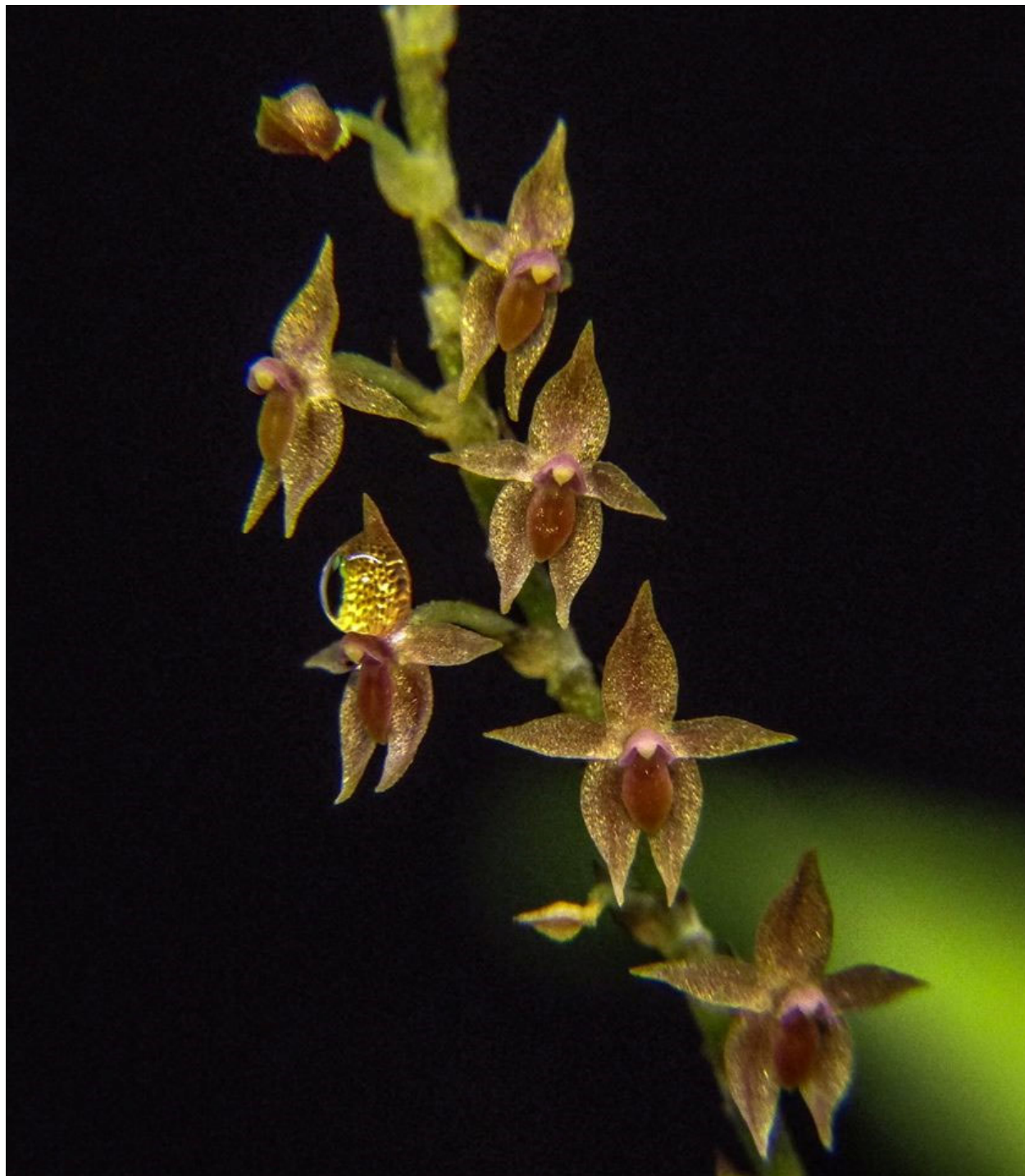


## Growing Pleurothallids Indoors in an Orchid Cabinet (Wardian Case)

Presented By Kevin Holcomb (Atlanta, Georgia)



