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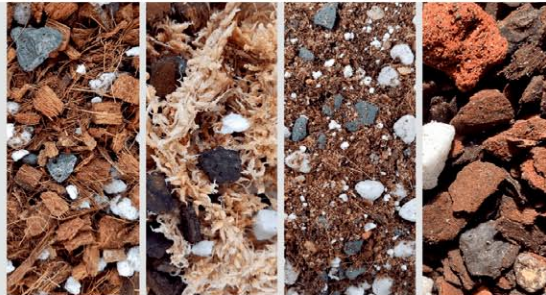
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VOL. 90 NO. 3 MARCH 2021



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The Bulletin of the American Orchid Society

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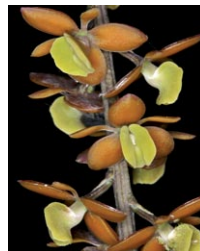
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FRONT COVER

Pterichis acuminata photographed by Spiro Kasomenakis in Colombia's Tatamá National Park.

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Pronunciation of orchid names can be daunting for the novice and experienced grower alike. Presented below is a simplified pronunciation guide specific to the names found in this issue of *Orchids* magazine. An attempt has been made to represent each syllable using easily recognized sounds or words separated by hyphens and not standard phonetic symbols. Check out the Orchidist's Glossary on our website at <https://www.aos.org/orchids/orchidists-glossary.aspx>.

<i>Acampe</i> (ay-KAMP-ee)	<i>Esmeralda</i> (ez-mer-AL-da)	<i>Paphinia</i> (paff-IN-ee-a)
<i>Acianthera</i> (ay-see-AN-ther-a)	<i>flava</i> (FLAY-va)	<i>parkinsonianum</i> (park-in-sone-ee-AY-num)
<i>Acineta</i> (a-sin-EE-ta)	<i>fletcherianum</i> (fleh-cher-ee-AY-num)	<i>Peristeria</i> (pear-is-TARE-ee-a)
<i>acuminata</i> (a-kew-min-AY-ta)	<i>furcata</i> (fur-KAY-ta)	<i>petotianum</i> (peh-toh-tee-AY-num)
<i>Adenoccos</i> (ad-en-ON-kose)	<i>Gastrochilus</i> (gas-troh-KYE-lus)	<i>Phalaenopsis</i> (fail-en-OP-sis)
<i>aequinoctiale</i> (eh-kwin-ok-tee-AY-lee)	<i>gigantea</i> (jye-GAN-tee-a)	<i>Phragmipedium</i> (frag-mih-PEED-ee-um)
<i>Aerides</i> (ay-air-EE-deez)	<i>Gongora</i> (GONE-gore-a)	<i>picta</i> (PIK-ta)
<i>agastor</i> (a-GAS-tore)	<i>granadensis</i> (gran-a-DEN-sis)	<i>Platanthera</i> (plat-AN-ther-a)
<i>albiflora</i> (al-bee-FLORE-a)	<i>grande</i> (GRAN-day)	<i>Pleurothallis</i> (plur-oh-THAL-liss)
<i>albolineatum</i> (al-boh-lin-ee-AY-tum)	<i>grandiflora</i> (gran-dee-FLORE-a)	<i>Pogonia</i> (poh-GOH-nee-a)
<i>alborosea</i> (al-boh-ROH-zee-a)	<i>Habenaria</i> (hab-en-AIR-ee-a)	<i>poikilostalix</i> (poy-kih-loh-STAY-lik)
<i>aloifolium</i> (al-loh-ee-FOLE-ee-um)	<i>hainanensis</i> (hye-nan-EN-sis)	<i>porrecta</i> (por-REK-ta)
<i>amabilis</i> (a-MAH-bih-lis)	<i>harrisonianum</i> (hair-ih-son-ee-AY-num)	<i>pseudoreichenheimiana</i> (soo-doh-rye-ken-hye-mee-AY-na)
<i>anachaeta</i> (an-a-KAY-ta)	<i>hashimotoi</i> (hash-ee-MOH-toh-ee)	<i>Psygmarchis</i> (sig-MORE-kiss)
<i>Angraecum</i> (an-GRAY-kum)	<i>hausmanianus</i> (house-man-ee-AY-nus)	<i>Pterichis</i> (TARE-ih-kiss)
<i>Anota</i> (a-NOH-ta)	<i>herbiola</i> (her-bee-OH-la)	<i>pumila</i> (PEW-mih-la)
<i>Arachnis</i> (a-RAK-niss)	<i>hirtzii</i> (HIRTZ-ee-eye)	<i>pumilio</i> (pew-MILL-ee-oh)
<i>aurantiacus</i> (aw-ran-tee-AY-kus)	<i>Holcoglossum</i> (hole-koh-GLOSS-um)	<i>punctatum</i> (punk-TAY-tum)
<i>aureus</i> (AW-ree-us)	<i>Homo</i> (HOE-moe)	<i>Renanthera</i> (ren-AN-ther-a)
<i>bahamensis</i> (bah-ha-MEN-sis)	<i>homoion</i> (hoe-MOE-ee-on)	<i>Rhynchostylis</i> (rink-oh-STYE-liss)
<i>barkeri</i> (BAR-ker-eye)	<i>illustre</i> (ill-LUSS-tree)	<i>rieferi</i> (REE-fer-eye)
<i>bifaria</i> (bye-FAIR-ee-a)	<i>imperiale</i> (im-peer-ee-AL-ee)	<i>Robiquetia</i> (roh-bee-KET-ee-a)
<i>boliviensis</i> (boh-liv-ee-EN-sis)	<i>incurvum</i> (in-KUR-vum)	<i>rochussenii</i> (roh-koo-SHEN-ee-eye)
<i>Bothrops</i> (BOH-throps)	<i>kentuckiense</i> (ken-tuk-ee-EN-sis)	<i>Rodriguezia</i> (rod-rih-GEZ-ee-a)
<i>Brachionidium</i> (brak-ee-oh-NID-ee-um)	<i>lancifolius</i> (lan-sih-FOLL-ee-us)	<i>Rossioglossum</i> (ross-ee-oh-GLOSS-um)
<i>Bucculenta</i> (buk-yew-LEN-ta)	<i>laucheanum</i> (lau-kee-AY-num)	<i>rugosa</i> (roo-GOH-sa)
<i>Bulbophyllum</i> (bulb-oh-FILL-lum)	<i>Lepanthes</i> (leh-PAN-theez)	<i>Saccolabium</i> (sak-koh-LAY-bee-um)
<i>burkillii</i> (bur-KILL-ee-eye)	<i>leucocorys</i> (lew-koh-KORE-iss)	<i>sapiens</i> (SAY-pee-enz)
<i>calodictyon</i> (kal-oh-DIK-tee-on)	<i>Liparis</i> (LIH-pare-iss)	<i>Scaphosepalum</i> (skaf-oh-SEE-pa-lum)
<i>Calopogon</i> (kal-oh-POH-gon)	<i>Listera</i> (LISS-ter-a)	<i>Schoenorchis</i> (show-en-ORE-kiss)
<i>carcinopsis</i> (kar-sin-OP-sis)	<i>Loeslii</i> (LOWES-lee-eye)	<i>Selenipedium</i> (sel-en-ih-PEED-ee-um)
<i>carunculigera</i> (kar-unk-yew-LIJ-er-a)	<i>longifolium</i> (lon-jih-FOLL-ee-um)	<i>sicaria</i> (sih-KAR-ee-a)
<i>Cattleya</i> (KAT-lee-a)	<i>lucida</i> (LOO-sih-da)	<i>Sigmatostalix</i> (sig-mat-oh-STAY-lik)
<i>Ceratochilus</i> (sir-at-oh-KYE-lus)	<i>Luisia</i> (loo-ISS-ee-a)	<i>smallii</i> (SMALL-ee-eye)
<i>chapmanii</i> (chap-MAN-ee-eye)	<i>Lycomormium</i> (lye-koh-MORE-mee-um)	<i>spathaceum</i> (spath-AY-see-um)
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<i>Cleistis</i> (KLY-steez)	<i>Macrobolbon</i> (mak-roh-BUL-bon)	<i>spiesii</i> (SPEEZ-ee-eye)
<i>coelestis</i> (see-LESS-tiss)	<i>Masdevallia</i> (mass-deh-VAHL-ee-a)	<i>Spiranthes</i> (spy-RAN-theez)
<i>Coelogyne</i> (see-LODJ-ih-nee)	<i>Maxillaria</i> (maks-ill-LAIR-ee-a)	<i>squalidum</i> (SKWAL-id-um)
<i>Coryanthes</i> (kore-ee-AN-theez)	<i>maxima</i> (MAKS-ih-ma)	<i>standleyi</i> (STAND-lee-eye)
<i>Crossoglossa</i> (kros-soh-GLOSS-a)	<i>meirax</i> (MYE-raks)	<i>Stanhopea</i> (stan-HOPE-a)
<i>cruentum</i> (kru-EN-tum)	<i>Micropera</i> (mye-kroh-PEAR-a)	<i>Staurochilus</i> (star-oh-KYE-luss)
<i>Cryptocentrum</i> (kryp-toh-SEN-trum)	<i>Miltoniopsis</i> (mill-tone-ee-OP-sis)	<i>Stelis</i> (STEE-liss)
<i>Cymbidium</i> (sim-BID-ee-um)	<i>moniliforme</i> (mon-ill-ih-FORE-mee)	<i>swertifolium</i> (swert-ih-FOLE-ee-um)
<i>cymifera</i> (sim-IF-er-a)	<i>mossiae</i> (MOSS-ee-eye)	<i>Telipogon</i> (tel-ee-POH-gon)
<i>Cypripedium</i> (sip-rih-PEED-ee-um)	<i>moulmeinense</i> (mool-meen-EN-see)	<i>Tolunnia</i> (toh-LUM-nee-a)
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<i>densiflora</i> (den-see-FLORE-a)	<i>oblonga</i> (ob-LONG-a)	<i>tuberosus</i> (too-ber-OH-sus)
<i>Dracula</i> (DRAK-yew-la)	<i>Odontoglossum</i> (oh-don-toe-GLOSS-sum)	<i>Vanda</i> (VAN-da)
<i>eburneum</i> (ee-BURN-ee-um)	<i>oliganthus</i> (oh-lig-AN-thus)	<i>Vanilla</i> (van-ILL-a)
<i>egertonianum</i> (ehj-er-tone-ee-AY-num)	<i>Oncidium</i> (on-SID-ee-um)	<i>ventricularia</i> (ven-trik-yew-LAIR-ee-a)
<i>Elleanthus</i> (el-lee-AN-thus)	<i>ophioglossoides</i> (oh-fee-oh-gloss-OY-deez)	<i>vexillarius</i> (veks-ill-AIR-ee-us)
<i>Epidendrum</i> (eh-pih-DEN-drum)	<i>orthosepalum</i> (ore-tho-SEE-pah-lum)	<i>violacea</i> (vye-oh-LAY-see-a)
<i>erectus</i> (ee-REK-tus)	<i>ovata</i> (oh-VAY-ta)	
<i>Erycina</i> (air-ih-SEE-na)		

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PRESIDENT'S MESSAGE

IT HAS BEEN wonderful to see that the year is progressing on a positive note. The vaccine for COVID-19 is available for many now and we can see the light at the end of the tunnel. The American Orchid Society has operated continuously, abiding by the pandemic guidelines, and has shown its resilience. The pace was somewhat slower last year, but it is clear to see we are bringing things back to speed.

The AOS has seen an increase in outreach judging events around the nation, not to mention the many judging centers and orchid societies that are having in-person meetings as well. All the while, everyone is following pandemic guidelines that, by now, are ingrained in our system.

Later this month is the AOS Spring Members' Town Hall Meeting. It will be a virtual meeting much like the last fall meeting, only better. We will be having an auction once again with more items to bid on, making this portion of the meeting even more exciting. With the success of the last auction, I want to be sure to thank all those involved. The commercial folks and those directly involved made this quite an awesome event given the turbulent times we have had. Members will partake in the afternoon virtual meeting when we will hear news, updates and more. This format actually gives the AOS an outlet to reach many more AOS members.

The jewel of this year will be the AOS Centennial Celebration this fall when we will be paying tribute to the 100 years of the American Orchid Society. Orchid conservation is the theme for this meeting with proceeds going to conservation of orchid habitats to ensure they are here for generations to come. Deforestation and increased urbanization have diminished orchid habitats and the flora and fauna along with them. This is very important to me and to all of us. Registration is open now, so it would be advisable to register for the celebration as soon as possible since some of the events may have limited seating.

Below are items on the agenda for the AOS meeting and Centennial Celebration October 27–30, 2021:

- Judging at the East Everglades Show and Sale
- Lectures by renowned orchid experts to share their knowledge
- An incredible auction with many one-of-a-kind pieces
- The members' Town Hall Meeting to share what is happening with the AOS
- An over-the-top banquet to celebrate the absolute best orchid society in the

world

As you can see, there is a lot on the menu and if I could take a moment to pay tribute to a group of unsung heroes that make so much of this possible, I would like to do that now. The American Orchid Society is very fortunate to have a staff that relentlessly steps up to the plate whenever they are called upon.

Calls that go to the AOS are received by Daniella Dutra and Sandra Kurzban, who always sound as though they are smiling. Both of them are always professional and friendly, fielding calls to the others on staff. They have to be very good at what they do because they are on the front-line, giving callers the first impression of the AOS.

Laura Newton is our awards registrar. We all work very hard to cultivate orchids at AOS standards. And when we are awarded for our plant, we carry that badge of honor forever. Laura records the awards and sends us our highly cherished certificates for posterity. Once those awards are in the books, it is official! Now, 2020 was a light year for awards, given everything that happened last year. But imagine in a normal year, how many awards might be given and all the work that comes with that. She does an amazing job, and we are all grateful for her work.

Every month we receive our *Orchids* magazine: Ron McHatton, with the help of Jean Allen-Ikeson, has made it possible. They proof article after article, formatting it and preparing it to follow the guidelines necessary for the magazine. Amazingly, they have just the right number of articles, photos and ads to perfectly fit every issue! Their work is phenomenal.

For those of you that have had the privilege to have been a part of the AOS at the 75th anniversary, you no doubt know how successful the AOS has been. The history of the AOS is well documented in the archives. This does not happen by



Bob Fuchs admires a *Miltoniopsis* at Juan Felipe Posada's nursery in Colombia.

chance. It does not come with frivolous spending or irrational requests. It comes from being run like any other successful corporation and there has to be someone in charge of the numbers. For the AOS, that person is Victor Perara. Victor has his pulse on the lifeline of the AOS, keeping meticulous records ensuring everything is in order.

The backbone of the AOS is Naya Marcano. She makes sure everything is running like a top! She is the go-to person for anything AOS. Everything that comes into the AOS comes through her desk and she handles them expertly and efficiently. The AOS is very fortunate to have such a knowledgeable person in Naya, since her experience keeps the AOS in the spotlight of the orchid world.

The combined work of the staff of the AOS and all the *remarkable volunteers* makes the AOS what it is today — the most extraordinary orchid society ever. Check out the AOS website at www.aos.org for more information on the spring meeting and the fall Centennial Celebration. I am looking forward to seeing many of you there! — *Robert Fuchs, AOS President (email: bob@rforchids.com)*.

An advertisement for White Plains Orchids. It features a collage of various orchids in shades of pink, purple, and white. The text includes: "Now Open! White Plains Orchids HOLESALE/RETAIL", contact information (Phone: (914) 948-2064, Email: whiteplainsorchids@gmail.com, Website: www.whiteplainsorchids.com, @WhitePlainsOrchids), and address (1485 Mamaroneck Ave., White Plains, NY).

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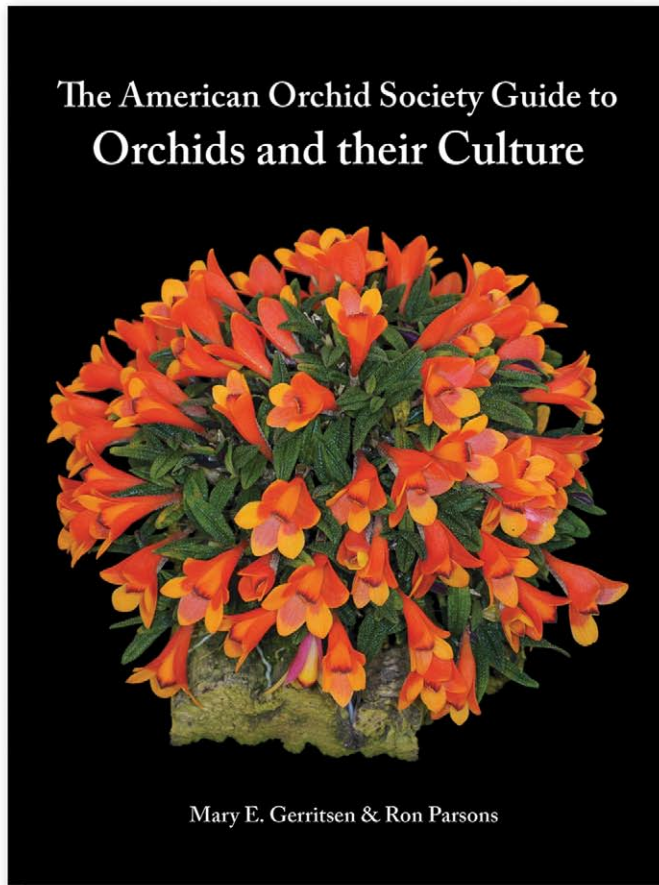
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March: The Quisquous Month

By Thomas Mirenda

AS A WRITER, I am enamored of words. They are my tools of expression and conveyance of ideas. I love their utility and their precision as well as the specificity they can offer in this regard. While some say that simple language is better for the sake of clarity, I believe that finding the best word, however obscure, might require a bit more effort by the reader, but conveys truth and meaning more completely. The ultimate insult once hurled at the great Ernest Hemingway was that his prose never once sent any of his readers to the dictionary. So, I will leave you to explore the meaning of this title. It in many ways encapsulates what is going on with our orchid collections. And besides, I cannot resist a word with two q's in it!



Thomas Mirenda

Orchids are quisquous entities: enigmas, puzzles and mysteries to be solved. The challenges they offer us — how to grow, thrive, bloom and reproduce almost 30,000 species and an astronomical number of hybrids — keep the orchid world forever perplexed and engaged in problem cracking. The subject is vast, and the solutions are varied and dependent on the unique circumstances of every orchid habitat, every orchid grower and every growing situation. Even here on the Big Island, some orchids grow beautifully in one nursery and fail miserably 5 miles (8 km) down the road! It is true! So, as much as we may want to grow every orchid, it is unlikely that any of us will ever be able to achieve such a monumental task. It will take a team, with collaboration and community to conserve them all.

EMERGENCY As days begin to lengthen this month across the Northern Hemisphere, we start to see action among many of our orchids. New growths and roots often accompany the advent of longer days and therefore I find this the most exciting time of the year. Every new growth bears the promise of new inflorescences. When multiple new growths occur on our plants, it means we are on our way to multifloral specimens and amazing, spectacular displays. There are a couple of things you can do to encourage these multiple growths.



MICHAEL NEWMAN

Bulbophyllum vaginatum growing in an Hawaiian garden.

Make sure that plants are spaced well enough so that every new growth gets adequate light. Overcrowded orchids seldom produce spectacle. While we all want as much diversity in our collections as possible, sometimes less is more. Crowded plants stretch toward the light and can become spindly, one-sided and weak. They can also pass diseases and parasites to each other if kept too close together.

IRRATIONAL EXUBERANCE The volatile month of March can be so exciting with all the growth commencing and blooming activity that is tempting to “jump the gun” with our cultural activities. When we are encouraged by our orchids so earnestly trying to grow, displaying fresh new root nubbins and delicate new sprouts, we might overreact by watering and fertilizing excessively this month. I caution you to show a little moderation at this time. New roots may be coming on cattleyas, oncidiums, cymbidiums and even phalaenopsis right now, but they need to be at least an inch or two (2.5–5 cm) long before they are really capable of handling a serious feeding or repotting. Indeed, those roots are searching for moisture and if you wet them constantly many of those roots will slough off and never lengthen or develop properly. They

are also exceedingly delicate and easily damaged at this stage. The best thing to do at this stage is supply enhanced humidity rather than drenching with moisture. Avoid the rotting that often happens on new growths this time of year with a little restraint.

ENTERPRISE Before the rush of repotting season in the next few months, it is imperative to prepare for the onslaught of new growths that are on their way. Assess your collection to see what supplies you might need, fresh bark and moss, new pots and baskets, fertilizers and other nutrients. If you wait till the last minute to acquire these things you may have trouble obtaining everything you need. In addition, you may want to begin to prepare; i.e., clean, sanitize and organize an outside or alternate growing space. Invariably in the crowded winter conditions, some pathogens have developed. Search them out and find and treat them now or they may burgeon uncontrollably as plant juices start flowing and plants are moved around for repotting. It is also quite rewarding to keep a notebook or journal about your plants to track their progress from one year to the next. This way you can record successes as well as failures to keep positive momentum going or, conversely,

keep disasters from repeating themselves. Our plants are our instructors, so take notes when they communicate with us in their inimitable, nonverbal ways.

FASCINATION Aside from being beautiful, our orchids are enthralling in every conceivable way. How far we delve into their peculiarities and ecologies will ultimately make us better growers and conservators of these astounding plants. There is a reason why orchids are beloved and lovingly nurtured by people like us around the world. They are endlessly interesting and rewarding once we have figured them out. Seek out the advice of your orchid community, your local nurserymen, growers and hobbyists, and the many amazing online communities as well as the professionals at local botanical gardens and university collections. Quisquous though they may be, they offer so much fulfillment and joy when we successfully engage with and solve their many mysteries.

— *Thomas Mirenda has been working professionally with orchids for over three decades and is the past chair of the AOS Conservation Committee. He is an AOS accredited judge in the Hawaii Center (email: biophilak@gmail.com).*

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Stakes

Text and photographs by Carlos Macku

COMMERCIAL SOURCES

Plant stakes are sold in nurseries and large hardware stores in all shapes and sizes, as well as made from different types of materials such as wood or bamboo, metal wire, and even plastic. Recently, dedicated orchid plant stakes are being commercialized over the internet from selected retailers and specialty stores.

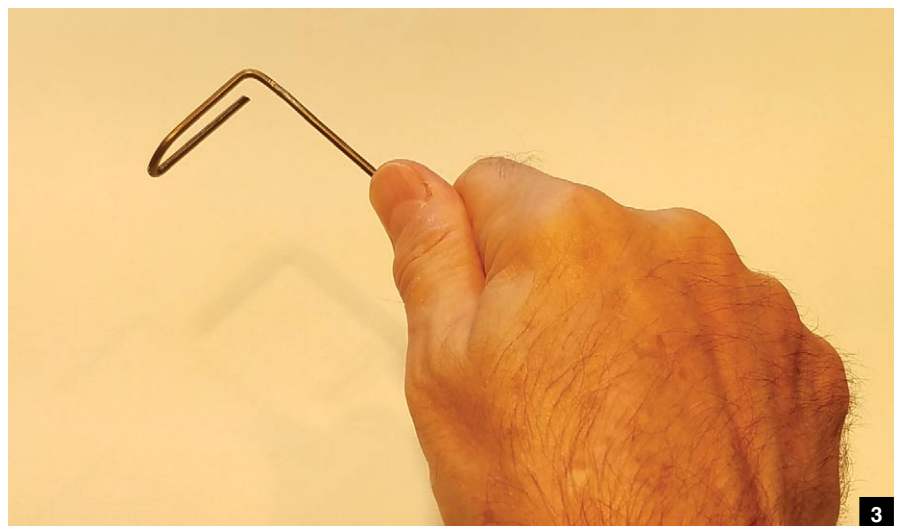
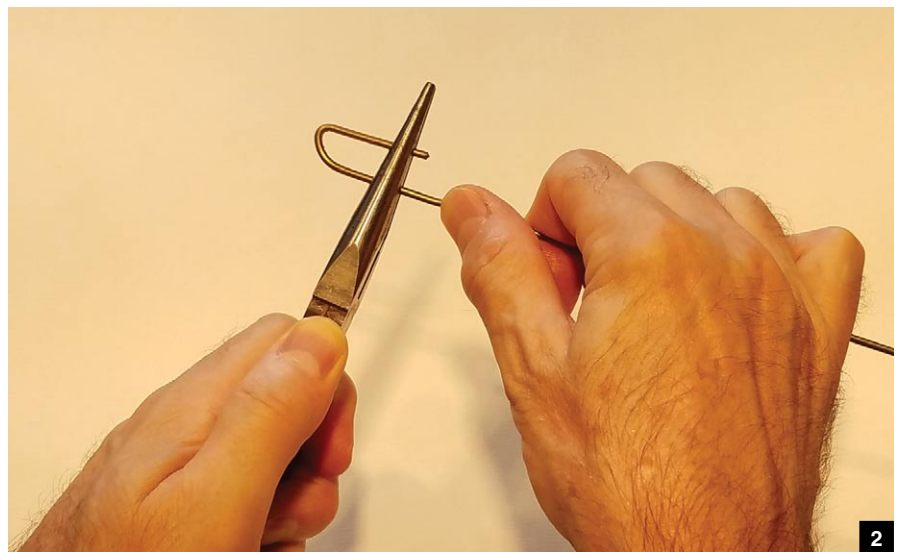
Wood or bamboo stakes are popular because of their appearance, conveying a natural blend with the potted orchid plant. These stakes are sold in natural color or dyed dark green. They are excellent for staking large cymbidium inflorescences, but too large for smaller or miniature phalaenopsis and paphiopedilums. However, because these are nature-made canes, their material cannot be bent or molded into hook-shaped trimmed stakes like the ones made of metal wire. Additionally, these stakes will rot over time, but the buried bottom portion can always be trimmed from time to time to make ever shorter stakes for additional smaller plants.

Metal wire stakes are sold in different gauges and lengths. In contrast to natural wood or bamboo, these stakes are shaped at the top to loop or lasso an inflorescence or other plant structure to create the desired presentation. They are sometimes coated with a layer of colored plastic, not only for appearance but also to avoid rust at the lower, buried portion of the stake. Nevertheless, if uncoated, metal stakes can also be trimmed like wood or bamboo canes for reuse. Metal stakes are excellent for small orchid plants.

