

ORCHIDS

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The mission of the American Orchid Society is to promote and support the passion for orchids through education, conservation and research

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The American Orchid Society provides leadership in orchids

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FRONT COVER

Not often seen in today's collections, barkerias can be very rewarding, floriferous specimens if their simple requirements are met. Pictured here is *Barkeria* Oaxacan Showers 'Sunshine' (Rebecca Marsh × *Obova* Ivory). This seminal hybrid involves three species; *palmeri*, *obovata*, and *naevosa* as a grandparent on both sides of the cross).

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PRONUNCIATION GUIDE

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>Aerides</i> (ay-air-EE-deez)	<i>godefroyae</i> (god-FROY-eye)	<i>Pyrorchis</i> (pye-RORE-kiss)
<i>affinis</i> (af-FIN-iss)	<i>Grafia</i> (GRAF-ee-a)	<i>reflexa</i> (ree-FLEKS-a)
<i>amabilis</i> (a-MAH-bee-liss – usually heard as a-MAH-bih-liss)	<i>graminifolia</i> (gram-min-ee-FOL-ee-a)	<i>Sarcochilus</i> (sar-koh-KYE-luss)
<i>appendiculata</i> (ap-pen-dik-yew-LAY-ta)	<i>gratrixianum</i> (gray-triks-ee-AY-num)	<i>scandens</i> (SKAN-denz)
<i>arisanensis</i> (a-riss-a-NEN-sis)	<i>Grussia</i> (GRUSS-ee-a)	<i>shoemakeri</i> (shoo-MAY-ker-eye)
<i>aristulifera</i> (a-riss-tew-LIF-er-a)	<i>Guarianthe</i> (gwar-ee-AN-thee)	<i>sieboldii</i> (see-BOLD-ee-eye)
<i>Arundina</i> (are-un-DEE-na)	<i>Habenaria</i> (hab-ee-NARE-ee-a)	<i>speciosum</i> (spee-see-OH-sum)
<i>aurea</i> (AW-ree-ah)	<i>harpophylla</i> (har-poh-FILL-a)	<i>spectabilis</i> (spek-TAB-ih-liss)
<i>barbigerum</i> (bar-BIJ-er-um)	<i>hatterii</i> (hat-TORE-ee-eye)	<i>spicerianum</i> (spy-ser-ee-AY-num)
<i>Barkeria</i> (bar-KARE-ee-ah)	<i>Hygrochilus</i> (hye-groh-KYE-luss)	<i>Stanhopea</i> (stan-HOPE-a but most often mispronounced as stan-HOPE-ee-a)
<i>barkeriola</i> (bar-kare-ee-OH-la)	<i>incumbens</i> (in-KUM-benz)	<i>Stauritis</i> (star-EYE-tis)
<i>bellatulum</i> (bell-LA-tew-lum)	<i>insigne</i> (in-SIG-nee)	<i>Stauroglottis</i> (star-oh-GLOT-tiss)
<i>brookii</i> (BROOK-ee-eye)	<i>japonica</i> (ja-PON-ee-ka – usually heard as ja-PON-ih-ka)	<i>striata</i> (stry-AY-ta)
<i>Calanthe</i> (kal-AN-thee)	<i>Kingidium</i> (king-ID-ee-um)	<i>strophinx</i> (STROH-finks)
<i>calceolus</i> (kal-see-OH-luss)	<i>Laelia</i> (LAY-lee-a)	<i>sylvatica</i> (sill-VAT-ih-ka)
<i>candida</i> (KAN-did-ah)	<i>lindleyana</i> (lind-lee-AY-na)	<i>tetragonum</i> (teh-tra-GOH-num)
<i>Catasetum</i> (kat-a-SEE-tum)	<i>linguiforme</i> (ling-yew-ee-FORE-mee)	<i>thailandica</i> (tye-LAND-ih-ka)
<i>Cattleya</i> (KAT-lee-a)	<i>lobbii</i> (LOB-ee-eye)	<i>tricarinata</i> (try-kare-in-AY-ta)
<i>charlesworthii</i> (Charles-WORTH-ee-eye)	<i>maculata</i> (mak-yew-LAY-ta)	<i>triplicata</i> (trih-plih-KAY-ta)
<i>citrosimum</i> (sit-ROS-mum)	<i>malipoensis</i> (mal-ee-poh-EN-sis)	<i>tsii</i> (TSEE-ee)
<i>concolor</i> (KON-kuhl-ur)	<i>marriottiana</i> (mare-ee-ot-ee-AY-na)	<i>uniflora</i> (yew-nih-FLOR-a)
<i>convallarioides</i> (kon-val-lair-ee-OY-deez)	<i>mascula</i> (MAS-kew-la)	<i>uruapani</i> (YEW-rah-wah-pan-ee)
<i>coodei</i> (KOD-eye)	<i>masculosa</i> (mas-kew-LOH-sa)	<i>Vanda</i> (VAN-da)
<i>cornu-cervi</i> (KORE-noo-SER-vee)	<i>Masdevallia</i> (mas-deh-VAHL-ee-a)	<i>Vanilla</i> (van-ILL-la)
<i>crispa</i> (KRIS-pa)	<i>masuca</i> (MAS-yew-ka)	<i>veitchii</i> (VEECH-ee-eye)
<i>Cuitlauzina</i> (kweet-law-ZEE-na)	<i>militaris</i> (mil-lih-TARE-iss)	<i>vejvarutianum</i> (vay-var-oot-ee-AY-num)
<i>Cymbidium</i> (sim-BID-ee-um)	<i>mossiae</i> (MOSS-ee-eye)	<i>vestita</i> (ves-TEE-ta)
<i>Cypripedium</i> (sip-rih-PEED-ee-um)	<i>multiflora</i> (mul-tee-FLOR-a)	<i>vietnamensis</i> (vee-et-na-MEN-sis)
<i>Cyrtorchilum</i> (sir-toh-KYE-lum)	<i>naevosa</i> (NEE-vo-sa)	<i>villosum</i> (vill-LOH-sum)
<i>Dactylorhiza</i> (dak-till-oh-RYE-za)	<i>nipponica</i> (nip-PON-ih-ka)	<i>violacea</i> (vye-oh-LAY-see-ah)
<i>decumbens</i> (dee-KUM-benz)	<i>obovata</i> (oh-bow-VAY-ta)	<i>whartonianana</i> (war-tone-ee-AY-na)
<i>Deliciosae</i> (del-ee-see-OH-see)	<i>Odontoglossum</i> (oh-don-toh-GLOSS-sum)	<i>yingjiangensis</i> (ying-jee-ang-EN-sis)
<i>Dendrobium</i> (den-DROH-bee-um)	<i>odorata</i> (oh-dore-AY-ta)	
<i>difformis</i> (dih-FORE-miss)	<i>Oncidium</i> (on-SID-ee-um)	
<i>Dignathe</i> (dye-NAY-thee)	<i>Orchis</i> (ORE-kiss)	
<i>discolor</i> (DIS-kuhl-ur)	<i>Ornithochilus</i> (ore-nith-oh-KYE-luss)	
<i>dorotheae</i> (door-a-THEE-a)	<i>Osmoglossum</i> (oz-moh-GLOSS-um)	
<i>Dracula</i> (DRAK-yew-la)	<i>palmeri</i> (PAL-mer-eye)	
<i>dubia</i> (DOO-bee-a)	<i>Palumbina</i> (pal-um-BEE-na)	
<i>egertonii</i> (eh-ger-TONE-ee-eye)	<i>Parishiana</i> (pair-ish-ee-AY-nee)	
<i>Encyclia</i> (en-SIK-lee-a)	<i>parishii</i> (pair-ISH-ee-eye)	
<i>equestris</i> (ee-KWES-triss)	<i>pendula</i> (PEN-dew-la)	
<i>Eucalanthe</i> (yew-kal-AN-thee)	<i>Phalaenopsis</i> (fail-en-OP-sis)	
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<i>falcipetalum</i> (fal-see-PET-a-lum)	<i>Platanthera</i> (plat-AN-ther-a)	
<i>Fitzgeraldia</i> (fits-JER-ald-ee-a)	<i>Polychilos</i> (pol-ee-KYE-los)	
<i>fitzgeraldii</i> (fits-JER-ald-ee-eye)	<i>Preptanthe</i> (prep-TAN-thee)	
<i>flava</i> (FLAY-va)	<i>psycodes</i> (SYE-koh-deez)	
<i>flavilabia</i> (flay-vee-LAY-bee-a)	<i>puberula</i> (pew-BER-yew-la)	
<i>furcata</i> (fur-KAY-tah)	<i>pulchella</i> (pull-KELL-a)	
<i>galeottianum</i> (gal-ee-ott-ee-AY-num)	<i>pygmaea</i> (pig-MEE-a)	

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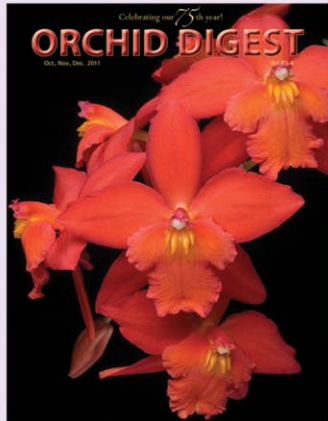
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Vegetable Starter Trays for Orchid Seedlings

I USE SEEDLING starter trays with humidity domes in the fall and spring for my vegetables. It did not occur to me to use them in the greenhouse for my orchids but when I deflasked my first orchid seedlings a couple of months ago, I needed a place, protected from the elements, to put the fragile seedlings. I keep a small amount of water in the tray and the humidity dome on top with both vents open. It sits on a shelf in my Arizona greenhouse in the southeast corner. After the first month, my seedlings doubled in size (the seedlings are pictured in the larger containers). So, I decided to move a few of my more fragile orchid divisions into the tray to see if I could encourage strength and growth. After another month, I noticed new growth and better color on the leaves (the divisions are pictured in the smaller pots).

I feed them every other week with MSU high-potassium fertilizer. Once a week, I leave the lid off for several hours just to increase the airflow and prevent mold or fungi from growing. If you grow indoors, this would be a great place



for orchids needing higher humidity or those that are more fragile. We often get small divisions or purchase orchids in 2-inch (5-cm) pots because they are cheaper. This tray and dome will keep them protected as they grow. It fits well under a counter and you can even mount a grow light under the counter if you are growing in a more shaded environment. These seedling starter trays with humidity domes cost under \$10. Be sure to get the heavy weight tray so that it will not collapse when moved.

— *Cindy Jepsen* (email: cindyjepsen@cox.net).

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PRESIDENT'S MESSAGE

ANOTHER WONDERFUL AOS Members' Meeting is behind us and a successful event it was. The virtual meetings, a very common occurrence these days, have been working well and I congratulate all those involved in the meeting for all their hard work. Beginning with the online auction all the way through to the town hall meeting, the meeting was enjoyable, informative and engaging.

The online auctions draw folks into an animated match where they compete for the big win. The flip side of those bidding are those who donated items for the auction. These generous people and the companies that donated goods and services for the auction, are the stars of the show. The AOS is very grateful for their goodwill.

One of the highlights of the town hall meeting is the announcement of promotions of judges to another level. At this meeting we had promotions from the Pacific to the Atlantic. Congratulations to these folks. Your hard work has paid off. I was also very pleased to welcome a meaningful number of student judges into the program. They will be the future of the American Orchid Society's judging family.

As more and more centers and orchid societies begin to operate normally, having in-person meetings and orchid shows, I am certain we will see more student judges coming on board and more promotions of judges. And we all know that judging is a very important part of the American Orchid Society.

So, with the 2021 fall Members' Meeting adjourned, we look forward to the 2022 spring Members' Meeting and the AOS Centennial Celebration. So much effort has been put into this meeting and celebration, and after two postponements, it will finally come to fruition. This remarkable centennial, which so many people are looking forward to, will be incredible. I cannot thank all those involved in this event enough for being so supportive and working with the American Orchid Society to accommodate them with all the changes. I am particularly grateful to the Biltmore Hotel and the entertainment company as they have shown tremendous willingness to help the AOS with this celebration.

Thankfully, in the state of Florida, we are seeing a decrease in active coronavirus cases from the unusually high peak we saw last August. As more and more people are vaccinated, we will see things getting much better in South Florida ensuring the celebration can go on. I, for one, am

looking forward to this magnificent event and I know many of you are too.

As we get closer to the 2022 spring meeting to be held April 6–9, 2022, I will be sharing more details of the Centennial Celebration. So, thank you for your patience — the celebration will be here before we know it! The date change also gives many folks time to register for the AOS Members' Meeting and the AOS Centennial Gala Celebration.

If you have not already done so, go to the American Orchid Society website, www.aos.org, and check out all of the information about the 2022 spring Members' Meeting. You will not want to miss this one!

The holiday season is approaching, beginning with Thanksgiving Day this month. I thought quite a bit about this year's Thanksgiving Day, given all that has happened over these past many months. Usually, when we talk about things we need to be thankful for, we begin with our health. For the last 18 months, health has been in the spotlight globally.

I am truly grateful to have my health. I have been following the guidelines of the CDC that apply to me and they have worked for me perfectly. I urge all of you to do as well, providing you are able to. Have a talk with your doctor to find out what is best for you.

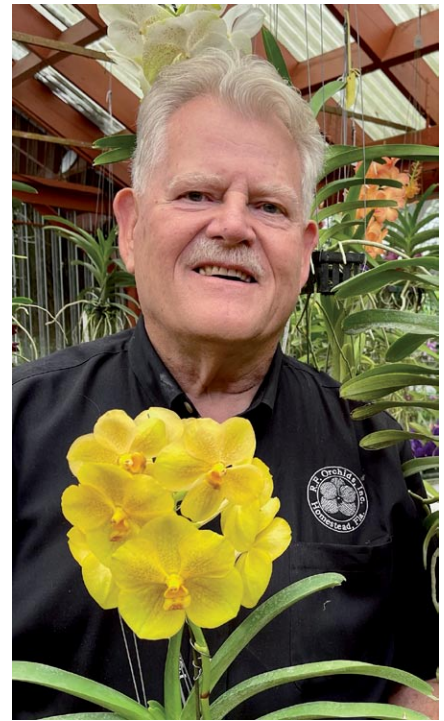
Apart from my health, I am thankful for my family and friends. Life is so precious, so to be able to spend time with those we hold so dear, is truly a blessing. The loss of someone we care about is terrible, but your orchid family will always be there to support you. This Thanksgiving Day will be very special for so many this year because of this.

There are countless other things to be thankful for such as work, including coworkers, sunny days, your favorite song, and in our case, our orchids. The list can be as short or as long as you like. Whatever is on your list, show that you are grateful.

Soon afterward, it will be Christmas, Hanukkah and the New Year will be here. Once winter is officially here, there will be a whole new crop of orchids blooming that will brighten up any winter day. These winter orchids have so many color varieties, I am sure you will find one that is perfect for your collection. So, immerse yourself in your collection and enjoy the beauty of orchids.

Have a wonderful Thanksgiving and save room for dessert!

— Robert Fuchs, AOS President (email: Bob@rforchids.com).



Robert Fuchs with *Vanda Crownfox Sundancer* 'Oro' (Fuchs Gold × *denisoniana*).

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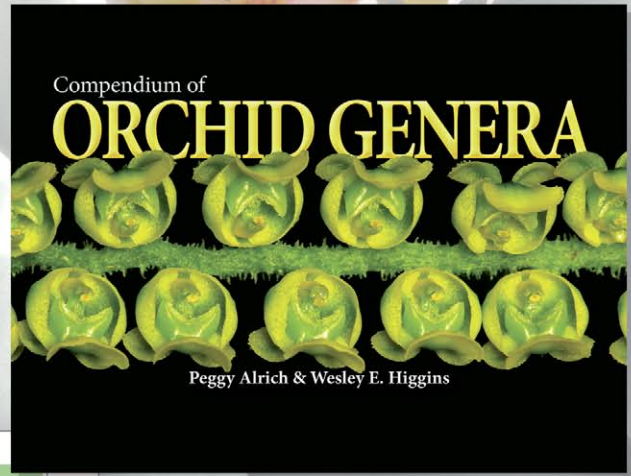
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by Peggy Alrich
and Wesley Higgins**



Angraecum Bory
(De Br. Atlas, 1: 39, t. 19 (1846).
Epiphytoides, Vandae, Angraecinae)

ETYMOLOGY: From the Latinized form of the Malay word (*Angrak* or *Angrak*) for the epiphytic orchids that resemble *Ardisia* and *Tinida* in habit. The name *Angraecum* originated with Georg Eberhard Rumphius (1628-1702), who coined it from the word *Angrak*, a name or title given by the Malayan to "parrot-like" plants, the meaning of which has not been discovered. From English Kamper (1651-1716) we learn that *Angrak* or *Angrak* is also the name used by the Javanese for figs plants.

GENETIVE: *Angraecum* *chrysanthum* Bory
(Illustration: Angraecum Bory)

More than two-hundred twenty-one, very small to very large monopodial epiphytes, a few lithophytes or rare terrestrial plants have a wide range of distribution in humid, low to mid elevation, coastal to hill scrub, savannas 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 clumpy-herbaceous, 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, channeled, unequally bilobed, usually ditrichous 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 regions vary widely from species to species. Generally they do best mounted on a fern slab with good drainage and most of the species benefit from a cooling period of reduced watering. Periodic intermediate conditions, bright to diffused light, high humidity and good air movement.

Valid Angraecum Synonyms

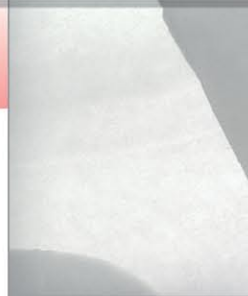
Aerobion Kamper ex Sprengel
Nov. 182 (Sprengel), ed. 16, 84: 279 & 716 (1836).
Ermoozon: Greek for air and life. Referring to the epiphytic habit of the plants.
Lacourne: *Aerobion superbum* (Thunberg) Sprengel (*Angraecum superbum* Thunberg) designated by C. G. Reiche, 36: 10 (1875).
Now recognized as belonging to the genus *Angraecum*, *Aerobion* was previously considered to include twenty-five epiphytes found in warm, mid elevation, montane forests of Madagascar and the Mascarene Islands.

Angraecoides (Candolle) Schachtel, Mytnik & Goechko
Bull. Bot. Conservat., 29: 9 (2013).
Ermoozon: *Angraecum*, a genus of orchids, and Greek for likeness or form. Refers to a similarity to *Angraecum*.
Tree Seces, *Angraecoides piquetii* (Frappet) Schachtel, Mytnik & Goechko (*Angraecum piquetii* Frappet)
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.

Archangraecum (Schlechter) Schachtel, Mytnik & Goechko
Bull. Bot. Conservat., 29: 11 (2013).
Ermoozon: Greek for spider and *Angraecum*, a genus of orchids. Refers to the long, spider-like segments.
Tree Seces, *Archangraecum rimboutum* (Thunberg) Schachtel, Mytnik & Goechko (*Angraecum rimboutum* Thunberg)
Now recognized as belonging to the genus *Angraecum*, *Archangraecum* 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.

Bonnieria Cordery
Jan. Gén. Bot., 13: 416, t. 10: 11 (1899).
Ermoozon: 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.
Tree Seces None designated
Now recognized as belonging to the genus *Angraecum*, *Bonnieria* was previously considered to include two epiphytes found in mid to upper elevation, bushy montane rain forests of Réunion.

Boryanagraecum (Schlechter) Schachtel, Mytnik & Goechko
Bull. Bot. Conservat., 29: 12 (2013).
Ermoozon: Named for Jean Baptiste Bory de Saint-Vincent (1778-1846) a French naturalist and author of *Voyage dans les Îles d'Afrique*. And *Angraecum*, a genus of orchids.
Tree Seces *Boryanagraecum pumilio* (Schlechter) Schachtel, Mytnik & Goechko (*Angraecum pumilio* Schlechter)
Now recognized as belonging to the genus *Angraecum*, *Boryanagraecum* was previously considered to include thirteen epiphytes found in cool, mid elevation, hill scrub and montane forests in found in Madagascar, Mauritius and Réunion.



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November: The Month of Abundance

By Thomas Miranda

AS WE MOVE toward the tunnel of winter, where so much of our activity is diminished, it is easy to forget all the fantastic bounty that blesses our daily lives. It is a certainty that we have become accustomed to spending more time at home sheltering from pandemic variants and public incivilities, but for me, that has made me appreciate the world I have surrounded myself with, the world of plants, gardens, pets, favorite delicious foods and the ability to share these things with close friends. All this bounty becomes increasingly precious to me with each passing day, and it is my goal to continue on this path until I burst with gratitude.

Our minds possess powerful influence over our lives and our ability to thrive.



Thomas Miranda

Quite simply, positivity creates abundance while the opposite creates obstruction and failure. I believe that orchids help us to obtain the kind of mindset to achieve that positive future we all really desire. So, surrounding ourselves with them can only make the world more optimistic, nurturing and beautiful. This does not mean that there is no effort involved, of course, but what better pastime could there be than to put your energies toward creating beauty and experiencing wonder every day. At the same time, by nurturing your plants, you contribute to their conservation and their continued survival and evolution. That is what this column is, and has always been, about.