I'm standing next to the first pleurothallid that I ever saw. It's the exact same plant, which has been in the exact same spot since 2002, when the ABG opened the Fuqua Orchid Center. I couldn't believe it was an orchid. To me, it looked like some sort of Anthurium. In 2002, the internet wasn't what it is today, so information on pleurothallids wasn't easy to come by. Fast-forward to around 2009, when I moved back to Atlanta, and started visiting the FOC on a regular basis. I started doing some research, and found a website for a place called Andy's Orchids, which specialized in orchid species, especially pleurothallids. I dug a little deeper, and found a blog called "Orchids In Bloom" by Ron Hanko. This blog displayed wonderful photos of Ron's miniature orchids grown in his homemade orchidarium. I also came across a wonderful flickr page by Wiel Driessen, which showcased his incredible collection of miniature orchids, especially Lepanthes! After seeing miniature pleurothallids growing in terrariums set up for dart frog habitats, I decided to set up an old 45-gallon aquarium to try to grow these plants myself. About 10-years later, and after a lot of trial-and-error, I'm still growing these odd, but beautiful, orchids, although I stick to the truly miniature species, which doesn't include the species in the next few photos.

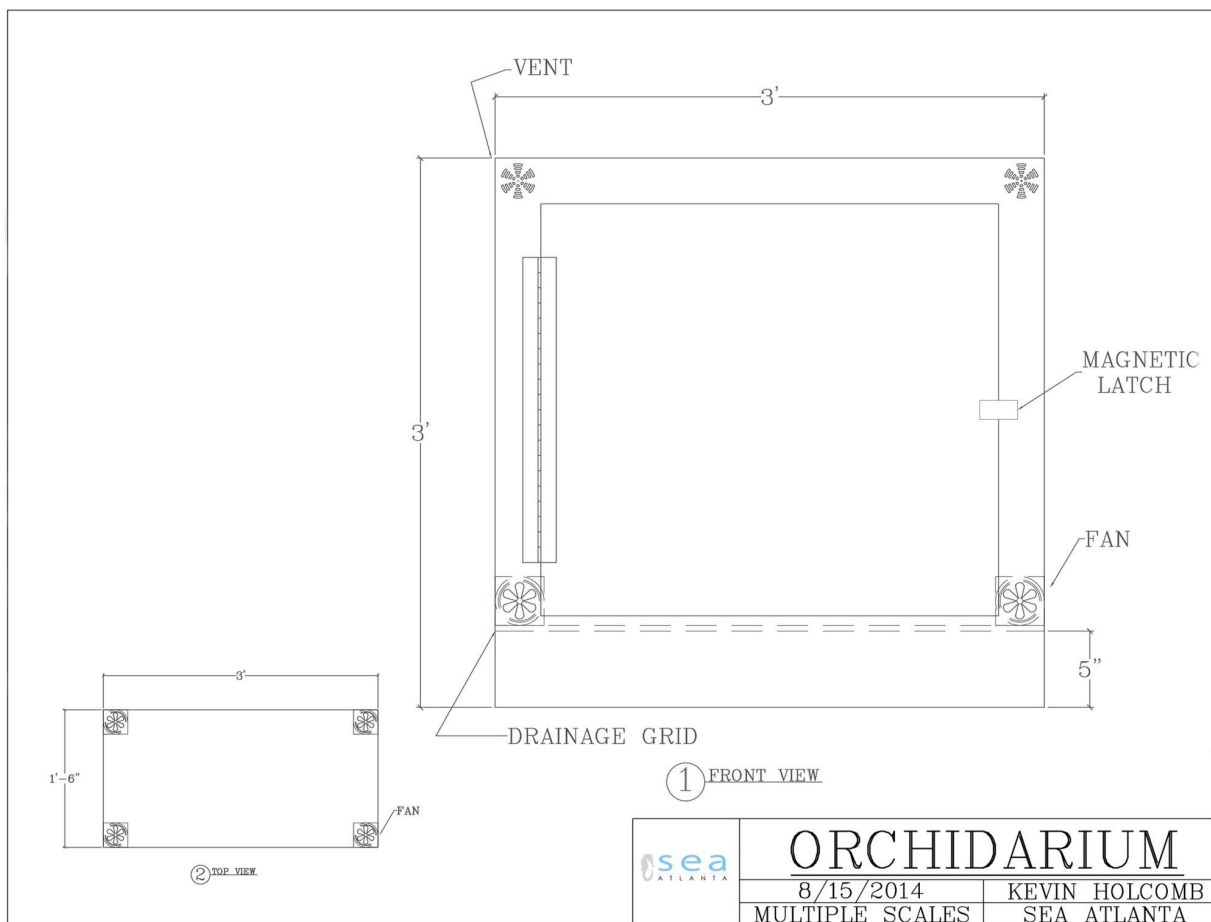




*Pleurothallis titan* in the Tropical High Elevation House at the Atlanta Botanical Garden