Not as popular as wood, bamboo, or metal wire, but with recent commercial availability, are plastic stakes for orchid plants. These stakes are sold in different sizes and rod gauges, and even made with a hook or lasso top trim. They are certainly impervious to rot or rust when compared to natural or metal alternatives, but their appearance and texture might not please some orchid growers looking for a more organic presentation.

RECYCLED MATERIALS

Personally, I like to reuse household objects that are no longer needed or meant for disposal or municipal recycling; one example is metal wire laundry hangers. They are an essentially



free and abundant source of material for homemade orchid stakes.

With a good pair of pliers, laundry hangers can be cut close to the neck, where the wire is twisted to form the hanging loop. A long and straight rod can be obtained by reshaping the two main side shoulders of the hanger. Each individual hanger can be turned into two to three good sized orchid stakes, depending on the need for tall or short stakes. I make metal wire stakes to support or straighten the inflorescences of phalaenopsis and paphiopedilums and a hook can be shaped from a hanger wire with two simple bending twists. They can also be custom-shaped to make more elaborate stakes to train other orchid parts such as leaning pseudobulbs or even pendent inflorescences.

GENERA-SPECIFIC CONSIDERATIONS

To illustrate the use of recycled metal wire stakes to fasten, train, and correct plant growth, I will focus on three of the most common orchid genera in the marketplace: phalaenopsis, paphiopedilum and cattleyas.

PHALAEOPSIS Phalaenopsis plants grown for the mass market are usually potted and raised in a container, always upright and facing the ceiling. However, such strictly vertical growth in the wild is rarely seen and as plants age, the natural tendency is to lean into the direction of the light source or to bend down under the weight of gravity. This happens in a pot in our homes as well and after one or two years in a container, our cultivated plants may need to be repotted to bring the foliage-barren part of the stem with aerial roots into contact with new growing media and to once again point the crown to the ceiling. If placed next to a window or glass sliding door, a developing inflorescence will never grow straight up as we see them sometimes staked. Light coming from the side of the plant will force the inflorescences to grow in a slanted or horizontal fashion unless staked.

To correctly train a developing phalaenopsis inflorescence, different lengths of metal wire stakes are used to direct the development. Of course, the most critical period in this exercise is when the inflorescence is tender and emerging from the leaves. Once the inflorescence has elongated, care must be taken to create an elegant curvature without breaking it. I use Velcro strips to fasten the inflorescence to the stake. These can be easily let out repeatedly as the shape of the inflorescence changes



without cutting into the tender tissue or, worse yet, suddenly snapping the inflorescence off.

Once the flower buds start to differentiate from the main stem (peduncle), it is time to think about the final phase of development. Phalaenopsis inflorescences can be left fully vertical, carefully allowed to arch from the lowermost bud or even bent down like a hairpin to create those spectacular displays of cascades of dozens of gigantic mothlike flowers displayed every year at some international shows. All of this is done by manipulation of the direction of available light, tight control of temperature variations and with long, flexible metal wire stakes.

PAPHIOPEDILUMS The flowers of complex hybrid paphiopedilums can be very heavy as can be the heavy multiple flowers of polyfloral species and hybrids and the inflorescences of Maudia-type hybrids tend to be rather thin. The result is that regardless of the type, paphiopedilum inflorescences can tend to arch and that arching lead to potential breakage or a downward presentation of the open flowers. These flowers, rather than being trained, need to be anchored, particularly if the potted plants are transported to a displaying location.

Metal wire stakes are ideal for securing paphiopedilum and phragmipedium flowers. The hook of a custom-made stake can be placed just below the flower, under the chin so to speak, or on the neck of the bloom, between the spike and the



- [1] The top of a straight metal wire is bent 180 degrees with a pair of pliers.
- [2] The metal lasso is bent 90 degrees to complete the orchid plant stake.
- [3] Final home-made metal wire stake for Phalaenopsis and Paphiopedilum blooms.
- [4] *Phal.* Tying Shin Phoenix 'Tahiti Sunrise' staked to present the flowers on an erect inflorescence.
- [5] A phalaenopsis inflorescence staked to display a more natural arch.
- [6] *Paphiopedilum* (World Exploit x Mildred Hunter) fastened with a metal wire stake around the neck of the flower, between the spike and the fused lateral sepals. This helps to not only hold the flower secure but improves the forward presentation.

fused lateral sepals. Care must be taken when placing the hook behind the flower to avoid snapping the flower off at the tip of the ovary. There's nothing worse than waiting weeks to see a paphiopedilum bloom only to snap off the opening flower.

CATTLEYAS Cattleyas and other sympodial orchids such as dendrobiums and oncidiums consist of a horizontal stem (rhizome) with more-or-less perpendicular pseudobulbs developing at intervals as the rhizome grows over the top surface of the growing media. If the influence of a long-term unidirectional light source is not significant, the pseudobulbs will grow in a natural upright position. Otherwise, they will slant in the direction of the light source or, if at sufficiently poor light levels, the heavy pseudobulbs will be weak at the base and unable to hold themselves upright. Should the rhizome reach the rim of the pot, the leading pseudobulbs will grow out over the cliff created by the container rim and will, because of their weight, require staking to keep them upright until the plant can be repotted.

As a result, staking in cattleyas is more a matter of training heavy pseudobulbs and inflorescences, rather than safeguarding bloom development. This means stakes often require more detailed designs than plain sticks with a hook as illustrated for phalaenopsis and paphiopedilum blooms. Here is where metal wire outperforms other types of material due to its flexibility to contour and adapt to individual situations.

Illustrated here is a good example of this specialized staking using a specimen of *Brassocattleya* Morning Song that has outgrown its pot. The lead pseudobulb and inflorescence have been secured with two custom-made stakes. This stabilizes the floral presentation during flowering and also helps to stabilize the whole front structure of the plant until it can be properly repotted.

CONCLUDING REMARKS

Geotropism, phototropism, and hydrotropism control how orchid plants grow in nature. These principles dictate the shape and the direction of plant growth. In one's home, orchids are grown and displayed following certain patterns and style guidelines that often require staking as part of the overall grooming of the plants we grow.

Further reading

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— Carlos Macku was born in Caracas, Venezuela. He received a doctorate degree in Agricultural and Environmental Chemistry from the University of California at Davis. He has been cultivating orchids for over 20 years inside his New Jersey residence (email: carlosmacku@yahoo.com).

[7] This *Brassocattleya* Morning Song (Morning Glory × *Cattleya* Melody Fair) has been staked using two wire stakes. The lower stake cradles the leaning pseudobulb at about the middle preventing it from becoming more horizontal and the second stake supports the flowers. This two-stake method provides much more flexibility in controlling the growth and pleasingly presenting the flowers.

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*— Regards, Ronnie Miller
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Psychopsis Mariposa Photo Credit: Ronnie Miller



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QUESTIONS AND ANSWERS



QUESTION

What causes an otherwise healthy-looking sheath to suddenly turn brown?

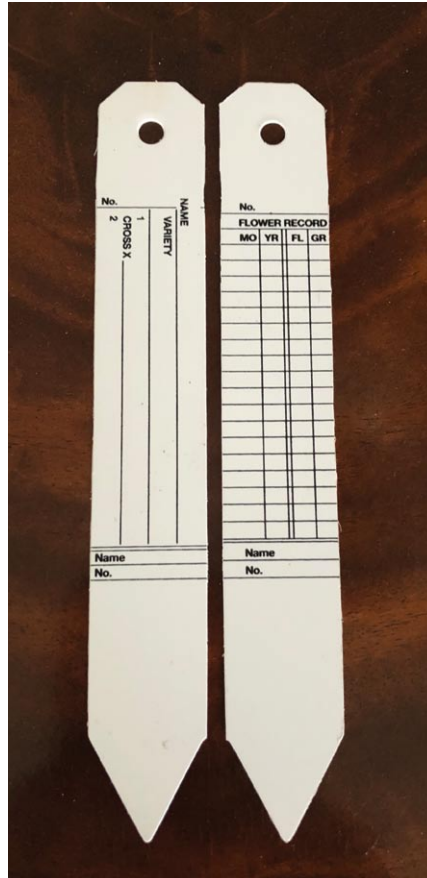
ANSWER

It depends on what the brown sheath looks like. Many cattleyas naturally flower from a dry sheath. They produce a new growth, the leaf forms, the sheath forms and then they sit, sometimes for months. The sheath will then turn brown and weeks or months later buds form and work their way up through a dry sheath. You can check this development by holding a light up behind the sheath and looking for the shadow of the buds. *Gurianthe aurantiaca* and *Guarianthe skinneri* are examples of cattleyas that flower from dry sheaths along with several labiata-type and bifoliate cattleyas. In fact, flowering from a green sheath vs. a dried sheath is one of the ways of distinguishing *Cattleya guttata* from *Cattleya tigrina*. The plant in the photograph above is *Cattleya Mildred Rives 'Orchidglade' FCC/AOS*. The plant initiates growth in the spring, maturing the pseudobulb in the early fall and the sheath turns brown. Flowering occurs in late February to early March from the dried sheath.

If the sheath suddenly browns or blackens, especially if it appears wet or mushy, it is indicative of a bacterial or fungal infection. Sometimes, it is possible to see droplets inside the sheath by holding a light behind it. If caught early enough, it is often possible to cut open the sheath and allow it to dry. Just be careful watering to avoid getting water in

the open sheath.

Sometimes browning of the sheath is simply a sign that the plant did not have the energy to flower because it has not quite reached flowering size or conditions necessary to initiate buds were not right. This sort of drying is very common in seedlings just reaching flowering size and in those cattleyas that need specific changes in daylength.



QUESTION

It seems most plastic labels get brittle and break after two to three years. Do you know any that will last longer?

ANSWER

I find the vinyl label in the accompanying photograph to be very resistant to sunlight and weather here in Florida. I personally have labels that I know have been in use for at least 10, if not closer to 15, years. They are 7 inches long and an inch wide (17.5 cm x 2.5 cm) and have room for a wealth of information. The front is printed with spaces for the plant name and parents and the back for recording the number of flowers, inflorescences and time of the year. Having this bloom record

lets you see at a glance if your growing technique is improving. I also use the back to record when I repotted the plant. This helps me keep track of proper repotting time. I know of at least one grower who uses space on the front to add country of origin, elevation and temperature requirements for his species. I use a pencil when recording information. It is not perfect and will fade over time but lasts far longer (years) than marking pens such as a Sharpie. Lastly, although I use white labels because I find the contrast makes the print easier to read, I am told that if you have trouble with squirrels pulling the labels out of your pots, the yellow ones work well. Evidently, squirrels don't like yellow labels.

As to sourcing these, they can be harder to find that the typical plastic labels and are a bit more expensive. Broward Orchid Supply in south Florida sells them in small quantities and likely other local supply vendors do as well. Flori-Culture Orchid & Specialty Growing Supplies in Carmichael, California also carries them and they are available in larger quantities from the printer at <https://hortcatalog.integracolor.com>.



QUESTION

Do you have any recommendations for sanitizing cork mounts for reuse?

ANSWER

My recommendation is do not do it. I just do not know of any way to reliably get such a rough, three-dimensional surface to a point that I know it is completely clean. Perhaps they could be steam sterilized but again the question would be when is enough. Clay pots, a much less rough inorganic surface are notoriously difficult, involving scrubbing, bleach soaking, repeated rinsing and, for many, a final high-temperature bake. I know many growers who aren't even comfortable trying to disinfect used clay pots.

These questions were part of one or more recent monthly webinar Q&As and compiled by Larry Sexton for inclusion here. Each month, a Q&A webinar is held during the first two weeks of the month. To view recorded Greenhouse Chats (Q&A webinars) or register for a future one, see <https://www.aos.org/orchids/webinars.aspx>. Send questions to greenhousechat@aos.org — Ron McHatton, AOS Chief Education and Science Officer.

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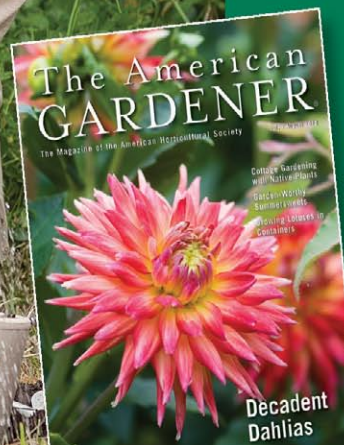
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Lessons from Nature

Some Observations About Epiphytic Orchids and Their Roots

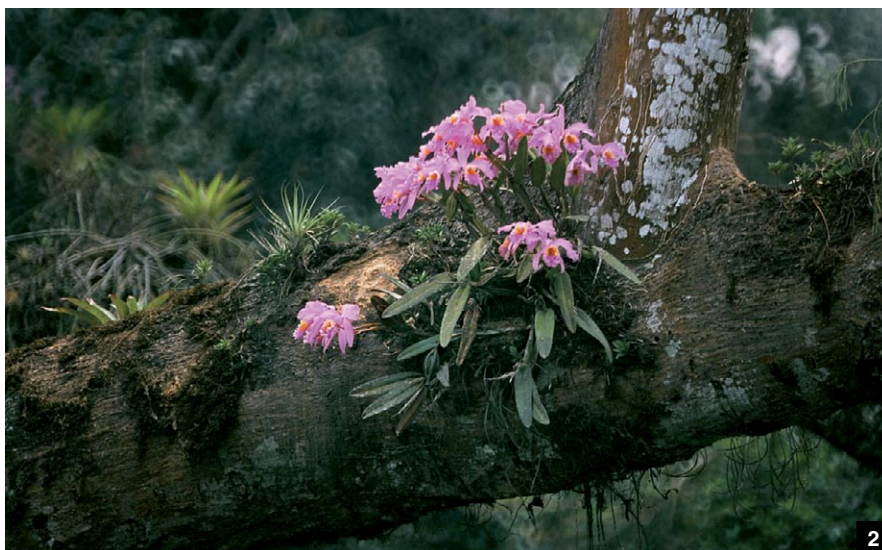
Text by Fred Clarke/Photographs by Greg Allikas

I LIKE TO grow many kinds of orchids, but epiphytic orchids are my favorites. An epiphyte is a plant that grows on another plant without deriving its nutrients from the host. In nature, epiphytic orchids mostly grow on trees, and many orchid species have been growing this way for about 20 million years or more. To put this into perspective, *Homo erectus* appeared about 2 million years ago, *Homo sapiens* appeared around 300,000 years ago, and *Orchidus hobbyistii* (that is us orchid growers) appeared just over 100 years ago. Epiphytic orchids were around roughly 18 million years before the first humans even appeared on the planet, let alone began admiring them! Truly humbling. Over millions of years, these orchids have evolved to grow well as epiphytes. Even with changing climate and seasonal weather variation, they continue to prosper and thrive on trees.

Understanding how orchids grow the way they do will help us make better decisions about how to care for them and allow us to be more successful in what we are most passionate about, our orchids! Every orchid species has a particular set of environmental conditions in which it grows. Learn about these environmental conditions, including the timing of rainfall and variation in temperature and light, then apply a similar practice in the cultivation of your own plants to help you achieve good plant growth and the spectacular flowering you desire.

During my time as an orchid grower, I have observed the following about trees and the roots of epiphytic orchids:

- Epiphytic orchids live on trees.
- The trunks and branches of trees are well drained.
- Thus, epiphytic orchid roots are well drained.
- Leaves and roots of orchid plants get a lot of air circulation.
- Trunks and branches of trees dry out quickly, as do the leaves and roots of orchids.
- Not a lot of nutrients are available on the trunks and branches of trees.



- Orchid roots have adapted to capture moisture and scarce nutrients.

My observations about an orchid's life on a tree, coupled with acknowledging their long and successful existence on this planet, have inspired me to try and provide a similar environment for my own plants' root systems to the greatest extent possible.

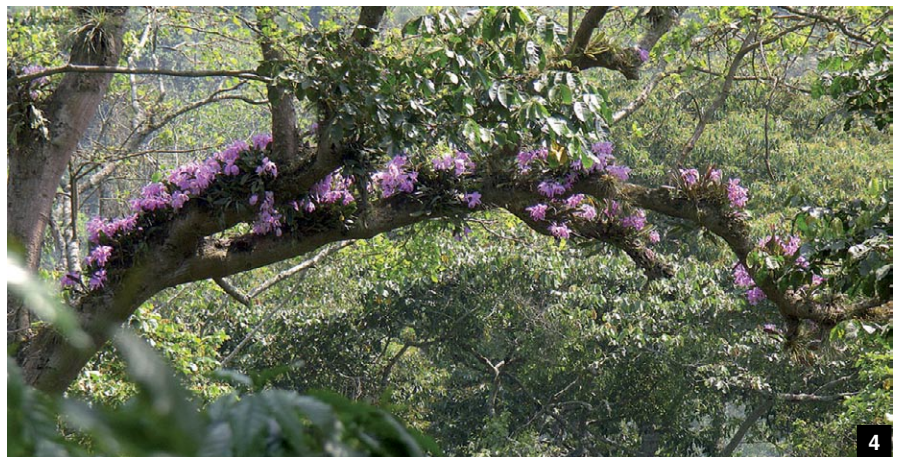
For epiphytic orchids, I use a potting medium that contains organic material, and my mixture of choice is bark and perlite. Bark is good because orchids evolved with their roots attached to this type of organic material. Perlite promotes drainage and good aeration. A freely draining bark mix can simulate the well-drained properties of tree trunks and branches. The potting medium must allow for air movement around the roots such that the roots dry out quickly, as they do in the habitat where they evolved.

Orchids in nature live in a low-nutrient environment. The few nutrients that are available are brought to the root system by each rain event. Because of this scarcity and the necessity of water and nutrients to survive, orchid roots have become excellent at absorbing both. Thus, I am careful not to overfertilize, instead using just a small amount of fertilizer, equivalent to about half the recommended strength, at every watering.

There is something else to consider about orchids and trees. Although orchid plants themselves are stationary, their roots can extend many feet (meters) from the plant in their quest to acquire water and nutrients. Besides acting as a mechanical anchor, the job of the roots is to find a way to get water and nutrients to the plant. Since the plant does not move, the roots must grow to obtain the resources they need, and they have gotten exceptionally good at doing so. I have noticed that roots favor the environment they formed in. You may have observed this phenomenon for yourself. Have you taken a plant with healthy aerial roots and potted them? Did those roots decline in a relatively short period of time in the pot? What about transitioning a well-rooted potted orchid plant to a mount? How did those roots that formed in the pot fare when tied to a mount and exposed to the air? Did they thrive or decline? Likely, they declined, because an orchid's roots are adapted to the environment where they formed. When presented with new conditions, orchids must develop a new set of roots that are suited for their new environment.



3



4

What does all this mean? It boils down to the main goal for all of us orchid lovers — raising healthy plants that produce beautiful blooms. I am offering important guidelines you can use when repotting your epiphytes. When you repot, you are changing the environment around the roots, and, as I mentioned earlier, roots do not like change. Therefore, we need to find a time when the plant is best able to respond to repotting: the period when new roots are starting to emerge. This timing should not be confused with new pseudobulb growth. Although some orchids form new roots as the new pseudobulb develops, many orchids grow their new roots after the most recent growth has matured. Thus, when deciding the best time to repot, look for new roots rather than new growths. As soon as you see new roots emerging, the time is right to repot. New roots will reestablish the plant in the new potting mix, taking over from the roots that developed in the previous potting mix and enabling the orchid to adapt.

Understanding the timing of new root growth is important so that you can make good decisions about when to

- [1] Fred Clarke in situ. It is always fascinating to see your favorite orchids growing in nature. Your awareness and understanding of their cultural needs will surely increase.
- [2] Note the distance the roots are spreading across this tree limb.
- [3] This photo puts into perspective the magnitude of this limb and other epiphytes growing along with the orchids. The plant in the previous photo is on the far left.
- [4] *Cattleya mossiae* growing on a bucare tree. When epiphytes have years of access to favorable environmental conditions, huge colonies can develop.

repot. Unfortunately, this is not always straightforward. Here is a valuable tip: on the pot tag, write the date when new roots start to emerge. After a few years, you will have a list of dates on the tag indicating the best time to repot. Once you adopt this practice of “when new roots emerge awareness,” it becomes indispensable, and you will soon realize it enables you to predict and make informed decisions about new or unknown plants, so these too can have the best opportunity to

thrive in your care.

A healthy root system is a key component of vigorous growing and flowering. Epiphytic orchids are survivors. They can tolerate many harsh conditions, and they are surprisingly adaptable, yet they will fare better and reward you more with their beauty if they are not subjected to a “survivalist challenge.” The stability of the root zone environment is important to your orchid’s health, and you support that health by only repotting with the onset of new roots. When choosing a potting medium, be sure that it includes an organic component, has a pH that will remain stable until the next time you repot, is well drained and dries out quickly. As much as possible, it should mirror the orchid’s favored environment.

The goal of this article has been to share some of my observations and acquired knowledge about how orchids grow in nature and in cultivation. I believe that understanding the environmental conditions under which epiphytic orchids have evolved and reflecting this in your decision-making for orchid care and repotting can only make you a better grower, and this will make your plants happier and bloom better. Good growing!

Acknowledgments

I am indebted to Ron Kaufmann, Sue Bottom and Mindy Hitchcock for their assistance in editing this article. Their combined insight and wisdom truly are beneficial.

Further Reading

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[5] Two *C. mossiae* are supported by the extensive network of roots on the surface of this tree.

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— Fred Clarke owns and operates Sunset Valley Orchids, which is dedicated to developing hybrids and producing select species for the orchid enthusiast. He has been growing orchids for over 40 years and hybridizing for 38 of those years. He is committed to the education of orchid hobbyists around the world in the culture of their plants. Fred is an accredited American Orchid Society judge in the Pacific South Judging Region. His hybrids have received hundreds of quality awards for orchid enthusiasts from the American Orchid Society and other orchid societies worldwide (email: fred.clarke@att.net; website: www.sunsetvalleyorchids.com).

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COLLECTORS' ITEM

Bulbophyllum section *Macrobulbon*

The "Big-Bulbed Stinkers"

Text and photographs by Charles Wilson



EVERYONE HAS EXPERIENCED the oft-heated debate among growers as to the correct name for an orchid species, but similar emotions can erupt when one attempts to group some of the similar species together into sections. The genus *Bulbophyllum* is no exception. With over 2,000 validly published names in the genus, there have been multiple attempts at dividing them into sections (based on similarity of various floral and vegetative parts) with some authorities recognizing as many as 120 or more sections. At first glance section *Macrobulbon*, with only six or so species, seems fairly well defined, or at least the German orchidist Friedrich Richard Rudolf Schlecter thought so when he circumscribed the section in 1912.



Charles Wilson

It should be noted that there are some taxonomic authorities today who do not recognize section *Macrobulbon*, but for the purposes of this article, we will discuss this group

as defined historically and as recognized by most of today's hobbyists. The section is generally consistent, with its members having relatively large pseudobulbs in relation to the large leaf size (*macrobulbon* means "large bulb") and somewhat short inflorescences typically with multiple, foully odoriferous flowers. Three of the species in this section (*orthosepalum*, *phalaenopsis* and *fletcherianum*) have the lateral sepals anteriorly connate (the front margins being fused), suggesting to some the appearance of a Dutch wooden shoe. These fused lateral sepals and a very hooded dorsal sepal can preclude even seeing the petals, mobile lip and column inside, which can only be accessed for pollination through small openings in the sides. The other three species (*agastor*, *macrobulbum* and *cruentum*) have lateral sepals fused on the back margins resulting in a more open presentation that exposes the column, hinged lip and small petals. Two species are often seen on the market with the names *spiesii* and *hashimotoi*, but both names are now considered synonyms of *fletcherianum* and *orthoglossum*, respectively.

Most of the species in this section are truly not for windowsill culture — unless your window can accommodate an orchid like *Bulbophyllum phalaenopsis* with individual leaves 10 inches wide (24 cm) by over 60 inches long (150 cm)! With its beautiful dark red but horrible smelling flowers covered in yellow protuberances (thought by some to resemble maggots on



2

rotting flesh to assist in attracting flies for pollination), it can be difficult to enter the greenhouse when this species is in flower. Some growers move it outside when in bloom. *Bulbophyllum agastor* (the species name means "a near kinsman") is one of the smaller members of this section with leaves only about 7 inches long (17 cm) and its cupped but open-faced flowers lack the foul smell of its other kinsmen in this section.

The species in this section occur from sea level to about 6,000 feet (1,900 m) in the forests of New Guinea. They send out their short inflorescences from the base of the newest grown pseudobulb and may have as many as 12 to 30 or more flowers lasting one to two weeks or longer. Individual flowers may be as wide as 3½ inches (8.5 cm).

CULTURE

LIGHT LEVELS Like most *Bulbophyllum*, members of this section thrive in bright, indirect light, but many actually benefit from the higher light levels often appreciated by some species of *Cattleya*, provided they get adequate air movement and high humidity (60 percent or more). Higher light levels generally produce



3

- [1] *Bulbophyllum macrobulbon* is the type species for this section.
- [2] *Bulbophyllum agastor* is undoubtedly the smallest in the section with five or more flowers to 1.3 inches (3.5 cm) wide and leaves to 12 inches (30 cm) long. This is 'Magnifico' CBR/AOS.
- [3] *Bulbophyllum orthosepalum*



4

vigorous and more frequent flowering.

TEMPERATURES The species in this section prefer warm growing temperatures with night minimums of 60 F (15.5 C) and can tolerate higher daytime temperatures even into the 90s F (32.2+ C) provided they have excellent air movement and high humidity. These species will grow year-round if kept warm and watered. Growing conditions that are too cool, below 55 F (13 C), generally slow vegetative growth and can retard blooming.

POTTING AND WATERING The large size and weight of the leaves usually dictates that these orchids do best when rafted or potted so that the pot, raft or basket hangs vertically. Because *Bulbophyllum* species have threadlike or fine fibrous roots, they may be an exception to the rule of “when in doubt, do not water.” *Bulbophyllum*s appear to love being watered, but only if they have perfect drainage. This fast-draining aspect is fairly obvious with rafted specimens or can be provided with a shallow layer of potting mix (e.g., we use 7 parts small bark, 1 part small Perlite and 1 part small charcoal) or a shallow layer of quality sphagnum moss atop an ample bottom layer of expanded polystyrene peanuts in a shallow pot or basket. This shallow layer of medium allows the grower to water nearly every day without much worry of

rotting the roots or the potting medium. Another key is to water the roots — not over-soak the medium. This method of shallow potting closely resembles the way *bulbophyllum*s grow in the wild — on top of branches and trunks that dry out quickly. The advantage of this shallow rooting in nature is in capitalizing on the high humidity of the tropics coupled with morning dew. In nature, they seldom totally dry out for long periods, even in the drier seasons.