MULTITUDES Buds and flowers abound this month of Thanksgiving as our plants return and reward our efforts over the growing season with sumptuous colors and exotic perfumes. Cattleyas, standard dendrobiums and many oncidium intergenerics are all vying for attention and adoration. The best way to show your appreciation is to groom and stake your budded and blooming plants for optimum presentation. While this should be done before plants are in full bloom to avoid awkward inflorescence twists and upside-down flowers, better late than never.

EMERGENCE Few things inspire optimism more than inflating flower buds. This month should therefore be a peak month for hopefulness as many of our most



ANNE KOTOWSKI

Cattleya dormaniana 'Shane' CCM/AOS; exhibitor: William Rogerson.

cultivated orchids, such as phalaenopsis and cymbidiums are throwing their spikes around now. Some plants are naturally graceful in their presentation, especially if grown as mounts or in baskets so they can cascade as they do in trees. Plants in pots often need a little assistance to present well, as it is an artificial presentation. It is important to guide those developing inflorescences with stakes or the inflorescences may develop in odd directions leading to poorly displayed or damaged flowers.

VISION Staking allows you to create a beautiful picture of your prized plants, especially if they have multiple inflorescences as do many older, specimen sized orchids. It is helpful to have knowledge of how your plants bloom to inform your vision and reach the ultimate potential of each spike. Does the spike arch gracefully as do most phalaenopsis? Is it upright like most slipper orchids or habenarias, or sharply pendent as in stanhopeas? Will they be too heavy once open as with many hybrid cattleyas? Knowledge of what your plants have the potential to do is the key to presenting and enjoying them at their best. There are simply too many permutations to list here, so only you can inform yourself of this crucial information

PEACE AND REST Although it is truly wonderful to sit and enjoy the serenity of your orchids, which allows us to recharge daily with optimism and inspiration, it is

also true that many orchids need a rest as well. Orchids from seasonally dry areas such as catasetums, nobile dendrobiums and habenarias are currently sloughing off leaves they no longer need in preparation for a restful dormancy. It is important to water less or withhold moisture almost completely now for many of these types of plants. Watering them now while their plant metabolism is shutting down can result in heartbreak. Exceptions include many cooler-growing montane plants such as masdevallias and draculas that grow best in chillier weather. Such plants will encourage you by sending up more new growths in addition to flowers. Enjoy them, their glories, and the abundance they bring to our lives.

— Tom Miranda 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).

Too cold in the winter greenhouse?

Stick one side of Velcro disks a foot apart onto the inside of the north side of the greenhouse to fit the shape of the foil-covered, bubble-wrap-type batts like the material used as jackets for hot water heaters. It can be purchased in rolls. The foil will reflect light back into the greenhouse and the bubble wrap will help insulate against the cold. It may also be used to insulate the west side of the greenhouse on the outside to help keep the greenhouse cool during the summer months.

— Jean Allen-Ikeson



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HOME REMEDIES

— Rather than expensive and potentially dangerous herbicides, spray full-strength vinegar to kill weeds between pavers and on greenhouse floors. (Do not spray on orchids.)

— Aspirin (just $\frac{3}{4}$ of one 325 mg tablet per gallon of water) helps protect plants from fungal and viral pathogens when used as a spray. More is NOT better. Do not exceed this amount.

— Homemade insecticide (mix in a 1 gallon [3.8 L] jug): 1 pint (0.5 L) rubbing alcohol, 1 pint (0.5 L) 409 spray cleaner, and 3 quarts (2.8 L) water. Apply as a spray.

— Isopropyl (rubbing) alcohol can be put into an empty spray bottle and used to treat scale, mealybugs, thrips, aphids, red spider mites and perhaps other pests. It works only while wet and must contact the insect.

— Neosporin has been reportedly used to treat orchid crown rot; remove rotted area of plant before treatment.

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QUESTIONS AND ANSWERS

SANITATION



TERRY BOTTON

QUESTION

I had an infestation of mealy bugs and aphids before moving my orchids outside (except for the phals) in the spring. Should I disinfect all the trays and shelving before bringing the orchids back indoors? Should I spray the orchids before I bring them indoors again?

ANSWER

If the trays and shelving are metal and not wood, they will likely not harbor insects. They should be wiped down and cleaned before being brought inside just from a sanitation perspective. Wooden structures can be another matter. Mealybugs and scale, as well as eggs of other insects can survive for significant periods in the cracks and crevices of wooden benches. I would spray wooden benches for insects and also spray with a fungicide before I bring in the plants. Page 652 of the September 2021 issue of *Orchids* has a short synopsis of effective chemicals and application intervals in preparation for moving back indoors. For those looking for “greener” products, horticultural oils and neem oil applications are reasonable choices. You should also do a very thorough plant and potting medium check to help limit the insects you bring in. For information on treating scale and mealybugs, consider watching our recorded Pest Management webinar available at [American Orchid Society Webinars \(aos.org\)](https://www.aos.org/webinars). Make sure plants are as clean as possible when you bring them in. It can be much harder in midwinter to treat an infestation that you brought in with plants in the fall if you cannot open up your greenhouse for ventilation or take a plant outside to spray.

PAPHIOPEDILUM CULTURE



RON MCHATTON

QUESTION

Any tips on paphiopedilum culture, specifically *Paphiopedilum rothschildianum* and its hybrids, plus tips on how to get them to bloom. What times of year do they bloom?

ANSWER

The species generally blooms from spring into summer, although plants have been known to bloom as early as late winter and even into early fall. Quite bright light and cooler nights (down into the low to mid-50s F [10–12.8 C]) during the fall and winter appear to be important in flowering *rothschildianum* and, possibly, the other large strap-leaved species and their hybrids. The leaves should be light green and not a darker shade of grass green for best performance. Flowering is also more reliable with bigger plants so do not divide clumps into small pieces unless absolutely necessary.

The hybrids tend to be similar but can extend blooming season throughout the year depending on the hybrid. Hybrids with other big strap-leaved species tend to follow patterns similar to *rothschildianum*. Hybrids with sequentially flowered species such as *glaucophyllum* can start blooming any time, and keep blooming successively for a very long time if the plants are big enough. Hybrids with a mottled leaf species such as *callosum* (or Maudiae hybrids) tend to require somewhat lower light levels and may not be as sensitive to night temperature but

it has been suggested that low humidity may inhibit flowering. Then there are hybrids with subgenus *Brachypetalum* such as *delenatii* or *bellatulum*. Although the newer remakes appear to be easier to flower than the older clones, they still have a reputation as recalcitrant bloomers. The brachys behave like succulents during the winter months and this may carry over into the hybrids requiring, in addition to bright light and somewhat cooler temperatures, a period of moderate drying.

BLOOMING PAPHIOPEDILUMS



BRYON K. RINKE

QUESTION

I have paphiopedilums that just will not bloom. They are growing well with good leaves and root structure, but no flowers. Most are Maudiae types with one multifloral. I have them on the bottom shelf in my greenhouse with 1,500–2,000 footcandles. My cattleyas are on the top shelf and shade the paphs. Any Advice?

ANSWER

I think the key to this is insufficient light. If the light levels you mention are what the cattleyas are getting, it is very likely that the paphiopedilums do not have enough light. Even if the paphiopedilum are getting 1,500–2,000 footcandles, that is on the low end for any that have multifloral species in their background. Of course, what is most important about light is not an instantaneous maximum reading but light integrated over the entire day. If that were not the case, none of those plants important into England long ago

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.

would have ever flowered. You need to look at how heavily shaded your plants are, and for how much of the day during the winter when the sun angle is low in the sky. What might be fine light levels during the summer, could be quite dark during the winter and that is the most critical time for getting these multifloral hybrids the light levels they need to flower. Also, check your night temperatures where the plants are growing. The multifloral species need somewhat cooler nights (mid-50s F [12.8 C]) during the winter months for best performance. The Maudiae types will flower with quite warm nights but not, as a rule, the multiflorals. If temperature is not a problem, my advice would be to raise the light level. Experiment by taking a few of these plants and put them up with the cattleyas and see what happens at the end of the next growth cycle. If they flower, your answer is the light issue.

Webinars-Coming Attractions!





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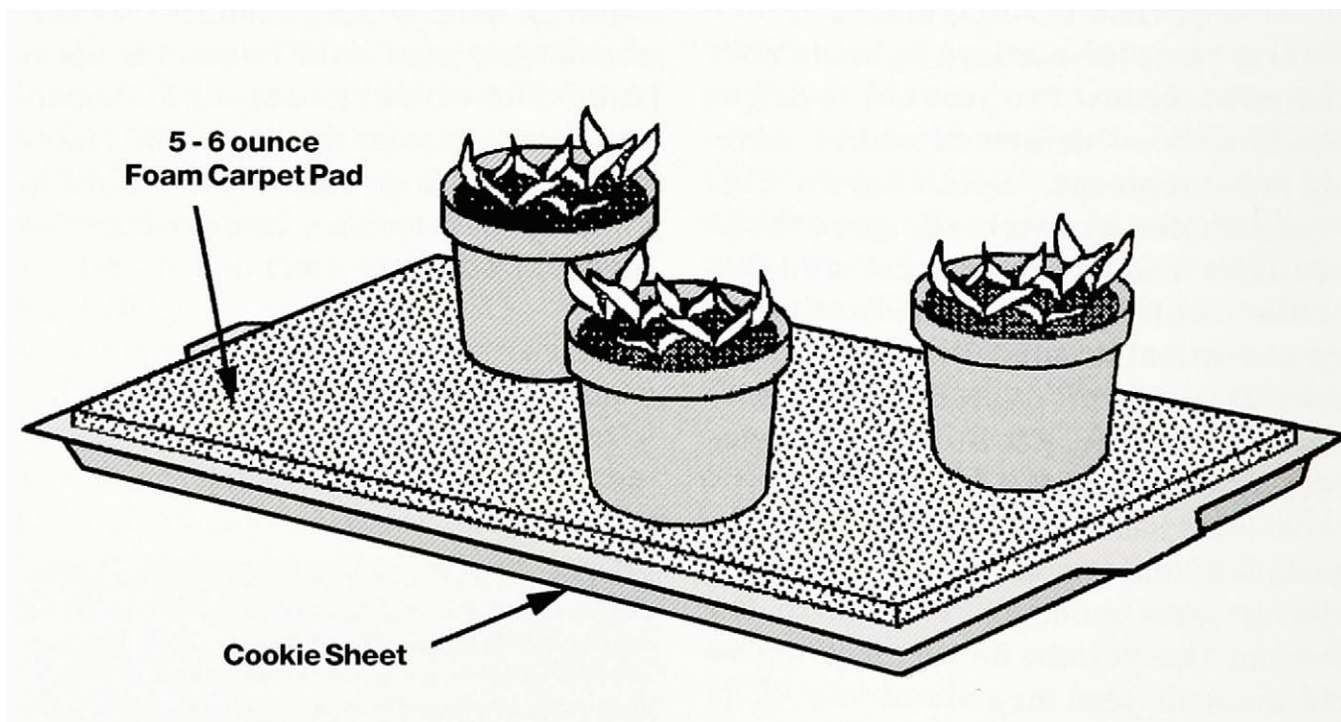
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By Ed Wright and Bill Tippit

Growing on the Magic Carpet (Reprinted from the April 1993 AOS Bulletin 63[9]:1036)



RECENTLY, someone arrived at the greenhouse with a couple of trays of mixed plants in 4-inch (10-cm) pots that they knew we would not mind keeping for an upcoming orchid society raffle. Naturally, we put them on the nearest bench and forgot about them. For some reason, this bench was partially covered with a scrap of urethane-foam carpet padding. Nobody seems to know why. At any rate, we put some of the plants on top of the carpet pad and some on the bare bench. By the time we found a new home for these plants, we were surprised to see those on the carpet pad had grown at a much faster rate than those on the bare bench. Same plants, many of the same cross, but the growth rate was remarkably superior in the group placed on the carpet pad. We then set up an area 3 feet \times 19 feet (about 1 m \times 5.8 m), covered it with 5-ounce (about 142 g) urethane carpet pad and covered that with 4-inch (10-cm) pots. Again, the growth rate was amazing.

A couple of our cronies brought plants in and placed them on the magic carpet. Smaller plants and plants in baskets re-

sponded wonderfully. Larger plants did well, but were less spectacular. A test area 6 feet \times 6 feet (1.8 m \times 1.8 m) devoted to mature phalaenopsis provided mixed results, but the blooms lasted up to twice as long as controls placed on plain benches. An especially rewarding test has been the use of carpet pad in a program at the San Antonio Botanical Gardens. There, we are trying to re-establish *Spiranthes parksii*, Texas' most endangered orchid species. Two of our 10 plants were placed on carpet pad and they have shown great improvement in growth and appear to be holding leaves longer than is normal for this species. We hope the extra leaf time will produce sufficient food for a great blooming and heavy seed set next autumn.

The underlights crowd heard about the pad approach and came to look and talk orchids. We developed the setup shown here, and a light-stand miracle occurred. We used an aluminum cookie sheet, and cut a piece of 5-ounce (about 142 g) carpet pad (it should be this heavy to provide stability for the pots) to fit closely inside the slightly raised rim. The pad is soaked with

water and then compots or other small pots are placed on the wet pad.

Whereas Perlite and other granular materials such as aquarium gravel tend to drain water away from the surface, carpet pad wicks water to the surface keeping the local atmosphere humid. A small fan blowing gently across the surface will reduce the local temperature several degrees. The combination seems to be made in heaven for most small plants, even temperamental cool growers. With a little care regarding water management, cookie sheets contain the moisture and are easy to handle.

Carpet pad can be purchased by the square yard (sq m) in most home-improvement-store flooring shops; we paid \$1.69 a square yard for ours. There is no reason one could not salvage some from carpet installers — just be sure it is still firm and will support the pots. This technique is too new for wide experience. What we've tried, we've liked, for the most part, so we're encouraged enough to share the idea. Hopefully, other users will send reports of their experience to the AOS Bulletin in the near future.

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Fertilizer Baskets

These little baskets were first introduced to me by Desert Valley Orchid Society (Phoenix) member Karla Velasco who was using them with a timed-release fertilizer. Because I was using a liquid fertilizer at the time, I put it aside for future use. Then I read about a fertilizer called Purely Organic manufactured in South Carolina (purelyorganicfertilizer.com/about/how-to-order). Sue Bottom's article (2017) showed excellent results on struggling orchids. The instructions were to put it into a tea bag and place the tea bag on top of the medium. The fertilizer will slowly release its nutrients as you water. I used the tea bag approach, which worked but looked really ugly sitting in the orchid pot. So, I ordered these little fertilizer baskets (the small size is 0.8 inches [2 cm]) from Amazon, 100 for around \$16.50. They were designed for pelletized fertilizers for plants such as bonsai and orchids. So far, they work beautifully. They blend in well with the plant and even fit into my small 2-inch (5.1-cm) pots. For my larger pots, I use two. You would think that the powdered fertilizer would fall through the small holes but if you press it down firmly, it does not leak out. — *Cindy Jepsen (email: cindyjepsen@cox.net)*.

References
 Bottom, S. 2017. Purely Organic. *Orchids* 87(5):344–349.

COLLECTOR'S ITEM

Cuitlauzina pendula

La Llave & Lex. 1825

By Judith Rapacz-Hasler



THIS LOVELY SPECIES was described in 1825 in *Novorum Vegetabilium Descriptiones 2 (Orchidium Opusculum)* Volume 33, 1825, by famous Catholic priest and naturalist, Dr. Pablo de La Llave (1773–1833) and Juan José Martínez de Lexarza (1785–1824), the son of one of Mexico's noble influential families of the time, as *Cuitlauzina pendula* in honor of Cuitlahuatzin, the Governor of Iztapalapa in Mexico. In later years, other authors published the species under several other names.

SYNONYMS *Odontoglossum citrosimum* Lindl. 1842, *Oncidium citrosimum* (Lindl.) Beer 1854, *Oncidium galeottianum* Drapiez 1839, *Odontoglossum pendulum* (La Llave et Lex.) Bateman 1865.

In earlier times and as King of the Aztecs, Cuitlahuatzin beautified the gardens in the west of the ancient city of Tenochtitlán with fruit trees, exotic and aromatic plants, and those with handsome flowers. He was the penultimate king of the Aztecs and well known in Mexico because he achieved a military victory over the Spaniards in June 1520, driving them out of Mexico City (Tenochtitlán) along with their Indian allies. Only a few months later, in November 1520, he died of smallpox and the Aztec capital was reconquered by the Spanish on August 13, 1521. Smallpox had been introduced from Europe by the conquistadors and was ravaging the indigenous population. It is believed that about ten million people succumbed to smallpox in the years following the conquest of Mesoamerica. It is possible that the Spanish conquest would have been different had the disease not been so virulent.

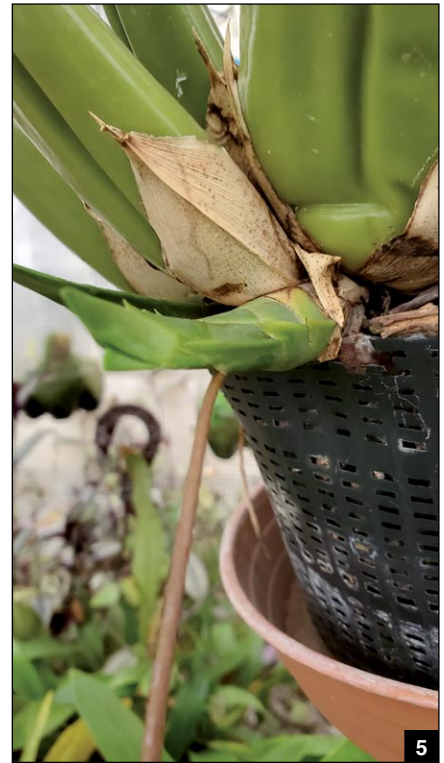
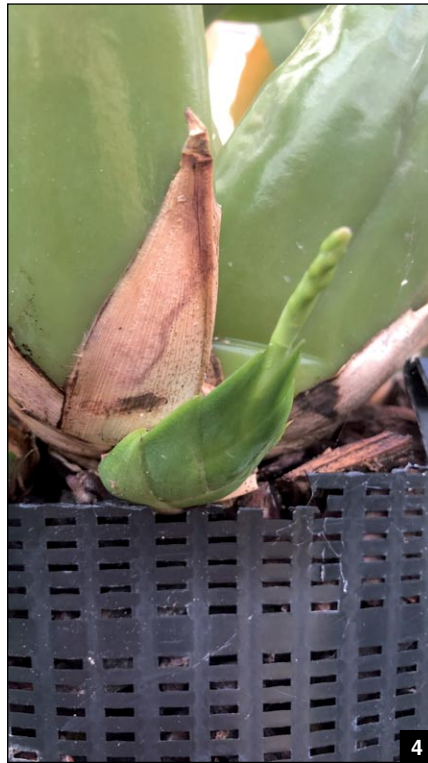
Initially, the genus was proposed as monotypic with the single species *Cuitlauzina pendula*. This has changed over the last decade as a result of molecular analyses as plants formerly classified as *Dignathe*, some *oncidiums*, some *odontoglossums*, *Osmoglossum* and *Palumbina* have been recognized as belonging to an expanded *Cuitlauzina*. Today the genus contains several species with beautiful flowers worthy of a king. As the name *Cuitlauzina* predates the genus names of recent transfers, it has priority in naming. Some species became known in other genera *Dignathe*, *Oncidium*, *Odontoglossum*, *Osmoglossum* and *Palumbina*. Today there are seven recognized species: *Cuitlauzina candida* (Lindl.) Dressler et N.H. Williams (Mexico and Guatemala), *Cuitlauzina convallarioides* (Schltr.)



Dressler et N.H. Williams (Costa Rica and Panama), *Cuitlauzina dubia* (S. rosillo) Yañez et Sotoarenasex Solano (Mexico), *Cuitlauzina egertonii* (Lindl.) Dressler et N.H. Williams (from Mexico to Panama), *Cuitlauzina pulchella* (Bateman ex Lindl.) Dressler et N.H. Williams (from Mexico to Nicaragua), *Cuitlauzina pygmaea* (Lindl.) M. W. Chase et N.H. Williams (Mexico) and *Cuitlauzina pendula* La Llave et Lex. (Mexico).

Cuitlauzina pendula is arguably the most beautiful species of this genus in Mexico. It meets all the expectations of a

- [1] *Cuitlauzina pendula* 'Lise Gobeille' CCM/AOS grown by the Jardin botanique de Montréal. Photograph by Michael MacConnail. Insert photograph by the author is an almost white cultivar grown by Anton Laub
- [2] *Cuitlauzina pendula* as *Odontoglossum citrosimum* plate 3 in: *Edwards's Botanical Register* vol. 29, (1843).



natural orchid species. Its relatively large flowers are very handsome and present a wide range of colors from nearly white to dark shades of pink, although the intensity of the pink color may be related to the amount of light. It is a small-to-medium sized, cool-to-cold growing epiphyte (sometimes terrestrial) from Sinaloa, Jalisco and Michoacan states of Mexico.

It is native to oak-pine forests at elevations of 4,600 to 7,200 ft (1,400–2,200 m) in seasonally humid climates with temperatures rising to 82 F (28 C) during the day and falling to 57 F (14 C) at night. Temperatures above 86 F (30 C) are usually not well tolerated, but in the winter months from November to January the temperatures can easily drop to 41 F (5 C).