## Construction

It was built in 2014 by a local, custom aquarium manufacturer. They are a business like the show "Tanked" on Animal Planet, and it's probably the smallest project they have ever done. I went to them with my idea, and they drew up an actual blueprint. It's made of exhibit-grade acrylic, which supposedly does not bend or warp. It has a 5.5-in (14-cm) deep basin in the bottom which catches runoff. As the water evaporates, it helps to increase my humidity. The plants sit on a removable acrylic grid. The door has a magnetic latch which allows me to close the door completely, or prop it open for ventilation. I usually keep it propped open, and the magnetic latch prevents the door from swinging open. The mounted plants are hung on wire mesh that is hung on large, thick acrylic hooks. The hooks can support quite a bit of weight.



## Dimensions

It's 36-in X 18-in X 36-in (91-cm X 45-cm X 91-cm). It has the same footprint as a US 65-gal aquarium. I chose those dimensions, so I could buy an inexpensive commercial stand, instead of having a stand built.





## Lighting

I use three Current USA Satellite Freshwater aquarium strips. They fit over the top of the cabinet just like they would an aquarium. I chose to keep the lights outside the enclosure, so that I could easily upgrade as lighting technology advances. As you can see in the previous photo, I started with T-5's, but they produced a significant amount of heat. I was able to replace the T-5's with LED lights, since the lights were not built into the enclosure. With the LED strips, you can also add additional light colors to enhance growth or flowering. I keep the additional LEDs set on red to promote flowering. The lights are set on a timer year-round from 8am to 11pm, which is a 15-hour photoperiod. Some people think that's too much, but it seems to work for me. Unlike other types of lights, LEDs produce very little heat, which is an advantage, considering the types of plants I grow.

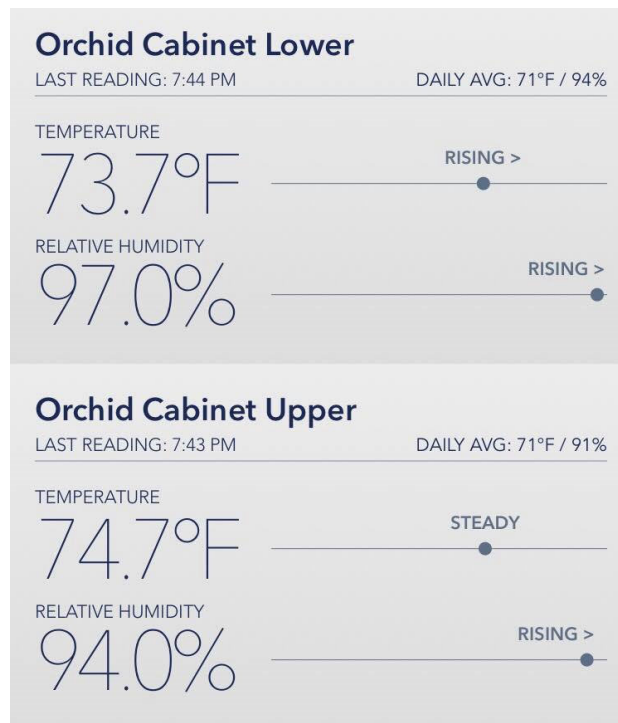


LED Aquarium Lights

## Cooling/Temperature

Originally, there were four fans, two at the top and two at the bottom. There is no internal cooling system. I rely completely on my home air-conditioner, which allows me to maintain an intermediate growing environment. My maximum day temperature is 75F (24C) and my maximum night temp is 64F (18C). In the winter, the night temp occasionally gets down to around 58F (15C). My relative humidity never drops below 80%. Temperature and humidity are monitored by two wireless, Bluetooth sensors made by Sensor Push. One is located at the top near the lights, and the other is in the lower portion. They send the data to an app on my phone. I tried digital hygrometers, but the high humidity destroys the LCD screens after a few months. Analog hygrometers tend to be significantly inaccurate. The wireless one has been extremely accurate, but I keep it raised up, because leaving it on the wet grating showed the humidity to be higher than it really was.