— Charles Wilson is an accredited AOS judge out of the Atlanta Judging Center and Chair of the AOS Conservation Committee who has been growing orchids for over 40 years. His special interests include *bulbophyllum*s, *coelogynes* and *paphiopedilums* (email: Zooemeritus@gmail.com).

[4] *Bulbophyllum fletcherianum*, often marketed under the synonym *Bulbophyllum spiesii*, has smooth outer surfaces to the sepals but still smells very bad to attract flies for pollination.

[5] The reddish leaves of this *Bulbophyllum phalaenopsis* are a natural consequence of higher light levels. This is ‘Chasus’ CCM/AOS. The inset clearly shows the maggotlike appendages of the sepals.



5



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Sylvia Strigari

Rhynchosstylis gigantea

Text by Franco Pupulin/Watercolor by Sylvia Strigari

Tribe Vandeeae
Subtribe Aeridinae
Genus *Rhynchosstylis* Blume

Rhynchosstylis gigantea (Lindl.) Ridl., *J. Linn. Soc., Bot.* 32:356. 1896. *Saccolabium giganteum* Lindl., *Gen. Sp. Orchid. Pl.* 221. 1833. *Gastrochilus giganteus* (Lindl.) Kuntze, *Revis. Gen. Pl.* 2:661. 1891. *Anota gigantea* (Lindl.) Fukuy., *Trans. Nat. Hist. Soc. Taiwan* 34:111. 1944. TYPE: [Myanmar]. Habitat in India Orientali prope Prome, *N. Wallich 7306* (holotype, K). Other synonyms: *Vanda densiflora* Lindl., *Paxton's Fl. Gard.* 2:21, sub t. 42. 1851. TYPE: [India]. Habitat in India Orientali prope Madras, *R. Wight s.n.* (holotype, K). *Vanda violacea* Lindl., *Edwards's Bot. Reg.* 27: Misc. 12. 1841. TYPE: Philippines. Manila. Sent to Messrs. Loddiges, *H. Cuming s.n.* (holotype, K). *Saccolabium harrisonianum* Hook.f., *Bot. Mag.* 90:t. 5433. 1864. TYPE: [Indonesia?]. Imported by C.H. Harrison from Pulo Copang, comm. from Messrs. Stuart & Low, Nov. 1863, *Harrison s.n.* (holotype, K). *Saccolabium albolineatum* Teijsm. & Binn., *Natuurk. Tijdschr. Ned.-Indië* 27:20. 1864. TYPE: Thailand. Hab. Regnum Siamense, *Teijsmann s.n.* (holotype, L). *Saccolabium giganteum* var. *illustre* Rchb.f., *Gard. Chron.* n.s. 21:44. 1884. TYPE: India: Assam, ex hort *F. Sander s.n.* (holotype, W). *Saccolabium giganteum* var. *petonianum* Rchb.f., *Gard. Chron.* n.s. 24:746. 1885. TYPE: [Vietnam] Cochinchina, ex hort. *M. Godefroy Lebeuf s.n.* (holotype, W). *Vanda hainanensis* Rolfe, *Bull. Misc. Inform. Kew* 1896(119):199. 1896. TYPE: China. Hainan, *B.C. Henry 37* (holotype, K).

A large, monopodial, erect *herb* up to 35 cm tall. *Roots* terete, stout, rigid, to 13 mm in diameter. *Stem* foliaceous, elongate, with adventitious roots produced all along the stem each 1–3 nodes, completely covered by the imbricating leaf bases, the lower leaves detaching with age, the leaf sheaths becoming papery, brown. *Leaves* green with several longitudinal pale veins, arched, ligulate-elliptic, unequally bilobed, with undulate margins, up to 30 × 4 cm. *Inflorescence* a lateral, drooping,

densely many-flowered raceme, to 25 cm long. *Floral bracts* small, triangular, papery, brown, ca. 3 × 1 mm. *Ovary* pedicellate, white, terete, ca. 2 cm long. *Flowers* waxy, with a distinct citrus fragrance, the sepals and petals white spotted with purple, the lip basally white, flushing solid purple at apex, the column white, boldly blotched with dark purple. *Sepals* spreading, broadly elliptic, obtuse to minutely rounded, ca. 15 × 8 mm, the dorsal sepal concave toward the apex. *Petals* narrowly elliptic-lanceolate, obtuse to subacute, 13 × 3 mm. *Lip* trilobed, 15 × 11 mm, the rear a conic, laterally compressed spur, 6–7 mm long; blade oblong, the lateral lobes subrectangular, the apical lobe tripartite, the side lobes rounded, ascending, the midlobe much smaller, subquadrate, retuse, convex; the disk with two raised keels at the base. *Column* transversely semi-elliptical, short, 3 × 4 mm. *Anther cap* cucullate, cordate, bilocular. *Pollinia* two, yellow, subspherical, connected to the narrowly rectangular stipe by two terete caudicles; viscidium large, peltate.

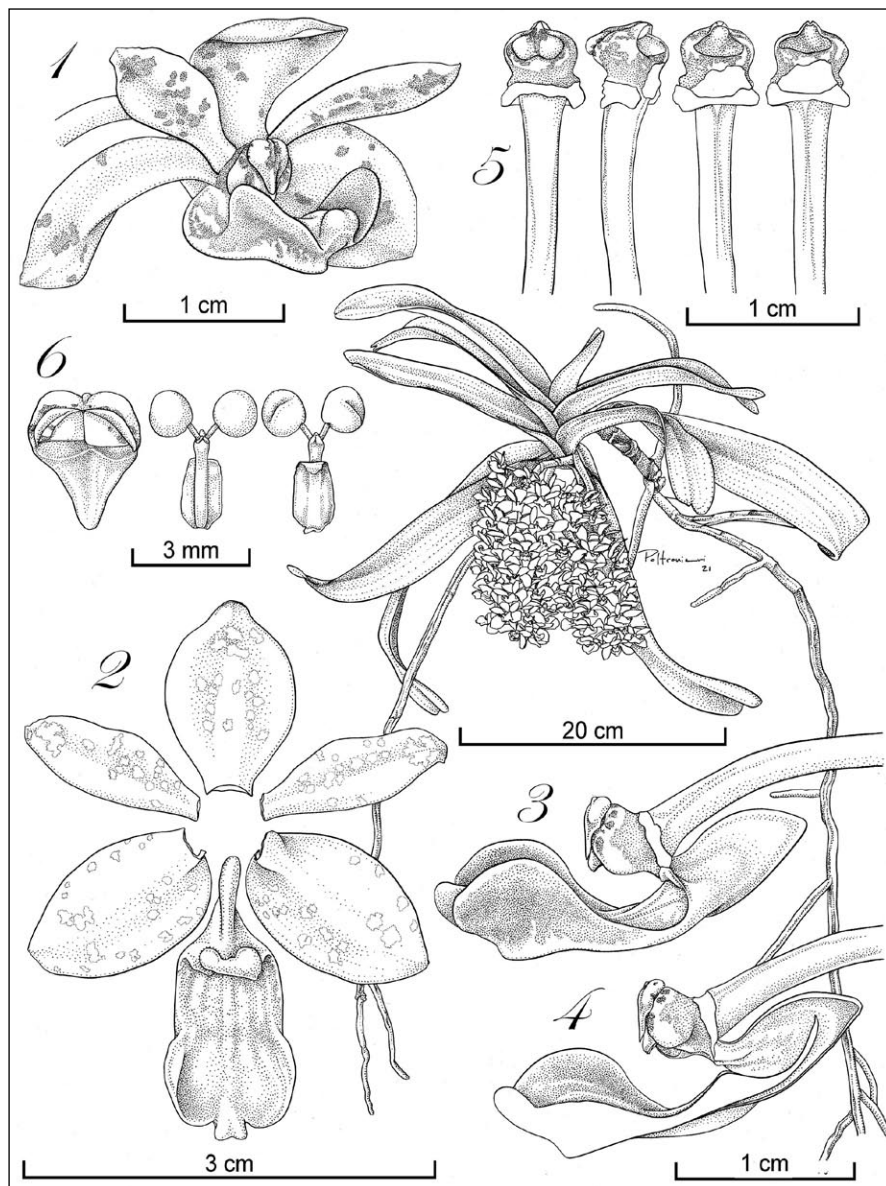
Twelve species and four subspecific taxa have been described in *Rhynchosstylis*, but only five species (with one subspecies and two formae) are recognized today as belonging to the genus, the others being synonyms or belonging to such diverse genera as *Acampe*, *Robiquetia*, and *Schoenorchis*. Actually, of the few taxa that are considered by modern botanists as true members of *Rhynchosstylis*, only *Rhynchosstylis cymifera*, *Rhynchosstylis rieferi* and the basionym of *Rhynchosstylis coelestis* f. *albiflora* were described in this genus, the other names being originally referred to *Epidendrum* (by Linnaeus), *Saccolabium* (by John Lindley, Reichenbach *filius* and Joseph Dalton Hooker), and *Vanda* (Lindley again).

This plethora of generic names around *Rhynchosstylis* can perhaps be explained by the difficulty that botanists have encountered since Lindley's time in classifying vandaceous orchids on the basis of their comparative morphology, inferred from the characteristics of plants and flowers. Such uncertainties are an obvious reflection of the very recent

evolutionary history of many groups in the Aeridinae, which multigene studies (i.e., Gustafsson et al. 2010, Givnish et al. 2015), and more recently the plastomic studies (using the complete sequence of plastomes, or the genome of plastids, organelles found in plants) by Kim and colleagues (2020) estimate occurred in the last 13 million years, with many genera diverging in the late Miocene and up to the Pleistocene, less than 5 million years ago (e.g., *Neofinetia* [now included in *Vanda*] and *Phalaenopsis*). Being still in a particularly active evolutionary stage, it should not be surprising that many of the characters (both vegetative and floral) that have been used in the past as diagnostics at the generic level, actually present large areas of overlap, which makes circumscriptions of genera based on pure morphological observations more subtle and difficult to interpret.

The phylogenetic analysis carried out by Zou and collaborators (2015) recovered *Rhynchosstylis* as the basal-most branch of the *Aerides* clade, including species of *Renanthera*, *Esmeralda*, *Arachnis*, and *Aerides*, sister to the *Vanda* clade (with *Luisia*, *Vanda*, *Holcolglossum*), and consecutively sister to the *Trichoglottis* clade (with *Micropera*, *Acampe*, *Adenoncos*, *Ceratochilus*, and *Staurochilus* among others, many of which with still-unresolved relationships).

When Karl Ludwig von Blume described *Rhynchosstylis*, he characterized the new genus by the lip forming a compressed spur together with the column foot, and the column provided with a long and narrow, convex rostellum (Blume 1825). He derived the name from the Greek words *ρυνχος*, *rhynchos*, "beak," and *στῦλος*, *stúlos*, "column," to refer to the broad and fleshy column of the flower. Today, none of these characters can be considered diagnostic to tell species of *Rhynchosstylis* apart from other closely related genera in the Aeridinae. According to Schuiteman (2014), *Rhynchosstylis* can be recognized by the stem longer than the persistent leaves, which are dorsiventrally flattened, thick and rigid, not twisted at base, with smooth margin, the rachis of the



Rhynchostylis gigantea. The plant.

1. Flower.
2. Dissected perianth.
3. Column and lip, lateral view.
4. Column and lip, the lip dissected.
5. Column views.
6. Anther cap and pollinarium in dorsal and ventral views.

All drawn from *Strigari s.n.* by Sara Poltronieri.

inflorescence longer than the ovary, the labellum rigidly attached, with a hollow spur without interior lamellae, the column without a foot, with raised margin of stigma not craterlike, and the presence of two pollinia. At the time of its description, only two species (today considered synonymous) were included in the new genus, which is typified by *Rhynchostylis retusa*.

John Lindley described the species known today as *Rhynchostylis gigantea* with the name *Saccolabium giganteum* in 1883. Several online taxonomic databases quote as the basionym of the species *Vanda gigantea*, also described by Lindley a few pages before in the same publication, but this name refers to an altogether different taxon, *Vandopsis gigantea*, which in fact is quite gigantic compared with species of the genus *Vanda*, as well as *Rhynchostylis*

gigantea is oversize in relation to species of *Saccolabium*. The type specimen of *Saccolabium giganteum* was found in the vicinity of Prome (Pyay) in the Bago Region in Myanmar, a town located on the bank of the Irrawaddy River, where Nathaniel Wolff Wallich (1786–1854) collected it in 1826, and again in January 1827.

A surgeon and botanist of Danish origin, Wallich worked as an assistant to William Roxburgh, the East India Company's botanist in Calcutta, before being appointed as the superintendent of the Royal Botanic Garden, Calcutta. Following his strong interest in the flora of India, he undertook expeditions to Nepal, West Hindustan, and lower Burma. He prepared a catalogue of over 20,000 botanical specimens, known as the "Wallich Catalogue," which also served as the basis for several of Lindley's orchid descriptions.

The distribution of *Rhynchostylis gigantea* ranges over India, southern China (Hainan), Cambodia, Vietnam, Laos, Myanmar, Thailand, peninsular Malaysia, Sumatra, Borneo and the Philippines, where it inhabits the semideciduous and deciduous forest of the lowlands, up to about 700–800 meters in elevation. Among other species of the genus, it can be recognized by the arching to pendent inflorescences, the lip distinctly trilobed at the apex, and the absence of a column foot (Higgins 2013).

Due to its regal poise, *Rhynchostylis gigantea* has been prominently portrayed in Victorian horticultural journals and books. In 1847, Lindley published an account on *Rhynchostylis gigantea*, illustrated with a fine drawing prepared by Mrs. Drake, under the synonymous name of *Vanda violacea*. Walter Hood Fitch illustrated the albino form of *Rhy. gigantea* (under the name of *Saccolabium harrisonianum*) in *Curtis's Botanical Magazine* in 1864, and a beautiful lithography with the same name was offered in Van Houtte's *Flore des serres et des jardin de l'Europe* in 1880. Another albino form was painted for *Lindenia* in 1897 (pl. 605), under the varietal name *Saccolabium giganteum* var. *petotianum*. In January 1881, John Day illustrated in his scrapbook a specimen of *Saccolabium giganteum* that he bought from Benjamin S. Williams, which had been introduced the year before from "Burmah" (Myanmar). Plants ostensibly from the same introduction were also depicted by John Nugent Fitch in Warner

and Williams' *Orchid album*, in 1883. The *Illustration Horticole* offered to the public a vivid portrait of the species in his volume 31 (pl. 517) for 1884, Frederick Sander celebrated its beauty printing a splendid illustration of *Saccolabium giganteum* in his monumental *Reichenbachia* in 1888 (pl. 22), and the same species was portrayed in the second volume of *Lindenia* for 1891 (pl. 83).

The American Orchid Society has granted awards to the white-flowered form of *Rhy. gigantea* (f. *harrisoniana*) under the varietal names *petotiana* (based on *Saccolabium giganteum petotianum*, "of the purest white," Reichenbach 1885) and "alba," but I was unable to retrieve the original authorship and protologue of the latter subspecific epithet.

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Selected Botanical Terms

- acuminate – tapering to a slender point
 acute – pointed
 adventitious roots – roots that grow from somewhere other than the primary root collar, for example, roots that grow along the stem or from leaves
 arcuate – curved, shaped like a bow
 attenuate – tapering gradually to a narrow point
 bidentate – appearing to have two teeth or small points
 bilobed – having two lobes
 bilocular – having two chambers
 caudicle – the slender stalklike appendage of pollen masses in orchids
 claw – narrow extension between two parts
 column foot – basal protrusion of the column to which the lip is attached
 concave – curved inward like the inside of a sphere
 conic – of or like a cone
 convex – shaped like the outside of a sphere
 cordate – heart-shaped
 coriaceous – leathery
 corrugate – covered in parallel and generally curved or wavy ridges separated by deep furrows
 cucullate – hooded
 cuneate – wedge-shaped
 deflexed – bent or turned abruptly down at a sharp angle
 dorsiventrally flattened – flattened like the blade of a leaf
 elliptic – oval
 emarginate – having a notched margin
 falcate – sickle-shaped
 fimbriate – fringed
 foliaceous – having the appearance of leaves
 glabrous – smooth
 imbricate – overlapping or layered as in shingles or scales
 inflorescence – the entire flowering structure including the peduncle and rachis
 lamellae – erect scales, blades or plates
 lanceolate – narrow oval tapering to a point at each end
 ligulate – tongue-shaped
 obtuse – not sharp-pointed or sharp-edged, blunt
 papyraceous – dry, papery
 pedicel – the stem that attaches a single flower to the inflorescence
 pedicellate ovary – an ovary that is attached to the inflorescence via a stalk or stem
 peduncle – the part of an inflorescence before the rachis or section to which the flowers are attached
 peltate – shield-shaped
 plicate – folded, corrugated
 protuberance – a structure that sticks out from another; a general term that can encompass many different structures, hairs, plates, scales although usually refers to a lump-like or warty structure
 pubescent – covered in fine hairs
 raceme – an inflorescence with separate flowers attached by short, equal stalks at regular distances along a central stem; racemes can be unbranched (simple) or have one or many branches (paniculate)
 rachis – the part of the inflorescence to which the flowers are attached
 resupinate – carrying the lip lowermost
 retrose – bent backward or downward
 retuse – having a rounded apex with a small central notch
 spatulate – spoon-shaped
 spike – an unbranched, indeterminate inflorescence, similar to a raceme, but bearing sessile flowers directly attached without a stalk; often heard in orchid circles as a synonym for inflorescence however orchids have pedicellate ovaries
 stipe – supporting stalk or stemlike structure
 sub – somewhat less than; i.e., subspherical would refer to almost but not quite a sphere
 subtend – covered as in an ovary subtended by a floral bract
 sulcate – longitudinally furrowed
 terete – cylindrical or pencil-shaped
 trilobed – having three lobes
 tripartite – consisting of three parts, as an example, *Stanhopea* lips generally consist of three distinct parts — hypochile, mesochile and epichile
 truncate – terminated abruptly as if cut off
 unguiculate – having a claw-shaped base
 viscidium – sticky pad to which orchid pollinia are attached.

Karen Kimmerle — Island Sun Orchids

Aloha, Ohana and Island Sun

BY THOMAS MIRENDA

MADAME PELE HAD just sent a scorching river of lava through one of the finest orchid-growing regions on the Big Island. Many nurseries and collections were lost and even more in peril. After less than a year on Hawaii Island, I had not yet come to grips with what it meant to live in such a place. Sure, we had exceptional natural beauty, comfortable year-round weather and superb growing conditions for virtually every kind of orchid somewhere on this big rock, but also many challenges, not the least of which were volcanic eruptions.

When I arrived on the Big Island a bit more than three years ago now, I did not yet understand the cultural shift I was about to experience. Even though this is a laid-back kind of place, the people here are quick to help each other when emergencies and cataclysms take place. So, in the spirit of aloha and “ohana” (“extended family”) that is so pervasive here, I wanted to help my friends who might be endangered by this fiery flow. One dear friend, Karen Kimmerle, had most of her neighborhood evacuated and it was a distinct possibility that her lowland nursery might be inundated. Her plan was to move her most valuable rarities, breeding plants and specimens to a safer location at a gracious friend’s nursery, that of Tom Lee, who was similarly imperiled a decade before when lava was approaching his nursery. Tom was happy to return the favor that another grower, Hawaii Orchids, had extended to him all those years ago. The orchid growers of Hawaii all know and support each other, so it is only natural they would help out in such emergencies. Having a small truck, I could be at least a little helpful during the temporary move. Luckily neither nursery sustained any damage this time. Since then, I have come to admire many individuals of the orchid community in this incredible place, not just for their astounding growing, but for their compassion, tenacity, hard-work ethic and their aloha for each other.

Karen Kimmerle, who owns and operates Island Sun Orchids in Kapoho and is an AOS judge, also took on the



leadership of the Hawaii judging center after the passing of our beloved Sandra Song in 2014. One of the most vibrant and productive judging centers in the USA, the Hawaii center deals with many challenges not faced by other centers. With members dispersed across four islands, logistics can be problematic, but the training that came from working with, and for, some of the larger orchid nurseries in the area crafted her into a fine leader and grower in her own right. Working with a local lab she has had a few successes with hybridizing. One, similar to an *Oncidium* Sharry Baby on steroids, she named after her daughter, *Oncidium* Nia Rose, and her cultivar 'Sweet 16' has an AOS Highly Commended Certificate. Another is an unregistered blue *Vanda*, a cross of Manuvadee × Rothschildiana 'Blue Sky', which blooms throughout the year on a very small plant with large flat flowers. Karen feels very grateful that her love of orchids has led to life-long learning, leadership, travel and the friendship of many great orchid people.

Island Sun Orchids may be off the radar for many in the orchid world, but it is a wonderful example of what can be done with orchids on a smaller scale. A classic mom-and-pop nursery, Karen and her husband Dale have managed to maintain an admirable livelihood and lifestyle, raise their children and live a life surrounded by beauty and fulfillment by growing orchids here. Their 10,000-ft² (929-m²) farm, being in the lowlands, is haven to a huge variety of warmer-growing species and hybrids with specialties in dendrobium and vandaceous alliances, but warmer-growing examples of a huge variety of genera are thriving there. For years, Karen has been supplying mainland orchid societies and wholesalers with wonderful, varied and astonishingly priced plants for auctions or sales at shows. Her eclectic mix of interesting plants never fails to intrigue. We island residents always enjoy her pop-up sales and farmers market appearances where invariably we find some new jewel for our collections among the treasures she regularly brings with her.

Hawaii is undoubtedly a unique and idyllic place when the gods are smiling on us. But when they are not, it is good to know that we live among a community of beautiful and caring individuals like Karen and Dale who embody the spirit of ohana and aloha while blessed in the warm glow of Hawaiian sunshine. — *Thomas Mirenda has been working professionally with orchids for over three decades and is the past chair of the AOS Conservation*



Committee. He is an AOS accredited judge in the Hawaii Center (email: biophiliak@gmail.com).

- [1] Karen Kimmerle in situ: Island Sun Orchids. Here she is holding two of her most favorite progeny: *Oncidium* Nia Rose 'Sweet Sixteen' HCC/AOS and a seedling of her unregistered cross *Vanda* (Manuvadee × Rothschildiana 'Blue Sky').
- [2] *Habenaria* Jiaho Yellow Bird 'Sunshine' AM/AOS
- [3] This beautiful display by Karen called Peaceful Motion garnered a coveted AOS Artistic Certificate.
- [4] *Cattleya maxima* (Coerulea color group) 'Slate Blue' JC/AOS.



M. Winters del.

EPIDENDRUM ALOIFOLIUM.

M. Seale. col.

Publ. by J. Ridgway & Sons, 169 Broadway, N.Y.C. 1940.

Flower Painter in Ordinary

by Wesley Higgins and Peggy Alrich



Augusta Withers

IN THE 17TH century, an innovative field of botanical illustration emerged. Artists focusing on botanicals pioneered techniques that allowed their work to cross over to science. Illustrators captured plants in exquisite detail, observing them in their settings, discerning new information about their role in the environment. Their work aided the work of formal botanists. Along with other illustrators, women — despite not being admitted to many universities — made important contributions to scientific research combining art and science. Natural History was considered an appropriate subject for the female gender by the patriarchal society. These women constitute a group that was breaking down the limits imposed by patriarchal society in matters of study and knowledge. Many of them, with pencil and watercolor in hand, took advantage of this license; among them, Augusta Withers.

Augusta Hanna Elizabeth Innes Baker was born in Dowdeswell, Gloucestershire, England (1793) to Reverend William Baker (chaplain to the Prince Regent) and Joanna Cave. Most women who became artists in 18th century were daughters of artists, but not all of them. The role of women



in the society was established with their education. Most women received their instruction from a governess in the home. It was important for women to learn to read and write, and to do other things that could help them be a good wife. However, as the century progressed, it became appreciated that young women could speak French and some Italian, as well as

draw and paint, but this knowledge was not to be taken too seriously.

Little is known about Augusta's early life or where she learned to draw and paint. She married Theodore Gibson Withers, an accountant, 20 years her senior in 1822. They began living in Lisson Grove, Marylebone, although the family later moved to St John's Wood and Chelsea. By the end of the 1820s Augusta was well established as a painter of flowers and fruit, particularly of newly imported exotics. She must have also been teaching botanical art on a wider scale by this time. Withers applied for the post of Botanical Flower Painter at the Royal Botanical Gardens, Kew but was turned down because of her gender. In August 1830, Augusta Withers was appointed Flower Painter in Ordinary and Teacher of Botanical Drawing to Queen Adelaide.

John Claudius Loudon, the most influential horticultural journalist of his time, commented in *The Gardener's Magazine* (1831) that her talents were of the highest order, and that "to be able to draw flowers botanically, and fruit horticulturally, that is, with the characteristics by which varieties and subvarieties are distinguished, is one of



ODONTOGLOSSUM GRANDE.

Painted by J. Dalrymple & Sons, 20, Piccadilly, Sept. 17, 1840.
 Engraved by F. Smith & Son, 10, Pall Mall St.

they were before us, who declared he had never seen any work of the kind so beautifully executed. There can be no question of the high talents and great industry of Mrs. Withers" (p. 452). Loudon went on to say that neither he nor the "eminent artist" liked her arrangement of the flowers: "the mode of mixing the different varieties together, adopted by Mrs. Withers, in common with the growers of florist' flowers, instead of arranging them according to their affinities" (p. 452). Mrs. Withers told Loudon "that the flowers were placed in the order she drew them by her employer." Loudon wrote: "This lady, and all other artists, should endeavour to correct the taste of their employers, in matters connected with their profession" (p. 453; *Gardener's Magazine*, 1834).

When William Hooker (not Sir William of Kew), the botanical artist to the Horticultural Society of London, became mentally ill, Augusta was one of four artists asked to finish his project of watercolor paintings of fruit designed to clarify the conflicting names of cultivated fruit varieties. Augusta Withers contributed 12 drawings in 1825–1826, and 13 plates for the *Transactions* of the Horticultural Society. Although her high fees apparently caused some irritation to the Society's council, she must have been well regarded. John Lindley, the Society's assistant secretary, took her on to illustrate his fruit journal, *Pomological Magazine* (1827–1830). This was later published in book form as *Pomona Britannica* (1841).