The plants have short rhizomes carrying ovoid, clustered, compressed pseudobulbs. The leaves are apical, coriaceous, broadly ligulate, acute or obtuse. Plants bloom in the late spring and summer on inflorescences that arise from the base of the newly forming immature growths, first vertically and then becoming sharply pendent once the inflorescence has cleared the new growth. Extremely well grown plants can produce often branched inflorescences as much as 30 inches (76 cm) long carrying up to 25 lemon-scented flowers on the distal third of the inflorescence.

Cuitlauzina pendula needs to be planted in a basket or grown on a mount to

accommodate the pendent inflorescence. They require a cool-to-temperate, dry winter rest without which they will not flower, followed by a heavy water and fertilizer regimen after new growths are initiated in the spring. Because of their need for a cool, dry winter rest and cool growing conditions, plants can be somewhat difficult to get to bloom. It is critical that plants not be fertilized when not in active growth.

CULTURE *Cuitlauzina pendula* is found mainly on tree trunks and on thick, lower tree branches, usually in association with mosses and ferns in seasonally dry, deciduous forest and, as such, requires conditions which mimic these natural conditions — plenty of water and fertilizer during the spring and summer growing months and a decidedly dry, cool and bright winter. A fertilizer high in potassium may be advantageous in developing the strongest possible pseudobulb, which fuels flowering of the next new growth. Due to their pendent inflorescences, plants are best grown mounted or in baskets. Some growers recommend a potting mix consisting of one part each of perlite, medium charcoal and chunky peat moss to seven parts of equally blended medium and fine fir bark. Whatever the choice of medium, waterlogging is not tolerated. As in the habitat, try to emulate the daily rains in the summer months and dry, cool winter months.

The biggest challenge in culture

[3—5] Inflorescence development. The inflorescence emerges very early in the development of new growth, first vertically or horizontally [3–4] and later becoming sharply pendent [5]. Photographs by the author.

appears to be the difficulty in getting them to flower, which is caused mainly by the so-called hydro-stress, or essentially starvation of water. Therefore, once the growths are mature and winter approaches, the plant needs to be dried out while at the same time keeping humidity high (best accomplished by daily misting or a cool-mist humidifier found in pharmacies). Water in the pot or basket should not be increased until the young inflorescences are evident emerging out of the new growth.

Flowering occurs from February through late spring, depending on growing conditions.

— *Judith Rapacz-Hasler is a member of the AOS editorial board, spending half the year on Florida's west coast and the remainder in Europe (email: jorapacz@wisc.edu).*

NEW DATES!



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Growing Environments

By Carlos Macku/Photographs, unless otherwise credited, by the author

IT IS BELIEVED that the most recent common ancestor of orchid plants appeared in the Cretaceous period, about 112 million years ago (Givnish et al. 2015). Through the ages, Orchidaceae became a successful family of specialists, with a diaspora of diverse plant forms that spread throughout the world, developing along the way incredible approaches for seed germination, growth and flower pollination. Some orchid flowers also evolved into whimsical shapes that were noticed by Victorian naturalists, explorers, and merchants (Berliocchi 2000). Over the last two centuries, botanists and plant growers further developed new and robust cultivars and hybrid plants that meet the commercial demands of the orchid market.

Orchids naturally grow on all continents, except Antarctica and with the help of modern technology, a wide array of these species and their hybrids can be grown and flowered anywhere in the world. Today, we could say that most orchid plants (and for all practical purposes, most ornamental, nutritional, medicinal and recreational plants) could live and be cultivated under appropriate outdoor or specialized indoor environmental conditions.

OUTDOOR ENVIRONMENTS Under outdoor environments, an orchid plant must be native to the location, or at least a transplant from a similar environment, to survive. If an orchid specimen is an import from a different latitude, such as tropical orchids brought to temperate zones, the plant can be raised outdoors, but only during the warmest seasons. The success of the opposite case, a temperate orchid plant brought to a tropical zone, will be limited due to seasonal dormancy requirement evolved over time. Nevertheless, for both cases, the viability for permanent survival can only be achieved with the assistance of temporary indoor growing conditions.

Orchid plants close to the equator are frequently epiphytes, but those from high latitudes are almost exclusively terrestrial (Kubicek 2020). In those extreme places, plants need to protect their root system from winter cold. But in the tropics, where mild temperatures are prevalent all year, orchid roots are attached to limitless types of surfaces that these resourceful



CARLA BARATTA



JOSE ANTONIO ALVAREZ

plants call home.

Outdoor environments can be classified under two subconditions: The natural outdoors and the horticultural outdoors.

Natural Outdoors

An orchid growing in a natural outdoor environment must survive and fend for itself all year. These plants are exposed to the full brunt of the elements such as extreme weather (storms and drought) as well as biological attack, mainly from herbivores, insects and pathogen microorganisms. These plants do not require any human assistance (and may actually be harmed by human activity) but may be routinely surveyed to gather botanical and ecological information. Typical natural outdoor environments may include continental expanses, mountain

[1] Picturesque view of Valle Aurina, Alto Adige, in the Italian Alps, where hikers can find *Dactylorhiza maculata* (inset) along their paths in the summer.

[2] A view of the City of Caracas from El Avila National Park where *Cyrtorchilus falcipetalum* (inset) can be found along its trails and hiking paths in the fall. The inset photograph was taken at 8,200 feet (2,500 m) in October of 2012.

ranges, or islands with no or little human encroachment, such as national parks, national forests, nature reserves and wildlife refuges.

Orchids in the wild may serve as personal enrichment for hardy souls with the fortitude to seek them out and for some, doing so is the pinnacle

of achievement. However, more wild orchids are harvested for food or aboriginal medicine throughout the world (Koopowitz 2001a). One example is salep, a beverage prepared in the Middle East from the tubers of native orchids such as *Orchis mascula* and *Orchis militaris* (in many cases leading to virtual extinction). Similarly, during the pre-Columbian era, the Totonac Indians of Southeast Mexico traded with the Aztecs the ripe fruits of *Vanilla planifolia* vines, which grew in the cloudy forests of what is today the State of Veracruz (Cameron 2011).

To prevent the overharvest of native wildlife (including orchids) caused by international commerce, the Convention on International Trade in Endangered Species (CITES) was created and has been endorsed by 183 signatory nations. The organization identifies threatened animal and plant species and tries to ensure that their international trade does not compromise their long-term survival (Koopowitz 2001b).

The European Alps are a system of mountain ranges that stretch across eight countries and includes five climate zones, each with distinct landscapes, flora and fauna. In addition to their rich geological and human history, pristine cities and towns and famous agricultural valleys, these highlands provide a place for exploration and discovery for hikers and mountaineers. The alpine flora of the region includes some of the first orchid species discovered by early botanists and naturalists, including *Dactylorhiza maculata* whose genus name refers to the shape of its tubers and species name to its darkly marked. *Dactylorhiza maculata* is a terrestrial orchid found at elevations of 5,000–6,500 feet (1,500–2,000 m), which blooms in the late spring to early summer with an inflorescence that can reach up to 24 inches (60 cm) tall.

Not far from the equator but still in the Northern Hemisphere lies the Venezuelan capital city of Caracas, located in a fertile valley at 3,300 feet (1,000 m) above sea level, but only 10 miles (16 km) from the Caribbean shore. Between the city and the sea, there is a mountainous range where Pico Naiguatá reaches an elevation of just over 9,000 feet (2,765 m). Most of this tropical alpine area was declared a national park in 1958, Avila National Park, which is also known for its indigenous name, Waraira Repano National Park (Álvarez 2012). The Park provides gratification to local hikers and tourists alike, with impressive views of El Litoral (the Caribbean shore) facing north,



- [3] Dendrobiums mounted on a tree trunk surrounding the swimming pool of a hotel near Tocumen International Airport, Panamá.
- [4] A healthy *Arundina graminifolia* in Tocumen, Panamá. This is an example of an Asian import growing under Central American climatic conditions.
- [5] A vanda in a home garden in Caracas, Venezuela just about to bloom.
- [6] A vanda blooming between banana tree foliage in Caracas, Venezuela.
- [7] Another vanda in bloom in a home garden in Caracas, Venezuela.

and the Valley of Caracas facing south. The Park also encompasses three climate zones, offering a great opportunity to appreciate the local flora and fauna, not too far from the hectic urban sprawl. Here, *Cyrtorchilus falcipetalum* (widespread from Venezuela to Colombia, Ecuador and Peru) blooms in the fall, in places that can be as high as Pico Naiguatá.

Horticultural Outdoors

Orchids grown in a horticultural outdoor environment must thrive (or at least endure) the local climate and weather conditions under the protection and surveillance of a gardener, landscape specialist, horticultural curator, botanist, commercial horticulturalist or individual hobbyist. Caretakers must keep close guard to prevent or minimize setbacks caused by weather or biology, and as a result, the general appearance and health of the specimens may be largely better than the specimens found in the wild and subject to all manner of fungal, bacterial and animal assaults. Orchids under outdoor horticultural conditions also lend themselves to container and basket culture not found in the natural outdoors.

These plants are usually near or mingled with plants from other families in settings such as public parks, public green areas along streets and highways, botanical gardens, horticultural fields, commercial nurseries and garden centers, house lawns and private gardens.

By definition, these plants are meant for the enjoyment of the public and tourists alike, as well as for the indulging private eye. However, their beauty can also help local economies by embellishing the green areas of restaurants, hotels, amusement parks, health and country clubs.

The horticultural outdoors is also the venue where orchid cash crops are cultivated. *Vanilla planifolia* was introduced during colonial times from Mexico and Central America to the Indian Ocean region, mainly to the islands of Madagascar, Reunion, Comoros and Seychelles. Today, large areas in these former French colonies are home to *Vi. planifolia* plantations, contributing more than half of the vanilla produced in the World (Cameron 2011).

To illustrate orchids under horticultural outdoor conditions, I captured images on a trip to Latin America during February 2020. I was fortunate to visit my family in Venezuela, just before the COVID-19 pandemic stopped all international air travel. Before reaching my destination, I

had to stop over in Panamá, spending a day in a local hotel near Tocumen airport. There, I saw hundreds of beautiful dendrobium plants mounted on palm trees around the swimming pool. Next to the cabana, where the bartender was serving delicious Cuba Libre and Mojito drinks, I found a healthy Bamboo Orchid (*Arundina graminifolia*) in all its blooming glory.

Once I arrived in Venezuela, I stayed at the home of my parents in Caracas. The garden at their house was lush and filled with banana, papaya, and other tropical trees and shrubs. Next to a wall, between a Bougainvillea and other tropical vines, I suddenly discovered a vanda plant just about to bloom. The monopodial plant was curling sideways between banana tree leaves like a stalking snake ready to strike. In just a matter of four days, I was lucky enough to see the buds become beautiful purple flowers.

Dendrobium and *Vanda* species, as well as *Arundina graminifolia*, are not native to Central and South America, but they are good examples of how well imported plants can flourish on a different continent with similar climate conditions.

Intermediate Outdoor Environments

Sometimes there are conditions where orchid plants grow in outdoor situations that are uniquely neither natural nor horticultural but retain characteristics of both types of environments. These situations are usually found in disturbed habitats where humans have established recent agricultural or urban advances on wild biomes.

In Latin America, ranchers are known to build human outposts deep inside rainforest areas. They also plant and watch over plants for local consumption as well as for leisure. A friend of mine who enjoys excursions to the countryside took a picture of a tree full of mounted *Cattleya mossiae* in full bloom. The barely tended orchids were in a rugged garden inside a hacienda, in western Venezuela. *Cattleya mossiae*, also known as Flor de Mayo, is the national flower of Venezuela. However, it is also worth mentioning that orchid imports from other continents are also grown in these environments, posing a potential threat to native habitats by invasive species and aggressive feral cultivars.

INDOOR ENVIRONMENTS An indoor environment implies a type of barrier between the outside elements (local climate, weather conditions and biological attack) and the orchid plant, therefore establishing tighter control over the



LUIS GARCIA

physical and chemical factors that affect the growth of these living organisms. Indoor conditions suggest a type of roof (and walls) placed above (and around) the cared-for plant, either clear glass or the cover of a home, office, commercial establishment or warehouse.

Indoor conditions could represent a challenge for the orchid grower because a whole set of nonlocal environmental conditions might need to be maintained 365 days of the year. This proposition can be costly and time consuming. It can also be unforgiving if physical conditions such as extreme temperatures are reached by accident or negligence, even just for few hours (Macku 2013).

When orchid plants are removed from their natural habitat and transferred to a controlled indoor environment, such as a greenhouse or a residential home, a new set of quasi-natural conditions are imposed on the plant. To start with, the roots of terrestrial orchids are no longer underground, and the roots of epiphytic and lithophytic orchids are, in general, no longer attached to a tree trunk or branch, or to a rock. These natural conditions are replaced by potted and mounted plant arrangements. Factors such as light, temperature, humidity, water availability, air circulation and the natural daily or yearly variations in climate are precariously mimicked to emulate the natural paradigm of the place from where these plants evolved and lived for millions of years. These artificial environmental compensations are certainly not perfect but are better attained in a greenhouse than in a tidy household environment.

Indoor environments can be broken down into two general categories:

horticultural and household.

Horticultural Indoors

Horticultural conformity and plant health under indoor conditions becomes more rigorous than under outdoor conditions, and this is achievable and expected due to the enhanced environmental control carried out by vested custodians. These caretakers give meticulous attention to the warded plants because most of these orchids will eventually be staged for competition, special events, commerce, or private greenhouse or home display.

Typical indoor horticultural environments include sunrooms, enclosed patios, commercial, public and private greenhouses, as well as warehouses converted to growing spaces.

Greenhouses or glasshouses, also known in the Victorian Era as hothouses or simply “stoves” (Berliocchi 2000), are structures built to control and regulate environmental growing conditions, using the sun as the main source of light. In modern and technically equipped greenhouses, watering and humidity are controlled with a sophisticated system of sprinklers and nebulizers, while temperature and air movement are controlled by a system of hydraulic windows and fans that allow the exchange of air between the interior and the exterior of the greenhouse. During cold winter months, reliable heat is indispensable and mostly supplied by gas heaters although smaller spaces in warmer climates may actually be maintained with electrical space heaters (BLT Liners 2019). Air movement is also complemented by the use of large and powerful fans, while light may be controlled by automatic screens that open and close depending on the actual light required inside the glass house. In extremely high latitudes, greenhouses can be customized with artificial lighting to provide extra indoor illumination.

For commercial purposes, large-scale greenhouses are built to raise potted orchids for distribution and sale in supermarkets and large hardware stores. These humongous greenhouses are like factories with mechanized systems that minimize physical strain on workers during growing, packaging and delivery of the product.

There are several greenhouses open to the public in New Jersey and neighboring states including the New York Botanical Garden (NYBG, Bronx, NY) with over 50 different themed gardens and greenhouses, Longwood Gardens



(LG, Kennett Square, PA) with 20 indoor gardens and the Orchid Range at Duke Farms (DF, Hillsborough, NJ), to name a few.

During February 2021, North America was hard hit with extremely cold weather caused by an extended polar vortex that reached many of our southern states. Just after a heavy snowstorm throughout the Northeast, I decided to venture out and visit Duke Farms, a 2,700-acre (1,093-ha) estate established by James Buchanan Duke and opened to the public in May 2012. To reach the Orchid Range, located in the heart of the estate, I had to walk 20 minutes on a cleared path surrounded by a beautiful, snow-covered landscape. Once I reached my destination, I took some outdoor pictures of the beautifully constructed orchid greenhouse. The building has a main greenhouse at the front to exhibit blooming plants displayed throughout an indoor tropical landscape. At the back are the growing houses, a series of smaller greenhouses, interconnected with one another, to keep orchid plants at different levels of development. To the side is a working shop to perform all maintenance operations for the large collection of orchid plants.

Household Indoors: Home and Office Environments

Conditions, either inside a home (household) or an office (commercial), must mesh with accepted human living standards (four website references provided below), which greatly limit the choices of plants from the commercial variety of orchid genera, species, and

- [8] Several plants of *Cattleya mossiae* in full bloom mounted on a tree trunk in the town of Calderas, Barinas, Western Venezuela.
- [9] The main greenhouse during winter at the Orchid Range in Duke Farms. Additional greenhouses are located behind the main structure to nurse a large collection of orchids.
- [10] Additional greenhouses are used to nurse orchid plants at different stages of growth.
- [11] A white cattleya bloom gazes through the greenhouse glass as if frightened from the snow and cold winter weather outside.
- [12] At the Duke Farms estate, clear signs indicate the path to reach the Orchid Range.

hybrids. In most places, these human living conditions are defined as comfortable temperatures (68–79 F [20–26 C]), reasonable indoor lighting (25–1000 lux), acceptable humidity levels (30–70 percent RH) and appropriate air movement (0.4–1.8 mph [0.15–0.8 m/s]). If an orchid plant cannot endure these limiting indoor conditions, its lasting outlook is not going to be very promising.

Another setback for orchids living in these indoor environments is their uniformity — little if any variation throughout the day or night. Through the millennia, these plants have adapted to experience variations of temperature

and light as the day cycles, from sunrise to sunset, and even during the nighttime hours. In addition, no yearly seasonal changes are experienced by plants grown indoors, critically important for triggering natural periods of growth and bloom.

I have cultivated orchids in my home for the last 22 years, building a collection that has grown to 70-plus potted plants, mostly phalaenopsis, cattleyas, dendrobiums, paphiopedilums and cymbidiums, which are distributed in three orchid stands (Macku 2011). These wooden stands are placed next to windows and sliding doors to maximize sun exposure. They are also outfitted with fluorescent lighting to increase the chances they will bloom. Small fans provide reasonable air circulation, and temperature and relative humidity are closely monitored with battery-powered sensors. During the summer, I relocate some plants to my small but sunny patio, where I keep a potted maple tree that provides transitional shade to avoid sun scalding on the unaccustomed leaves. Once in bloom, the plants are moved from the orchid shelves to dedicated display places in my home, those of friends, or at work.

CONCLUDING REMARKS There are four sets of well-defined environmental conditions where orchid plants can grow: natural outdoors, horticultural outdoors, horticultural indoors, and home or office. Modern technology and standards of living have enabled cultivation under indoor environments, delivering reliable ways to cultivate orchids from any location on the globe, anywhere in the world. Growing, or being constrained to grow, orchid plants in any of the four environments opens the doors for new possibilities, as well as for horticultural limitations. Climate, weather, environmental and trade laws, achieving vigorous plants, biological control through the use of pesticides and growing arrangements (terrestrial or epiphyte, mounted, potted, hydroponics) are some of the considerations imposed by each of these growing environments.

Acknowledgments

I thank my friends Luis García and José Antonio Álvarez in Venezuela, and Carla Baratta in Italy, for their photographic contributions to this manuscript.

References

Álvarez, J.A. 2008. Febrero 2008. Excursión en Solitario al Pico Naiguatá (Parque Nacional Waraira Repano) Via Santa Rosa (El Avila). <https://www.youtube.com/watch?v=vjmHTs3hjX8> Accessed February 25, 2021.

American Society of Heating, Refrigerating, and Air Conditioning Standards, Inc. (ASHRAE) Standards. 2011. *Thermal Environmental Conditions for Human Occupancy* (ASHRAE Standard 55-2010). <http://arco-hvac>.



[ir/wp-content/uploads/2015/11/ASHRAE-55-2010.pdf](https://www.ashrae.org/~/media/ASHRAE/Files/Technical%20Standards/55-2010.pdf). Accessed February 25, 2021.

Berliocchi, L. 2000. *The Orchid in Lore and Legend*. Timber Press, Portland, Oregon. p. 57–86.

BLT Liners. 2019. *How to Heat a Greenhouse in Winter*. <https://www.btliners.com/heat-greenhouse-in-winter/>. Accessed February 25, 2021.

Cameron, K. 2011. *Vanilla Orchids: Natural History and Cultivation*. Timber Press, Portland, Oregon. p. 11–21.

CITES. 2021. <https://cites.org>. Accessed February 25, 2021.

Duke Farms. 2021. <https://dukefarms.org>. Accessed February 25, 2021.

Givnish, T.J., D. Spalink, M. Ames, S.P. Lyon, S.J. Hunter, A. Zuluaga, W.J.D. Iles, M.A. Clements, M.T.K. Arroyo, J. Leebens-Mack, L. Endara, R. Kriebel, K.M. Neubig, W.M. Whitten, N.H. Williams, and K.M. Cameron. 2015. Orchid Phylogenomics and Multiple Drivers of Their Extraordinary Diversification. *Proceedings of the Royal Society B: Biological Sciences* 282: 2015.1553.

Koopowitz, H. 2001a. *Orchids and Their Conservation*. Timber Press, Portland, Oregon. p. 66–77.

_. 2001b. *Orchids and Their Conservation*. Timber Press, Portland, Oregon. p. 103–113.

Kubicek, S. 2020. Epiphytic Orchids North of the 49th Parallel. *Orchids* 89(8): 672–673.

Longwood Gardens (LG). 2021. <https://longwoodgardens.org>. Accessed February 25, 2021.

Macku, C. 2011. A Passion for Orchids: Pots, Saucers and Bookshelves Add Up to Success. *Orchids* 80: 678–685.