The fans are attached to movable mounts that were designed, and sold, by Devin Biggs. They are acrylic with extra-strong suction cups, so they can be positioned anywhere in the cabinet. After experimenting with the fans positioned in different areas of the cabinet, I found that having them at the bottom, pointing upward, pushes the cool, moist air toward the top. Placing fans in the upper area near the lights just re-circulated warm air at the top. I have a temperature sensor in the upper and lower area of the cabinet, and at times, there was up to a 4-degree difference. After putting all the fans at the bottom, I'm currently at a 1-degree difference. I also want to see every plant moving in the breeze. With my previous fan placement, there were several "dead zones", where plants stayed either too wet or too hot due to lack of air movement. Currently, they run 24-hours a day.





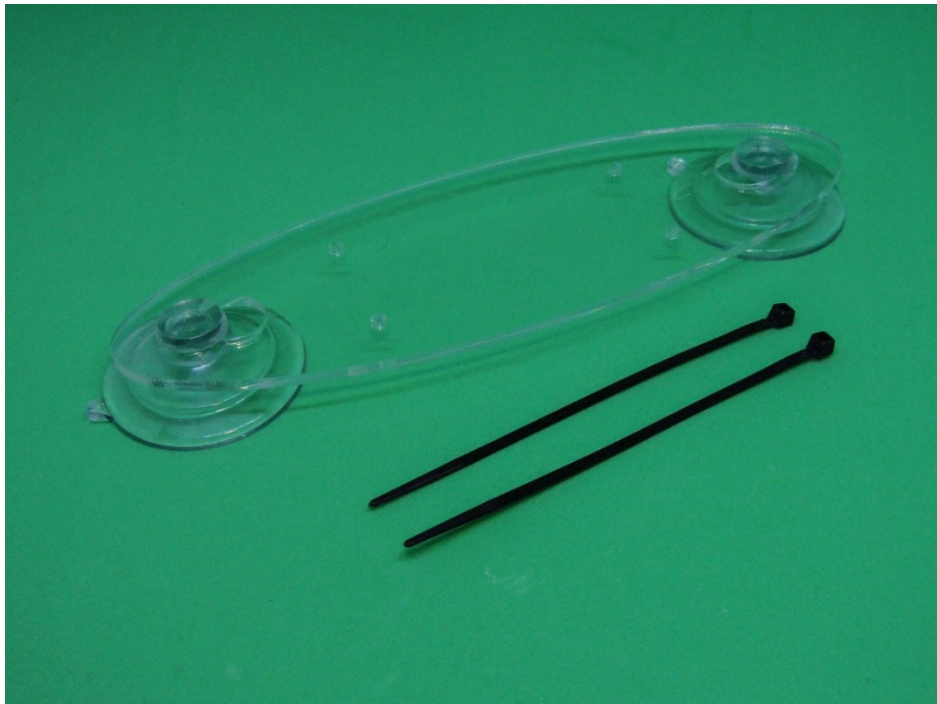


All four fans are placed at the bottom pushing air upward.