Mrs. Withers, as she signed all her paintings, exhibited at the Royal Academy, from 1829 to 1846, and with the New Watercolour Society. Mrs. Withers painted over 100 illustrations for Benjamin Maund's *The Botanic Garden* (1825) and she also produced illustrations for his *The Botanist*, (1836–1842). Augusta painted the color plates for Robert Thompson's *The Gardener's Assistant* (1859), Edward Henderson's *Illustrated Bouquet* (1857–1863), and for *Curtis's Botanical Magazine*. While working with Sarah Anne Drake, her greatest achievement was drawing all the illustrations for the lithographic plates in James Bateman's monumental *Orchidaceae of Mexico and Guatemala* (1837–1841), which was dedicated to Queen Adelaide, her patron.

The 1840s were not a good time for the Withers. Perhaps her high fees were the reason she did not receive as many botanical commissions as in previous years; her husband became ill and went blind; and her main patron Queen

the most useful accomplishments of your ladies of leisure, living in the country" (p. 95). Loudon went on to say: "we have observed, with no small pride and pleasure, that several of our principal nurseryman, not only about London, but in the country, have brought, or are bringing, forward their daughters, so as to be competent to make scientific portraits, not only of fruits and flowers, but of trees and shrubs, in their different stages of

growth" (p. 95).

Loudon was also capable of being critical of her work. In *The Gardener's Magazine* (1834) he reported on "An exhibition of 'A selection of heartseases' painted by Mrs. Withers, which had lately been exhibited at the Horticultural Society's rooms, and also shown to us at Bayswater. The varieties are beautiful, and they are most exquisitely painted. An eminent artist happened to call while



W. Woburn, del.

M. Cassini, sculp.

ONCIDIUM INCURVUM.

Publ. by J. Poulsson & Sons, 169 Piccadilly, Dec. 1841.

Printed by J. Evans.

Adelaide also died in 1849.

In the principal biographical treatment for Augusta Withers by Audrey Le Lièvre (1989) she says “Her last years were dismal, marred by poverty” (p. 66–69). Her financial position became so desperate that she had to pawn her paintings. “Being a gentlewoman she did not approach the Artists’ Benevolent Foundation or the Artists’ General Benevolent Institution for relief, but instead petitioned Queen Victoria” (p. 66–69). As a result of her successful petition, the appointment of Flower Painter in Ordinary to the Queen was revived on May 24, 1864, but that did not revitalize sales of her works.

Theodore Withers died in 1869 and Augusta found herself “positively penniless and nearly starving” (Le Lièvre 1989). She died on August 11, 1876 in obscurity of pneumonia and “senile decay” in an asylum, St. Luke’s Hospital for Lunatics, Old Street, London.

EPILOGUE

In 1713, Italian physician Bernardino Ramazzini described in his *De Morbis Artificum Diatriba* a mysterious set of symptoms he was noticing among artists: “Of the many painters I have known, almost all I found unhealthy. . . . If we search for the cause of the cachectic and colorless appearance of the painters, as well as the melancholy feelings that they are so often victims of, we should look no further than the harmful nature of the pigments.” The 1834 *London Medical and Surgical Journal* describes sharp stomach pains occurring in patients with no other evidence of intestinal disease, thus leading the authors to suspect that this “painter’s colic” was a “nervous affection.”

Watercolor paint is made by mixing pigments or dyes with gum arabic. The same pigments used in oil paints are also used in watercolors. Poisoning may validate well-documented attacks of melancholy and irascibility or “madness” of painters.

- Poisoning can occur if toxic pigments are inhaled or ingested. The main hazard in standard painting techniques is accidental ingestion of pigments due to eating, drinking or smoking while working, inadvertent hand to mouth contact, or pointing the paint brush with the lips.

- The classic example of a toxic inorganic pigment in painting is white lead, or flake white. Lead pigments can cause anemia, gastrointestinal problems, peripheral nerve damage, kidney damage and reproductive system damage. Other inorganic pigments may be hazardous,

including pigments based on cobalt, cadmium and manganese.

- Some of the inorganic pigments, in particular cadmium pigments, chrome yellow and zinc yellow may cause lung cancer. In addition, lamp black and carbon black may contain impurities that can cause skin cancer.

- Chromate pigments (chrome yellow and zinc yellow) cause skin ulceration and allergic skin reactions (rashes).

Did William Hooker and Augusta Withers both suffer with “painter’s colic?”

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6

Mrs Withers

- [1] *Epidendrum parkinsonianum* as *Epidendrum aloifolium*, *The Orchidaceæ of Mexico and Guatemala*, t.25 (1841).
- [2] *Cattleya pumila*, *Botanical Magazine*, 65: t.3656 (1838).
- [3] *Rossioglossum grande* as *Odontoglossum grande*, *The Orchidaceæ of Mexico and Guatemala*, t.24 (1841).
- [4] *Oncidium incurvum*, *The Orchidaceæ of Mexico and Guatemala*, t.29 (1841).
- [5] *Phalaenopsis amabilis* as *Phalaenopsis grandiflora* and *Correa cardinalis*, *The Gardener’s Assistant*, t.12 (1895).
- [6] *Stanhopea eburnea*, *The Botanist*, 4: t.176 (1840).
- [7] *Acineta barkeri* as *Peristeria barkeri*, *The Orchidaceæ of Mexico and Guatemala*, t.25 (1841).



M^r Wickers, del^t

M. Cassell, lith.

PERISTERIA BARKERI.

Pub^d by J. Ridgway & Sons, 103, Piccadilly, March, 11th 1858.

Printed by P. Colver, 8, North Duneau, Bedford, St.

Trias oblonga

and Andrew Thomas Gage

BY RUDOLF JENNY



Trias oblonga Lindl., *Genera and Species of Orchidaceous Plants* 60.1830

Synonyms

Bulbophyllum burkillii Gage, *Journal and Proceedings of the Asiatic Society of Bengal New Ser.* 2(8):343–344.1906

Bulbophyllum moulmeinense Rchb. f., *Annales Botanique Systematicae* 6(2):249.1861

Bulbophyllum oblongum (Lindl.) Rchb. f., *Annales Botanique Systematicae* 6(2):249.1861

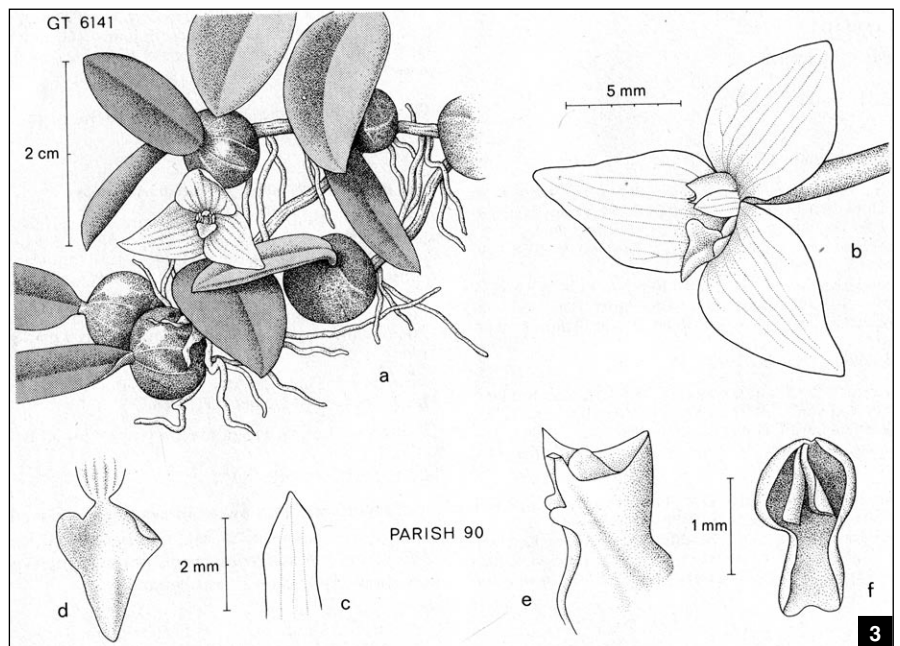
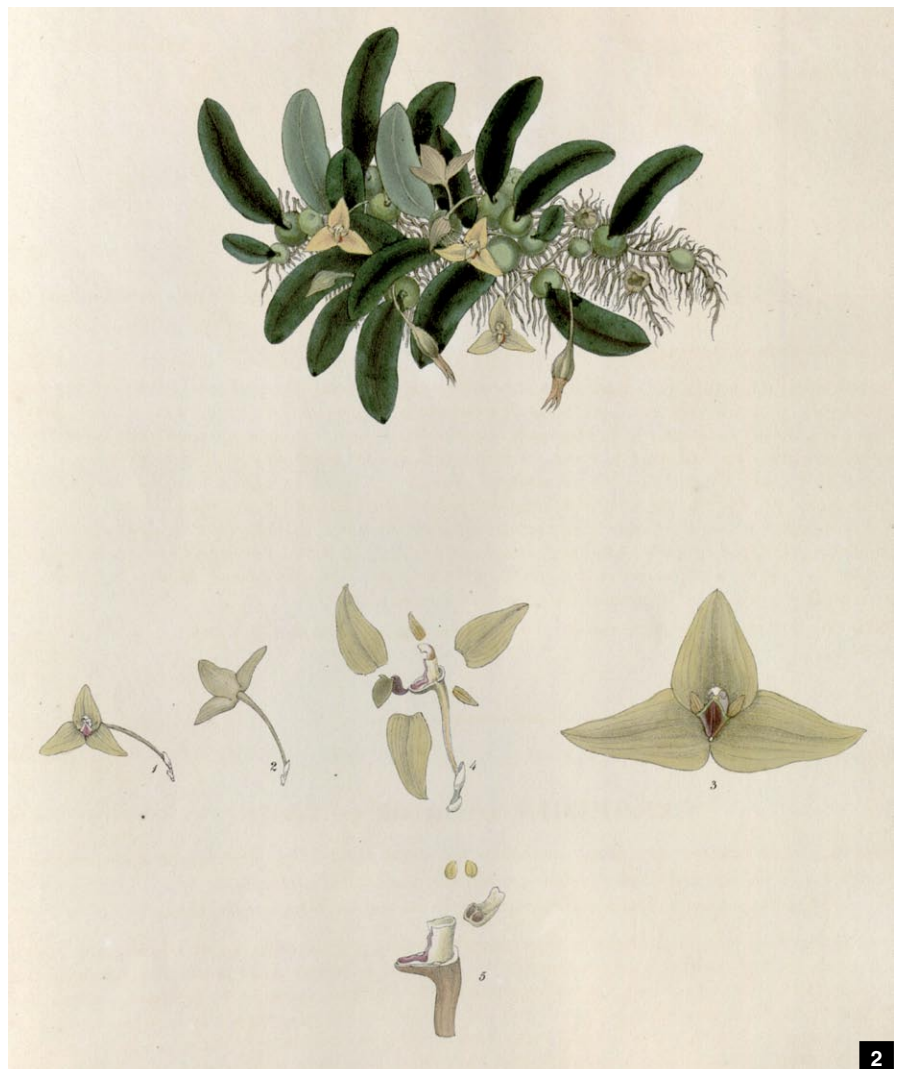
Dendrobium tripterum Wallich ex J.D.Hooker, *Flora of British India* 5:780.1890

Trias ovata Lindl., *Genera and Species of Orchidaceous Plants* 60.1830

The genus *Trias* was created by John Lindley in May 1830 in *Genera and Species of Orchidaceous Plants*. Lindley described two species of *Trias*: *Trias oblonga*, mentioned in Wallich's catalogue (*A numerical List of dried specimen of plants, in the East India Company's Museum*, 1828, no. 1977) and *Trias ovata*, after a drawing by Wallich. *Trias ovata* is a synonym of *Trias oblonga* and the latter would be the type of the genus. *Trias* is now considered a synonym of *Bulbophyllum*. Nathaniel Wallich published in July 1830 in the third part of the first volume of *Plantae Asiaticae Rariorum* a beautiful and clear drawing of *Trias oblonga*, together with a detailed description. Wallich wrote: "I have found another species on trunks of trees, on the banks of the rivers in Martaban, which seems to differ only in having shorter, ovate or subrotund leaves. My friend Professor Lindley, in his excellent work on the *Orchideae*, p.60, calls it *T. ovata*."

In his description of *Trias ovata* of 1830, Lindley had most probably referred to this drawing, as he stated "v.ic.pict.," which means "vidi iconem picturatum" or translated: "I have seen a drawing."

Heinrich Gustav Reichenbach created two names for *Trias oblonga* when he revised *Bulbophyllum* in 1861 in *Annales Botanique Systematicae*. He recombined *Trias oblonga* Lindl. to *Bulbophyllum oblongum* and mentioned *Trias ovata* Lindl. as a synonym, although he was not absolutely certain and put a question mark behind Lindley's *Trias ovata*. On the same page Reichenbach described *Bulbophyllum moulmeinense* as a new species, based on a collection by William Griffith from Moulmein (Myanmar) in Lindley's herbarium. The comment Reichenbach added to the description of



[1] Flower of *Trias oblonga*.

[2] Plate of *Trias oblonga* from Wallich's *Plantae Asiaticae Reriores*, 1830.

[3] Drawing of *Trias oblonga* by Seidenfaden from *Opera Botanica*, 1986. Courtesy of G. Seidenfaden.

Bulbophyllum moulmeinense was “Num huc pertinebit haec litteraria miseries?” which translated means “Does this refer to the more than unfortunate literature citation?” It is not clear what Reichenbach meant by this, as it could refer to either the comments of Griffith or to those of Lindley. *Bulbophyllum moulmeinense* is today considered a synonym of *Trias oblonga*.

Joseph Dalton Hooker mentioned in 1890 in his treatment of the Orchidaceae for the *Flora of British India* another binomial from Wallich’s catalogue, *Dendrobium tripterum*, as synonym of Lindley’s *Trias oblonga*.

Finally, *Trias oblonga* was described as *Bulbophyllum burkillii* in 1906 by Andrew Thomas Gage in the *Journal and Proceedings of the Asiatic Society of Bengal*, dedicated to Isaac Henry Burkill who had collected it in 1904 in Myanmar. The plant was presented to the Royal Botanic Garden Calcutta where it flowered in 1905. Gage described the species and compared it with *Bulbophyllum dayanum* and *Bulbophyllum moniliforme*, both species from different sections of the genus. Although the plant was described without illustration it is very clear that it should be treated as a synonym of *Trias oblonga*.

Andrew Thomas Gage was born in Aberdeen, Scotland on December 14, 1871. He attended grammar school in Aberdeen and later on studied botany and medicine at the University of Aberdeen and at King’s College. In 1891 he gained his Master of Arts, then in 1893 a Bachelor of Science and, in 1896, Bachelor of Medicine. In 1897 Gage joined the Indian Medical Service as a surgeon-lieutenant. He kept this position until 1898, when he became curator of the herbarium at the Calcutta Botanical Garden. In 1905 he followed David Prain as director of this institution. Between 1917 and 1918 he worked for the army in British India, when he was responsible for the production of quinine.

After the war he returned to his position at the herbarium of Calcutta Botanical Garden, from which he resigned in 1923 and in 1925 returned to England. Since 1901 Gage had been a fellow of the Linnean Society of London, and from 1924 to 1929 he worked as librarian and assistant secretary of the society. Using his experience as assistant secretary and librarian, and asked by the society’s council, Gage wrote “A history of the Linnean Society of London,” published in 1938. In 160 pages he outlined in detail



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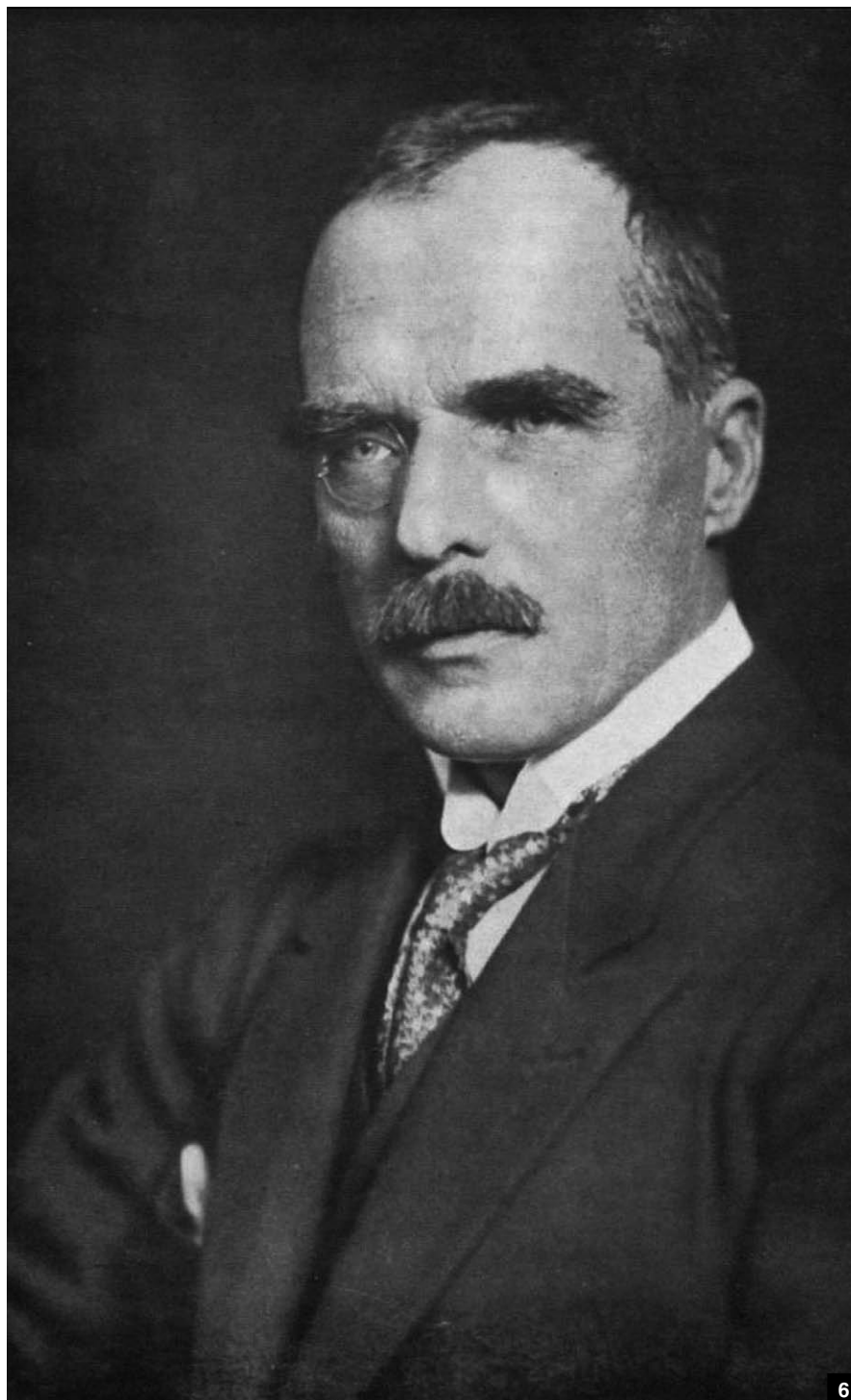
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the history of this important and famous scientific society from its beginnings in 1788, up to its 150th anniversary in 1938. In 1935 his alma mater, the University of Aberdeen, honored him with the degree of LL.D. ("Doctor of Laws," a doctorate-level academic degree in law, or an honorary doctorate, depending on the jurisdiction). J. MacQueen Cowan wrote in Gage's obituary in 1945 in the *Proceedings of the Linnean Society*: "One of Gage's marked characteristics was his devotion to his official duties with the result that he had few outside interests as far as sport and amusement are concerned. He was, however, very keen on motoring and was among the earliest users of a car in Calcutta; never content if his car was not tuned to perfect running."

Gage was a keen plant collector, and during his time in India he traveled through Sikkim, Assam, Chittagong, Malaysia and Myanmar. He published several papers about his expeditions and the plants he found; e.g., "A botanical tour in the south Lushai Hills" in 1901 and "The vegetation of the District of Minbu in Upper Burma" in 1904; both papers were published in the *Records of the Botanical Survey of India*. Plant collections by Gage went to the Royal Botanic Gardens, Kew and the Botanical Survey of India. Founded in February 1890, it is today the organization for survey, research and conservation of plant resources, flora and endangered species of India and belongs to the Ministry of Environment, Forest and Climate Change of India. Andrew Thomas Gage died after a long illness on January 21, 1945, at Strathpeffer, Scotland.

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— Rudolf Jenny is a Research Associate at the Jeny Renz Herbarium, University of Basel. Owner of the most complete orchid library in private hands, he is maintaining the literature database *BibliOrchidea* and has published a number of papers on the history of orchids (rjorchid@gmx.ch).

- [5] Flower of *Trias nummularia*.
 [6] Flower of *Trias picta*.
 [7] Portrait of Andrew Thomas Gage.

The Atlanta Botanical Garden

A Beacon for Orchid Conservation

TEXT AND PHOTOGRAPHS, UNLESS OTHERWISE CREDITED, BY PHILIP SEATON



The seasonal vanda display in the Atlanta Botanic Garden Fuqua Conservatory.



I FIRST VISITED the Atlanta Botanical Garden (ABG) in February 2010, as part of a whistle-stop tour to promote participation in Orchid Seed Stores for Sustainable Use (OSSSU), a Darwin Initiative global seed banking project coordinated from the Millennium Seed Bank (MSB) of the Royal Botanic Gardens, Kew in the UK. I arrived in New York at the tail end of "snowmagedon," an event that dumped record amounts of snow on the northeastern states and, after visiting the Brooklyn Botanical Garden, flew down to Atlanta via Washington, DC and the Smithsonian. I had been told that the Atlanta Botanical Garden was a key player in orchid conservation efforts in the USA and was conducting a number of orchid reintroduction projects. I wanted to know more.

More than 10 years have now passed, and I have fond memories of eating breakfast at the Flying Biscuit with Matt Richards and his family. Matt was already storing seeds of North American native orchids in a fridge (at 41 F [5 C]) in the garden's micropropagation lab, and was having a lot of success in germinating most, if not all of them. I was impressed with his petri dishes of *Cypripedium kentuckiense* overwintering in a large fridge in Ziplock bags. With a reputation for being difficult to germinate, techniques for germinating cypripediums had only been developed comparatively recently. Even today, a number of *Cypripedium* species still present a challenge. The garden had also begun a program to rescue *Cyrtopodium punctatum*, the cigar or cow-horn orchid in Florida's Fakahatchee Strand (Ferreira et al. 2012). Some of the few remaining wild specimens (about 16 plants) had been hand-pollinated, and mature seed was collected in 2009. I was shown flasks of germinating seedlings.

Later, in 2012, Matt wrote, "We have had a fairly good summer here thus far. After six years of extreme drought, we have seen a return to our normal subtropical summers with regular thunderstorms (almost daily). As a result, it has been a good year for orchid discoveries. We have discovered two NEW species records for the state of Georgia (*Liparis loeslii* and *Spiranthes lucida*). We have also located numerous additional populations of very rare things (like mountain populations of *Calopogon tuberosus* and *Pogonia ophioglossoides*, and *Platanthera flava* var. *herbiola*, *Listera smallii*, and *Cleistes bifaria*, which has begun popping up in large numbers where we have been collaborating with mountain bog restoration activities). Most recently (last week) we discovered another new population of *Platanthera chapmanii*. When we started this project in 2009, we had no records in the state . . . now we had four officially! This year's discovery was a new county record."

My visit in 2010 had been all too brief, so that when I had the opportunity to return in March 2014, I grabbed it with both hands. By this time, the seedlings of *Cyrt. punctatum* had grown by the hundreds into robust specimens and, beginning in 2011, many had already been successfully reintroduced back into their previous habitat. In addition, there were hundreds of flowering dancing lady orchids (*Tolumnia bahamensis*) ready to be reintroduced into the rosemary scrub habitat along the Atlantic coast of



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southeast Florida in Jonathan Dickinson State Park. The population had been reduced to 40 individuals. It was just about clinging on until a team from the Atlanta Botanical Garden intervened and began tracking survivorship. Thanks to a program of hand-pollinations, and augmentation using garden-raised plants, the population today (2020) is around 200 individuals. Atlanta Botanic Garden researchers have since found robust populations in the Bahamas, and have been collecting seed as an insurance against future environmental change.

Regular correspondence with garden staff had whetted my appetite for more. I was keen to see for myself how things had progressed in the intervening years. After all, I remember being told by my students when taking them on a visit to Kew that botanical gardens were my natural habitat. So, I was delighted to be invited to pay another visit in November of 2019, to see how their conservation work was progressing and

how the garden was fulfilling its mission to develop and maintain plant collections for the purposes of display, education, conservation, research and enjoyment.

THE LIVING ORCHID COLLECTIONS A breath of warm, humid air, with the delicious aroma of moist earth and hints of exotic perfumes, escapes through the glass doors as they open to allow visitors to enter the Fuqua Orchid Center in the early morning. As they follow a winding path through the display, families and groups of schoolchildren are immersed in a tropical wonderland, created by a mixture of rainforest plants, some with leaves resembling elephant ears. Panicles of brightly colored flowers of heliconias peer between clumps of upright banana-like leaves. The orchids are displayed in a series of landscaped areas, reflecting different habitats. Vanillas twine up the wooden pergolas, from which hanging baskets dangle to show off plants such as paphinias, whose helicopter flowers are best viewed from beneath. Although some

orchids, such as an enormous *Angraecum eburneum* are permanent residents in the center, others have to take their turn from the botanical garden's large and diverse collection of orchids. The displays vary according to the season. In the spring it could be masses of elegantly arching sprays of phalaenopsis. When I visited in the fall it was the season for the intense indigos and rich, ruby reds of vandas suspended in teak baskets. As well as being a space to sit and enjoy, visitors can learn more about the orchids from the permanent display boards and, a touch that others might copy, temporary boards that highlight plants in flower of particular interest at the time.

Clearly there is a talented team behind the displays. This became even more apparent when Becky Brinkman told me that they were able to successfully grow the notoriously "impossible-to-grow" coryanthes that occur naturally in ant gardens . . . from seed. Raising species from seed is part of an ongoing policy of hand pollinations, providing material both for long-term storage and propagation in the lab. The benefits of having someone with many years of experience are plain to see, someone who is able to share their enthusiasm and experience with new staff members. At home in the UK, I am keen to persuade growers to begin pollinating their plants, with the aim of raising plants that are threatened with extinction both in the wild, and in cultivation, from seed.