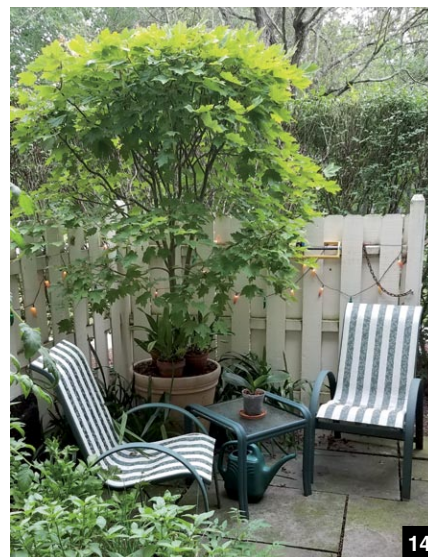
_. 2013. Hurricane Sandy: Reflections on the Aftermath of a Storm. *Orchids* 82(11): 686–689.

New York Botanical Garden (NYBG). 2021. <https://www.nybg.org>. Accessed February 25, 2021.

NSW Government, SafeWork. N.D. Maintaining Thermal Comfort in Indoor Work Environments. <https://www.safework.nsw.gov.au/resource-library/heat-and-environment/maintaining-thermal-comfort-in-indoor-work-environments>. Accessed February 25, 2021.

Engineering ToolBox. 2004. Illuminance—Recommended Light Level. https://www.engineeringtoolbox.com/light-level-rooms-d_708.html. Accessed February 25, 2021.

Wikipedia. 2021. Relative Humidity. https://en.wikipedia.org/wiki/Relative_humidity. Accessed February 25, 2021.



- [13] An orchid stand inside a residential home placed next to a southwestern-facing window. This stand can hold 12–18 potted orchids.
- [14] A sunny patio provides the right place to expose indoor orchids to extra light during the warm summer months. A shady corner is provided by a potted maple tree, which eases plant transition from indoor to outdoor conditions.
- [15] A cymbidium hybrid grown under home conditions is being showcased at a commercial office.

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

Nominations for AOS Conservation Awards

By Charles Wilson

DO YOU KNOW someone, an agency or society who has done something notable in the interest of orchid conservation? You have an opportunity to nominate them for recognition for their efforts!

- The Philip E. Keenan Award was established to recognize and reward individuals, groups, or affiliated societies for outstanding work in the field of orchid conservation, restricted to North America.
- The AOS Conservation Recognition Award was similarly established to recognize and reward individuals, groups, or Affiliated Societies worldwide for outstanding work in the field of orchid conservation.

Two \$500.00 first-place awards and two \$250.00 second-place awards may be given in each category each year.

The application period for both of these awards has been extended to December 1, 2021.

Applications for these prestigious awards should include a nomination statement, a short biography of the proposed recipient when it concerns an individual's efforts, or a short history of the nominated group, organization or affiliated society. A concise description (no more than two pages) of the project or endeavor and its effectiveness must be submitted along with the nomination. Several photographs of the conservation work should be included, as well as no more than three letters of recommendation from individuals who are familiar with the work. It is hoped that we can feature these projects in regular articles in *Orchids* as a reward for the recipients' good work and to encourage conservation efforts. Nominations or questions should be sent to conservation_committee@aos.org.

— Charles Wilson, AOS Conservation Committee Chair (email: conservation_committee@aos.org).



[1] *Corallorrhiza maculata* (summer coralroot) in eastern Oregon at GROWISER.

[2] *Cypripedium montanum* (mountain lady's slipper) at GROWISER

Call for Grants!

Each year, the AOS offers grants for work in education, conservation and research. It is that time of year!

EDUCATION

The AOS Education Committee will be accepting applications for education grants from November 1, 2021 through February 1, 2022. Applicants will be notified of status in May 2022.

Education grants support the development, implementation, maintenance or support for comprehensive educational programs and activities that embrace learners of any age level and promote passion for orchids through education. We are seeking applicants engaging in a wide range of projects.

Requirements include an article featuring the project submitted for publication in *Orchids* magazine following completion, and a webinar about the project to be used for educational purposes. Multiyear projects are funded on an annual basis upon submission of a report due by March 14 on work from the previous year.

Application forms are available with instructions on the AOS website at [aos.org](https://www.aos.org). Use the All About Orchids menu and click on Education Grant Program, or contact the AOS Education Committee directly at education_committee@aos.org for an application or to answer any questions regarding the grants. If the project is also suitable for conservation or research grants, those applications must be submitted separately to the respective committees.

Good luck! — *Phyllis S. Prestia, EdD, Chair, AOS Education Committee.*

CONSERVATION

All conservation-oriented projects, anywhere in the world, will be considered. An institutional affiliation is required for administration of international grants. We are seeking applicants engaging in a wide range of projects that study, protect or restore orchids and their natural habitats. Conservation grants are intended to encourage a more practical, applied, hands-on approach. We require all projects to be reported on annually, and that an article featuring your project be submitted for publication in *Orchids* magazine within six months of completion. Multiyear projects are funded on an annual basis after a required satisfactory progress report has been submitted by March 14 on work

from the previous year. Applications must be submitted on the application form, which is available with instructions on the AOS website at <https://www.aos.org/about-us/orchid-conservation/grant-application.aspx>. Your grant may be more suited for either a research or education grant, which are also available, but those applications must be submitted separately to their respective committees. Please contact the Conservation Committee at conservation_committee@aos.org with any questions in advance of the February 1, 2022 deadline. All applicants will be notified of their acceptance status by May 1, 2022.

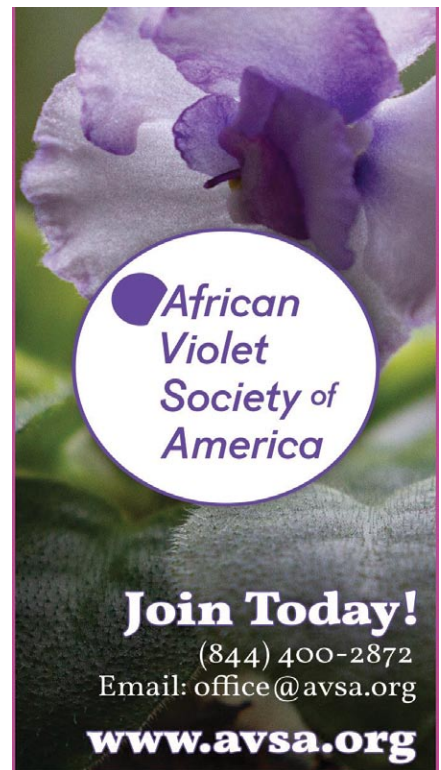
Good luck! — *Charles Wilson, Chair, AOS Conservation Committee.*

RESEARCH

All orchid research projects, anywhere in the world, will be considered. An institutional affiliation is required for administration of international grants. We are seeking applicants engaging in a wide range of research projects with a focus on orchids, such as anatomy, biogeography, conservation science, development, ecology, evolution, genetics, horticulture, morphology, physiology, propagation, systematics and so on. We require all projects to be reported on annually, and that an article featuring your project be submitted for publication in *Orchids* magazine within six months of completion. Multiyear projects are funded on an annual basis when a satisfactory progress report on work from the previous year is submitted by March 14. Applications must be submitted on the application form, which is available with instructions

on the AOS website at <https://www.aos.org/about-us/orchid-research/application-guidelines.aspx>. Your grant may be more suited for a conservation or education grant, which are also available, but applications for these must be submitted separately to their respective committees. Please contact the Research Committee at research_committee@aos.org with any questions in advance of the February 1, 2022 deadline. All applicants will be notified of their acceptance status by May 1, 2022.

Good luck! — *Robert J. Griesbach, PhD, Chair, AOS Research Committee.*



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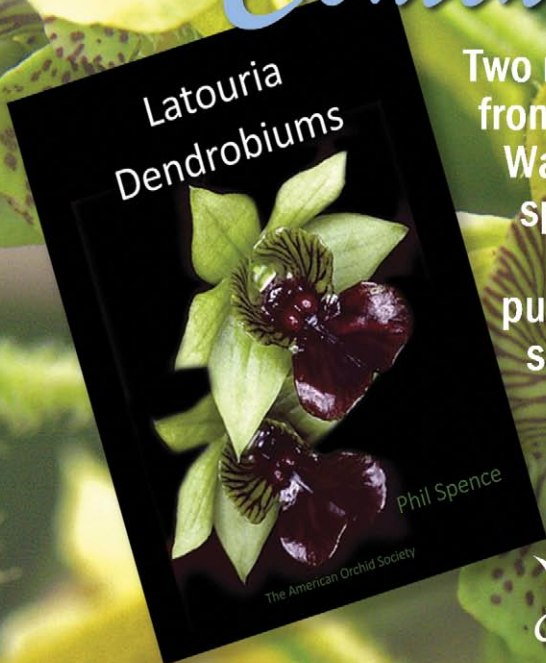


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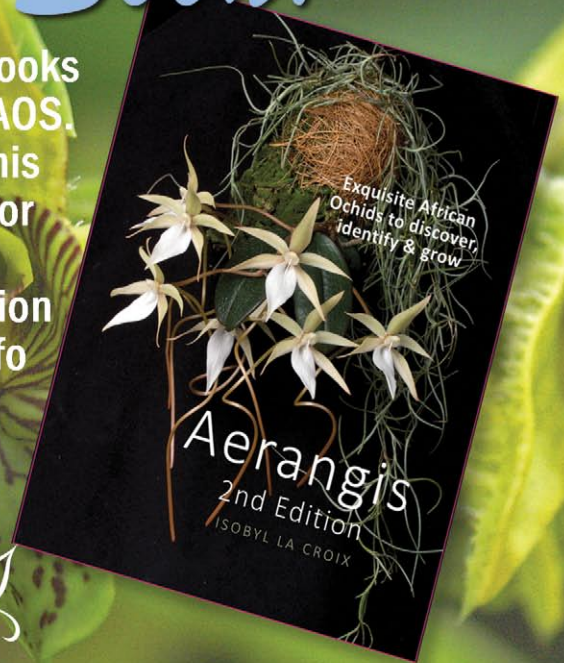
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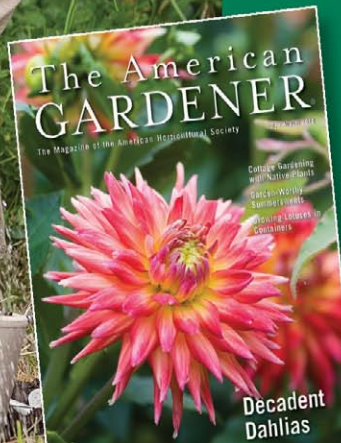
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Sylvia Strigari

Phalaenopsis lobbii

Text by Franco Pupulin/Watercolor by Sylvia Strigari

Tribe CYMBIDIEAE
Sutribe AERIDINAE
Genus PHALAEOPSIS *Blume*

Phalaenopsis lobbii (Rchb.f.) H.R.Sweet, *Genus Phalaenopsis* 53. 1980. *Phalaenopsis parishii* var. *lobbii* Rchb.f., *Refug. Bot.* 2: sub pl. 85. 1870. *Phalaenopsis decumbens* var. *lobbii* (Rchb.f.) P.F.Hunt, *Amer. Orchid Soc. Bull.* 40:1094. 1971. *Polychilos lobbii* (Rchb. f.) Shim, *Malayan Nat. J.* 36(1):24. 1982. *Phalaenopsis lobbii* (Rchb.f.) Aver., *Bot. Zhurn. SSSR* 73(3):432. 1988. *Doritis lobbii* (Rchb. f.) T.Yukawa & K.Kita, *Acta Phytotax. Geobot.* 56:156. 2005. TYPE: Eastern Himalaya. "Gathered by T. Lobb so early as 1845, in the Eastern Himalaya," ex Hort. Veitch, *T. Lobb s.n.* (W-R). *Phalaenopsis lobbii* f. *flava* (Gruss & Rölke) Christenson, *Phalaenopsis Monogr.* 71. 2001. TYPE: photo in *Die Orchidee* 43(1):42. 1992. *Phalaenopsis lobbii* f. *flavilabia* Christenson, *Phalaenopsis Monogr.* 72. 2001. TYPE: photo in Christenson 2001, without locality, *Hort. Trudel* 585. *Phalaenopsis lobbii* var. *vietnamensis* O.Gruss & Roeth, *Orchidee (Hamburg)* 57(1):97. 2006. TYPE: Vietnam, 27 Jun 1992, *N. Diem ex O. Gruss & J. Röth* (holotype, HAL).

An epiphytic, small, monopodial *herb* with erect leafy stems, to about 10 cm tall. *Roots* numerous, long, fleshy, glabrous, thick, strongly flattened, with green apices, to 6 mm in diameter. *Stem* very short, completely enclosed by the imbricating leaf sheaths. *Leaves* 4–7, distichous, suberect to pendent, membranous to thick, elliptic, obtuse, obliquely emarginate, abaxially ribbed, dark green and somewhat prismatic, 3–14 × 2.2–5.0 cm, sometimes shredding after flowering. *Inflorescences* 1–3, each a suberect, loose, few-flowered (1–6), lateral raceme produced from the axils of the lower leaves, shorter than the subtending leaves, occasionally surpassing them, to 7 cm long, with 1–3 triangular-ovate, obtuse, coriaceous, brown bracts, tightly clasping the peduncle. *Floral bract* glumaceous, pale green, broadly elliptic-ovate, obtuse, to 4 × 3 mm. Pedicellate *ovary* long, gently sigmoid-arcuate, white, to 2.5 cm long including the pedicel. *Flowers* spreading, sweetly scented, the sepals and petals creamy white to pure white, the lip white to pale yellow, the lateral lobes white, finely spotted brown, the midlobe with two broad, longitudinal chestnut bars; the column

white with a pair of definite brown spots at the basal swelling. *Dorsal sepal* elliptic-ovate, obtuse, 10 × 5 mm. *Lateral sepals* obliquely broadly ovate to suborbicular, obtuse, slightly concave, 8 × 7 mm. *Petals* obovate-subspatulate from a cuneate base, obtuse to rounded, deflexed, 8 × 4 mm. *Lip* adnate to the column through a short claw, trilobed, ca. 8 × 10 mm; lateral lobes erect, triangular-falcate to elliptic, acuminate, with a fleshy keel, U-shaped from the top, 3 × 1 mm; the midlobe hinged, mobile, transversely triangular with rounded-obtuse apices, to 7 × 10 mm, concave, the lateral margins somewhat erect; the disk provided at the base with a semicircular, raised, fleshy plate with irregularly subdenticulate margin, on top of which is a flat, fleshy projection to 5 mm long, deeply divided into four filiform appendages. *Column* short and stout, slightly arcuate, to 5 mm long, terete from a basal bilobed, concave, massive swelling. *Anther cap* cucullate, ovate-subtrapezoid, complanate, bilocular. *Pollinia* two, obovate, deeply cleft, on a narrowly triangular, attenuate stipe and a peltate, hyaline viscidium.

The limits of what we have traditionally been accustomed to considering as the "genus *Phalaenopsis*" have been somewhat modified in recent years (Kocyan and Schuiteman 2014), largely as a result of the interpretation of molecular data relating to the relationships between species, and their translation in terms of systematics and nomenclature (Padolina et al. 2005, Yukawa et al. 2005, Tsai et al. 2006, 2010, Cribb and Schuiteman 2012). Today it may seem strange to consider that the plant which produces the large white flowers in raceme-like cascades, the type of the genus *Phalaenopsis*, *Phalaenopsis amabilis*, must be considered congeneric with *Phalaenopsis japonica* (which we have seen in another chapter of the *New Refugium Botanicum*), *Phalaenopsis marriottiana* or *Phalaenopsis tsii* (subgenus *Hygrochilus*), and even more so when compared with *Phalaenopsis difformis* or *Phalaenopsis yingjiangensis* (both in the subgenus *Ornithochilus*), with small flowers of just over a centimeter in size and provided with a prominent (for the size of the flower) spur.

To put things in perspective, however, we must not forget that for our "systematic" perception it is quite obvious to consider that *Phalaenopsis cornu-cervi* or *Phalaenopsis*

equestris are legitimate members of the genus, but the two species were originally described in 1827 and 1843 in two genera of their own, *Polychilos* and *Stauroglottis*, by Jacob Gijsbert Samuel van Breda and Johannes Conrad Schauer respectively. The "King of Orchids," Prof. Reichenbach *filius* in Hamburg, even created a new genus in 1862, *Stauritis*, for a species of *Phalaenopsis* today appreciated as such all over the world: *Phalaenopsis violacea*. To stay closer to the species this chapter of the *New Refugium Botanicum* deals with, still in relatively recent years proper genera have been proposed for some of the species in the subgenus *Parishianae*, such as *Grafia* by Alex D. Hawkes in 1966 for *Phalaenopsis parishii* [the name is in any case a synonym of *Grafia* Reichenbach (1837) in the Apiaceae] and *Grussia* by Manfred Wolff in 2007 for *Phalaenopsis appendiculata*.

We have already commented on repeated occasions on the pages of this series that the phylogenetic relationships as they are evidenced through the analysis of the genetic sequences of the species, and as they are visualized through the "evolutionary trees" that we call cladograms, do not provide a pattern that can translate, without interpretation, into a classification system based on rigid hierarchical levels, as it is foreseen by our nomenclatorial system. The analysis of the similarities and dissimilarities of those given regions of the DNA gives us a hypothesis on the degree of genetic proximity between the species and, indirectly, of their greater or lesser "consanguinity" in the evolutionary tree. The paradigms of modern systematics also indicate the necessity that in order to be considered scientifically congruent, each grouping, each clade, must include only the descendants of a specific ancestor, and all its descendants. However, except for the terminal branches — those of the species —, it cannot tell us at what taxonomic level these groups should be treated, and the "decision" whether to consider the branches, progressively thinner, as genera, subgenera, sections, or any other formal taxonomic level, still largely depends on the real taxonomic experience of the interpreter and on his or her familiarity with the organisms in question.

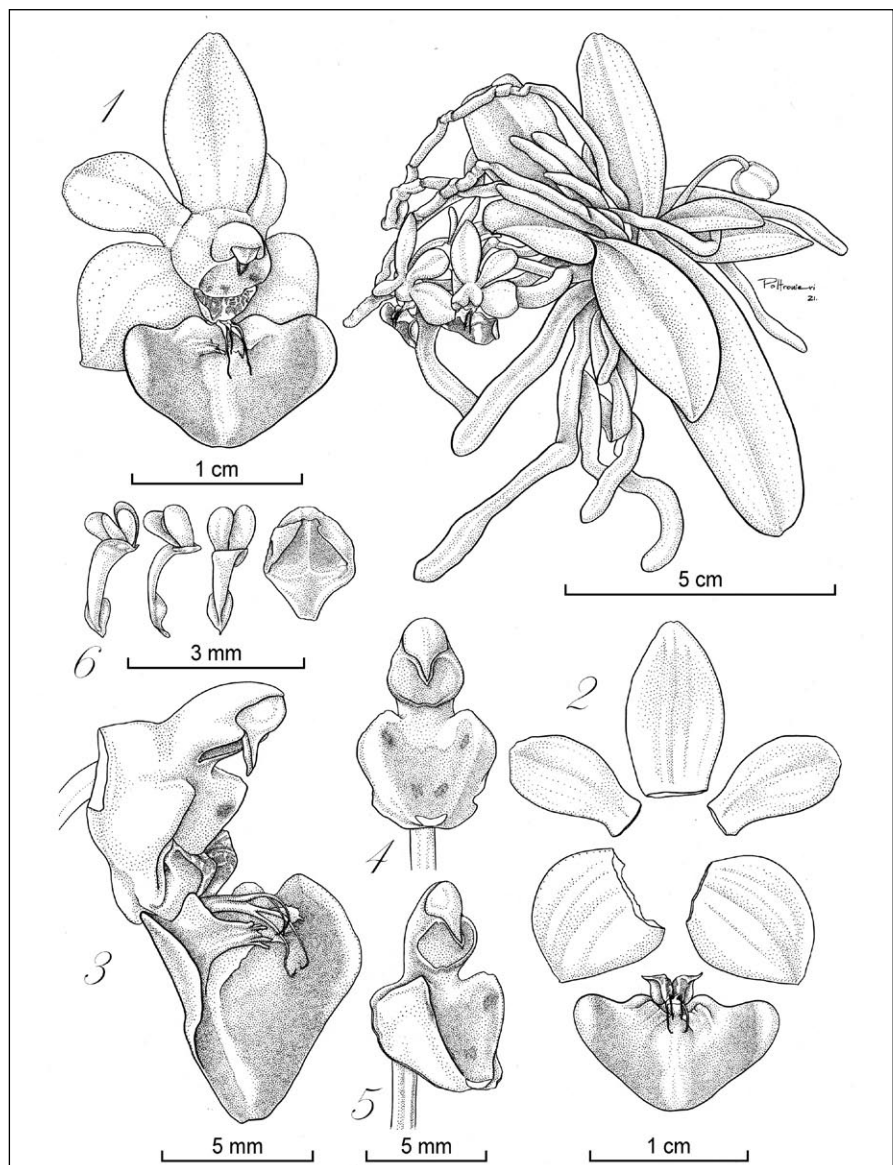
I say this because, without wanting to defend a priori the current circumscription

of the genus *Phalaenopsis*, it is however necessary to leave our preconceptions on the side. The genera of plants, as we see them, are to a large extent the product of a custom in the use of a certain classification system, which we assume to the point that seems to us quite “natural.” Today, after having been now split from *Cattleya* for 20 years, our eyes perceive *Guarianthe* species as very different from those of *Cattleya*. And nevertheless, at the beginning there was a certain resistance to accept the genus *Guarianthe*, because the traditional use of the names had made in our eyes the species of *Guarianthe*, which are more like the *Laelia* of the north of the Central American isthmus, completely assimilable to the South American *Cattleya*, despite their differences.