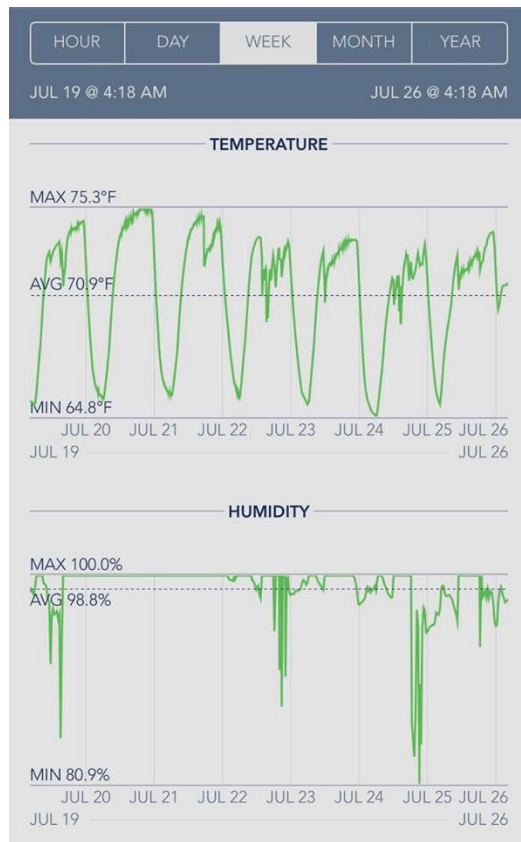
MassCool 70-mm Computer Fans



Movable Fan Mounts



SensorPush Digital Hygrometer/Thermometer



SensorPush Data



Bottom of cabinet with removable grating.



Bottom of cabinet with grating removed. There is a 5-inch deep reservoir that collects runoff, and helps keep humidity high.



There is a grooved lip that holds the grating in place.

## What I Grow

Except for a few plants, I grow only pleurothallids, and I try to stick to growing plants that are 3-in (7.5-cm) or less in height, excluding the flower spikes. At last count, I had 83 plants, which represent 14 different genera, mostly *Platystele*, *Trisetella* and *Stelis*. They are mostly cool or cold-growing species, but they all seem to do well for me in the intermediate range, and there are always several plants in-bloom year-round. I have found that the key to keeping cloud forest plants is making sure the humidity never drops below 80%.

## Plant Culture

I grow most of my plants in live red sphagnum moss (*Sphagnum capillifolium*) in 25-mm or 30-mm terra cotta pots.

I prefer pots, because they can be turned occasionally to maintain even growth. When using artificial lights, the light only shines on the plants from one direction. As a result, plants mounted on wood or tree fern tend to grow to one side.

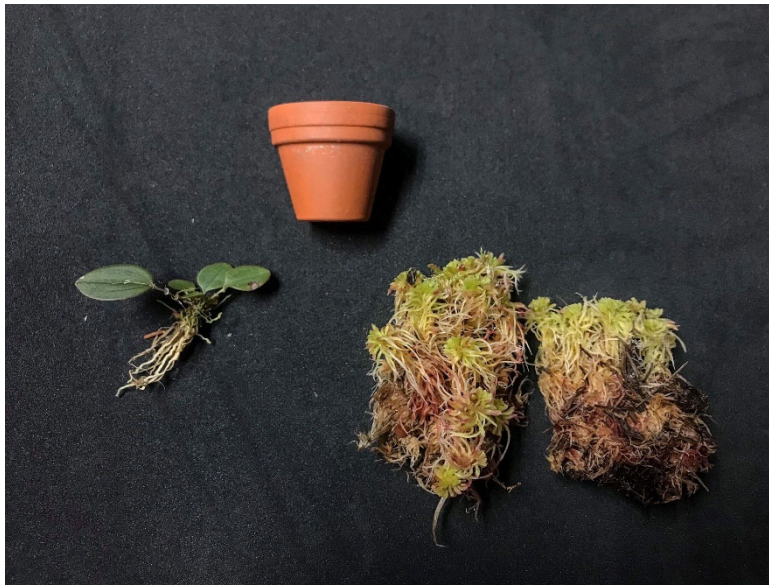
Red sphagnum moss, compared to other species, stays tiny even in fairly deep shade, and it doesn't overgrow the plants like other species of sphagnum. Also, it can be used as a "watering meter" of sorts. I only water when the tips of the sphagnum start to turn brown.



Left: 30-mm pot; Right: 25-mm pot



Clumps of red sphagnum moss



*Lepanthes orchestris*, 30-mm terra cotta pot, clumps of red sphagnum moss



Red sphagnum bunched around the roots with the budded tips pointing upward like a bouquet of flowers