I thought I knew how to pollinate almost any orchid until I was presented at a local orchid society meeting with a stanhopea. With a reputation of having very short-lived seeds, I wanted (and still want) to find out if this was deserved or not. I knew where to place the pollinia, but would they stay there? They would not! One of the Atlanta Botanical Garden's research programs focuses on euglossine bee-pollinated orchids: stanhopeas, gongoras, acinetas and peristerias. Becky was able to show me what the problem was. Instead of having a nice big pool of sticky stigmatic fluid beneath the tip of the column, the entrance to the stigmatic surface is a mere slit, meaning that the pollinia have to be firmly inserted to achieve success. It was not until I returned home, however, that I discovered that the tight squeeze was a mechanism to avoid self-pollination, a strategy technically referred to as "dichogamy," the mating elements maturing at different times. Van der Pijl and Dodson (1969) say, "The stigma is narrow when the bee first visits and the pollinia are thick before drying



- [1] Atlanta Botanic Garden researchers looking for *Cyrtopodium punctatum* in Cuba. The inserts are a close up view of a plant in situ and a single flower. The flower close-up photograph was taken by the author. Although the species is widespread from southern Florida through the Caribbean to Venezuela and into southwestern and central Colombia, few plants in Florida or the Caribbean set seed capsules suggesting decreasing populations of the natural pollinator.
- [2] Several *Dendrobium* species and a *Coeloglyne* species on display in the main conservatory. The inset photograph is *Coeloglyne rochussenii*, an easily grown species that flowers profusely in the late fall and early winter.
- [3] A mass display of *Angraecum eburneum*.

and therefore cannot be inserted" (p. 214). Becky also told me that when pollinating gongoras, the pollinia should be removed and left for a while. Then, and only then, the slit would gradually relax, allowing insertion of the pollinia. It all goes to show, no matter how long you have been growing orchids, there is always something new to learn.

Research is at the heart of the garden's activities, and there are extensive behind the scenes collections. Collecting material from plants in their natural habitats, however, is extremely resource intensive, in terms of both finance and staff time. Living collections that have been established over many years therefore provide an invaluable and often undervalued resource of genetic material.

THE MICROPROPAGATION LAB Today visitors can view activities in the newly refurbished and expanded lab through ceiling-to-floor, plate glass windows. I could not wait to get inside. Avoiding contamination of flasks is key to success, and everything has to be kept spotlessly clean. On stepping over the threshold, before donning a crisp, white lab coat, I was asked to take off my shoes, and select a pair of the right size of freshly cleaned Crocs. It all felt very Japanese, but instead of tatami mats underfoot, there was a sparkling tiled floor.

I have enjoyed the good fortune of seeing a lot of orchid micropropagation labs around the world. It is an invaluable opportunity to exchange experiences and ideas and to learn something new. We all have our own favorite way of sowing seeds. Personally, I favor the "packet method," where you make little envelopes out of coffee filter paper that are then sterilized in the disinfectant solution. In contrast, the lab manager in Atlanta, Jason Ligon, uses a technique involving sterilizing the seeds in a test-tube of disinfectant solution, filtering the seed suspension through a filter paper, and then sowing the seed by dabbing the filter paper on the surface of the culture medium. The point is that both methods work equally well. In Jason's case, this was evidenced by hundreds of healthy bright green orchid seedlings, all growing under LED lights on black, charcoal-based media in clear plastic tubs and glass jars, on shiny metal racks.

The lab is currently expanding the garden's seed banking activities, thereby making a valuable contribution to a global effort to better understand the storage responses of the seeds of an



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[4] *Dendrobium densiflorum*

[5] *Coryanthes alborosea*, a rare Peruvian endemic.

[6] *Coryanthes leucocorys*, a more widespread species, is found from Colombia to Peru.

[7] *Coryanthes macrantha* is the most widespread species in the genus, found throughout tropical South America to Trinidad.

[8] *Lycomormium squalidum*. The genus consists of five rather rare species confined to Colombia, Ecuador and Peru.

[9] Jason Ligon transplanting orchid seedlings in the Fuqua lab.

[10] Extracting DNA from strawberries.

[11] *Tolumnia bahamensis* raised from seed at the Atlanta Botanical Garden.

[12] *Vanilla imperialis*, not often seen in cultivation, occurs naturally throughout tropical west Africa to southwestern Ethiopia and Angola.

GEORGE GUENTHER

GEORGE GUENTHER

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ever-increasing number of orchid species. Orchid seeds, on the whole, can be considered to be orthodox; that is to say that they can be dried to low moisture contents and stored at a conventional seed bank temperature of -4 F (-20 C). With around 29,000 species, however, one would expect there to be considerable variation in the responses to seed storage conditions in the Orchidaceae, and there remains a considerable amount of work that needs to be done to identify those species that have short-lived seeds (*Stanhopea* species perhaps?). In view of the potential variation in response of some species to storage temperature, the lab is equipped with freezers maintained at -112 F (-80 C) and -220 F (-140 C) and a liquid nitrogen facility at -321 F (-196 C) that may be required for storage of particularly “problematic” seeds in the future.

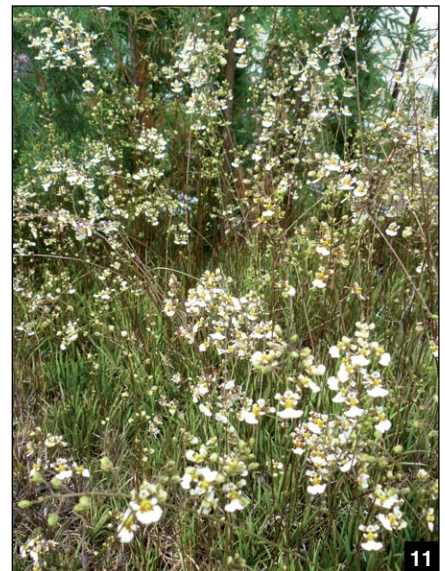
Seed from each maternal line is divided into three glass vials, one each for seed banking and for initial tetrazolium and germination testing. For banking, vials of seed with their caps loosely screwed to allow their contents to equilibrate with the surrounding air, are placed in a desiccator that maintains a relative humidity 30 percent for a minimum of one week. The caps of the vials are closed tightly and hermetically sealed within foil laminate pouches before placing in the freezer at -4 F (-20 C). The percentage germination of any seed lot will inevitably decline over time, therefore regular testing is essential for monitoring the quality of stored seed. Both germination and tetrazolium testing are carried out before storage and subsequently at regular intervals.

In addition to being sourced from the garden’s own living collections, seed is also collected from native orchid populations. The aim is to collect from at least 50 maternal lines within a population, without collecting more than 10 percent of a season’s total seed production. Where possible, seed is collected from a minimum of five populations across the species’ range. For extremely geographically limited species this is relatively simple, but for a farther spread distribution this will take the collaboration of a well-organized network of seed banks to ensure that enough genetic diversity is held somewhere in an ex situ conservation collection.

PRIMED FOR SUCCESS: DNA BARCODING In 2007, at the International Orchid Conservation Congress, held in San José, Costa Rica, tropical biologist Dan Janzen predicted that,

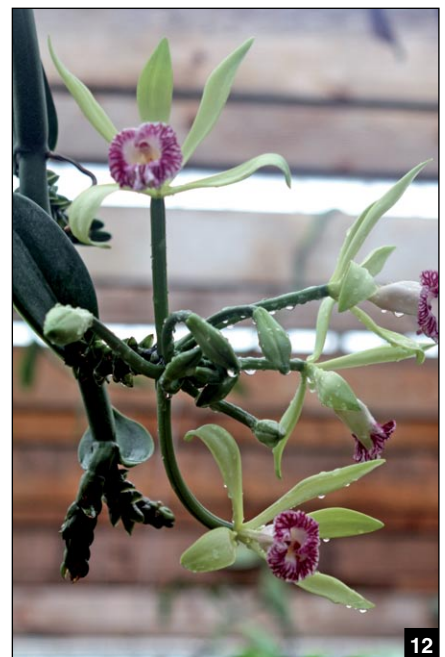


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before long, all that would be needed to identify any particular insect species (Dan is an entomologist) would be a single leg that could be inserted into a handheld biosensor, conjuring up a vision of a rainforest populated with five-legged arthropods, the sixth limb having been recently amputated by over-enthusiastic entomologists.

Browsing the internet, recently, I found that Dan’s dream has now come true. Why should orchid biologists also be excited by this concept? The answer is that, until recently it has been necessary for an orchid to be in bloom to be identified with any degree of confidence. The dream is to be able to confidently identify nonflowering specimens, seedlings and even pollinia, both in the greenhouse and in the field. DNA barcoding has the potential to turn



this dream into reality.

DNA barcoding is based on comparing short, standardized fragments of DNA. All that is needed is a small piece of tissue. A snippet of leaf about ½-inch (1-cm) long is, for example, sufficient. To preserve the DNA, tissue samples are dried with silica gel, and then kept in a refrigerator or freezer until they are ready to be analyzed. Extracting DNA from cells is surprisingly easy: It is routinely performed by teenagers in schools around the world. Strawberries are ideal. To break open the tough cellulose cell walls and release the DNA, strawberries are mashed to a pulp in a clear plastic bag to which has been added a soapy, salty solution. After filtering the mush through coffee filter paper, ice-cold ethanol is carefully added and, voilà, long strands of sticky DNA will appear at the interface of the two liquids.

As you might have expected, a slightly more sophisticated technique is needed when using small amounts of tissue, and it is necessary to obtain a much purer sample of DNA. For example, Lauren Eserman, PhD, told me that the leaf sections are ground using tiny sharp fragments of garnet. Lauren is currently barcoding the garden's entire orchid collection. The ability to accurately identify plants in the collection using the garden's DNA library is both providing a better understanding of the plants in the living collection, and a sound basis for further research. The purified samples are sent to the Center for Biodiversity Genomics in Canada, and the information shared with BOLD (Barcode of Life Database). Voucher specimens are deposited in the herbarium at Columbus State University and collated with species images.

One challenge in studying the evolution and population genetics of orchids is having the right tool kit to address questions. To overcome this, Garden staff, in collaboration with Arbor Biosciences and the University of Georgia, set out to develop a system to sequence hundreds of genes (963 to be exact) from a single orchid DNA sample at a time. This "target sequence capture" has the potential to revolutionize genetic analyses of orchids and reveal hidden information necessary for their conservation. This advanced DNA sequencing method will be applied to answer key questions about orchids, which before now could never be answered.

EDUCATION Although the current fate of orchid populations remains largely in the hands of an older generation, if we wish future generations to be able to

enjoy the diversity that we see today, it is important to pass on our knowledge and expertise to today's young people.

As a UK STEM ambassador, running an orchid micropropagation lab in a local school, teaching both young people and adults techniques for growing orchids from seed both symbiotically and asymbiotically and monitoring germination and viability of seeds in storage, I was delighted to be able to hear some excellent student presentations from Georgia Tech. The ABG acts as a role model for the ways in which, with a little imagination, botanical gardens around the world can make an important and lasting contribution to orchid conservation.

NATIONAL AND INTERNATIONAL COLLABORATIONS The ABG's research programs incorporate both National (with the North American Orchid Conservation Center [NAOCC], for example) and international collaborations enabling the sharing of knowledge and expertise.

In addition to being found in Florida, *Cyrt. punctatum* also occurs across the water in the Ciénaga de Zapata Parque Nacional, in Cuba, and garden staff have been able to share their expertise in conserving this orchid with Cuban scientists. Garden staff have also been working with biologists at the Quito Botanic Garden (JBQ), in Ecuador, to help safeguard *Selenipedium aequinoctiale* through seed collection and in vitro propagation, leading to the reintroduction of propagated plants into its natural habitat.

Additional Ecuadorian work has

included supporting research activities at the Siempre Verde Research Station. Activities have included documenting orchids, supporting and providing expertise for establishing an orchid garden for educational activities for students in Ecuador, and conducting pollinator experiments targeting euglossine bee pollinated orchids across the research station. In the future, the aim is to deploy the SlothBot, a slow-moving, high-efficiency robot enabled with remote sensing capabilities designed to help researchers gain a better understanding of the abiotic conditions in the canopy where epiphytic orchids are growing. This technology can then be used to create highly accurate predictive models and capture pollinators visiting targeted orchids.

Acknowledgment

The author thanks Emily Coffey PhD, Vice-President, Conservation and Research, for giving him the opportunity to return to the ABG.

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— Philip Seaton is a retired biology lecturer and member of the Management Team for Orchid Seed Science and Sustainable Use (OSSSU). Author, illustrator and international speaker on a range of orchid conservation themes, he runs a volunteer orchid micropropagation lab in a local school. (email: philipseaton@gmail.com).

FROGS

Parents may have some difficulty in enticing their young children away from terrariums containing electric blue-splashed poison dart frogs *Dendrobates tinctorius azureus* morph located in the entrance to the orchid display house at the Atlanta Botanic Garden. What they may not have been aware of when I visited in 2014 that behind the scenes was the "frog pod," a shipping container where rare and endangered frogs were being bred for reintroduction back into their natural habitats in Panama. Many amphibians around the world are endangered due to the spread of the deadly chytrid fungus (*Batrachochytrium dendrobatidis*) and, much like many orchid species, the establishment of captive populations provides some sort of safety net against future



extinctions. Here I learned that keeping frogs depends on raising sufficient numbers of their insect food.

A Hot Spot for Orchids

The Tatamá National Park in Colombia

TEXT BY SPIRO KASOMENAKIS/PHOTOGRAPHS BY SPIRO KASOMENAKIS UNLESS OTHERWISE CREDITED

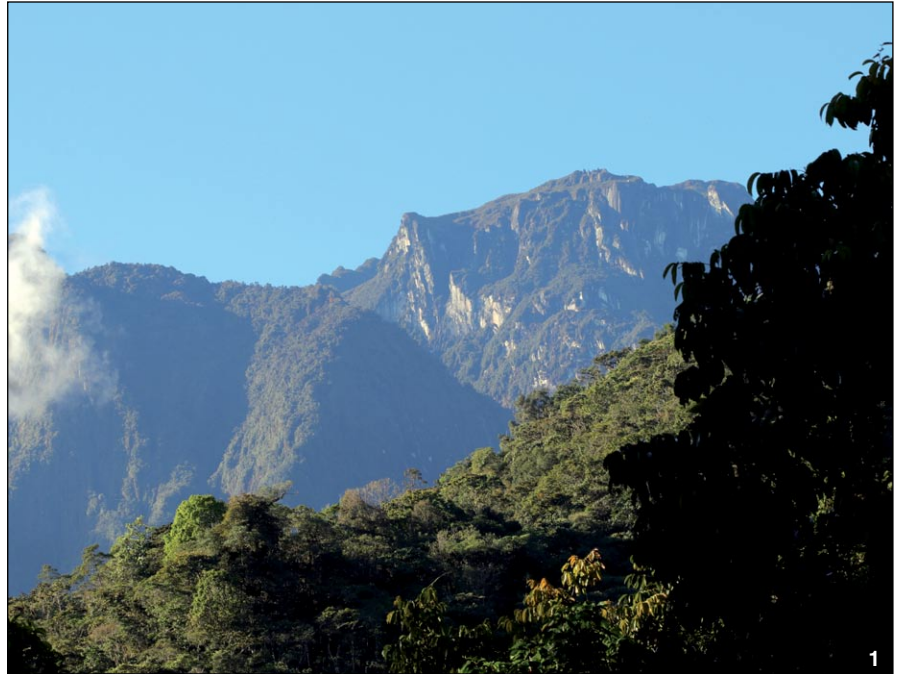
COLOMBIA IS A country with an immense orchid flora. Many special and endemic species are found there in diverse and often pristine habitats. Together with Ecuador and Peru, it is considered the center of orchid speciation in the New World. The country has at a minimum 4,000 species with new ones discovered all the time. One would need several lifetimes to get to know and study this number of species.

I have had the opportunity to join a small group of nature lovers on a two-week trip to observe and photograph orchids in their native habitats. The areas we visited were varied and distant from each other and included the Tatamá National Park, La Linea, Viterbo, Jardín, the Colombian Orchid Society's Reserve (Reserva Orquideas), the Orchid Conservation Alliance (OCA) Rainforest Trust Preserve (La selva de Ventanas), Yarumal and areas near Cali, as well as private collections and at least two large orchid nurseries. The tour was organized by the Orchid Conservation Alliance (orchidconservationalliance.org) and guided by In Situ Expeditions (Colombia).

We saw approximately 300 orchid species in bloom on the entire trip with 120 in Tatamá National Park alone!

This article covers our first major stop, namely the Tatamá National Park, an area rich in diversity of both fauna and flora, many of which are endangered. This protected and pristine natural area covers ca. 200 square miles (519 km²) of Colombia's Western Andes (Cordillera Occidental) and is between 6,988 and 10,007 feet (2,130–3,050 m) in elevation. It is essentially a cloud forest, sunny and breezy in the morning, foggy and rainy after 3:00 pm, and always cool. We, therefore, had to do our walks and exploration as early as we could, often returning to the lodge in the middle of the afternoon rain. There is only one facility for visitors to stay in the park, owned by a family that has been caretakers of the area before it was even a national park.

The rooms are often booked well in advance by birding groups that come to



see and photograph another one of the park's riches: the avifauna of the area. As a matter of fact, all that is needed to attract dozens of species of hummingbirds is a few feeders around the breakfast patio.

Orchids begin to appear as well all around us as we had our breakfast: *Erycina*

[1] Colombia's Tatamá National Park, November 2018.

[2] *Phragmipedium longifolium*

KASOMENAKIS

(*Psygmorchis*) *pumilio* naturalizes in the shrubs, and a *Phragmipedium longifolium* at the base of another nearby shrub.

A small detour from the road on the way to the cabins leads to a trail by the river. There, in the constant high humidity and mist, we found *Lepanthes calodictyon*, an undescribed species of *Scaphosepalum* or possibly a form of *Scaphosepalum swertiifolium*, several other *Lepanthes* species, and *Maxillaria acuminata*, as well as many other plants not in flower.

An observation: *Lepanthes calodictyon* plants, as well as many other species of this genus, do not become large plants in nature; most have no more than 3–4 leaves. Only in cultivation have I seen plants with 10 or more leaves. On the way back to our rooms, various other species were seen along the trees: *Epidendrum* species, *Cyrtorchilum meirax*, *Oncidium poikilostalix*, *Acianthera sicaria*, *Masdevallia nidifica*, *Stelis* species and many others.

On this same muddy road, one evening we almost stepped on a poisonous snake, a Fer-de-lance (*Bothrops asper*), that was resting in the mud. Having no medical facilities in the area, the chances of surviving a “good” bite are slim. After that we shone our flashlights on the ground and walked carefully back to our cabins after dark!

Orchid-wise, the great majority of species were seen on the road that leads up to the peak and along the various footpaths that cut into the forest from both sides of the road. On the first day’s outing, we saw and photographed an incredible variety of orchids in bloom: pleurothallids and *Maxillaria* species. This area also has an unusual concentration and diversity of former *Cryptocentrum* species.

All the different vegetative types are represented here: tiny “pine-needle” tufts less than 1 inch (2.5 cm) tall of *Maxillaria* (*Cryptocentrum*) *standleyi*, trailing dichaea-like plants, large monopodial clusters of *Maxillaria sciabolata* (*Cryptocentrum spathaceum*), etc. The various *Masdevallia* species were a welcome sight: *Masdevallia bucculenta*, *Diodonopsis* (*Masdevallia*) *anachaeta*, *Masdevallia ventricularia*, *Masdevallia peristeria*, *Masdevallia nidifica* and *Masdevallia mutica*, as well as the numerous *Lepanthes* species, the diversity of which was mind-boggling!

The species are too numerous to discuss. Among them were several undescribed species that our *Lepanthes*-expert guide did not even recognize.



[3] *Maxillaria speciosa*

[4] This deadly Fer-de-lance can barely be made out against the mud.

[5] *Lepanthes furcata*

[6] *Epidendrum laucheanum*, generally considered to be a Central American species, can also be found in Colombia.



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I offered to lend my name as a possible species epithet for any that prove to be new (just to make things easier for them, you understand), but that did not go down well with the experts. Oh well, there is always tomorrow.

Large and small *Elleanthus* species (*Elleanthus aurantiacus*, *Elleanthus lancifolius*, *Elleanthus aureus*, etc.), all very colorful and mimicking gingers, were interspersed throughout the trails. They are mostly pollinated by hummingbirds; hence the tubular flowers and yellow-orange-red color palette. Among the several terrestrial species we saw in bloom, two stand out for their elegant flowers and unusual growth habit. The first is *Pterichis acuminata* with its tall spikes of nonresupinate orange-and-green flowers, and the other is *Crossoglossa* aff. *hirtzii*. The latter has spidery orange flowers, and a fan of delicate wavy-edged leaves. *Dracula carcinopsis* was spotted by one of our members in full bloom; its flowers hanging like bells fully visible only from below. A real treat was finding a rare, spectacular species that our guides knew to inhabit these woods. That was *Brachionidium imperiale*, a giant species by brachionidium standards. We spotted two plants, the first in bud and the second in full flower. It is a sprawling, scandent plant in a delicate habit, a small leaf every several inches (centimeters) on an upwardly climbing stem, and at the juncture of leaf and stem, a giant (ca. 6 inches [15.2 cm] from tip to tip) purple flower, which was waxy and glistening in the mist. It was an unforgettable sight! Various *Oncidium* and *Cyrtorchilum* species clambered over shrubs in open areas where the sun reaches deeper into the understory.

On the same day, coming back late in the afternoon, while rain began to fall, a plant of *Miltoniopsis vexillaria* was spotted high up on a tree beside the road. It is a spectacular plant with showy, large pink flowers, but I was too exhausted and wet to climb on top of the jeep to get a decent photo of it. In any case, we would see excellent examples of this species in private collections later in the trip.

The next day we took another road to the top of the mountain (over 9,843 feet [3,000 m] elevation) stopping along the way to see many of the same species we saw the previous day, but with some additional species to be added to the list. Among the numerous *Pleurothallis*, *Epidendrum* and *Stelis* species, we saw a spectacular plant of *Telipogon* aff. *hausmannianus*, at 7,710 feet (2,350 m).



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This is a showy flower, bright yellow and with a network of netting in dark brown on the face of the flower. Large *Maxillaria* species were visible from a distance. They tended to be growing terrestrially and I must assume that the mass and weight of these plants makes them too heavy for life in the trees above.

Another special plant seen, unfortunately only in bud, was *Paphinia rugosa*; a pretty thing when in bloom. Again, the variety of plants overall, and orchids in particular, in these forests is incredible. There are black-spathed anthuriums and tubular-flowered begonias, variegated gesneriads, carnivorous utricularias, and the list goes on and on.

As far as the orchids go, I will give one final example of the diversity found here by concentrating on orchid species found in bloom on a single rock in a clearing near our sleeping quarters. Here were *Maxillaria (Trigonidium) egertoniana*, *Maxillaria pseudoreichenheimiana*, *Maxillaria porrecta*, *Maxillaria boliviensis*, *Elleanthus oliganthus* and *Erycina pumilio* — and all were in bloom on this one rock!

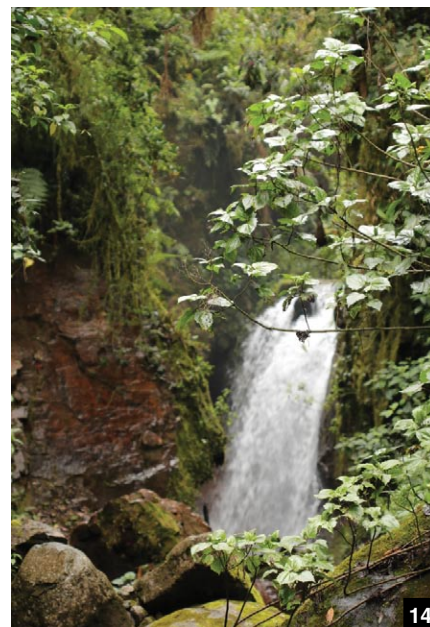
Nearby on a low tree, *Rodriguezia granadensis* was blooming. All in all, it was a wonderful destination, one of the richest in orchids that I have seen so far. It is also good to know that it is, and will continue to be, protected because it is a national park. Its remoteness and protection from overdevelopment are two more reasons why this small slice of paradise should make it intact into the 21st century and beyond.

I thoroughly enjoyed this wonderful tour with the great company of other like-minded participants.

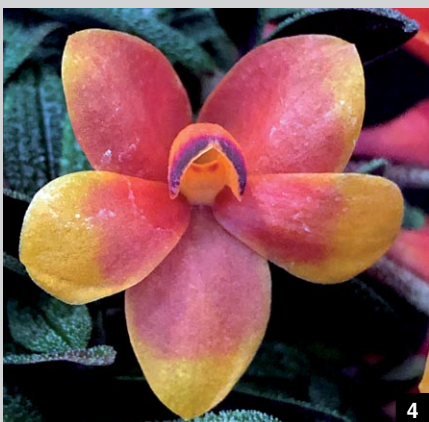
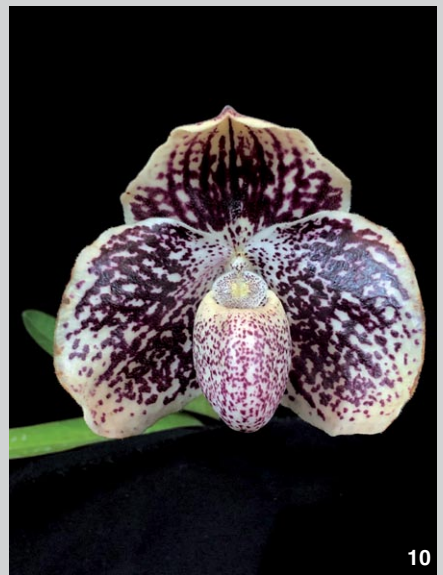
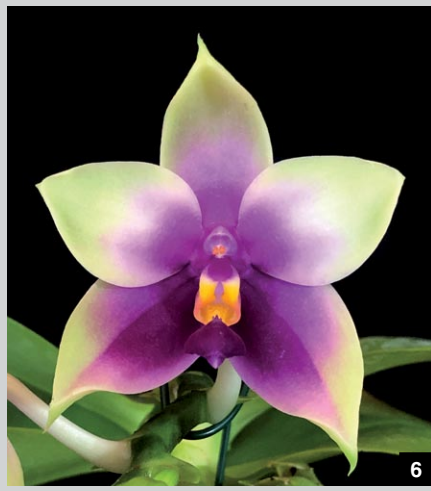
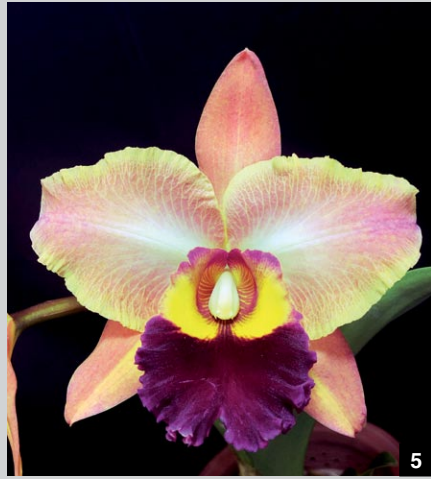
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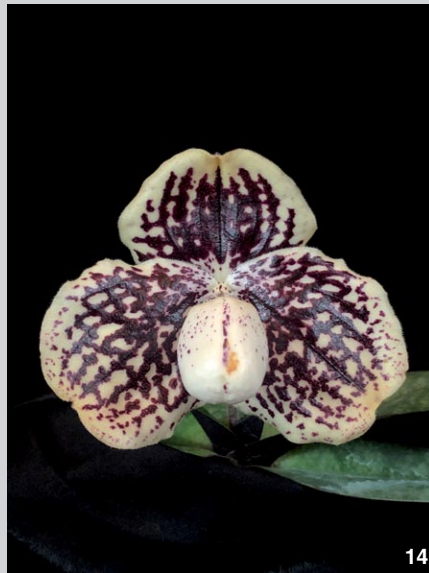
I thank Chris Ehrlert and Gary Yong Gee, fellow participants, for their invaluable aid in the identification of species and Gary's fastidious recordkeeping. I also thank Judith Rapacz-Hasler for her encouragement to write this article.