What is undoubted is that the results of all recent molecular studies indicate that the traditional subgeneric groupings of *Phalaenopsis* are largely artificial. The same subgenus *Parishianae*, to which the darling of our history belongs, has revealed itself polyphyletic in all analyses, where it forms a clade with the subgenus *Deliciosae* (*Kingidium*). The species of this group are mostly native to southern China, down to the Himalayan region, and to Indochina. All *Parishianae* and *Deliciosae* species have four pollinia, considered the ancestral number for the genus.

Reichenbach (1869) described *Phal. lobbii* as a variety of *Phal. parishii*, which he also named a few years before (Reichenbach 1865), basically differing in the coloration of the lip, white with two large tan bands instead of violet. As new specimens of the true *Phal. parishii* did not surface in the market until the end of the last century, the more common *Phal. lobbii* was frequently confused with it and misnamed under that name. Actually, the structure of the callus is quite different between the two species, as the rim of the ridge under the main filamentous callus is slightly denticulate in *Phal. lobbii*, while in *Phal. parishii* it is provided with long fringes (Sweet 1980). In recent years, with the introduction of new species of the group (*Phalaenopsis malipoensis* Z.J.Liu & S.C.Chen in 2005, *Phalaenopsis thailandica* O.Gruss & Roeth in 2009), the whole group of subgenus *Parishianae* has attained renewed popularity.

Phalaenopsis lobbii is known from the eastern Himalayas, northeastern India, Assam, Bhutan, Sikkim, Myanmar and Vietnam. A previous Chinese record from southeastern Yunnan refers, in fact, to *Phal. malipoensis*. Plants of *Phal. lobbii* are found in lowland and premontane



evergreen forests, from 300 to over 1,200 m in elevation, where they establish on rough barked trees, producing an extensive root system reaching several meters in length, or in humid forests on mossy branches and trunks. The plants are leafy during the rainy season, but those exposed to drier environments become deciduous during the dry season. Under a continuous watering regime, plants in cultivation maintain their leaves year-round and flower more profusely. Flowering has been mostly recorded from November to January.

References

Cribb, P.J. and A. Schuiteman. 2012. *Phalaenopsis* - Classification. *Renziana* 2:14–15.
 Kocyan, A. and A. Schuiteman. 2014. New Combinations in Aeridinae (Orchidaceae). *Phytotaxa*
 Padolina, J., C.R. Linder and B.B. Simpson. 2005. A Phylogeny of *Phalaenopsis* Using Multiple Chloroplast Markers. *Selbyana* 26:23–27.
 Reichenbach, H.G. 1865. Zwei Neue *Phalaenopsis*. *Bot. Zeit.* 23(18):146–147.
 —. 1869. *Phalaenopsis parishii*. Sub t. 85 in W. W. Saunders (ed.). *Refugium Botanicum; or, figures and descrip-*

Phalaenopsis lobbii. The plant.

- [1] Flower.
- [2] Dissected perianth.
- [3] Column and lip, three quarters view.
- [4] Column, ventral view.
- [5] Column, three quarters view.
- [6] Pollinarium (three views) and anther cap.

All drawn from JBL-08948 by S. Poltronieri.

tions... vol. 2.
 Sweet, H.R. 1980. The Genus *Phalaenopsis*. The Orchid Digest, Pomona.
 Tsai, C.C., S.C. Huang and C.H. Chou. 2006. Molecular Phylogeny of *Phalaenopsis* Blume (Orchidaceae) Based on the Internal Transcribed Spacer of the Nuclear Ribosomal DNA. *Plant Syst. Evol.* 256:1–16.
 Tsai, C.C., Y.C. Chiang, S.C. Huang, C.H. Chen and C.H. Chou. 2010. Molecular Phylogeny of *Phalaenopsis* Blume (Orchidaceae) on the Basis of Plastid and Nuclear DNA. *Plant Syst. Evol.* 256:77–98.
 Yukawa, T., K. Kita, T. Handa and H. Topik. 2005. Molecular Phylogenetics of *Phalaenopsis* (Orchidaceae) and Allied Genera: Re-evaluation of Generic Concepts. *Acta Phytotax. Geobot.* 56:141–161.

Selected Botanical Terms

abaxial – underside or backside
 acuminate – tapering to a long point
 acute – pointed
 adaxial – upper side or front surface
 adnate – fused
 apical – at or from the top
 arcuate – bow-shaped; curved
 axillary – arising from the juncture of leaf and stem
 attenuate – gradually tapered
 bilocular – having two chambers
 bract – modified or specialized leaf
 callus – thickened tissue on the lip
 claw – narrow section connecting two parts
 clinandrium – cavity which houses the orchid's anther
 complanate – flattened; carried in one plane
 concave – bowl-shape; curved inward
 convex – shaped like the surface of a ball
 coriaceous – leathery
 cucullate – hooded
 cuneate – shaped like a wedge
 deflexed – bent downward
 dehiscent – spontaneous splitting open; as in the capsule of an orchid
 denticulate – toothed

distichous – arranged in two opposite rows
 dorsal surface – upper surface
 etiolated – pale and drawn out due to lack of light
 elliptic – oval
 emarginate – notched margin
 epiphyte – a plant that uses another plant as a means of support
 falcate – sickle-shaped
 filiform – shaped like a filament
 foliaceous – leaflike
 glabrous – smooth
 glumaceous – having chaffy bracts as in grasses and sedges.
 hyaline – translucent, glassy
 imbricate – overlapping like scales
 keel – thickened area(s) on the lip of an orchid
 membranous – thin; like a membrane
 monopodial – growing from a single growing point
 oblique – slanting
 obtuse – blunt
 obovate – egg-shaped with narrow end at the base
 orbicular – round
 ovate – egg-shaped with wider end at the base

pedicel – a stalk attaching the flower to the inflorescence
 pedicellate – appearing as a stalk
 peltate – more or less circulate with point of attachment on the underside
 perennate – survive a winter or dry season to grow again
 racemose – an inflorescence that continues to elongate producing flowers and does not terminate in a floral bud
 semi – half; also as a prefix to mean more or less.
 sigmoid – curved in two directions like the letter s.
 spatulate – spoon-shaped
 stipe – stalk supporting another structure
 sub – somewhat less than; i.e., subspherical would refer to almost but not quite a sphere
 subtend – beneath or close to as in subtended by a bract.
 terete – cylindrical or pencil-shaped
 trapezoid – four-sided with only two sides parallel.
 viscidium – sticky pad to which the pollinia are attached

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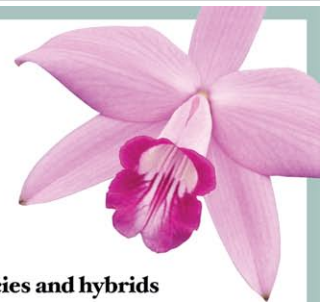


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The Genus *Calanthe* R. Brown 1821

The “Beautiful Flower” Orchid: Evergreen, Deciduous or Winter Hardy?

TEXT BY CHARLES WILSON/PHOTOGRAPHS, UNLESS OTHERWISE CREDITED, ARE BY THE AUTHOR

The genus *Calanthe*, or the “beautiful flower” orchid, (from the Greek words *kalos* meaning beautiful and *anthe* meaning flower) consists of 207 or so species found widely distributed from the tropical and subtropical areas of Africa, eastward to Asia and on through the South Pacific to Australia. There are even a very few oddball species found in Central America and Northern South America,

The flowers can be quite lovely with colors ranging from white through yellow to lavender and even red. The attractive but mostly non-fragrant flowers may be more than 2 inches (5 cm) across.

The two basic vegetative types of *Calanthe*, deciduous (*Preptanthe*) and evergreen (*Eucalanthe*), not only look obviously different, but they also require markedly different methods of care in cultivation. Amazingly, there are a few species that have been reported to even withstand hard frosts and freezing temperatures as far north as USDA Zone 7B.

The deciduous subgenus group, *Preptanthe*, consists of only nine species. All occur at lower elevations in a rather restricted southeast Asian geographic range from Assam through Laos, Cambodia, Thailand and Vietnam to the Philippines, New Guinea and Sumatra. They all experience a marked dry season for several months each year. During these times they shed their thin, plicate (folded) leaves and reveal their prominent, rather angular and somewhat elongated pseudobulbs. These are covered with a papery thin grey-green sheath that often appears netlike. The starkly bare pseudobulbs present something of a modern art sculptured arrangement until the inflorescences emerge and bloom around midwinter, followed by new leaves appearing on the next year’s growth. Watering and fertilizer should be abundant during their active growth period beginning in early spring after the new leaves and pseudobulbs begin to emerge at the base of last year’s pseudobulbs,

In late summer, watering should be slowly reduced as the leaves begin to



fade and fall off, eventually reduced to only a misting sufficient during the winter months to prevent the pseudobulbs from excessive shriveling. Their upright inflorescences emerge in the late fall to early winter from the base of the most recently matured, leafless pseudobulbs

[1] *Calanthe coodei* 'Chasus' CHM/AOS, from the Philippines, grown by the author. Photograph by Ross Leach. Inset close-up by the author shows the yellow, pebbled crest characteristic of the species.



and may have 18 or more flowers lasting three or more weeks. Because flowers open sequentially, inflorescences may produce flowers the entire winter. The unbranched inflorescences may reach 35 inches (90 cm) or more in length. They are quite hairy their entire length and are typically gracefully arched distally where the flowers occur.

The evergreen or nondeciduous species of *Calanthe* subgenus *Eucalanthe* number some 198 species. This group is distinctive in that the small, stemlike pseudobulbs are essentially completely concealed inside the bases of the numerous and persistent plicate leaves. Their upright inflorescences, as tall as 39 inches (98 cm), emerge from between the closely held lower leaves. Each may present up to 32 or more flowers, typically concentrated near the apex, and may last three weeks or longer.

Although it should be noted that hybridization between species of the two subgroups, *Preptanthe* and *Eucalanthe*, (*i.e.* deciduous types crossed with evergreen types) have often been reported to be impossible, Chris Purver of the Eric Young Orchid Foundation in Jersey, UK (pers. com. 2013), noted several successful crosses to the contrary.

Calanthe *Laucheana* (*vestita* × *triplicata*) registered in 1894 and *Calanthe* *Novelty* (*Sedenii* × *triplicata*) registered 1897 are two rather notable examples.

The first recorded hybrid of an orchid was *Calanthe* *Dominyi* (*sylvatica* × *triplicata*), registered in 1856 by Veitch Nurseries and named in honor of the hybridizer John Dominy, head gardener to Veitch Nursery. Please note the spelling, date and the names of the parents involved. It must be noted that there can be considerable confusion in the names of these older hybrids. For example, there is also a registered, but differently spelled *Calanthe* *Dominii* (*furcata* × *masuca*) registered by Veitch in 1858. This is even further compounded in that *furcata* is now considered a synonym of *triplicata* and a hybrid named *Calanthe* *Rollissonii* was registered with those parental names in 1877.

TEMPERATURE AND LIGHT Both the deciduous and evergreen types essentially prefer warmer growing temperatures with minimum nights of 55–60 F (13–16 C). The evergreen group (*Eucalanthe*) prefers to be watered throughout the year. Many members of this evergreen subgroup benefit from somewhat warmer night temperatures to even 70 F (21 C). Daytime

- [2] After shedding its leaves, the bare pseudobulbs of *Calanthe vestita* present a rather stark and modern art-sculpted appearance.
- [3] The new leaves emerge in the spring after blooming finishes.
- [4] *Calanthe discolor*.

temperatures of 90 F (32 C) or even higher can be tolerated by both groups provided there is ample air movement and high humidity. Species of both groups prefer dappled light conditions or part shade. Direct sunlight may burn their delicate, thin leaves.

THE WINTER HARDY All winter-hardy calanthes are of the evergreen type (*Eucalanthe*). This small group of proven winter hardy calanthes (to Zone 7B) include *discolor*, *puberula* (*reflexa*), and *striata* (*sieboldii*) (pers. com. Douglas Hartong, 2021). It should also be noted that *discolor* and *striata* both have lovely fragrances! There are an additional five species that have been suggested to also be winter hardy: *aristulifera*, *arisanensis*, *hattorii*, *nipponica* and *tricarinata*. General requirements to overwinter these species down to 20 F (-6.6 C) include a well-drained site and shady conditions for the growing season. The foliage will die down for the winter to a perennating bud from which the new growth and inflorescences will emerge when warmer weather permit the following spring. For the faint at heart, when planting these orchids directly into the garden, a little extra layer of mulch can be added in the late fall and removed in the spring after the threat of the hardest frosts has passed, or they can be grown in suitable pots and moved into a more sheltered area during temperature extremes.

POTTING Calanthes, as with most terrestrial orchids with thick roots, flourish in a mix that allows for a uniformly moist but buoyant root zone that provides quicker drying and maximum air interchange. Heavier, dense mixes tend to limit the all-important air interchange to the roots and typically hold too much water, creating a soggy environment ill-suited for successful growing and blooming. We use a mixture of 50 percent potting soil combined with an equal amount of our regular orchid mix (7 parts small fir bark, 1part small charcoal, 1part small perlite). This “terrestrial mix” should be used on top of an ample bottom layer of inert drainage material to insure excellent drainage. This mixture rapidly takes on and easily holds moisture, but also quickly dries out for the longer dry periods preferred for the deciduous varieties.

Calanthes are an easy-to-grow and rewarding genus — plus the many evergreen species make attractive foliage plants for the house even when not in flower.



5



CHARLES MARDEN FITCH

6



MICHAEL PEARSON

7



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

- [5] *Calanthe* Dominyi. The inset photographs are the parents of the cross — left: *Calanthe sylvatica* 'Zia's 15309' grown by Raymond H. Gabaldon III (photograph by Karl Siegler); right: *Calanthe triplicata* 'Rona' CHM/AOS grown by Harold and Rona Goldstein (photograph by James Osen).
- [6] *Calanthe reflexa* (*puberula*) 'Trident' CHM/AOS grown by Wilford B. Neptune, MD.
- [7] *Calanthe tricarinata* 'KIG' CHM/AOS grown by Arlen Hill.



Calanthe striata (sieboldii)
'TYDARES #70' AM/AOS
grown by Taoyuan
District Agriculture
Research. Photograph
by Jea Shang
Photography.



Mrs Drake, del.

Aerides affine.

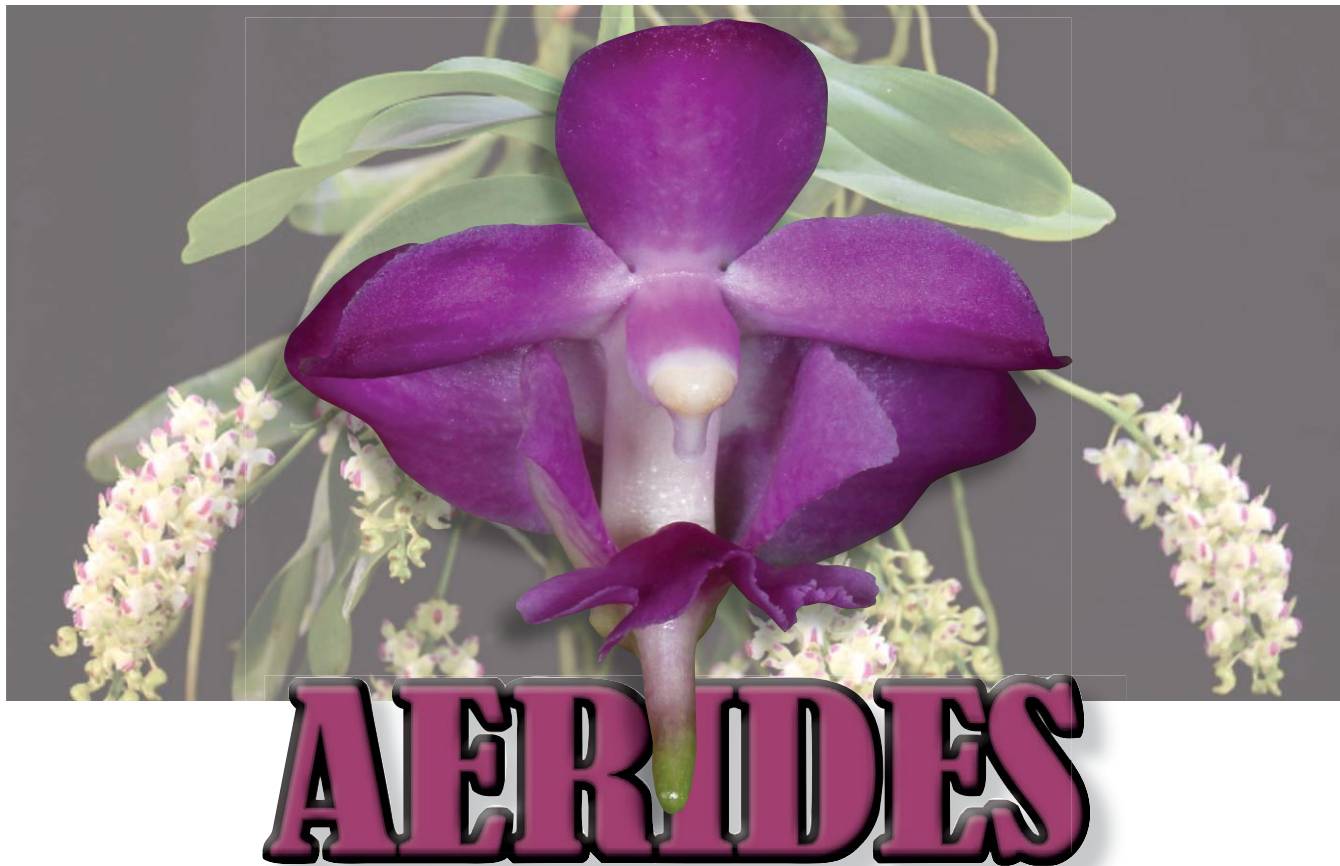
M. Gouvi, lith.

Pub^d by J. Ridgway & Sons, 169, Piccadilly, July 1, 1838.

Printed by P. Gouvi.

Aerides by Wesley Higgins and Peggy Alrich

A South Asian Genus



THE GENUS *AERIDES* was described by João de Loureiro (1717–1791) in *Flora cochinchinensis* (1790). The etymology of *Aerides* comes from Greek for air, alluding to the plants' epiphytic habit and the name is usually given as "daughters of the air."

An attractive genus with 32 often spectacular, monopodial epiphytes or lithophytes known as foxtail orchids that are valued in horticulture for their showy flowers.

They are found in tropical, low to middle elevation, hill scrub to montane evergreen forests ranging from southern China (Yunnan to Guangdong), northern India (Kashmir to Assam), Nepal, Bhutan, Sri Lanka, Myanmar to Vietnam, Indonesia and New Guinea to the Philippines.

These coarse plants have short or long, erect or climbing, often stout, branching stems, each with several narrow to oblong, distichous, flat leathery leaves that have bilobed, notched tips. There are ligules (a membranous scale) on the inner side of the leaf sheath at its junction with the leaf blade. The several,

long, arching to hanging, densely packed, numerous- to few-flowered inflorescences are sometimes up to 2 feet (61 cm) long. The moderately large white, yellow, deep pink, purple to lilac, waxy, long-lived flowers, opening all at once, are suffused or spotted rose or purple and have a sweet, strong fragrance. The mobile or immobile, white to rose-colored, simple or trilobed lip has overlapping, often erect, small or large side lobes, a usually larger, forward pointing midlobe, and a small, forward-curved spur. The flowers have a short, wingless column with a viscid disc (viscidium) larger than the stipe. Pollinia two, unequally grooved, waxy, attached by a long, slender stipe to a solitary viscidium.

Phylogenetic analyses have revealed that *Aerides* is monophyletic and consists of three well-supported subclades, which are only partly in accordance with previous sectional delimitations based on floral characters. This phylogeny is another example in Orchidaceae where floral morphology cannot be relied upon to reconstruct phylogenetic history but

rather is the result of pollinator-driven selection. The two different flower types in *Aerides* (hidden versus open spur entrance) seem to have evolved at least twice in geographically distinct areas (Kocyan et al. 2008).

CULTURE

Temperature requirements vary from cool- to warm-growing, depending on the species. Baskets or hanging pots are best for the hanging inflorescence's growth habit and the rampant, wildly roaming roots. Provide bright light, intermediate to warm conditions, constant high humidity and water throughout the year.

Reference

Kocyan, A., E. Vogel, E. Conti, and B. Gravendeel. (2008). Molecular Phylogeny of *Aerides* (Orchidaceae) Based on One Nuclear and Two Plastid Markers: A Step Forward in Understanding the Evolution of the Aeridinae. *Molecular Phylogenetics and Evolution*. 48: 22–443.



Aerides Brookeii, Batem.

2



Aerides crispum LINDL.
Ind. or. (Serre chaude.)
P. Steudert del. nat. pinx. in Horto vosscheffii. Lili. de L. Steudert a grand. A. vosscheffii pull.

3



Aerides maculosum.