The ends of the moss trimmed just below the roots of the plant





*Lepanthes orchestris* potted in red sphagnum moss



*Pleurothallis cernua* roots after several months in live red sphagnum

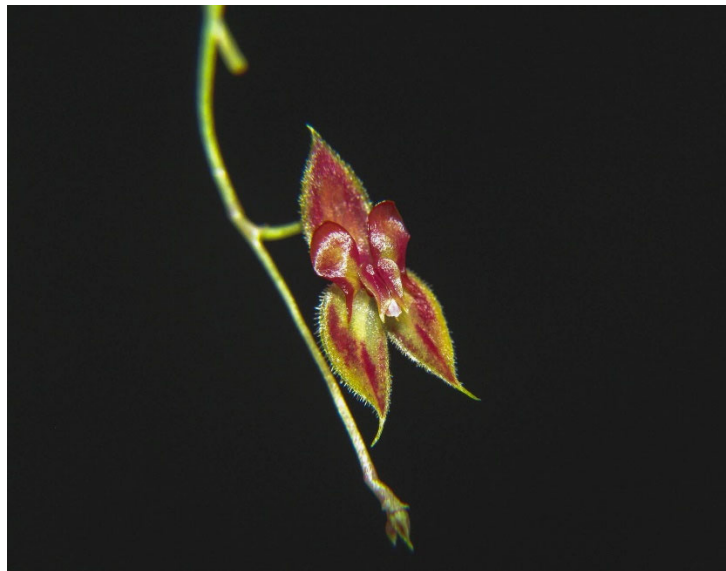
## **Watering**

I hand-water with a 32 oz. spray bottle. With almost every watering, I add 1/8 tsp. of Miracle-Gro Bloom Booster fertilizer. In the fall, winter, and spring, I water about every third day. In the summer, I water at least every other day. Rarely do I water every day.