— *Spiro Kasomenakis has been growing orchids, and has been an AOS member, since the 1980s. Looking forward to traveling again, after the current plague is over, and seeing orchids in the wild (email: kasomenakis@aol.com).*



- [7] *Lepanthes calodictyon*
- [8] *Brachonidium imperiale*
- [9] *Lepanthes carunculigera*
- [10] *Epidendrum* cf. *homoion*
- [11] *Masdevallia mutica*
- [12] *Epidendrum cleistocoleum*
- [13] *Maxillaria (Trigonidium) egertoniana*
- [14] One of the many waterfalls in the park.
- [15] *Elleanthus oliganthus*



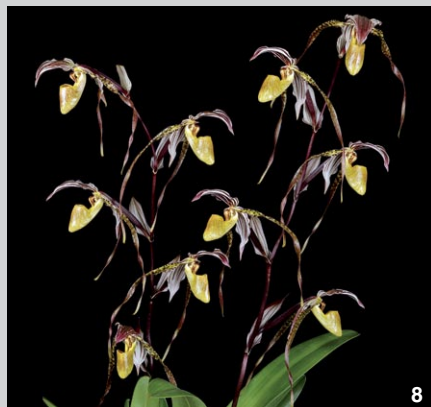


- [1] *Phalaenopsis bellina* 'Krull's Amaze-ment' AM/AOS 81 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging
- [2] *Phalaenopsis bellina* 'Krull's Clown' AM/AOS 87 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging
- [3] *Phalaenopsis bellina* 'Krull's Round Robin' AM/AOS 83 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging
- [4] *Dendrobium cuthbertsonii* 'Orange Glow' AM/AOS 81 pts. Exhibitor: Gold Country Orchids; photographer: Wes Newton. Florida North-Central Judging
- [5] *Rhyncholaeliocattleya* Krull's Dragon Fire 'Apopka Chief' HCC/AOS (Carolina Splendor x Theresa Hill) 78 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging
- [6] *Phalaenopsis bellina* 'Krull's Shannon' AM/AOS 86 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging
- [7] *Phalaenopsis bellina* 'Krull's Sorrento' HCC/AOS 78 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging
- [8] *Dendrobium* Jiaho Delight 'Big Bear Resurrection' AM/AOS (Hsinying Frostymaree x *tobaense*) 87 pts. Exhibitor: Ryan Kowalczyk; photographer: Kay Clark. Florida North-Central Judging
- [9] *Paphiopedilum* Jennifer Reinoso 'Krull-Smith' CCM/AOS (Memoria Hirohisa Kawai x *godefroyae*) 87 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging
- [10] *Paphiopedilum* Leucofroyae 'Krull-Smith' AM/AOS (*godefroyae* x *leucochilum*) 82 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging
- [11] *Catasetum* Corinne's Frilly Spots 'Flossie's Frilly Tiger' AM/AOS (Frilly Doris x *tigrinum*) 81 pts. Exhibitor: Corinne Arnold; photographer: Kay Clark. Florida North-Central Judging
- [12] *Paphiopedilum* Leucofroyae 'Crystelle' AM/AOS (*godefroyae* x *leucochilum*) 85 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging
- [13] *Paphiopedilum* Leucofroyae 'Wekiva Springs' HCC/AOS (*godefroyae* x *leucochilum*) 79 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging
- [14] *Paphiopedilum* Leucofroyae 'Ponkan' HCC/AOS (*godefroyae* x *leucochilum*) 76 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging
- [15] *Paphiopedilum* Leucofroyae 'Little James Krull' HCC/AOS (*godefroyae* x *leucochilum*) 79 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging
- [16] *Paphiopedilum* Leucofroyae AQ/AOS (*godefroyae* 'Krull's Black Cherry' AM/AOS x *leucochilum* 'Ponkan' AM/AOS). Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging





- [1] *Phalaenopsis violacea* f. *alba* 'Jim Krull' CCM/AOS 81 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging
- [2] *Paphiopedilum* Catherine Briois 'Littlefrog Big Alex' HCC/AOS (*delenatii* x *godefroyae*) 79 pts. Exhibitor: Littlefrog Farm; photographer: Ed Cott. Great Lakes Judging
- [3] *Paphiopedilum* Walnut Valley Royal Bel 'M & B Sunshine' AM/AOS (Bel Royal x *armeniacum*) 80 pts. Exhibitor: Max Thompson and Bryon Rinke; photographer: Bryon Rinke. Great Plains Judging
- [4] *Paphiopedilum* Presidential Moon 'Slipper Zone Sorry' HCC/AOS (Luna Magic x President Fred) 78 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging
- [5] *Paphiopedilum* Odette's Beguilement 'Slipper Zone Color Wins' AM/AOS (Grand Fred x Odette Doubled) 81 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging
- [6] *Encyclia* Judy Russ 'Jim Krull' HCC/AOS (*tampensis* x Orchid Jungle) 77 pts. Exhibitor: Krull-Smith; photographer: Kay Clark. Florida North-Central Judging
- [7] *Encyclia* Renate Schmidt 'Ponkan' AM/AOS (Orchid Jungle x *alata*) 80 pts. Exhibitor: Krull-Smith; photographer: Kay Clark. Florida North-Central Judging
- [8] *Paphiopedilum godefroyae* 'Littlefrog Ron's Choice' HCC/AOS 76 pts. Exhibitor: Littlefrog Farm; photographer: Ed Cott. Great Lakes Judging
- [9] *Cattlianthe* Precious Ruby 'Jacob Carlo' HCC/AOS (Rajah's Ruby x *Cattleya* Precious Jewel) 79 pts. Exhibitor: Max Thompson and Bryon Rinke; photographer: Bryon Rinke. Great Plains Judging
- [10] *Encyclia* Renate Schmidt 'Jim Krull' AM/AOS (Orchid Jungle x *alata*) 82 pts. Exhibitor: Krull-Smith; photographer: Kay Clark. Florida North-Central Judging
- [11] *Encyclia* Renate Schmidt 'Krull's Hallelujah' AM/AOS (Orchid Jungle x *alata*) 85 pts. Exhibitor: Krull-Smith; photographer: Kay Clark. Florida North-Central Judging
- [12] *Cattleya* A Miracle Everyday 'Attics of My Life' HCC/AOS (*briegeri* x Circle of Life) 78 pts. Exhibitor: Ben Oliveros and Orchid Eros; photographer: Glen Barfield. Hawaii Judging
- [13] *Paphiopedilum* Hisae's Royal Duck 'Syzygy' HCC/AOS (Bel Royal x *ad ductum*) 78 pts. Exhibitor: Pete Ostlund; photographer: Ed Cott. Great Lakes Judging
- [14] *Aranda* Salaya Red 'Timbucktoo' AM/AOS (without known parents) 81 pts. Exhibitor: Sarah Pratt; photographer: Bryon Rinke. Great Plains Judging
- [15] *Encyclia* Cindy 'Caldicott's Hawaii' CCM/AOS (*tampensis* x *alata*) 84 pts. Exhibitor: William Rawson; photographer: Glen Barfield. Hawaii Judging
- [16] *Catyclia* Serena's Tinkerbelle 'Paradise' CCM/AOS (El Hatillo x *Encyclia randii*) 85 pts. Exhibitor: William Rawson; photographer: Glen Barfield. Hawaii Judging





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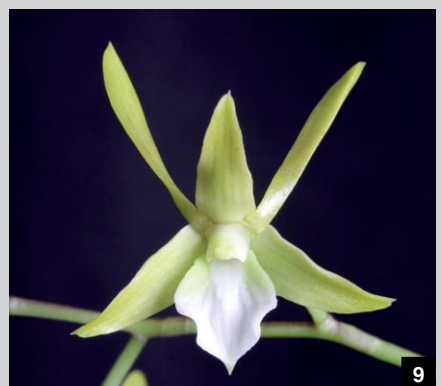


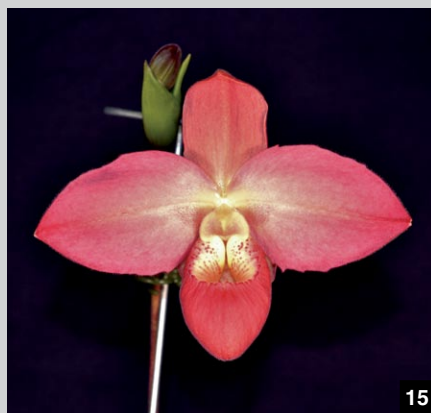
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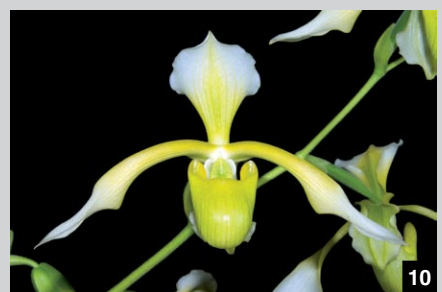
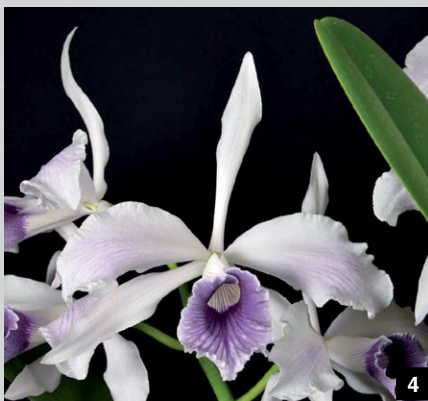
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- [1] *Rhyncholaeliocattleya* Lucinda S. Seale 'First Sister' AM/AOS (Hey Song x Edisto) 81 pts. Exhibitor: Ben Oliveros and Orchid Eros; photographer: Glen Barfield. Hawaii Judging
- [2] *Dendrochilum filiforme* 'Pacific Heights' CCE/AOS 93 pts. Exhibitor: Katherine Leonard; photographer: Roy Andrade. Hawaii Judging
- [3] *Brassia Memoria* Fritz Boedeker 'Mitamura' AM/AOS (*arcuigera* x Rex) 82 pts. Exhibitor: Scot and Karen Mitamura; photographer: Roy Andrade. Hawaii Judging
- [4] *Masdevallia* Clarita Bucheli 'Daphne Anne' AM/AOS (*rex* x *uniflora*) 80 pts. Exhibitor: Mary Ann Denver; photographer: Maurice Garvey. Northeast Judging
- [5] *Prosthechea radiata* 'Makawao Pride' AM/AOS 83 pts. Exhibitor: Andrew Okada; photographer: Michael Blietz. Hawaii Judging
- [6] *Vanda* Laura Lynn House 'Karol' HCC/AOS (*Manuvadee* x *coerulea*) 79 pts. Exhibitor: Larry Yamamoto; photographer: Roy Andrade. Hawaii Judging
- [7] *Sobralia macrantha* 'Angelica' AM/AOS 83 pts. Exhibitor: Waldor Orchids, Inc.; photographer: Bayard Saraduke. Mid-Atlantic Judging
- [8] *Paphiopedilum* Temptation 'Rogan's Lady Kathleen' HCC/AOS (*kolopakinggii* x *philippinense*) 79 pts. Exhibitor: John Rogan; photographer: Bayard Saraduke. Mid-Atlantic Judging
- [9] *Procatavola* Golden Peacock 'Orange Beauty' AM/AOS (*Brassocattleya* Richard Mueller x *Prosthechea vitellina*) 80 pts. Exhibitor: Melvin Z. Waki; photographer: Roy Andrade. Hawaii Judging
- [10] *Paphiopedilum* Carolyn Butcher 'Memoria Alex McConnell' HCC/AOS (*Fanaticum* x *delenatii*) 78 pts. Exhibitor: Mark Prout; photographer: Melissa Garner. Mid-America Judging
- [11] *Dendrobium uniflorum* 'Forest's Geburtstag' HCC/AOS 79 pts. Exhibitor: Randy Bayer; photographer: Melissa Garner. Mid-America Judging
- [12] *Paphiopedilum tranlienanum* 'Marvin' AM/AOS 82 pts. Exhibitor: Sarah Hurdell; Photographer: Bryan Ramsay. National Capital Judging
- [13] *Bulbophyllum patens* 'Rainbow' CCE-AM/AOS 97-86 pts. Exhibitor: Marilyn LeDoux; photographer: Melissa Garner. Mid-America Judging
- [14] *Vandachostylis* Anyara 'Gwain Kiela' CCM-HCC/AOS (Lou Sneary x Tham Yuen Hae) 79-87 pts. Exhibitor: Mary Jo Gilsdorf; photographer: Bayard Saraduke. Mid-Atlantic Judging
- [15] *Paphiopedilum* Kemp Tower 'Rogan's Gold' AM/AOS (Prince Edward of York x *philippinense*) 81 pts. Exhibitor: John Rogan; photographer: Bayard Saraduke. Mid-Atlantic Judging
- [16] *Thunia bensoniae* 'Irene' CHM/AOS 84 pts. Exhibitor: Al and Irene Messina; photographer: Maurice Garvey. Northeast Judging





- [1] *Paphiopedilum richardianum* 'Hidden Treasure' AM/AOS 82 pts. Exhibitor: Sergey Skoropad; Photographer: Bayard Saraduke. Mid-Atlantic Judging
- [2] *Lepanthes regularis* 'Saint Bill' CHM/AOS 83 pts. Exhibitor: Mary Ann Denver; Photographer: Maurice Garvey. Northeast Judging
- [3] *Catasetum* Diana's Dots 'Tabasco' AM/AOS (Orchidglade x tigrinum) 80 pts. Exhibitor: Robert Hydzik; photographer: Richard Noel. Cincinnati Judging
- [4] *Dendrobium fulgidum* subsp. *fulgidum* 'Irene' CBR/AOS 0 pts. Exhibitor: Al and Irene Messina; Photographer: Maurice Garvey. Northeast Judging
- [5] *Cattleya* YNS Green Leopard 'Jade Dragon' HCC/AOS (Love Bourbon x Thospol Spot) 79 pts. Exhibitor: Waldor Orchids, Inc.; Photographer: Bayard Saraduke. Mid-Atlantic Judging
- [6] *Cattleya* Hardyana (1896) 'Waldor Spectacular' AM/AOS (*dowiana* x *warscewiczii*) 84 pts. Exhibitor: Waldor Orchids, Inc.; Photographer: Bayard Saraduke. Mid-Atlantic Judging
- [7] *Rhyncholaeliocattleya* Memoria Ralph Placentia 'Toreador' FCC/AOS (*Cattleya* Memoria Albert Heinecke x Norman's Bay) 93 pts. Exhibitor: Bayard Saraduke; Photographer: Bayard Saraduke. Mid-Atlantic Judging
- [8] *Coelogyne septemcostata* 'Irene' AM/AOS 80 pts. Exhibitor: Al and Irene Messina; Photographer: Maurice Garvey. Northeast Judging
- [9] *Dendrobium militare* 'Irene' CHM/AOS 82 pts. Exhibitor: Al and Irene Messina; Photographer: Teck Hia. Northeast Judging
- [10] *Collabium chinense* 'Irene' CHM/AOS 83 pts. Exhibitor: Al and Irene Messina; Photographer: Maurice Garvey. Northeast Judging
- [11] *Cylindrolobus aporoides* 'Irene' CBR/AOS 0 pts. Exhibitor: Al and Irene Messina; Photographer: Teck Hia. Northeast Judging
- [12] *Cattleya praestans* 'Black Beauty' HCC/AOS 77 pts. Exhibitor: Amy and Ken Jacobsen; Photographer: Ken Jacobsen. Pacific Central Judging
- [13] *Cyrtorchilum zebrinum* 'Casuka' CCM/AOS 87 pts. Exhibitor: Masaki Asuka; Photographer: Ken Jacobsen. Pacific Central Judging
- [14] *Paphiopedilum* Catherine Briois 'Austin Creek Orchids' HCC/AOS (*delenatii* x *godefroyae*) 79 pts. Exhibitor: Dale Martin; Photographer: Ken Jacobsen. Pacific Central Judging
- [15] *Phragmipedium* QF Ula'ula 'Buck Moon' HCC/AOS (Haley Decker x Eric Young) 78 pts. Exhibitor: John McCallen; Photographer: Ken Jacobsen. Pacific Central Judging
- [16] *Centroglossa macroceras* 'Kyung Ran' CCM/AOS 85 pts. Exhibitor: Ron Parsons; Photographer: Ken Jacobsen. Pacific Central Judging





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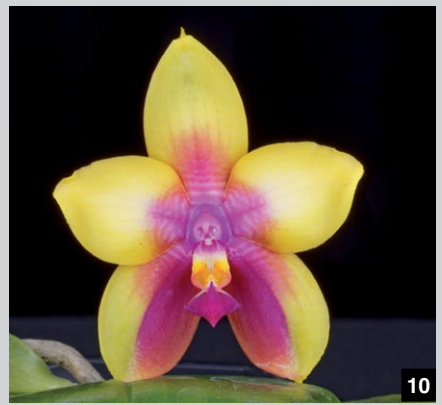
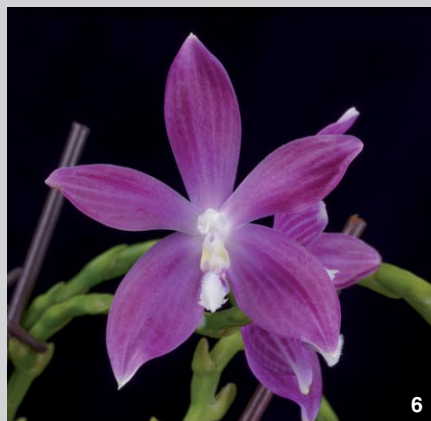


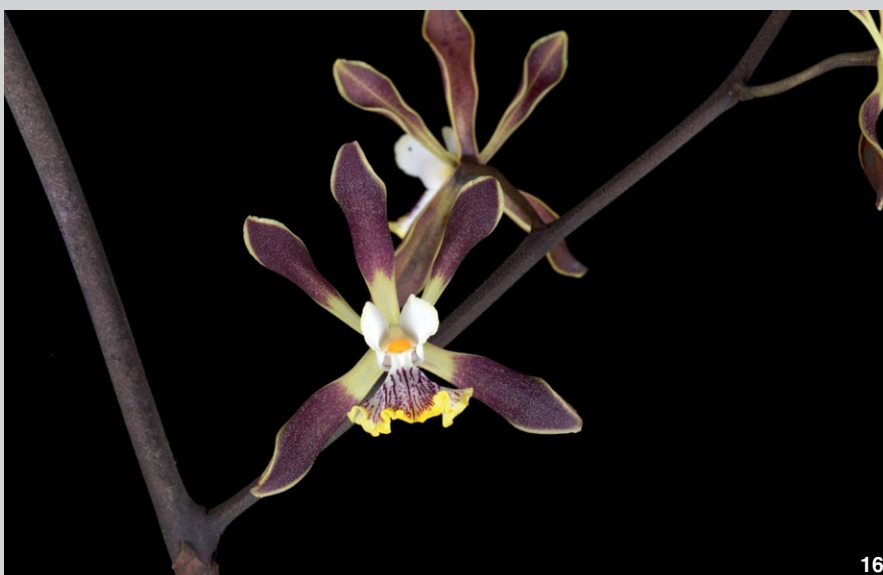
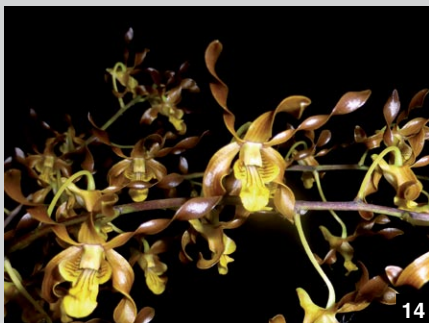
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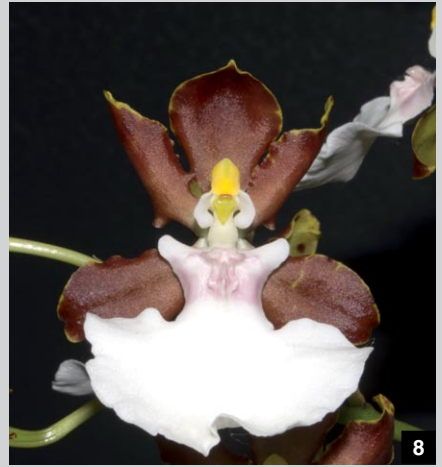
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- [1] *Habenaria erichmichelii* 'Kalkaska' HCC/AOS 76 pts. Exhibitor: James Heilig; photographer: Chaunie Langland. Pacific Central Judging
- [2] *Cattleya* Mareeba Tiger 'Birthday Gift' HCC/AOS (*tigrina* x *schilleriana*) 79 pts. Exhibitor: Donna Ballard; photographer: Arthur Pinkers. Pacific South Judging
- [3] *Cattleya* Gaudii 'Kathleen' AM/AOS (*loddigesii* x *tigrina*) 84 pts. Exhibitor: Alex Nadzan; photographer: Arnold Gum. Pacific South Judging
- [4] *Cattleya* Exeter Beauty 'Blue Tiger' HCC/AOS (*purpurata* x *Pulcherrima* (1898)) 77 pts. Exhibitor: Amy and Ken Jacobsen; photographer: Chaunie Langland. Pacific Central Judging
- [5] *Aganisia cyanea* 'Rachel's Blue' HCC/AOS 78 pts. Exhibitor: Rachel Burns; photographer: Arnold Gum. Pacific South Judging
- [6] *Coryanthes macrantha* 'RoEm' HCC/AOS 77 pts. Exhibitor: Mary Bui-Pham; photographer: Chaunie Langland. Pacific Central Judging
- [7] *Cattleya purpurata* 'Hot Enough' HCC/AOS 78 pts. Exhibitor: Amy and Ken Jacobsen; photographer: Chaunie Langland. Pacific Central Judging
- [8] *Thunia Gattonensis* 'Jillian' HCC/AOS (*majorensis* x *winniana*) 77 pts. Exhibitor: David Morris; photographer: Ross Leach. Pacific Northwest Judging
- [9] *Cattleya tenebrosa* 'Bronze Belle' HCC/AOS 78 pts. Exhibitor: Amy and Ken Jacobsen; photographer: Chaunie Langland. Pacific Central Judging
- [10] *Paphiopedilum lowii* 'Verdigris Ice' AM/AOS 82 pts. Exhibitor: Michael Tibbs; photographer: Arnold Gum. Pacific South Judging
- [11] *Dendrobium* Yellow Stars 'Honey Bugs' CCE-AM/AOS (*polysema* x *finisterrae*) 92-84 pts. Exhibitor: Steve Sanders; photographer: Ross Leach. Pacific Northwest Judging
- [12] *Phalaenopsis* KS Pulchell 'Peloric' JC/AOS (*pulcherrima* x *bellina*). Exhibitor: Norman's Orchids; photographer: Arnold Gum. Pacific South Judging
- [13] *Encyclia adenocaula* 'Paradox' AM/AOS 85 pts. Exhibitor: Paul and Ann Tuskes; photographer: Arnold Gum. Pacific South Judging
- [14] *Phalaenopsis pulcherrima* (Champonensis) 'Rainbow' AM/AOS 80 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [15] *Promenaea ovatiloba* 'Lana Banana' AM/AOS 80 pts. Exhibitor: Rachel Burns; photographer: Arnold Gum. Pacific South Judging
- [16] *Tolumnia* Pine Hollow 'Lue's Red' AM/AOS (Sunset Reef x Maple Dancer) 80 pts. Exhibitor: Alex Nadzan; photographer: Arnold Gum. Pacific South Judging