4

Aerides

ANTIQUÉ PLATES

- [1] *Aerides multiflora* as *Aerides affinis*, *Sertum Orchidaceum*, t.15 (1838).
- [2] *Aerides crispa* as *Aerides brookeii*, *Flore des Serres et des Jardins de L'Europe*, 1: 93 (1845).
- [3] *Aerides crispa*, *L'illustration Horticole*, 4: t.123 (1857).
- [4] *Aerides maculosa*, *Paxton's Magazine of Botany*, 12: 49 (1849).
- [5] *Aerides maculosa* as *Aerides affine* var. *godefroyæ*, *Revue Horticole Belge*, 17: t.15 (1891).
- [6] *Aerides odorata* as *Aerides virens* var. *ellisii*, *Orchid Album*, 7: t.298 (1885).
- [7] *Aerides multiflora* as *Aerides veitchii*, *Belgique Horticole*, 7: t.8-9 (1888).



AERIDES AFFINE VAR. GODEFROIJÆ.

5



PL. 298.

J. Nugent Fitch del et lith.

AERIDES VIRENS ELLISII

B.S. Williams Publ.

6



J. Strobant, Chromolithogr. Gand.

La Belgique horticole.
1881, pl. VIII-IX.

AERIDES VEITCHI Hort.

Moulmein.
Serre chaude.

7

Let There Be Light

Part 5: Spectrum and Photoperiod

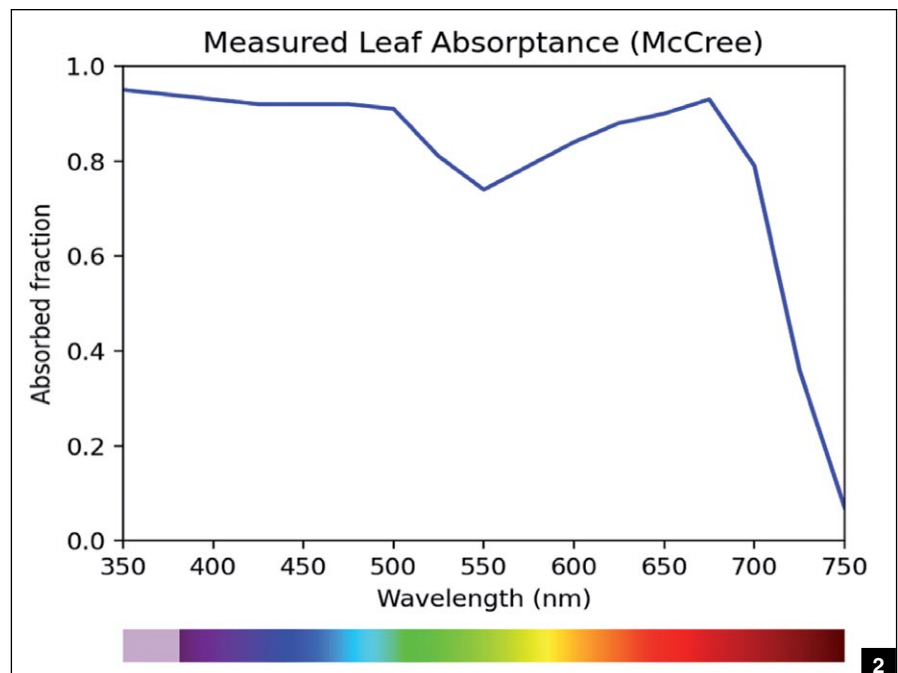
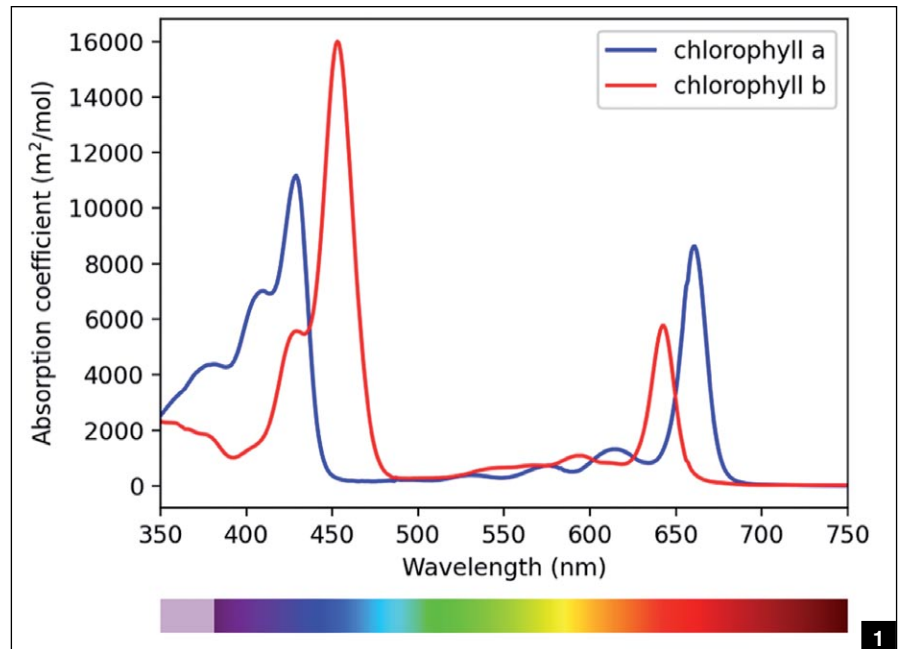
BY KELLY MCCRACKEN

THE STUDY OF growing orchids and houseplants under lights is still relatively new and not a lot is known about how subtle spectral changes affect orchid growth and in particular, flowering. The spectra of light emitted by LED diodes can be very carefully controlled, even down to 5 nanometers, so how do you, as a casual consumer, decide what type of spectrum to buy?

The point I hope to make in this article is that a subtle spectral difference between two types of LED fixtures is probably not that important. Err on the side of more wavelengths (i.e., always buy “full spectrum” fixtures that are intended for use as horticultural grow lights) and stay away from gimmicky pink or blue fixtures. If the manufacturer does not provide any spectral data on their product, it is unlikely to be as suitable as a fixture that does have this data.

SPECTRUM Fairly often I come across a graph like Figure 1, touted as the absorption of light by chlorophyll at different wavelengths. The data in these graphs are collected from the chlorophyll molecule having been isolated and suspended in a solution. The Y-axis represents an “absorption coefficient,” which is a parameter of the so-called Beer-Lambert law of light absorption. Absorption coefficient graphs have been misused for LED marketing purposes, and they have led to the popularity of “blurple” lights. Blurple is a term used to describe LED lights with just red and blue diodes. These lights appear as a dark fuchsia color to our eyes, and render green foliage grown under them an alien black color. To a lover of emerald foliage, these lamps can be particularly offensive.

Graphs like Figure 1 are not very helpful for understanding how light interacts with plants; the data is just too limited. Absorption coefficients are hard to interpret on their own: to figure out how much light is actually absorbed, you also need to know the chlorophyll concentration and the length that light travels through the solution. While it may be true that chlorophyll on its own absorbs mostly red and blue light, inside



a plant there are other light-absorbing molecules and other physical processes at work.

In contrast, when the light absorbed by a whole leaf is plotted, and not just the isolated chlorophyll (Taniguchi and

- [1] Absorption spectrum of chlorophyll as a function of wavelength.
- [2] Actual leaf absorbance as a function of wavelength.
- [3] Comparison of the emission spectrum of several common light sources.

Masahiko 2018), we get a much different line (McCree, 1971). All wavelengths of light are absorbed, showing the importance of a full spectrum fixture for best plant growth.

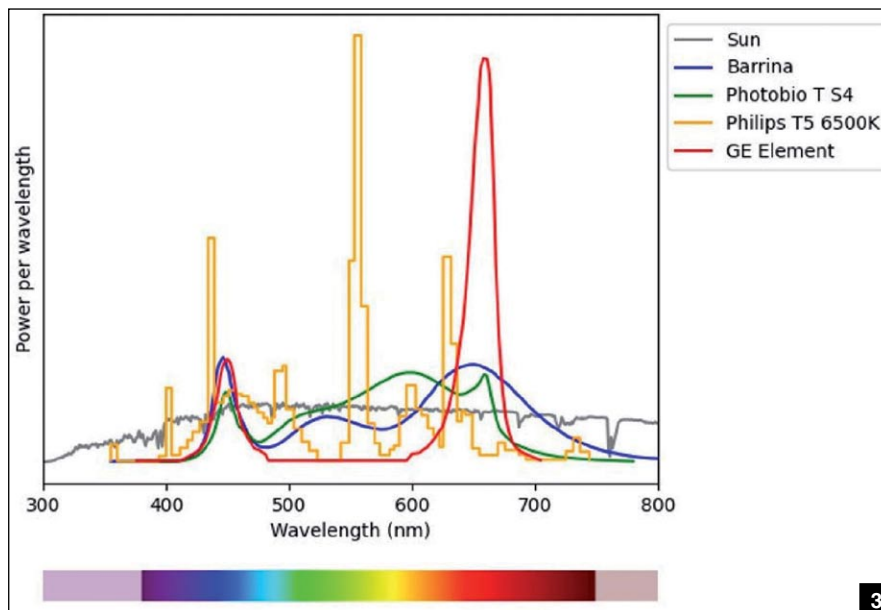
Included here is a comparison between a few different light sources, assuming equal PPF (for more info on what PPF is, please read the first article of this series, “An Introduction to PAR and PPF”; McCracken 2021a). The red line in the plot is a blurple light; look how much it is missing compared to the full spectrum LEDs (blue and green lines). The yellow line is a full spectrum fluorescent bulb.

Another idea that is heavily marketed by lighting companies is that blue light influences plant growth, and red light is responsible for flowering. The effect of blue light vs. red light has been studied on food crops and cannabis, and evidence from these studies does show a significant effect of light color on plant growth (Brown et al. 1995). Plants grown under pure red light experienced etiolation and a smaller biomass, which was alleviated when blue light was added. Plants have evolved to grow under full spectrum sunlight, and experiments have shown that plants grow much better under artificial sunlight spectra than limited spectra such as fluorescent or blurple (Hogewoning et al. 2010).

Full spectrum bulbs are widely available on the market today. As a home grower, you should pick a light that provides as many wavelengths as possible and makes your plants attractive to your eye, as some are tinted more pink, blue or yellow. The subtle spectral difference between one bulb or another likely does not matter for hobbyist applications, and more research needs to be done to provide evidence for the “best” spectrum of light to promote optimal orchid growth and flowering. Choosing a bulb that is as close to natural sunlight as possible will bring the greatest benefits to your plants.

PHOTOPERIOD The final question I hope to answer for you is what the ideal photoperiod for orchids is and should that photoperiod change seasonally. Photoperiod is the term used to describe the total amount of time a plant receives light during a 24-hour period.

The lights at the High Desert Orchids grow-house have been on a 12-hour photoperiod since we turned the lights on in July 2020. My rationale for this 12-hour photoperiod is that we grow mostly epiphytic orchids, and the ecological distribution of these plants usually occurs around the equator. The equator



does not get the ± 6 -hour seasonal shift in day-length like we do in the northern hemisphere. Day length in these orchid regions varies only ± 2 hours throughout the year. So, to make my life simple, I started with a 12-hour photoperiod.

The other question I get asked often is if plants need a seasonal change in photoperiod to induce flowering. This means changing the amount of time your lights are on in your grow-space to emulate natural day-lengths. It seems to be rather widely accepted that some seasonal change is required, but I have not found any scientific evidence that agrees with this notion. As stated above, orchids do not get a shift in nature, so why would a seasonal change be required to make plants flower in our homes?

I mentioned my natural light greenhouse in the second article of this series, “Target PPF for Orchids and Tropical Plants” (McCracken 2021b). Both the grow-house and my natural light greenhouse maintain intermediate temperatures (55–85 F [12.8–29.4 C]), and the humidity is about the same (75–85 percent RH). The primary difference between these two places is the amount of light the plants get. At the grow-house, plants always receive a 12-hour photoperiod, while the natural light greenhouse gets a natural seasonal day-length change. I grow many mericlones, species and hybrids in both facilities to study the effect of photoperiod on flowering. So far, I have not come across a single instance of a plant flowering in the natural light greenhouse but not flowering in the grow-house. In fact, in most cases, plants grown in the two facilities open their flowers within a week of each other. I have even

had single-day flowering *Diplocaulobium* species and *Dendrobium pachyphyllum*-types flower on the same day in both facilities. This tells me that light is not influencing their flowers at all, and most likely they are being induced to flower by temperature fluctuations instead.

I hope you have enjoyed reading this series of articles on lighting. Please feel free to email me with further questions or visit my website www.highdesertorchids.com for more information on lighting and orchid growing.

References

- Brown, C.S., A.C. Schuenger, and J.C. Sager. 1995. Growth and Photomorphogenesis of Pepper Plants under Red Light-emitting Diodes with Supplemental Blue or Far-red Lighting. *Journal of the American Society for Horticultural Science*, 120(5):808–813. doi:10.21273/jashs.120.5.882.
- Hogewoning S.W., P. Douwstra, G. Trouwborst, W. van Ieperen, and J. Harbinson. 2010. An Artificial Solar Spectrum Substantially Alters Plant Development Compared with Usual Climate Room Irradiance Spectra. *Journal of Experimental Botany*, 61:1267–1276.
- McCracken, K. 2021a. An Introduction to PAR and PPF. *Orchids* 90(7):520–521.
- 2021b. Target PPF for Orchids and Tropical Plants. *Orchids* 90(8):596–597.
- Taniguchi, M. and J.S. Lindsey. 2018. Database of Absorption and Fluorescence Spectra of >300 Common Compounds for Use in PhotochemCAD. *Photochemistry and Photobiology*. 94:290–327. onlinelibrary.wiley.com/doi/abs/10.1111/php.12860.

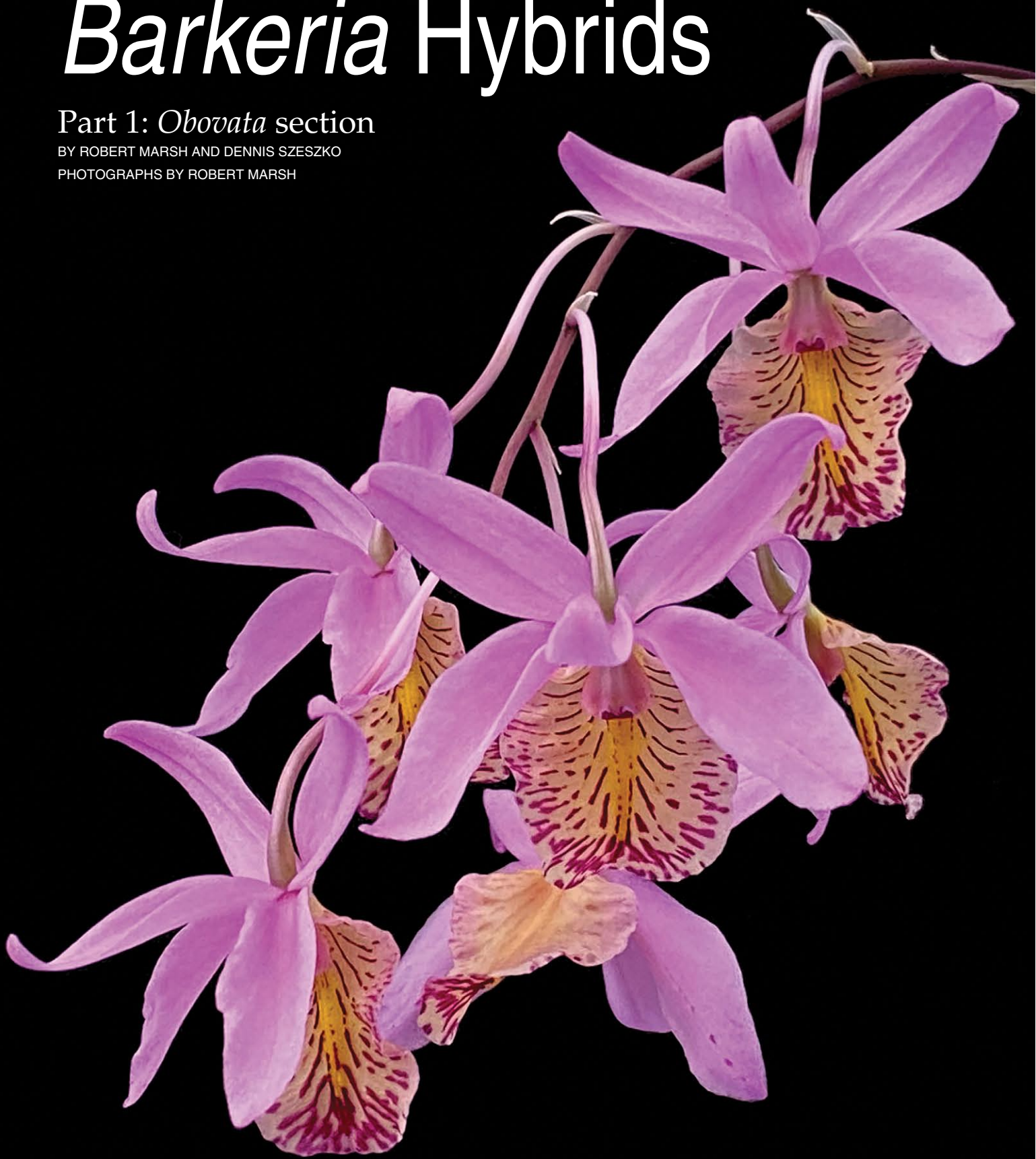
— Kelly McCracken is the owner of High Desert Orchids in Albuquerque, New Mexico. She is an avid grower, breeder and seller of orchids. Currently, she is growing in a 3,000-square-foot high bay warehouse space all under artificial light. Kelly also does orchid society talks on lighting and other orchid-related topics. You can email her at kelly@highdesertorchids.com, visit her website highdesertorchids.com or follow her on Instagram at @hdorchids.

Barkeria Hybrids

Part 1: *Obovata* section

BY ROBERT MARSH AND DENNIS SZESZKO

PHOTOGRAPHS BY ROBERT MARSH



BARKERIA IS MONOPHYLETIC; meaning that all extant members of the genus are descended from a common evolutionary ancestor (Soto-Arenas 2005). However, within the genus there are obvious clusters of closely-related species that indicate that there were speciation events during their evolutionary history when the *Barkeria* phylogenetic tree branched. Recently, molecular data (DNA analysis) (Angulo et al. 2012) corroborates this long-held suspicion and provides evidence that the similarities in growth habits, morphology, and biogeography obligates the formal introduction of an ersatz classification scheme that had been used informally among researchers for the past 50 years. Building on the genetic relationships uncovered by DNA sequencing, we propose the modern concept of three sections for the three clades within *Barkeria* and suggest eponymously naming these sections after the first species formally described for each. In keeping with this convention, the names of the three sections would be: *Uniflora*, *Obovata*, and *Scandens*. An alternative classification system espoused by some researchers would recommend that the most basal species of each clade (oldest ancestor) should be used for the name of the sections. This would also be our preference since names would be determined via evolutionary antiquity and not subjective criteria. At present, the molecular data corroborates *Barkeria obovata* being the oldest member of its section so this dovetails nicely with our proposed name, but for the other two sections a handful of species not included in the study by Angulo et al. must still be sequenced to give us a fuller perspective on phylogenetic relationships within the genus. While we await this new evidence, our imperfect naming scheme must suffice for now.

There may be disagreement over what to name the sections, but the evidence for there being three major branches (clades) in the *Barkeria* family tree is not in dispute. There is strong molecular corroboration that the first of these clades in *Barkeria*, the *Uniflora* section, should include *Barkeria barkeriola*, *Barkeria dorotheae*, *Barkeria shoemakeri*, and *Barkeria uniflora*. *Barkeria uruapani*, a recently proposed species (León-Peralta et al. 2021), likely also belongs to this clade. The five species in this section share morphological characteristics, but are also geographically segregated as they grow in the most northern parts of the genus' distribution range. None of them cross the geographic barrier of the Isthmus of



Tehuantepec in Southern Mexico. The narrow dispersal of this section may be time-limited owing to the fact that it diverged two million years ago at the beginning of the Pleistocene. In contrast, the two other clades diverged much earlier from a common ancestor in the Pliocene, when the *Scandens* and *Obovata* sections split around four million years ago (Angulo

- [1] *Barkeria* Oaxacan Showers 'MAS Supernova'.
 [2] *Barkeria* Jaliscan Starburst 'Royal Maya' surrounded by *Barkeria palmeri* wild type (upper left) and alba form (lower right) growing in the first authors' greenhouse.

et al. 2012). The *Obovata* section includes four caespitose species with short columns: *Barkeria naevosa*, *Barkeria obovata*, *Barkeria palmeri* and *Barkeria strophinx*. After excluding the nine species in the first two sections, the eight remaining *Barkeria* species represent another monophyletic group, a third clade, that we now call the *Scandens* section. While they share some vegetative and floral characters, the biogeographic evidence is murkier and there are some extraordinarily rare species whose extreme endemism and morphological nonconformity raises questions about whether they should be considered evolutionary dead-ends or living fossils, depending on your point of view.