Some Of My Collection



*Barbosella gardneri*



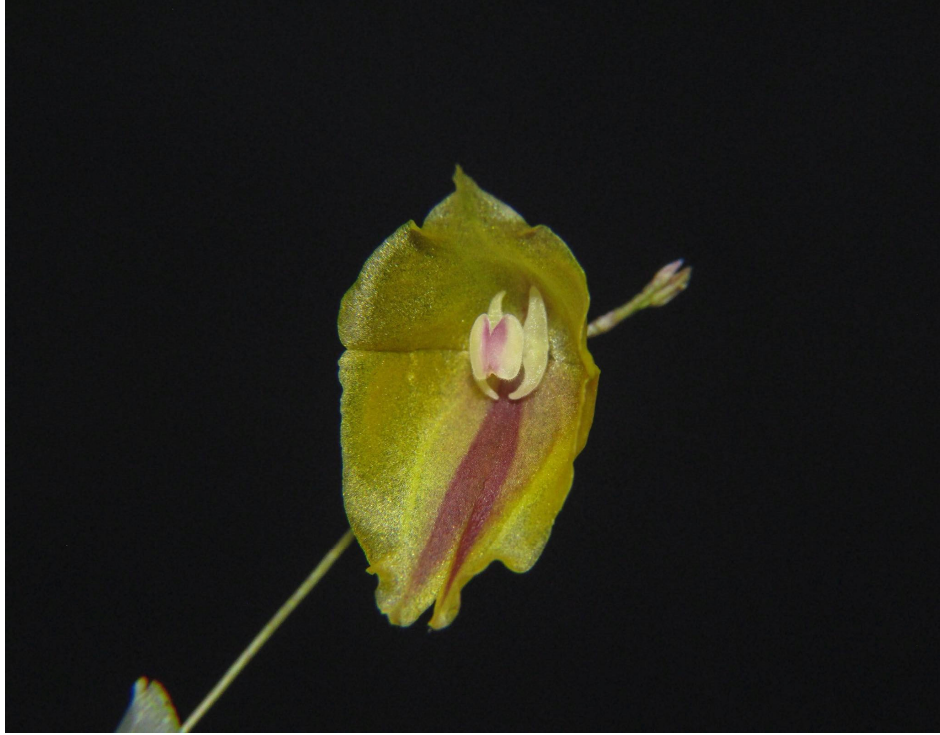
*Lepanthes calophlebia*



*Lepanthes dodsonii*



*Lepanthes domingensis*



*Lepanthes escobariana*



*Lepanthes estrellensis*



*Lepanthes fiskei*



*Lepanthes meniscophora*



*Lepanthes ovalis*



*Lepanthes pretiosa*



*Lepanthes saltatrix*



*Lepanthes tsubotae*





*Lepanthes tsubotae*



*Lepanthopsis acuminata*



*Lepanthopsis astrophora*



*Phloeophila cymbula*



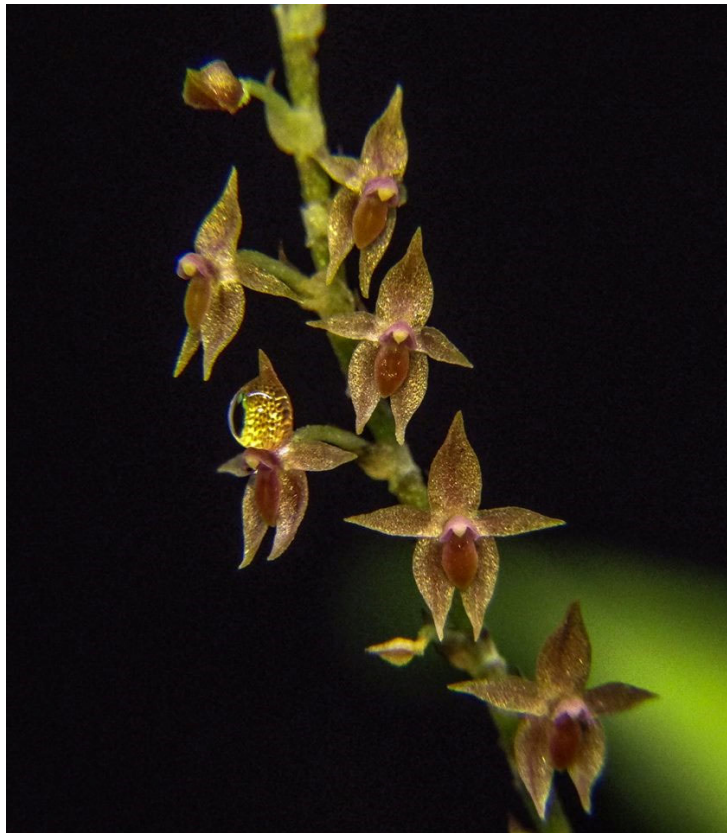
*Platystele argentosa*



*Platystele baqueroi*



*Platystele consobrina*



*Platystele densiflora*



*Platystele orectoglossa*



*Platystele repens*



*Pleurothallis amphygia*



*Pleurothallis aurita*



*Pleurothallis dorotheae*



*Pleurothallis dubbeldamii*



*Pleurothallis nitida*

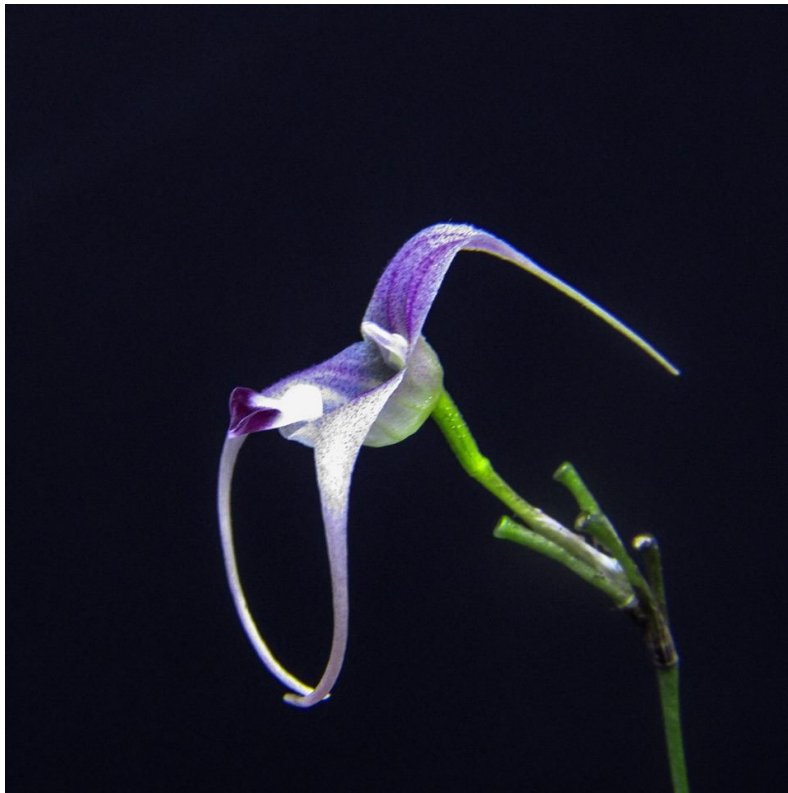


*Pleurothallis* aff. *sphaerantha*





*Pleurothallis aff. tryssa*



*Porroglossum sergii*



*Stelis concinna*



*Stelis microchila* (Xanthic Form)



*Stelis pusilla*



*Stelis* sp.