- [1] *Paphiopedilum* Lady Mirabel 'Eureka' CCM/AOS (Transvaal x *stonei*) 84 pts. Exhibitor: Thornton Conservatory; photographer: Arthur Pinkers. Pacific South Judging
- [2] *Phalaenopsis tetraspis* f. *livida* 'Norman's Blue' FCC-CHM/AOS 90-88 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [3] *Vanda falcata* 'Jelly Bean' CCE/AOS 90 pts. Exhibitor: Peter T. Lin; photographer: Arthur Pinkers. Pacific South Judging
- [4] *Catasetum* Ten Dragons 'Julio David' AM/AOS (Dragon's Teeth x *tenebrosium*) 80 pts. Exhibitor: Julio David Rios; photographer: Irma Saldaña. Puerto Rico Judging
- [5] *Phalaenopsis* Mituo Bellina 'Montclair' AM/AOS (Mituo Peoker x *bellina*) 83 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [6] *Phalaenopsis tetraspis* 'Jamie Fang' AM/AOS 82 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [7] *Phalaenopsis* Helen Ng 'Joy' HCC/AOS (Coral Isles x *violacea*) 76 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [8] *Phalaenopsis* Chienlung Happy Queen 'Jamie' AM/AOS (KS Happy Eagle x LD's Bear Queen) 84 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [9] *Phalaenopsis* Chienlung Happy Queen 'Eric' AM/AOS (KS Happy Eagle x LD's Bear Queen) 83 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [10] *Phalaenopsis* Chienlung Happy Queen 'Norman' AM/AOS (KS Happy Eagle x LD's Bear Queen) 83 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [11] *Catasetum* Greg Scott 'Golden Black Cherry Cola' AM/AOS (Donna Wise x *pileatum*) 84 pts. Exhibitor: Thornton Conservatory; photographer: Arthur Pinkers. Pacific South Judging
- [12] *Phalaenopsis* Chienlung Happy Queen '(KS Happy Eagle 'Montclair Jade' x LD's Bear Queen 'FANGtastic') AQ/AOS. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [13] *Paphiopedilum lowii* 'Norman's Jade' HCC/AOS 79 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [14] *Dendrobium* Touch of Gold 'Fco Valentina' AM/AOS (*gouldii* x *johannis*) 81 pts. Exhibitor: Francisco Martinez Rivera; photographer: Irma Saldaña. Puerto Rico Judging
- [15] *Lycaste fuscina* 'Daughter of Dionysus' CCE-HCC/AOS 90-79 pts. Exhibitor: Thornton Conservatory; photographer: Arthur Pinkers. Pacific South Judging
- [16] *Encyclia* Renate Schmidt 'Maroon Starburst' AM/AOS (Orchid Jungle x *alata*) 81 pts. Exhibitor: Ruben Colmenares; photographer: Arthur Pinkers. Pacific South Judging





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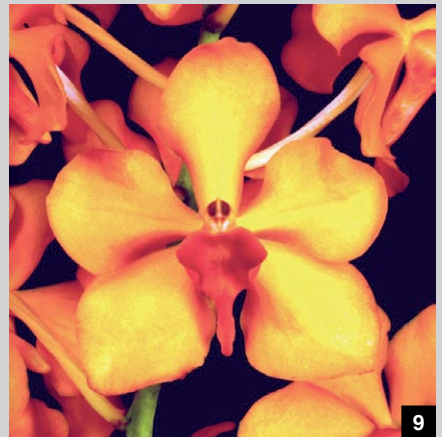
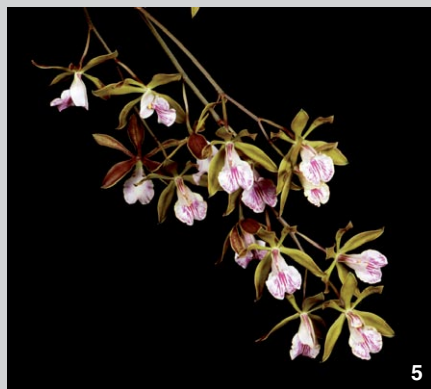


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- [1] *Phragmipedium* Alejandro Teson 'Julia Katherine' HCC/AOS (*pearcei* x *andreetae*) 78 pts. Exhibitor: Eron Borne; photographer: Wilton Guillory. Shreveport Judging
- [2] *Stanhopea saccata* 'Dude' AM/AOS 85 pts. Exhibitor: Mary Mancini; photographer: Wilton Guillory. Shreveport Judging
- [3] *Phragmipedium* Joan Montmorency 'Charlotte' AM/AOS (Praying Mantis x Coral Jewel) 84 pts. Exhibitor: Joe Chow; photographer: Alexey Tretyakov. Western Canada Judging
- [4] *Phalaenopsis* Jungo Amber 'Bob' CCM/AOS (Sogo Hollywood x *amboinensis*) 80 pts. Exhibitor: Pat Van Adrichem; photographer: Alexey Tretyakov. Western Canada Judging
- [5] *Catasetum* Nicole Smile 'B-C' HCC/AOS (Portagee Star x Louise Clarke) 79 pts. Exhibitor: B. Butts- C. Lefave; photographer: Ed Cott. Toronto Judging
- [6] *Calanthe rosea* 'Orquivalle' AM/AOS 86 pts. Exhibitor: Andrea Niessen; photographer: Juan Carlos Uribe. West Palm Beach Judging
- [7] *Catasetum* B-C Catherine 'Southwell' HCC/AOS (Jessie Ang x Christine Chowning) 75 pts. Exhibitor: B. Butts- C. Lefave; photographer: Ed Cott. Toronto Judging
- [8] *Trichocentrum* Maui Gold 'Jardin botanique de Montréal' AM/AOS (Florida Gold x *lanceanum*) 83 pts. Exhibitor: Jardin botanique de Montréal; photographer: Thang Dam. Toronto Judging
- [9] *Phalaenopsis* CTL Cornu Queen 'Purple Haze' AM/AOS (*cornu-cervi* x LD's Bear Queen) 80 pts. Exhibitor: Pat Van Adrichem; photographer: Alexey Tretyakov. Western Canada Judging
- [10] *Paphiopedilum dianthum* 'Louisiana' HCC/AOS 79 pts. Exhibitor: Al Taylor; photographer: Wilton Guillory. Shreveport Judging
- [11] *Schoenorchis fragrans* 'Jardin botanique de Montréal' CCM/AOS 84 pts. Exhibitor: Jardin botanique de Montréal; photographer: Thang Dam. Toronto Judging
- [12] *Dendrobium lineale* 'Orquivalle' CCM/AOS 86 pts. Exhibitor: Orquideas Del Valle; photographer: Juan Carlos Uribe. West Palm Beach Judging
- [13] *Phragmipedium* Manzur La Aldea Caricias 'Manzur' AM/AOS (Manzur la Aldea x *schlimii* var. *manzurii*) 82 pts. Exhibitor: David Manzur; photographer: Juan Carlos Uribe. West Palm Beach Judging
- [14] *Anguloa cliffonii* 'San Isidro' AM/AOS 85 pts. Exhibitor: Daniel Piedrahita; photographer: Juan Carlos Uribe. West Palm Beach Judging
- [15] *Neomoorea wallisii* 'Memoria Rodrigo Mejia' AM/AOS 86 pts. Exhibitor: Esperanza Mejia; photographer: Juan Carlos Uribe. West Palm Beach Judging
- [16] *Masdevallia* Highland Monarch 'Salome' AM/AOS (Highland Fling x Monarch) 84 pts. Exhibitor: Luis Herrera and Martha Cecilia Oliveros; photographer: Juan Carlos Uribe. West Palm Beach Judging





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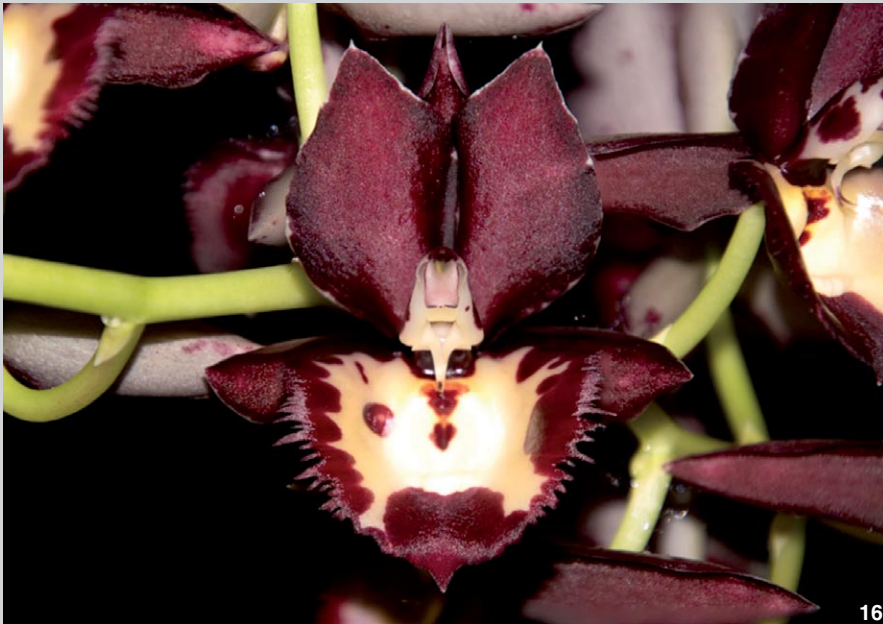
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- [1] *Rhynchodenia* Magic Wand 'Crownfox Innocence' AM/AOS (*Rhynchostylis coelestis* x *Seidenfadenia mitrata*) 80 pts. Exhibitor: R. F. Orchids, Inc.; photographer: Tom Kuligowski. West Palm Beach Judging
- [2] *Paphiopedilum niveum* 'PbR' CCE/AOS 91 pts. Exhibitor: Ross Hella; photographer: Nile Dusdieker. Chicago Judging
- [3] *Vanda* Thai Spots 'Brayden Koester' AM/AOS (Jiraprapa x Suksamran Spots) 84 pts. Exhibitor: Anthony Nuccio; photographer: Nile Dusdieker. Chicago Judging
- [4] *Chuanyenara* Sompol 'Zebra' AM/AOS (*Aranthera* Ubol x *Rhynchostylis gigantea*) 84 pts. Exhibitor: R. F. Orchids, Inc.; photographer: Tom Kuligowski. West Palm Beach Judging
- [5] *Encyclia* x *camagueyensis* 'Jim Roberts' CHM/AOS (*altissima* x *phoenicea*) 83 pts. Exhibitor: Wayne T. Green; photographer: Tom Kuligowski. West Palm Beach Judging
- [6] *Paphiopedilum* Temptation 'Curly Wafflebait' AM/AOS (*kolopakingsii* x *philippinense*) 83 pts. Exhibitor: Shea Johns; photographer: Arthur Pinkers. Pacific South Judging
- [7] *Vanda* Memoria Jim Solly 'Alexis' AM/AOS (Yarnisa Gold x Bangkhuntian Gold) 84 pts. Exhibitor: R. F. Orchids, Inc.; photographer: Tom Kuligowski. West Palm Beach Judging
- [8] *Vanda* M. V. Tannins 'Starburst' AM/AOS (*lamellata* x Memoria Thianchai) 80 pts. Exhibitor: R. F. Orchids, Inc.; photographer: Tom Kuligowski. West Palm Beach Judging
- [9] *Papilionanda* Ambrosian Twinkle 'Madeline' AM/AOS (Josephine van Brero x *Vanda miniata*) 80 pts. Exhibitor: Wayne T. Green; photographer: Tom Kuligowski. West Palm Beach Judging
- [10] *Aeranthes orthopoda* 'Rodco Green Monster' HCC/AOS 79 pts. Exhibitor: Carson Barnes; photographer: Jason R. Mills. Atlanta Judging
- [11] *Rhynchostylis coelestis* var. *coerulea* 'Redland Sky' AM/AOS 82 pts. Exhibitor: R. F. Orchids, Inc.; photographer: Tom Kuligowski. West Palm Beach Judging
- [12] *Papilionanda* Kyra Green 'Minghus' AM/AOS (*Vanda* Lamennea x Mimi Palmer) 80 pts. Exhibitor: Wayne T. Green; photographer: Tom Kuligowski. West Palm Beach Judging
- [13] *Aerides* Dottie's Delight 'Crownfox' AM/AOS (*crassifolia* x *rosea*) 81 pts. Exhibitor: R. F. Orchids, Inc.; photographer: Tom Kuligowski. West Palm Beach Judging
- [14] *Papilionanda* Chao Praya Sunshine 'Charlie' HCC/AOS (Mamo x *Vanda* Doctor Anek) 78 pts. Exhibitor: Wayne T. Green; photographer: Tom Kuligowski. West Palm Beach Judging
- [15] *Gastrorchis humblotii* 'Missy's Rose Nimbus' HCC/AOS 77 pts. Exhibitor: Carson Barnes; photographer: Jason R. Mills. Atlanta Judging
- [16] *Catasetum* Diana's Dots 'Yosemite Sam' AM/AOS (Orchidglade x *tigrinum*) 80 pts. Exhibitor: Robert Hydzik; photographer: James Curtis. Carolinas Judging

LINDLEYANA

Two New Species of Sudamerlycaste (Orchidaceae: Maxillarinae) from Southwestern Ecuador

José Portilla, Hugo Medina and Iván Portilla



ABSTRACT Two new species are described based on material collected under the research permit “Rescate, conservación, reproducción y manejo ex situ de la flora del Ecuador,” authorization No. 027-19 IC-FLO-FAU-DNB/MA, Ministerio del Ambiente in accordance to the Acuerdo Interministerial SENESCYT-MAE No. 001 2019, issued to Ecuagenera Cia. Ltda. *Sudamerlycaste alexportillae* and *Sudamerlycaste ecuadorensis* from the provinces of Morona-Santiago and Zamora-Chinchipec, Ecuador, are described, illustrated and compared to *Sudamerlycaste fulvescens* (Hook). Archila. and *Sudamerlycaste lata* (Rolfe). Archila., respectively.

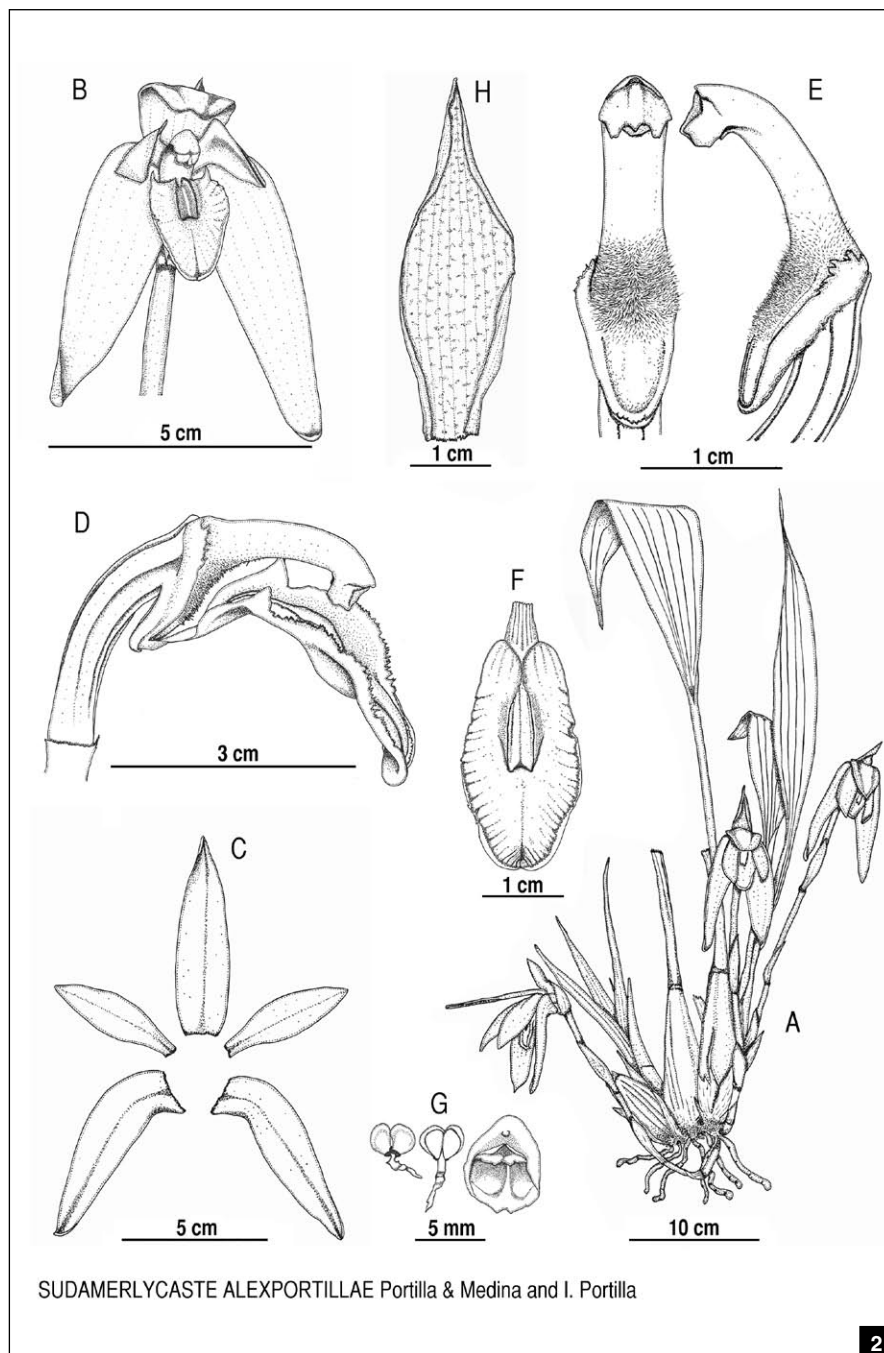
KEYWORDS Ecuador, Maxillariinae, New Species, *Sudamerlycaste alexportillae*, *Sudamerlycaste ecuadorensis*.

INTRODUCTION

The genus *Lycaste* s.s. is mainly restricted to Central America with just a few species occurring in South America (ABO). The species of *Lycaste* found in Ecuador are part of the *macrophylla* group including: *Lycaste macrophylla* subsp. *litensis* Poepp. and Endl., reported from northwestern Ecuador, *Lycaste macrophylla* subsp. *macrophylla* Poepp has been reported in southeast Ecuador, *L. xytriophora* Linden and Rchb. f., reported from west-central Ecuador, *Lycaste fuscina* Oakeley, described from the collection of the late Father Angel Andretta and *Lycaste oculata* Oakeley, reported from east-central Ecuador. The new species described here were found in the southeast of Ecuador, and easily recognized as belonging to *Sudamerlycaste* based on the morphological characteristics.

The genus *Sudamerlycaste* Archila has a complicated nomenclatural history. It was originally attributed to *Lycaste* Lindl. and segregated by Archila (2002) based on a phylogenetic analysis in order to accommodate species of *Lycaste* distributed throughout the Caribbean and South America formerly attributed to the *nomen nudum* *Lycaste* sect. *Fimbriatae* Fowlie. A year later, Oakeley and Ryan (2003) published the superfluous *Ida* based on morphological characteristics. However, *Sudamerlycaste*, published a year earlier takes priority.

Vegetatively, the plants are quite distinctive from *Lycaste*. The plants of some species of *Sudamerlycaste* are fire adapted and can regenerate quickly after the pseudobulbs have been burnt, (Oakeley and Ryan 2008) and the inflorescences of some species such as



SUDAMERLYCASTE ALEXPORTILLAE Portilla & Medina and I. Portilla

Sudamerlycaste costata can measure up to a meter in length. The pseudobulbs are also distinctive in lacking spines and retaining the leaves for up to three years (Oakeley 2003).

TAXONOMY

Sudamerlycaste alexportillae J.Portilla, H.Medina and I.Portilla *sp. nov.*

TYPE ECUADOR. Morona-Santiago: Comunidad La Chontilla, in front of the Daniel Palacios Dam, 2°35'36.03"S 78°33'02.08"O, 2700 m, flowered in cultivation at Ecuagenera, Gualaceo, October 2019, *J.Portilla 0280* (holotype: HA).

DIAGNOSIS *Species novae similis*

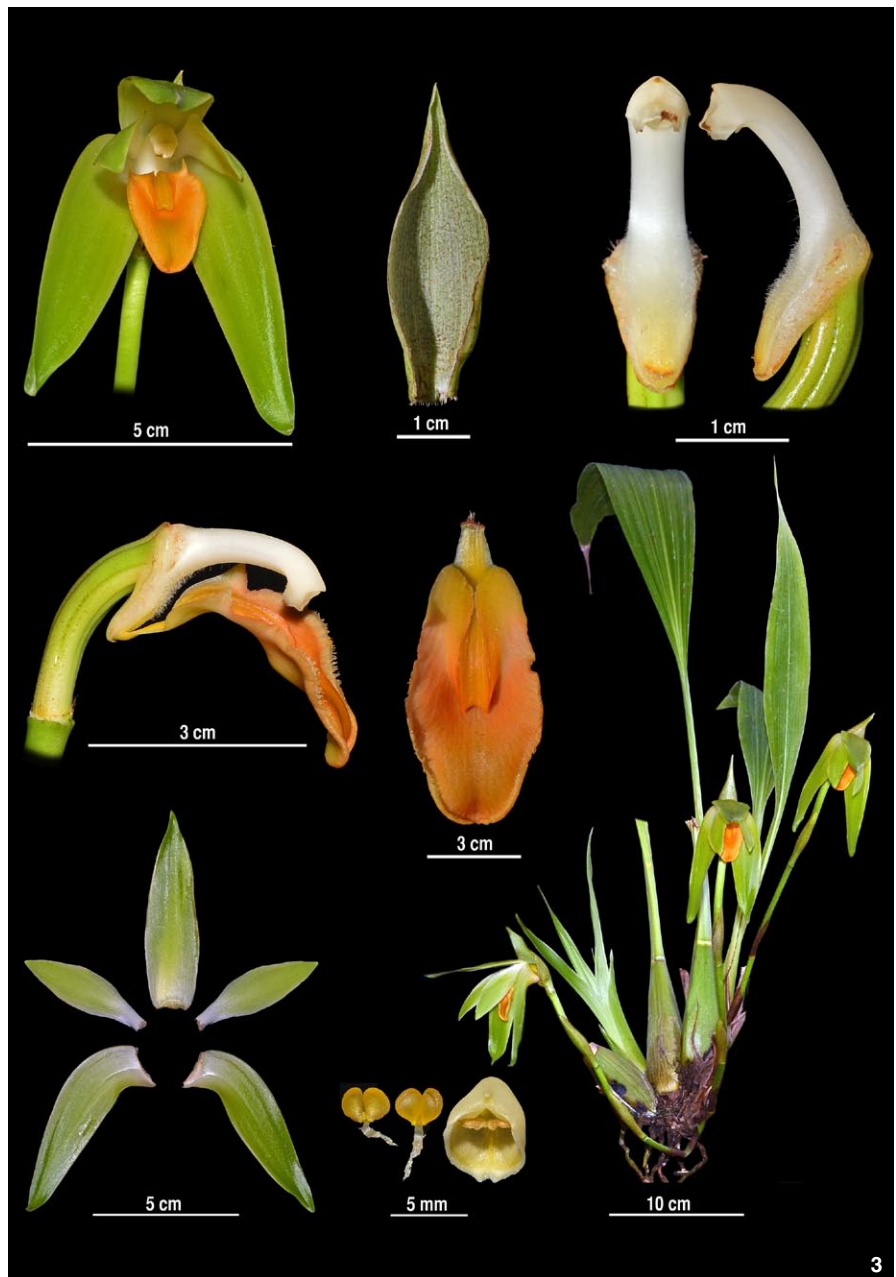
[1] *Sudamerlycaste alexportillae* photographed from the front clearly illustrating the lip side lobes and crest and from the side illustrating the relative size of the floral bract and ovary. Photographes by Hugo Medina.

[2] *Sudamerlycaste alexportillae* J.Portilla et al. A. Habit. B. Flower. C. Perianth dissected. D. Column and lip side view. E. Column lateral and front view, F. view lip. G. Layer of the anther and pollinaria (two views), H. Bract covering the ovary, front view. Illustration of the plant that served as holotype, by Hugo Medina.

est *Sudamerlycaste fulvescens* (Hook.) Archila., non differat, sed maxime in ellipticis labrum. Denique cum notorie lobis anguste committitur callum basi leviter fimbriated vs. labro lobis lanceolatis magna margine late patentibus dense callum fimbriado astricta basi. Columna plus minus elongatis angustis leviter ventriculo facial; petalis rectam nobis leviter concava foliis margine deflexus concavus leviter retrorsum; bractee late in covering ovarium excedit magnitudine, vs. inflorescentiae magnitudinem ovarium.

DESCRIPTION Plants epiphytic or terrestrial, up to 94 cm tall; roots grayish in color, up to 30.0 cm long, 0.2 cm in diameter; pseudobulbs cylindrical, elliptical, obtuse-truncate at the base, lightly corrugated, 6.0–10.0 cm long, 2.7–4.5 cm in diameter, enveloped by six, imbricating sheaths, 7.5–10.5 cm long, 2.4–4.8 cm wide; leaves two, olive green, glabrous, apical, plicate, acuminate apex, coriaceous, attenuate-cuneate base, 72.0–80.0 cm long, 5.9–7.0 cm wide; inflorescence basal, erect, solitary flower produced by mature pseudobulbs; peduncle terete, 18.0–22.0 cm long, 0.5 cm in diameter, enveloped by four, lanceolate, acuminate bracts with a truncate base at each node, 4.2 cm long, 2.4 cm wide; the flower resupinate, semi-open, without a detectable fragrance, the sepals and petals green becoming whitish towards their base, the lip orange, subtended by a dark green and lanceolate bract covering the ovary, 3.8–8.5 cm in diameter; ovary dark green, terete, six-sulcate, arcuate, 2.5 cm long, 0.5 cm wide, dorsal sepal elliptic-acuminate, becoming concave towards the acute apex, arcuate, glabrous, 6.8 cm long, 1.8 cm wide; lateral sepals elliptical-falcate, concave and acuminate apex, 6.5 cm long, 1.9 cm wide; petals elliptical-spatulate, acute, slightly arcuate, 4.7 cm long, 1.4 cm wide; lip sulcate, elliptical, obtuse, deflexed, unguiculate, minutely fimbriate, the disc with a bidentate callus above two keels merging into two retrorse lobes near the base, 1.6 cm long, 0.5 cm wide, the foot 0.5 cm long, 0.2 cm wide; column arcuate, white, glabrous at the apex, 1.8 cm long, 0.4 cm wide, column-foot pubescent, 1.3 cm long, 0.8 cm wide, stigma an oval cavity, 1.0 cm wide, anther cap cucullate and divided into two cells, pollinia yellow, four in two pairs each united by a stipe, 0.2 cm long, 0.1 cm wide. Fruit unknown.

EPONYMY Named to honor Alexander (Alex) Portilla of Ecuador



who participated in the collection of this species. Alex is the nephew of José Portilla, founder and President of Ecuagenera Cía. Ltda.

DISTRIBUTION *Sudamerlycaste alexportillae* is distributed in eastern Ecuador on the border with the Andean region in the province of Morona-Santiago, La Chontilla community, 2,700 m., January 2017, *J. Portilla 0280* (HA).

PHENOLOGY Plants flower sporadically between March and October.

HABITAT AND ECOLOGY Plants grow as epiphytes in primary cloud forests, and occasionally as terrestrials in exposed areas around 2,700 m.