There are several characteristics observed in all four species in the *Obovata* section. First, they are all twig epiphytes that attach to their hosts via thin, wiry, flattened roots. Although these species can be found growing vigorously on various tree species in different biomes, they appear to have a predilection for riparian habitats, and so it is common to see the plants growing at the tips of branches overhanging streams or rivers (Warford 1993). The pseudobulbs are fusiform, meaning that they are spindle-shaped and so taper both basally and distally. The plants demonstrate a caespitose habit, meaning that new growths emerge adjacent to previous growths and will form clumps over time. All the taxa in this section develop panicles as inflorescences with star-shaped flowers; short, clavate columns; and petals that project over the lip. Distinctively, *naevosa* and *strophinx* are remontant, producing new flowers from lower nodes on the rachis when initial blooms from upper nodes have faded. In contrast, *obovata* and *palmeri* flower from most of their nodes simultaneously.

All four species in this section prefer hot climates and grow from sea level up to about 5,250 feet (1,600 m). Three of the species are endemic to Mexico with one of them, *palmeri*, growing as far north as the Mexican state of Sonora. The distribution range of *palmeri* encompasses the northern half of Mexico's Pacific coastline from Sonora southward towards the state of Colima, which is about 60 miles (100 km) south of the well-known beach resort of Puerto Vallarta. The other two Mexican endemic species are *naevosa* and *strophinx*, both of which grow in southwestern Mexico. *Barkeria naevosa* grows on the Pacific coastal plains and adjacent lowland valleys of the Sierra Madre del Sur Mountains in Guerrero



and Oaxaca states, while *strophinx* is an inland vicariant of *naevosa* whose center of distribution surrounds the Nanchititla mountain range in southwest Mexico State (Szeszko 2011).

The fourth species in the section, *obovata*, is not only the most widely distributed species of this section, but also of the entire genus. Its peripatetic wanderings have allowed it to become established in 11 of Mexico's 32 states, including both its Pacific and Caribbean watersheds, as well as every country in Central America as far south as Panama (MAS Orchids 2021). The plant is highly adaptable and will grow in tropical deciduous forest, high-canopy tropical jungle, coffee plantations, citrus orchards, and city parks. There is a cleistogamous form that demonstrates remarkable fitness

- [3] *Barkeria obovata*, non-self-pollinating form.
- [4] *Barkeria naevosa*, dark form.
- [5] *Barkeria naevosa* f. *aurea*
- [6] *Barkeria strophinx*
- [7] *Barkeria* Rebecca Marsh 'With Love' HCC/AOS', an F2 cultivar bred from the *aurea* form of *Barkeria naevosa*.
- [8] *Barkeria* Natalie Warford (*palmeri* x *obovata*)
- [9] *Barkeria* Oaxacan Showers 'Sunshine'
- [10] *Barkeria* Oaxacan Showers 'Moonlight'
- [11] *Barkeria* Oaxacan Showers 'Golden Promise'
- [12] *Barkeria* Oaxacan Showers 'Splish Splash'

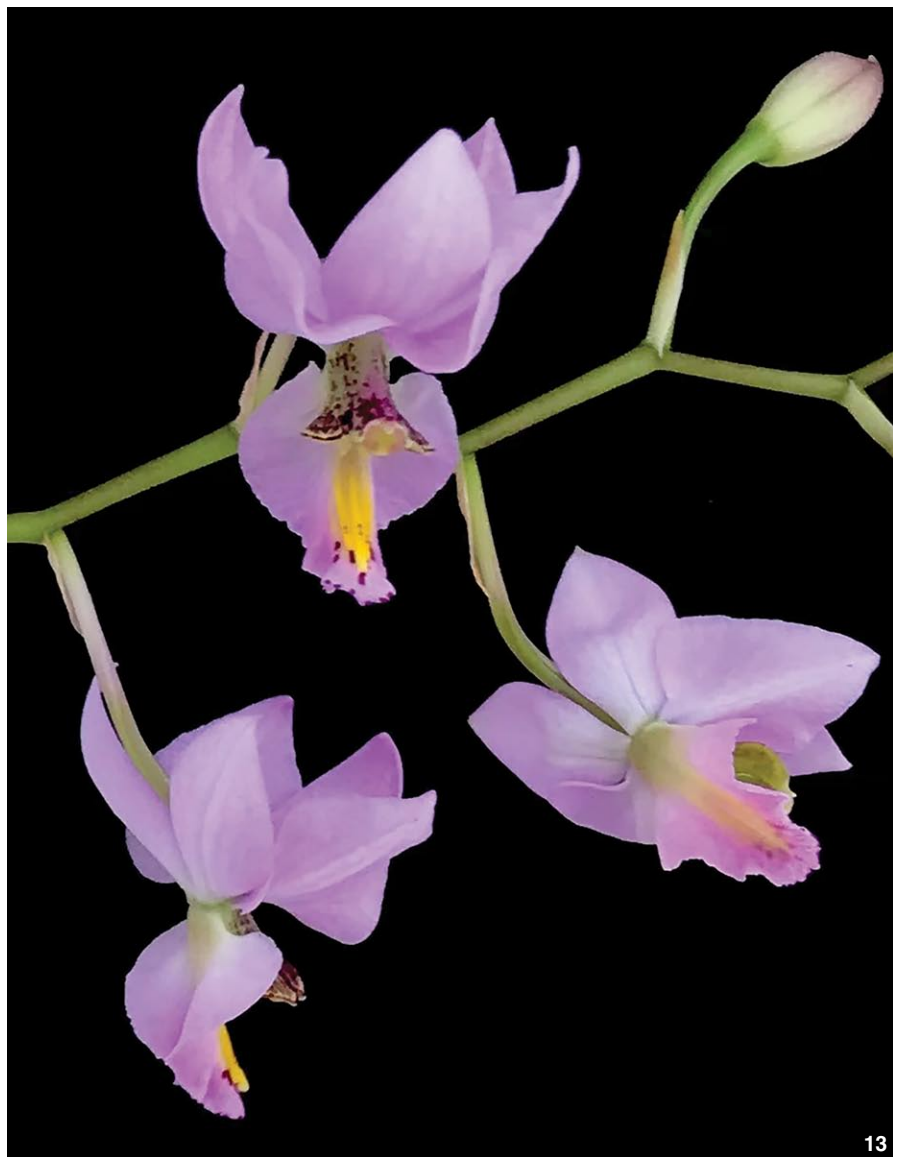


advantages in a wide range of habitats. It is able to self-pollinate and reproduce at levels at which it may be characterized as a weed.

Barkeria naevosa — This species is the most striking in the section and has the largest flowers, up to 2 inches (5 cm) in width. The flowers vary in color from pale lavender to scarlet-magenta, and infrequent wild clones are known with excess production of yellow pigments in the lip creating stunning contrasts in coloration. The fragrance is harsh and unpleasant, similar to cheap soap, and there is a pronounced, ventrally engorged, decurrent nectary at the tip of the pedicellar ovary. The symmetrical magenta veining on the boat-shaped lip is heritable and can be expressed to great effect in its hybrids, as can the weakness of the rachis whose floppiness lends itself to producing arching inflorescences and “waterfall” displays of flowers.

Barkeria obovata — For breeding, we concern ourselves only with the chasmogamous form since the self-pollinating trait of the cleistogamous form appears dominant and ensures that the flowers only partially open for a few days. Both forms of this species have a scarlet-red anther cap with raised veins on a yellow lip, and randomly disseminated warts pigmented with intensely reddish-purple splotches. It is the only *Barkeria* flower whose tepals are creamy-white to very pale yellow in color; all the other species are pink-lavender or rose-magenta. In crosses between *obovata* and the other *Barkeria* species, the deep yellow color in the *obovata* lip is a recessive trait that is difficult to breed into hybrids. Only by crossing with hybrids with yellow in their background or with species that also naturally have some yellow in their lips, such as *Barkeria scandens* or *naevosa*, can yellow lip color be preserved in the progeny.

Barkeria palmeri — This species produces showy, plume-like panicles with five or more side branches and 50 or more pink-lavender flowers. Elevated veins randomly pigmented in dark lilac to plum decorate the lips whose edges have undulating margins. Of all the *Barkeria* species, *palmeri* may be the one with the most color variants: alba, semialba, caerulea and albescent clones are known. On sunny days, *palmeri* releases a delightfully sweet fragrance. At one time, this species was considered to be a subspecies of *obovata* based on vegetative similarities between the two. This was an easy mistake to make with only dried herbarium material to



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inspect since the most obvious difference between the two species, the pink vs. ivory flowers, would not be conserved in desiccated floral tissue. In addition to the flower colors, the method of branching on the inflorescence, their biogeographic distributions, and details of the lip all serve to distinguish the two species.

Barkeria strophinx — This taxon has suffered indignity after indignity throughout its history. It was originally incorrectly reported as Guatemalan in origin, and later unceremoniously either reduced to synonymy as an inland morph of *naevosa* or proposed as a natural hybrid. Both of those theories are now discarded, and there is sufficient evidence in the form of biogeography and floral morphology to warrant it being elevated to species status (Szeszko 2011). The plants and the flowers of *strophinx* and *naevosa* are passingly similar at first glance, but there are various differences in their anatomy. Generally, the flowers of *strophinx* are paler in color, smaller in size at 0.7–1 inch (1.8–2.5 cm) in width, more numerous on panicles, and sweetly scented. The most important characteristic that this species can offer to *Barkeria* breeding is the immense number of flowers that it can produce. Some clones can produce inflorescences with up to a dozen side branches and over 100 flowers.

It is astonishing to think that a large portion of the color spectrum and markings visible in many of the most eye-catching *Barkeria* intrageneric hybrids derive from genes found only in the first three species in this section. Although the plants have relatively small flowers their genetic contribution to *Barkeria* breeding and to subsequent hybrid phenotypes has been outsized. *Barkeria obovata* contributes white and yellow shades with random, irregular, vivid reddish-purple spots on the lip. *Barkeria palmeri* adds vigor, high flower counts, and dark stippling on the lip. *Barkeria naevosa* imparts yellow and rose hues with magenta veining on the lip. All three species contribute warmth tolerance, compact plant height, and flat lips to hybrids arising from crosses with larger-flowered *Barkeria* species from other sections whose biggest drawbacks include reduplicate lateral lip margins (saddle-shaped), and occasional untidy scandent or climbing growth habits.

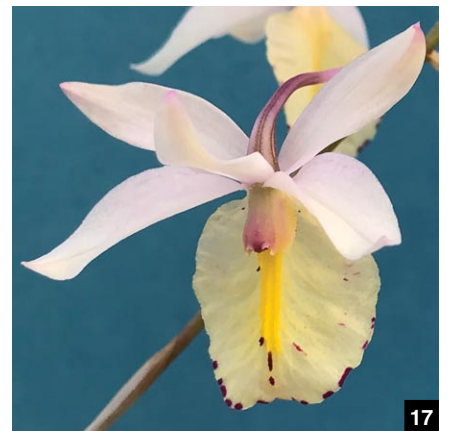
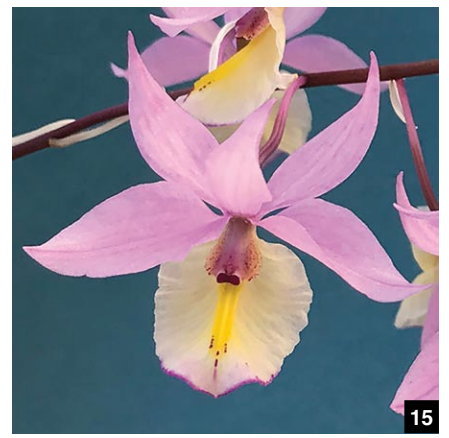
The first hybrids made with *Obovata* section species were registered in 1987 by Robert Marsh. Other early hybridizers using *Obovata* section species were David Hunt in the United States, Hans-Jörg Jung in Germany, and Roland Schafflützel in

Switzerland. To date, 41 intrageneric hybrids with genes from this small section have been registered. Only two intergeneric hybrids have been registered: *Barclia* Canción del Viento (*Bark. obovata* × *Encyclia incumbens*) and *Cattkera* Lara Kleinheyer (*Cattleya harpophylla* × *Bark. naevosa*). Among registered hybrids, the most frequently used parent in the *Obovata* section is *Barkeria naevosa* followed in decreasing order by *palmeri*, *obovata*, and *strophinx*. Only two registered hybrids have been made with *strophinx*.

Although innately charming in appearance, the flowers of the *Obovata* section hide their best feature, the labellum. This is due to the nodding presentation of the flowers, as a result of a bend in the pedicel where the flower attaches to the inflorescence, and the orientation of the petals and dorsal sepal, which project over the lip and shield it from view. Overcoming these aesthetic disadvantages would be a priority when creating hybrids. When breeding within the section, cultivars can be selected with flowers that are more upright and with somewhat reflexed sepals and petals. Combined, these characteristics permit an unobstructed view of the beautifully marked lip. For example, *Barkeria* Rebecca Marsh ‘With Love’ HCC/AOS, a second-generation sib-cross of *palmeri* × *naevosa* ‘Brandenburg’ HCC/AOS, improves the lip presentation, flaunting *palmeri* markings on a partially yellow lip inherited from the *naevosa* parent.

Bringing *obovata* genes into the hybrid mix illustrates an unusual turn of events. The creamy white color of *obovata* is dominant and suppresses the production of lavender pigment, unlike the recessive white typically encountered with alba-mutant genes in the *Cattleya* Alliance. This can be seen in the remarkable *Barkeria* Natalie Warford which is *palmeri* × *obovata*. This primary hybrid produces fully-branched inflorescences with two to four dozen white flowers with purple spots on the lip. *Barkeria* Obova Ivory (*obovata* × *naevosa*) is also white with some minor, light-purple spotting on a small, boat-shaped lip, but this primary hybrid is altogether inferior to *Bark. Natalie Warford* in terms of its visual impact.

Barkeria Obova Ivory may not win many beauty pageants on account of its lackluster flowers, but its importance as a seminal grex for *Barkeria* breeding cannot be overstated. Crossing *Bark. Rebecca Marsh* with *Obova Ivory* yields *Barkeria* Oaxacan Showers: a hybrid that is half *naevosa*, and a quarter each of *obovata* and *palmeri*.



[13] *Barkeria whartonia* ‘MAS Orchids’

[14] *Barkeria* Marsh Mela (*lindleyana* × *whartonia*)

[15] *Barkeria* Brigitte Foellmer ‘MAS Orchids I’

[16] *Barkeria* Brigitte Foellmer ‘Peach’

[17] *Barkeria* Brigitte Foellmer ‘MAS Orchids II’

This hybrid represents the amalgamation of the most interesting *Obovata* section genes. As Mendel’s work with peas would predict, the dominant ivory coloration of *obovata* shows up in half the progeny. The rest are lavender, and there are hints of yellow on some lips. In turn, sib-crosses of these first-generation Oaxacan Showers

yield progeny with various combinations of coloration genes being expressed, including interesting patterns of spots and veins on the lips. Some have white or cream flowers, others are various shades of lavender, but the elusive, recessive characteristics, like a clear yellow lip, can also occur. A serendipitous surprise is the appearance of art shades and rose tones, due to the presence of varying amounts of both magenta and yellow pigments in the tissue and likely also to changes in cell structure.

Working just with the species in the *Obovata* section produces interesting colors and patterns, but to further refine the aesthetics of the flowers, genes from additional species found in other sections of the genus are required. Bigger flowers are possible if subsequent crosses are made with *Scandens* section species *Barkeria lindleyana* or *Barkeria spectabilis*, or with *Barkeria uniflora*, all of which can produce flowers up to 3.25 inches (8 cm) wide in exceptional, selected clones. And, to improve the width of the petals and the conformation of the flowers, *Barkeria whartonia* (another *Scandens* section species) is an excellent choice as a parent. Although this species does not have very large flowers, being only 0.8–1.2 inches (2–3 cm) wide, its *Cyclamen*-like tiara of sepals, yellow keels on the lip, and harmoniously wide petals more than offset this debility. Perhaps the most interesting trick up its sleeve is the ability of *whartonia* to cross with otherwise infertile hybrids to breed fertile progeny when other species cannot, and thus allow a hybridizer to tunnel out of what appears to be a dead-end lineage. This genetic quirk may be a result of *whartonia* being an evolutionary outlier, residing alone on a branch of the *Barkeria* genetic tree which arose shortly after the *Obovata* and *Scandens* sections diverged (Angulo et al. 2012).

There is very rarely an orchid that “has it all,” but the primary hybrid *Barkeria* Marsh Mela is a close contender for being the perfect parent. The combination of a large-flowered parent (*lindleyana*) with the uplifted sepals and fertility of *whartonia* results in a stunning hybrid that, in turn, produces progeny with a wide range of characteristics.

Putting *Bark.* Marsh Mela to use by crossing it with Oaxacan Showers creates *Barkeria* Brigitte Foellmer. If a lavender, yellow-lipped cultivar of Oaxacan Showers is used as parent, the result is a beautifully varied grex with yellows, peaches, and other art shades. Lips can have a waterfall of spots and keels ranging from light yellow



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to deep orange, no doubt owing in part to the bright yellow keels of *whartonia*. The progeny of this grex consistently have the dorsal and lateral sepals held in a three-pronged crown with petals positioned at or near right angles to the lip, allowing for a full, unimpeded view of the striking labellum. The flowers average about 1.6 inches (4 cm) in diameter and are beautifully held on erect or arching inflorescences.

A grex similar to *Bark.* Brigitte Foellmer is *Barkeria* Jaliscan Sunset. This is a cross between Oaxacan Showers and *Barkeria* Mary Marsh (Marsh Mela × *naevosa*). Among the progeny are plants that produce luscious, deep-rose flowers with orange lips, overlaid with rose, and veined or spotted with dark magenta. This coloration can be intensified by backcrossing Jaliscan Sunset with Oaxacan Showers. Unfortunately, the high proportion of *Obovata* section genes in the resulting hybrid produces smaller flowers with the dorsal sepal partially obscuring the colorful, well-marked lip. Better form with an apical dark magenta waterfall can be obtained by crossing Jaliscan Sunset with Marsh Mela.

Lips with particularly spectacular waterfalls of spots are seen in the hybrid *Barkeria* Jaliscan Starburst. This grex results from crossing *Bark.* Mary Marsh with *Barkeria* Marsh Maze, the latter

[18] *Barkeria* Brigitte Foellmer ‘Tricolor’

[19] *Barkeria* (Oaxacan Showers × Jaliscan Sunset) ‘MAS Orchids’ illustrates the intensity of color possible among hybrids made with Oaxacan Showers. This hybrid has Oaxacan Showers as a parent and a grandparent.

[20] *Barkeria* (Marsh Mela × Jaliscan Sunset) ‘Picasso’ has *lindleyana* on both the maternal and paternal sides, improving form and size.

identical to Oaxacan Showers except that the *obovata* grandparent is replaced by *Barkeria scandens*, an attractive species with flowers in an eye-searing shade of rose-magenta or fuchsia.

The riot of colors and patterns so clearly illustrated in the accompanying figures is the result of a breeding program begun by Robert Marsh over 30 years ago and demonstrates that *Barkeria* species can produce fantastic intrageneric hybrids above and beyond what might be thought possible. In 1987, Marsh published an article in the AOS *Bulletin* on some of the earliest *Barkeria* intrageneric hybrids titled “*Barkerias* — The Shape of Things to Come.” In the article, there were some tantalizing clues hinting at what could be achieved, with the author making some ambitious predictions presaging the development

MARSH AND SZESZKO

of modern *Barkeria* hybrids. It took many years to deliver on some of those promises, far longer than expected, but the *Barkeria* hybrids envisioned in that article have largely been achieved by combining the best traits from two different branches of the *Barkeria* family tree: the *Obovata* section and the *Scandens* section. Many more exciting developments in *Barkeria* hybridizing await.

References

- Angulo, D.F., E. Ruiz-Sanchez, and V. Sosa. 2012. Niche Conservatism in the Mesoamerican Seasonal Tropical Dry Forest Orchid *Barkeria* (Orchidaceae). *Evolutionary Ecology* 26:991–1010.
- León-Peralta, C.E., J. Valdez-Partida, E.A. Pérez-García. 2021. *Barkeria uruapani* (Laeliinae, Epidendroideae, Orchidaceae), a New Species from Western Mexico. *Phytotaxa* 513(4):282–294.
- Marsh, R. 1987. *Barkerias*—The Shape of Things to Come. *American Orchid Society Bulletin* 56(6):580–587.
- MAS Orchids, 2021. *Distribution Map*, accessed 30 August, 2021, <<http://masorchids.com/welcome/species/map>>.
- Soto-Arenas, M.A. 2005. *Barkeria*. In *Genera Orchidacearum, 4 Epidendroideae (Part one)*. Edited by Pridgeon, A.M., P.J. Cribb, M.W. Chase, and F.N. Rasmussen, Oxford University Press, UK, 199–205.
- Szeszko Fabila, D.R. 2011. *La Orquideoflora Mexiquense*. Gobierno del Estado de México, Toluca de Lerdo, México.
- Warford, N. 1993. The Jaliscan *Barkerias*. *Orchid Digest* 5(7):159–164.

— Robert Marsh, Ph.D., is a molecular biologist and former associate professor in the Department of Biological Sciences at the University of Texas at Dallas. He has more than 60 years of experience growing orchids and is the recipient of the AOS Botanical Trophy, formerly the Nax Trophy. *Barkeria* species and a series of hybrids have received AOS quality awards owing to Robert's work with the genus. Recently, he partnered with Dennis Szeszko to establish MAS Orchids LLC. Together they are working to commercialize the results of the breeding program, and have created the website MASorchids.com to provide in-depth information to growers about *Barkeria* species and hybrids (email: rmarsh@utdallas.edu).