*Stelis aff. opercularis*



*Stelis uniflora*



*Stelis uniflora*



*Trichosalpinx pergrata*



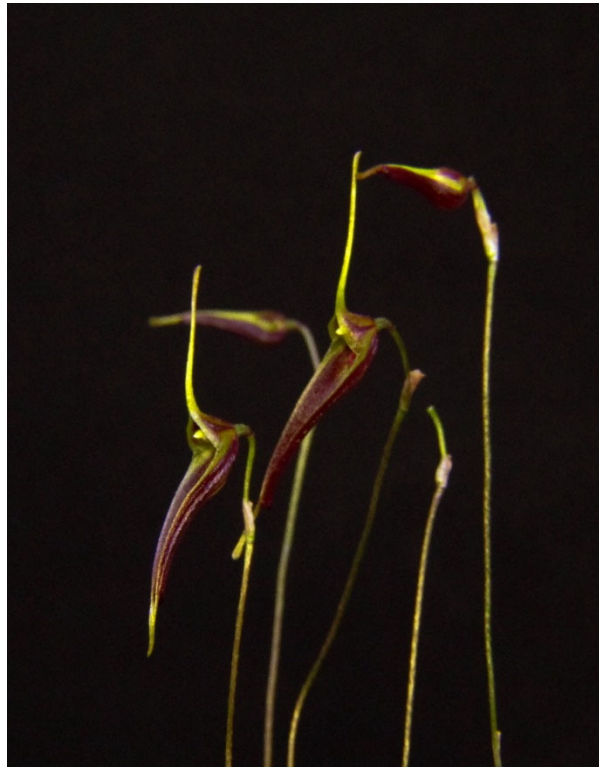
*Trisetella cordeliae*



*Trisetalla pantex*



*Trisetella didyma*



*Trisetella didyma*



*Trisetella regia*





*Trisetella tenuissima*



*Trisetella triaristella*



*Trisetella triglochin*

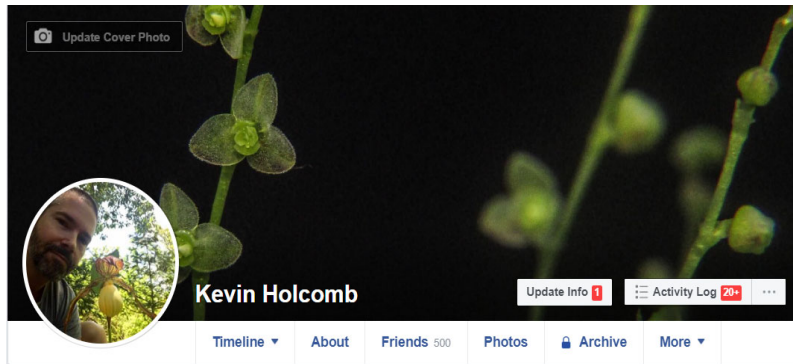


*Trisetella triglochin*

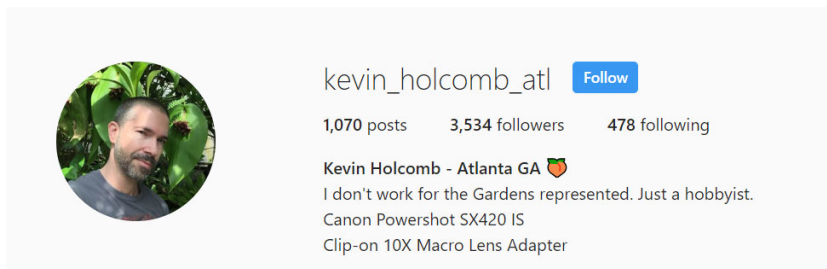
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