DISCUSSION: The new species is similar to *Sudamerlycaste fulvescens*

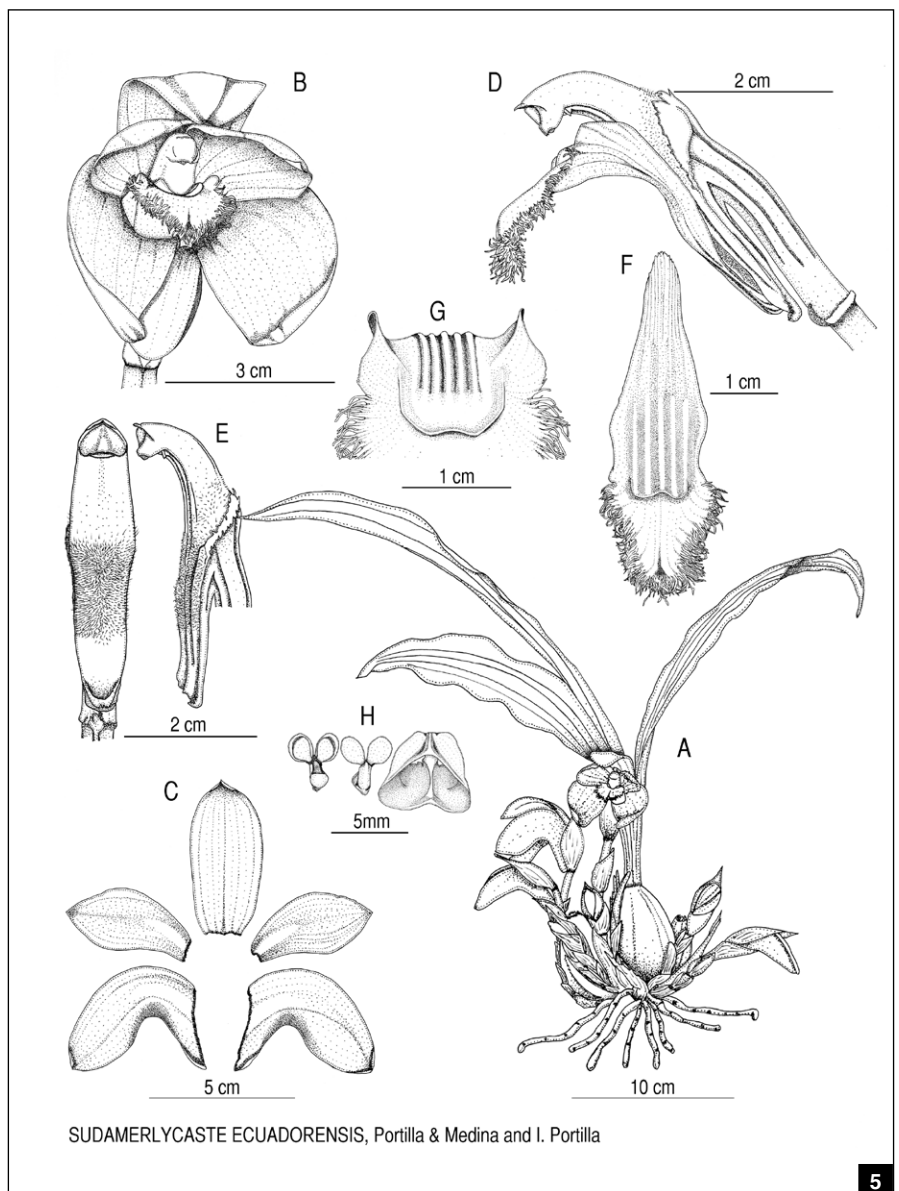
- [3] *Sudamerlycaste alexportillae*, prepared sheet of the plant that served as holotype, by Hugo Medina.
- [4] *Sudamerlycaste ecuadorensis*, photographed by Hugo Medina.
- [5] *Sudamerlycaste ecuadorensis* J.Portilla et al. A. Habit. B. Flower. C. Perianth dissected. D. Column and lip side view. E. Column lateral and front view, F. view lip. G. Lip callus approach, H. Layer of the anther and polinaria (two views). Illustration of the plant that served as holotype, by Hugo Medina.

(Hook.) Archila., but can be distinguished by the elliptic lip with shorter lobes, slightly fimbriate margin, a long callus that meets at the base vs. lanceolate lip with large lobes, long fimbriate margin, with an open callus that does not meet at the base. The column is shortly pubescent and short and narrow vs. longer pubescence and broader. The petals are slightly concave with a straight margin vs. slightly concave with a deflexed margin. The bract that covers the ovary is much larger than the ovary vs. the same size as the ovary.

Sudamerlycaste ecuadorensis, J.Portilla, H.Medina and I.Portilla sp. nov. Type: ECUADOR. Zamora-Chinchi: Cantón El Panguí, J. Portilla 0280 (holotype: HA).

DIAGNOSIS *Species novae similis est Sudamerlycaste lata* (Rolfe). *Archila.*, non differat, sed viridis cum flores et alia cocta tetrum odorem spirant vs. *floribus albis foliis viridibus labium olet; lobis elongatis conspicue labium maior villi cavum vs. labro lobis brevioribus dense pilosum paulo brevioribus; tam brevibus albidis longa tegitur vs. magnitudine excedit eum viridis tegit ovarium bractea; plant sphaerae igitur ellipticis lanceolatis acuminatis vs. plant ovovados pseudobulbos longa linearibus.*

DESCRIPTION Plants epiphytic or terrestrial, up to 46 cm tall; roots whitish in color, pubescent, up to 25.0 cm long, 0.2–0.3 cm in diameter; pseudobulbs cylindrical, shiny, 6.5 cm long, 5 cm in diameter, enveloped by four, imbricating sheaths, 4.8 cm long, 1.4 cm wide; leaves up to three, green, glabrous, apical, lanceolate, plicate, acuminate apex, keeled with four well defined nerves on the abaxial surface, 27.0–41.2 cm long, 6.9–9.0 cm wide; inflorescence a solitary flower, basal, erect, generally appearing on mature pseudobulbs, 9.5 cm long, 0.4 cm in diameter with four nodes and enveloped by a lanceolate, acuminate bracts with a truncate base, 2.5–5.2 cm long, 1.2–2.8 cm wide; the flower resupinate, semi-open, with an unpleasant odor, the sepals and petals green, the lip green becoming whitish towards the base, subtended by a dark green and lanceolate bract covering the ovary, 4.0 cm wide; ovary dark green, terete, six-sulcate, arcuate, 3.5 cm long, 0.6 cm wide, covered by an inflated bract; dorsal sepal oblong-elliptic, green, semiconcave, truncate at the base, arcuate, glabrous, 6 cm long, 2.4 cm wide; sepals falcate, concave, acuminate at the apex, truncate at the base, 5.4 cm long, 2.5 cm wide; petals green,



SUDAMERLYCASTE ECUADORENSIS, Portilla & Medina and I. Portilla

elliptic, acuminate at the apex, truncate at the base, glabrous, 4.2 cm long, 2.3 cm wide; lip arcuate, angled, fimbriate, with a minute nectar spur at the point of connection to the column foot, from the disc 5.2 cm long, 1.7 cm wide, from the disc to the apex forming a heart with a fimbriate margin, emarginate and folded back at the apex with glabrous lobes, 0.3 cm diameter, with a prominent callus at the apex, 0.1 cm long, 0.8 cm wide, with three smooth keels; column arcuate, white, glabrous at the apex, 5.4 cm long, 0.8 cm wide, column-foot minutely pubescent, stigma an oval cavity, 0.4–0.6 cm wide, anther white, 0.5–0.6 cm, anther cap cucullate with a protuberance that presumably separates the pollinia, pollinia yellow, four, 0.1–0.2 cm wide, in two pairs each united by a rhomboid, transparent stipe, 0.15 cm wide. Fruit unknown.

ETYMOLOGY Named to honor Ecuador, the country where it was discovered.

DISTRIBUTION *Sudamerlycaste ecuadorensis* is distributed in a south eastern Ecuador in Zamora-Chinchipec, Cantón El Pangui, road to San Antonio, 3°35'16.40"S 78°37'23.66"O, 1360 m., 2019, *J. Portilla 0161* (HA).

CONSERVATION STATUS The species was pollinated and reproduced artificially by Ecuagenera supporting its ex situ conservation.

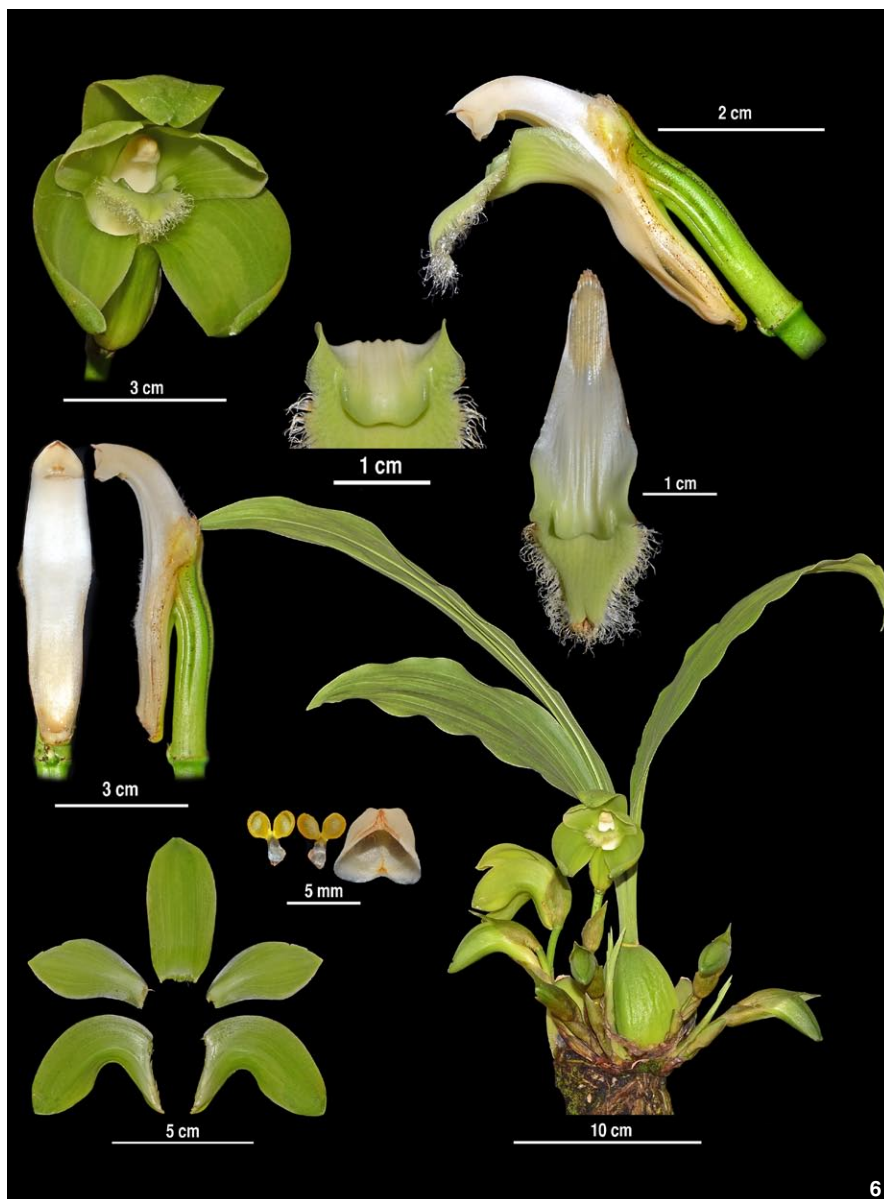
PHENOLOGY Plants flower sporadically between March and October.

HABITAT AND ECOLOGY The new species grows as an epiphyte in primary cloud forests. Occasionally on exposed sites and also as a terrestrial on slopes among short vegetation around 1,360 m.

DISCUSSION The new species is most similar to the *Sudamerlycaste lata* (Rolfe). Archila, but has green flowers and an unpleasant smell rather than greenish white flowers with a white lip lacking a detectable odor. *Sudamerlycaste lata* can further be distinguished by the lip with shorter lobes and shorter, denser hair, and the whitish ovary covered by a shorter bract. Vegetatively, *Sud. lata* can be distinguished by the lanceolate pseudobulbs and elliptic-acuminate leaves vs. oval pseudobulbs and lanceolate-acuminate leaves.

References

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 Ministerio del Ambiente (MAE). 2019. No. 027-19 IC-FLO-FAU-DNB/MA del Ministerio del Ambiente



[6] *Sudamerlycaste ecuadorensis*, prepared sheet of the plant that served as holotype, by Hugo Medina.

en uso de las atribuciones que le confiere el Acuerdo Interministerial SENESCYT-MAE No. 001, Para el Rescate, conservación, reproducción y manejo Ex Situ de la Flora del Ecuador. Documento Oficial. Sin Publicación. Quito – Ecuador.
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— José (Pepe) Portilla is the CEO, founder and President of Ecuagenera CIA Ltda. and the current president of the Azuay Orchid Society. Pepe, as most people know him, has dedicated his life to research and conservation of Ecuador's natural richness. Ecuagenera, a family-owned company in business more than 27 years, leads South America in research, conservation and propagation of species and new hybrids that are exported worldwide (email: pepe@ecuagenera.com).

Iván Portilla, Pepe's brother, is Vice-President of Ecuagenera and in charge of orchid shows worldwide (email: ivan@ecuagenera.com) and Hugo Medina is a research assistant and has described numerous new Ecuadorian orchid species (email: producciongye@ecuagenera.com).

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MARCH

5-7—Martin County Orchid Society's "Orchid Sock Hop," Martin Country Fairgrounds, Building G, 2616 SE Dixie Hwy, Stuart, FL. Contact: Debbie Wilson; 561-351-1515, daveanddebwilson@hotmail.com

6-7—Tampa Bay Orchid Society's "Orchids — A Continuing Education," Tampa Scottish Rite Center, 5500 Memorial Highway, Tampa, FL. Contact: Eileen Hector; 813-368-7353, tampabayorchidsociety@verizon.net

20-20—Jacksonville Orchid Society Show, Mandarin Garden Club, 2892 Loretto Rd., Jacksonville, FL. Contact: Lorraine Conover; 561-320-6010, lorrainesorchids@gmail.com

27-28—Nature Coast Orchid Society Spring Show, VFW Post 8681, 18940 Drayton St., Spring Hill, FL. Contact: Steve Mattana; 218-556-1895, stevemattana123@gmail.com

APRIL

3-4—Flamingo Gardens Orchid Society Show, Flamingo Gardens, 3750 S Flamingo Rd., Davie, FL. Contact: Jan Amador; 954-347-2738, jbamador@bellsouth.net

10-11—Desert Valley Orchid Society Show, Berridge Nurseries, 4647 E Camelback Rd, Phoenix, AZ. Contact: Gloria Zemla; 480-216-5883, zemizz@cox.net



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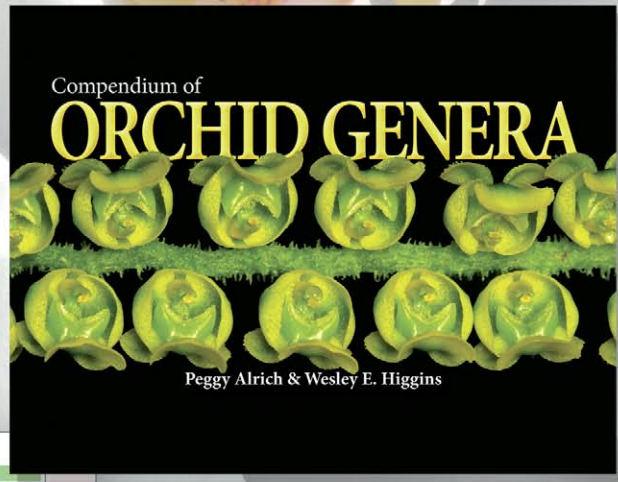
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Angraecum Bey
 Type: *Angraecum sesquipedale* (L.) Sw. (1801).
 Epiphytic orchid. *Angraecum sesquipedale* (L.) Sw. (1801).
ETYMOLOGY: From the Latinized form of the Malay word (*Angrak* or *Angrok*) for the epiphytic orchid that resembles *Aerolis* and binds its habit. The name *Angraecum* was given by George Eberhard Rumphius (1626-1702), who coined it from the word *Angrak*, a name or title given by the Malays to "parasitical" plants, the meaning of which has not been discovered. From Engelbert Kaempfer (1685-1716) we learn that *Angrak* or *Angrok* is also the name used by the Javanese for these plants.
GENETICS: *Angraecum obscurum* Bey
 Illustration: *Angraecum sesquipedale*

More than two hundred twenty-one, very small to very large monopodial epiphytes, a few lithophytes or rare terrestrial have a wide range of distribution in humid, low to mid elevation, coastal to hill scrub, savanna to montane evergreen forests of mainly tropical Africa (Guinea to Somalia, Gabon to Zimbabwe and South Africa), Madagascar, Mauritius to Réunion, although one species is found as far away as the Seychelles and Sri Lanka. These miniature to large, rambling to clump-forming, warm to cool growing plants are vegetatively and florally quite diverse. The short to long, sometimes branched stems are leafy throughout with fleshy to leathery, channelled, unequally bilobed, usually distichous leaves. The one to several, short to long, solitary to few-flowered inflorescences have long-lasting, small to large flowers in shades of white, ivory or green with sepals and petals free, usually spreading. The flowers are noted for their spurs of widely varying lengths from quite long to short. The flowers have a thick, almost leathery texture, an exceptionally long flowering period, and an extraordinarily heavy nocturnal fragrance (usually within the long-spurred species) and the lip is larger than the other segments. The shell or boat-shaped, simple or obscurely lobed lip is usually quite concave, its base more or less encloses the column, and it has a central callus. The flowers have a very short, footless column with deeply divided lobes.
Pollinia 2, waxy, each attached to its own narrow or elliptic viscidium. **Culture:** Growing conditions and habitat options vary widely from species to species. Generally they do best mounted on a firm slab with good drainage and most of the species benefit from a resting period of reduced watering. Provide intermediate conditions, bright to diffused light, high humidity and good air movement.

Valid Angraecum Synonyms

Aerobion Kuntze ex Sprengel
 Syn. *Usp.* (Sprengel), ed. 16, 8:479 & 716 (1826).
 Ermozeop: Greek for air and life, referring to the epiphytic habit of the plants.
 Lectotype: *Aerobion asperifolium* (Thunberg) Sprengel (*Angraecum asperifolium* Thunberg) designated by C. G. Hill, 2003 (2007).
 Now recognized as belonging to the genus *Angraecum*, *Aerobion* was previously considered to include twenty-four epiphytes found in warm, mid elevation, montane forests of Madagascar and the Mascarene Islands.

Angraecoides (Candolle) Schachler, Mytnik & Goodrich
 Biodivers. Res. Conservation, 29: 11 (2013).
 Ermozeop: *Angraecum*, a genus of orchids, and Greek for likeness or form. Refers to a similarity to *Angraecum*.
Two Species: *Angraecoides pinguis* (Sprengel) Schachler, Mytnik & Goodrich (*Angraecum pingue* Sprengel).
 Now recognized as belonging to the genus *Angraecum*, *Angraecoides* was previously considered to include twenty-five epiphytes found in cool, mid elevation, hill scrub and montane forests in northwestern Madagascar, Mauritius and Réunion.

Arachnangraecum (Schlachter) Schachler, Mytnik & Goodrich
 Biodivers. Res. Conservation, 29: 11 (2013).
 Ermozeop: Greek for spider and *Angraecum*, a genus of orchids. Refers to the long, spider-like segments.
Two Species: *Arachnangraecum rufum* (Thunberg) Schachler, Mytnik & Goodrich (*Angraecum rufum* Thunberg).
 Now recognized as belonging to the genus *Angraecum*, *Arachnangraecum* was previously considered to include thirteen epiphytes found in cool, mid elevation, hill scrub and montane forests in found in northwestern Madagascar, Mauritius and Réunion.

Bonniers Cokerley
 Rev. Gén. Bot., 11: 616, 6: 10-11 (1899).
 Ermozeop: In appreciation of Eugène Marie-Gaston Bonnier (1853-1922), a French botanist, editor of *Revue Générale de Botanique* and publisher of Candolle's notes on the orchids of Réunion.
Two Species: None designated.
 Now recognized as belonging to the genus *Angraecum*, *Bonniers* was previously considered to include two epiphytes found in mid to upper elevation, bushy montane rain forests of Réunion.

Boryangraecum (Schlachter) Schachler, Mytnik & Goodrich
 Biodivers. Res. Conservation, 29: 12 (2013).
 Ermozeop: Named for Jean Baptiste Bory de Saint-Vincent (1778-1848) a French naturalist and author of *Voyage dans les îles d'Afrique*. And *Angraecum*, a genus of orchids.
Two Species: *Boryangraecum parvifolium* (Schlachter) Schachler, Mytnik & Goodrich (*Angraecum parvifolium* Schlachter).
 Now recognized as belonging to the genus *Angraecum*, *Boryangraecum* was previously considered to include thirteen epiphytes found in cool, mid elevation, hill scrub and montane forests in found in Madagascar, Mauritius and Réunion.

A



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The AOS welcomes the submission of manuscripts for publication in *Orchids* magazine from members and non-members alike. Articles should be about orchids or related topics and cultural articles are always especially welcome. These can run the gamut from major feature-length articles on such topics as growing under lights, windowsills and thorough discussions of a species, genus or habitat to shorter, focused articles on a single species or hybrid to run under the Collector's Item banner. The AOS follows the World Checklist of Selected Plant Families with respect to species nomenclature and the Royal Horticultural Society Orchid Hybrid Register for questions of hybrid nomenclature. The AOS style guide and usage guides can be downloaded from <http://www.aos.org/about-us/article-submissions/style-guide-for-aos-publications.aspx>. Articles as well as inquiries regarding suitability of proposed articles should be sent to jean.ikeson@gmail.com or the editor at rmchatton@aos.org.

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Walter F. Scheeren

1928–2021

ONE OF THE many privileges we are afforded when we are lucky enough to be orchidists — hobbyist or otherwise — is the excellent company we frequently find ourselves in. I am grateful for a good many things but few more than the excellent and wonderful people I have the pleasure of calling my friends — indeed my family — all because we share a sense of love and wonder for these gorgeous plants. And so, I was deeply saddened when I heard of the passing of a longtime Hilo Orchid Society (HOS) member and AOS judge Walter Scheeren.

If you had the privilege of meeting Walter and his wife Ann, then you know Walter was one of the very best and we were lucky to know him.

I first met Walter and Ann over 23 years ago, before I knew about HOS or even that there was such a thing. They were the kind of old world, well-spoken, well-traveled, intelligent, gracious folks my grandparents frequently socialized with. At the time I was six years old and very new to orchids. I did not much care about *Vireya* rhododendrons (we first met at a *Vireya* Society meeting) or any other kind of plant. But occasionally, Walter would bring a blooming something-or-another orchid species to a raffle or auction and I would seize on that plant like lightning to a rod. And Walter, being the gentleman he was, would talk with me for hours at a time about which species came from where, why certain species had adapted in certain ways and what, in general, made orchids so fantastically wonderful. He seemed to everyone an endless font of horticultural wisdom. Ann, being the amazing woman she was, kept us fed and refreshed throughout all these meetings, and acted as a sounding board or external memory when Walter would forget whether they collected maxillarias or stanhopeas in Venezuela (before the days of the Convention on International Trade in Endangered Species of Wild Fauna and Flora) or if the *Cattleya* they had sketched and painted in-situ while on honeymoon was *maxima* or *amethystoglossa*.

Walter was an accomplished grower. For some time, he and Ann lived in Schaghticoke, New York, where he operated Walter Scheeren Orchids. I

confess, I do not really know much about this part of their life and now wish I had asked him more about it. I remember him once remarking on how much easier it was to grow orchids in Hawaii, if only because we had one tax rate. Apparently New York had 10–12 different tax rates depending on which borough plants were sold in, and if said transaction was retail or wholesale. He told me he was once audited, and the tax man sent to look over his books refused to believe he had made all his money entirely by selling flowers. Only after showing him the rooftop greenhouse they had on their apartment, along with photos of them out in the wilds, did the tax man finally relent although he still issued a \$7 citation.

At some point between 1998 and 2000, they decided a move to Hawaii was in order and eventually settled in Kalopa on the Big Island. Their property was right around 4,500 feet (1,375 m) above sea level, enabling him to grow many cool- to cold-growing genera that would never survive the drive downslope, much less into our Hilo show. Consequently, he had extensive collections of masdevallias, draculas and other rare and unusual genera. Once, I told Walter I hoped to one day make it to South Africa to see *Disa uniflora*, a brilliantly colored, charming terrestrial orchid with nonresupinate flowers, in its native habitat. The next HOS meeting, he brought me a cut inflorescence of one. I cried I was so happy.

While you might not have realized it, a popular plant around Hilo and in the commercial trade, *Zygotia* Midnight Blue, was one of Walter's creations. He had a selection he considered the best, 'Cardinal's Roost'. He frequently used this clonal name to identify his preferred selections. This also served as a small reminder to him of his old rooftop greenhouse in New York where, in the eaves, a pair of cardinals had made their roost. I hope now when you see the name you will think of Walter. I know I always do.

My good friend, and I believe the very best grower in the United States, Kai Quintal, admired Walter greatly. In 2016, Kai registered *Phragmipedium* QF



CHARLES MARDEN FITCH

Zygotia Midnight Blue AD/AOS (*Pescatoria violacea* × *Zygopetalum* B.G. White) registered by Walter Scheeren in 1996. Exhibited by Walter and Ann Scheeren, it received an Award of Distinction as the first hybrid of its kind and a worthy new direction in breeding.

Walter Scheeren (*Memoria* Julius Dixler × *boissierianum*).

Graham Wood, of Lehua Orchids in Mountain View, said that while he did not always agree with Walter's judging philosophy, he always enjoyed judging alongside him. Walter had a unique and insightful perspective which made Hilo judging that much better.

Although it had been a while since the last time Walter and I were able to speak to one another, I feel his loss exceptionally keenly and I miss him terribly. He was kind, caring and generous to a fault. His knowledge of orchids was immense, yet I never once saw him speak down to someone. Walter was a gentleman of the first order and, I think, the kind of fellow we all wish we had as a friend. The Hawaiian orchid community has lost an exceptional member, and the world has lost an amazing man.

— Jurahame Leyva (email: theorchidfix@gmail.com).

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