and compare the number of inflorescences for each direction to determine which produced the most inflorescences.

Results:

The following table shows the results I recorded on the direction of which *Tillandsia caput-medusae* bromeliads had inflorescences in two locations: Sibun citrus grove (Sibun), and the citrus grove (Citrus) (modeled after Whitney Pasquesi's table).

Tree #	# of Bromeliads	Inflorescences	Direction	Grove
1	6	0	W	Sibun
2	9	4	NE	Sibun
3	2	2	NE	Sibun
4	8	2	SW	Sibun
5	2	1	NW	Sibun
6	3	1	E	Sibun
7	2	1	NE	Sibun
8	2	1	E	Sibun
9	5	2	E	Sibun
10	9	0	W	Sibun
11	8	4	NE	Sibun
12	2	0	NE	Citrus
13	3	1	NE	Citrus
14	2	1	NW	Citrus
15	2	2	E	Citrus
16	6	1	N	Citrus
17	3	0	W	Citrus
18	2	1	SW	Citrus
19	1	1	E	Citrus
20	10	6	NE	Citrus
21	4	1	NE	Citrus
22	5	0	W	Citrus
23	3	1	SW	Citrus
24	8	2	NW	Citrus
25	4	1	NE	Citrus

From the 25 trees that I found *Tillandsia caput-medusae* bromeliads on, I counted a total number of 111 bulbs. From these bulbs, 36 had inflorescence. 28 of the bulbs placed on the northern, eastern, or northeastern branches of the trees had inflorescence; and 63 bulbs total were placed on the branches in these directions on the trees.

Conclusion:

78% of the *Tillandsia caput-medusae* that had inflorescence were on the northern, eastern, or northeastern branches of the trees in the two citrus groves. Thus, the data in which I collected supported my hypothesis that these directions were the best for producing bromeliad inflorescence. Errors could have occurred from the lack of time to collect enough data from the trees. If I were to return to Belize (which I plan on doing) I would collect the same data from more trees. Also, I would determine if the height at which the bromeliads were placed had an effect on their inflorescence.

Sources:

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