—Dennis Szeszko had what many readers of this publication would consider a “dream job.” He was employed by the Mexican government as a botanist and was lucky enough to spend five years doing field research looking for orchids in the wild. As part of his research objectives, Dennis completed a flora of all of the orchid species that grow in Mexico State, which became the basis for his book, *La Orquideoflora Mexiquense*. The book was published in 2011 by the Mexican government as a large-format “coffee table” book to commemorate both the bicentennial of Mexico's independence from Spain and the centennial of the Mexican Revolution (email: dszeszko@gmail.com).



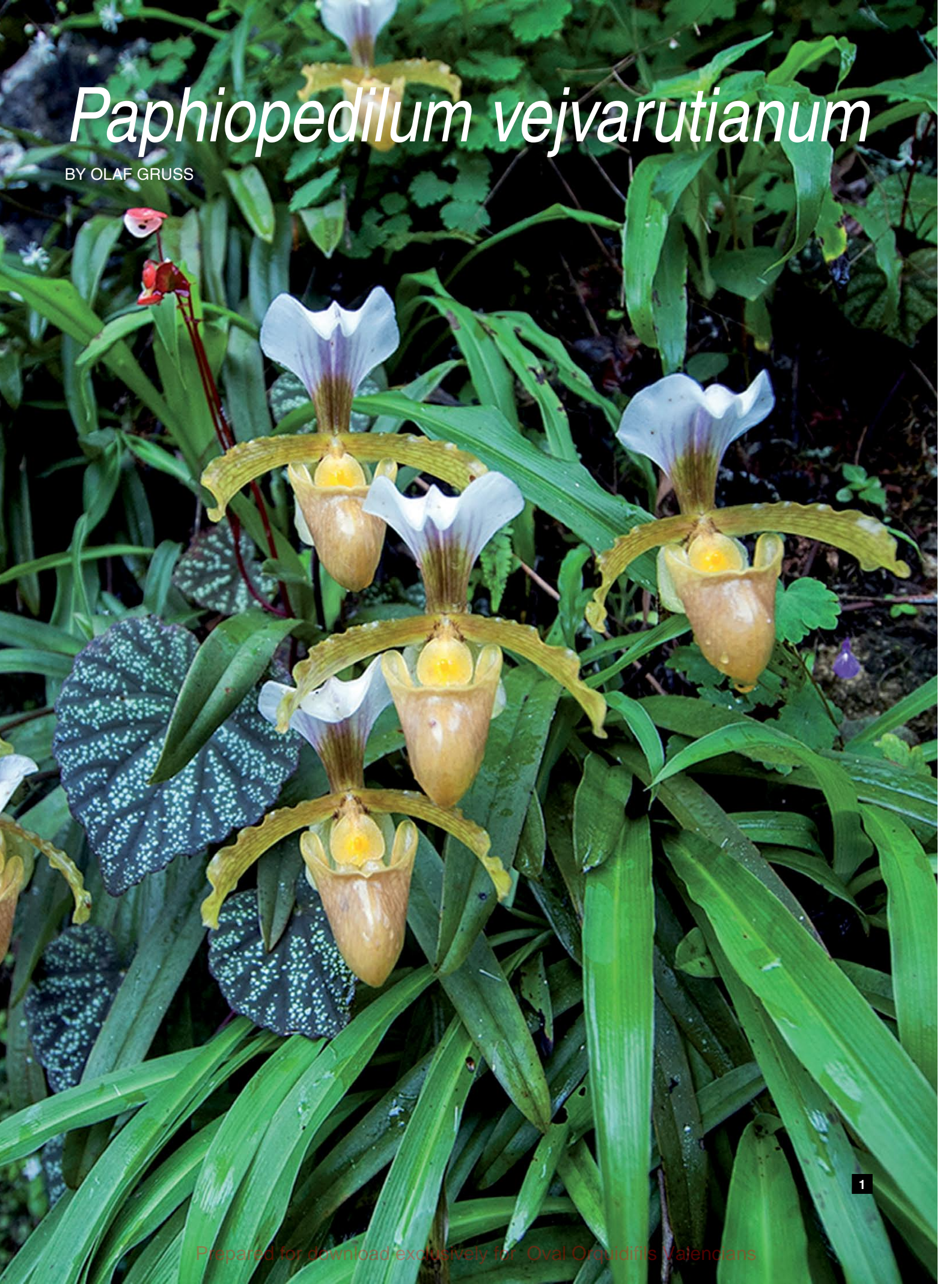
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Paphiopedilum vejvarutianum

BY OLAF GRUSS



***Paphiopedilum vejvarutianum* O.Gruss
&Roellke, 2003.**

SYNONYMS *Paphiopedilum charlesworthii* 'Kanchanaburii' – Trade-name, *Paphiopedilum 'krairitii'* – Trade-name, *Paphiopedilum barbigerum* var. *vejvarutianum* O.Gruss & Roellke 2003; Perner, 2013.

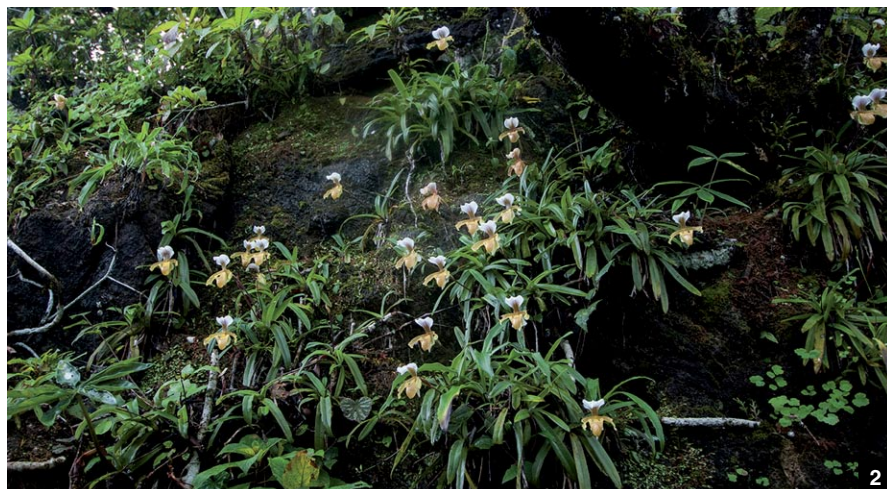
DISTRIBUTION Thailand, Khao Laem Dam area, Thong Pha Phum, Kanchanaburi

HABITAT The plants grow near the bases of trees in sand and moss cushions, or lithophytically on steep, rocky cliffs in evergreen, broadleaved forests at an elevation of 1,640–2,460 ft (500–750 m).

DESCRIPTION The four-to-six distichous leaves are narrow, suberect, narrowly lanceolate to linear, and uniformly green. Plants bloom in the fall and winter on erect, green, $4\frac{3}{4}$ – $6\frac{2}{5}$ in (12–16 cm), single-flowered, short, brown-to-dull-yellowish, pubescent inflorescence with an elliptical floral bract and carry a small, single flower. The synsepal is elliptical, petals tan to carmine-brown with a wavy yellowish edge, pouch typically yellowish brown but varying from yellow to pinkish carmine-brown and the obovate staminode light yellow with an orange cast.

HISTORY In 2003, Olaf Gruss and Lutz Röllke described as new a long-known species from Thailand as *Paphiopedilum vejvarutianum*, writing in their description: "Many years ago a report from Thailand appeared that a plant of the genus *Paphiopedilum*, found in the region of Khao Laem Dam, Thong Pha Phum, Kanchanaburi, resembles the growth pattern of *Paphiopedilum gratixianum*, but differs clearly by the flower and especially the bract. The bud and the flower bract remind of the clear purple marbling of *Paphiopedilum charlesworthii*, the flower rather of *Paphiopedilum barbigerum*."

Several hundred of these plants were found by Mr. Krairit Vejvarut, who supplied appropriate visual material that supports the suspicion that it is something completely new. According to him, the plants grow at an altitude of 1,640–2,460 ft (500–750 m) on rocks, which are covered with sand and humus and completely covered with moss. There is relatively high humidity and it is hot during the day, while the temperatures drop sharply at night. Initially, the collectors called these plants *Paph. charlesworthii* – Kanchanaburi, but Krairit Vejvarut, an orchid collector and trader, recognized



that, despite the great similarity to the plants to *Paph. charlesworthii*, there were clear differences. He asked in Europe for a determination of the plants on the basis of image material. According to him, no other species of the genus can be found in the area. However, some distance south, *Paphiopedilum parishii* and *Paphiopedilum concolor* grow, and, further north to the border with Myanmar, *Paphiopedilum villosum*, *Paphiopedilum spicerianum*, *Paph. charlesworthii* and *Paphiopedilum bellatulum* are also found. He expressed his suspicion that such plants had come years ago into the trade as *Paph.*

[1–2] *Paphiopedilum vejvarutianum* in situ growing on rock faces in humus, sand and moss cushions at elevations of 1,640–2,460 feet (500–750 m). Photographs courtesy of Pornpet Momkaew.
[3] *Paphiopedilum vejvarutianum* flower viewed from multiple angles.

charlesworthii, *Paph. gratixianum* or even as *Paphiopedilum insigne*.

Such plants appeared in a flower shop in Belgium, and together with *Paph. gratixianum*, were imported from Thailand many years ago. Since the plants

were in very poor condition, it took a few years for them to recover and to bloom. Additional plants were found later as individual specimens in other collections and could be examined.

The invariably intensely spotted flower bud suggested that this was a new plant. The flower confirmed Krairit Vejvarut's suspicion that it could be a new species or natural hybrid.

A comparison with primary hybrids with *Paph. gratixianum*, *Paph. villosum*, *Paph. barbigerum* and *Paph. charlesworthii* refute the suspicion that it is a new natural hybrid. No such crosses produced plants that resembled this new plant. However, the possibility of a natural hybrid can only be ruled out if these plants are used for inbreeding in cultivation.

Furthermore, the description by Gruss and Röhlke (2003) states: "That is why we decided to describe this plant from Myanmar as an independent species and to name it after the discoverer Krairit Vejvarut. With the choice of the name, we respected the wish of the discoverer, even if plants years ago appeared under the name *Paph. krairitii*." *Paphiopedilum vejvarutianum* is rarely sold commercially because it is not as attractive as other species in the genus. This means that the locations are also well protected against looting. Sometimes plants of this species from Thailand are also called *Paph. barbigerum*, and in 2013, Holger Perner proposed classifying it as *Paph. barbigerum* var. *vejvarutianum*.

ETYMOLOGY *vejvarutianum* = named in honor of Krairit Vejvarut, who recognized the plants as a new species.

POSSIBLE CONFUSION The possibility of nomenclatural confusion with this species exists as it does with all species closely related to *Paph. barbigerum*. In growth habit, this species is similar to *Paph. gratixianum* (Rolfe 1905b), but is completely different in flower. Although it is similar to *Paph. barbigerum* described by Tang and Wang in 1940, it differs by the larger plant habit, the intensely spotted flower bract, the differently shaped staminode, the lack of hair on the petals and the stance or posture and patterns on the dorsal sepal. At first glance, the characteristic that is most reminiscent of *Paph. charlesworthii* is the intensely spotted flower bract.

FLOWERING PERIOD February to May in the wild, possible all year in cultivation.

Acknowledgments

On the one hand, I thank the many photographers who made their material



OLAF GRUSS



MAURICE GARVEY

available to me, and on the other hand, I thank the gardeners and orchid friends who gave me the opportunity to take photographs of their collections. My thanks to Judith Rapacz-Hasler for the German-to-English translation.

References

- Gruss, O. and L. Röhlke 2003. *Paphiopedilum vejvarutianum*, Eine Neue Art Aus Thailand – Schon Seit Langem Unbeachtet in Kultur. *Die Orchidee* 54(1):56–59.
- Perner, H. 2013. Die *Paphiopedilum* Arten Chinas. Teil 4, *Die Orchidee* 64(1):6–13.
- Rolfe, R.A. 1905a. Notes. *Orchid Review* 14:62–63.
- Rolfe, R.A. 1905b. *Paphiopedilum gratixianum* in Mast. *Gardener's Chronicle. Orchid Review* 13:63.
- Tang, T. and F.T. Wang. 1940. Contributions to the Knowledge of Eastern Asiatic Orchidaceae I. *Bulletin of the Fan Memorial Institute of Botany, Botanical Series*. 10(1):23–46.

— *Olaf Gruss is internationally recognized for his work with paphiopedilums, phragmipediums and phalaenopsis. He has written books about*

[4–5] Close-up views of the staminode.

[6] Plant in bud.

[7] *Paphiopedilum vejvarutianum* 'Maximus' AM/AOS grown by Fred Allen is a beautiful, richly colored example of the species.

the genus Phalaenopsis and the albino forms of the genus Paphiopedilum, a booklet about the genus Phragmipedium, and recently a new book in three volumes on Asiatische Frauenschuhe (Asian Lady's Slippers) in Paphiopedilum; Orchideenzauber-Verlag, Germany. He has been a member of the editorial board of the journal of the German Orchid Society, Die Orchidee. Gruss resides in Germany and lectures throughout Europe, Japan, Taiwan, China and the USA. In der Au 48, 83224 Grassau, Germany (email: a-o.gruss@t-online.de).

Who Were These Guys: Part 15

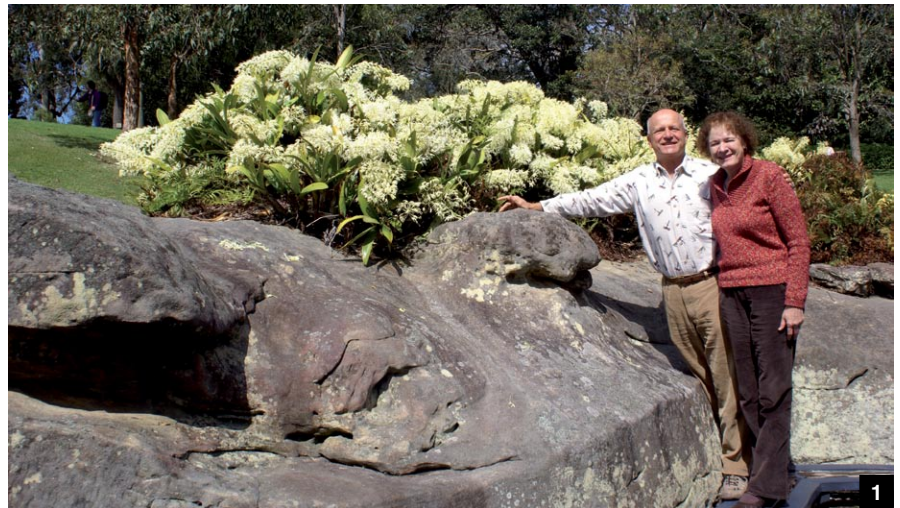
Robert David Fitzgerald (1830–1892)

BY DAVID ROSENFELD, MD

EVERY ORCHID GROWER, whether a hobbyist or an internationally recognized expert, has a story about how they initially became enchanted and then obsessed with orchids. For many of us, orchids became just another source of enjoyment in our lives. For a few, however, the encounter was a life changing experience. For Robert David Fitzgerald his first orchid discoveries began a 30-year infatuation with Australian botany and orchids. During the ensuing decades, Fitzgerald wrote his definitive work on the orchids of Australia. Four volumes of *Australian Orchids* were published before his death in 1892 and a fifth was later completed by associates using his drawings and notes in 1894. This article is the story of the Irish ornithologist Robert David Fitzgerald, who transformed himself into an accomplished botanist and became the most notable Australian orchidologist of the late 19th century.

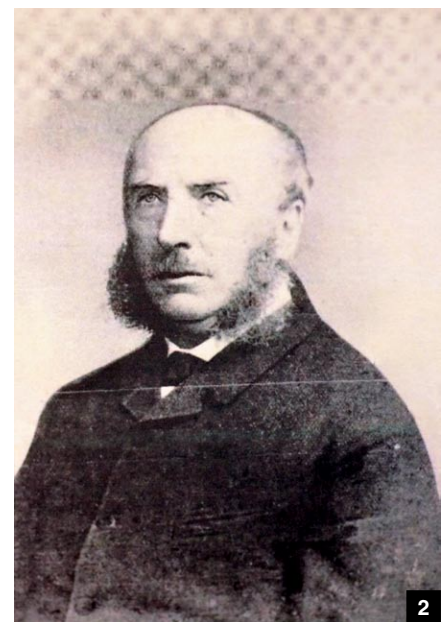
Fitzgerald was born in 1830 in Tralee, Ireland into a prominent banking family. He received his formal education in civil engineering at Queen's College, Cork. Concurrent with his college studies was his growing interest in ornithology as an avocation. He acquired a large collection of skins and eggs of British birds and became proficient in taxidermy. His artistic skills resulted in exquisite mounting of many of his bird specimens. In 1856, he and his family emigrated to Australia, settling in Sydney. His civil engineering skills proved valuable. He was hired by the Land Department of the state of New South Wales (NSW) to the position of "qualified civil engineer," a post he held for 35 years. After establishing a homestead, Fitzgerald started studying Australian birds. It was on one of these ornithological expeditions in 1864 that Fitzgerald discovered orchids.

Fitzgerald and his botanist friend L.S. Campbell went on an excursion 100 miles (161 km) north of Sydney to a coastal lake for the purposes of collecting bird specimens and fish. Fortunately for Australian orchid history, there were few birds of interest, and the fish were so plentiful that the sport of angling provided little interest. The gentlemen became



engrossed in multiple, huge clumps of "rock lilies," *Dendrobium speciosum*, growing on giant boulders at the water's edge. Campbell years later described, "One clump was remarkably fine ... Mr. Fitzgerald longed to have this in his garden but considered it would be hopeless to take such a huge specimen off the rock to the steamer. I assured him that if we returned to that place, he would get it all right" (Campbell 1924). The *Dendrobium speciosum* was indeed successfully transported back to Fitzgerald's garden in Sydney. That giant epiphytic orchid specimen was the stimulus to the eventual writing and publication of *Australian Orchids* years later. While on the trip, they also collected several other *Dendrobium* species. These were subsequently identified as *Dendrobium tetragonum*, *Dendrobium fairfaxii* and *Dendrobium linguiforme*.

During the next 15 years, Fitzgerald's interest in botany, primarily ferns and orchids, accelerated. He was a very meticulous individual and became a keen observer of orchids in the mold of Charles Darwin (Rosenfeld 2019). Additionally, it is known that Fitzgerald was an advocate of Darwin's theory of evolution and corresponded with him for several years. (Unfortunately, these letters were accidentally destroyed.) In his orchid lectures, he frequently referenced Darwin's book *On the Various Contrivances*



[1] Known in Australia as the "rock lily", Nile Dusdieker and his wife pose with a magnificent specimen of *Den. speciosum* in the Royal Botanical Garden in Sydney in 2010.

[2] Portrait of Robert David Fitzgerald.

by *Which British and Foreign Orchids are Fertilized by Insects* and Fitzgerald developed similar meticulous techniques of orchid dissection and illustration.

Fitzgerald's Surveyor General position in the NSW government proved to be an

excellent vehicle for discovering new orchid species. He traveled around the state, as his job required, and would encounter botanical treasures as a bonus. Most notably was his discovery of the wonderful epiphytic orchid *Sarcochilus fitzgeraldii* in a gorge of the upper Bellinger River in the coastal mountains of northeastern NSW. The orchid was described in 1870 by his friend and accomplished Australian orchid botanist Ferdinand Mueller and named in Fitzgerald's honor. This orchid species has received 18 awards internationally, has been used profusely in hybridization, and can be found in the background of over 800 hybrids. Mueller also established the orchid genus *Fitzgeraldia* (now synonymous with *Pyrorchis* D.L. Jones & M.A. Clem.) after his friend.

Fitzgerald was instrumental in preserving many of the natural wonders of NSW as national parks. He was also fascinated with the native ferns of the region and built a remarkable rock garden fernery in which he grew his ferns and many orchids.

Fitzgerald was a man of many talents and fortunately one of them was being an excellent artist. This skill, plus the meticulous care he took studying and drawing his orchid specimens, led to the eventual publication of his monumental work *Australian Orchids*. Each plate was prepared using living orchid specimens. Great care was taken to ensure the plants and flowers were in their natural position by using a specially constructed microscope and forceps. From these templates, Fitzgerald beautifully drew each orchid. The first volume was published in 1882 in black and white and dedicated to Charles Darwin. Subsequent Volumes 2–4, were completed with colored lithographic plates. At the time of his untimely death in 1892, drawings and copious notes were available for a fifth volume. This last volume was completed by Fitzgerald's lithographer A.J. Stopps in 1894. In addition to the 205 lithographic plates in *Australian Orchids*, there were another 100 completed, but unpublished, lithographic plates of native Australian flowering plants, from diverse regions of the country, including Western Australia, diligently rendered in the same scrupulous detailed fashion. Almost all these illustrations can be found in the Mitchell Library in Sydney.

Fitzgerald also published descriptions of what he thought were 58 new Australian orchid species. However, 19 of them later proved to be synonyms of orchids previously described by European



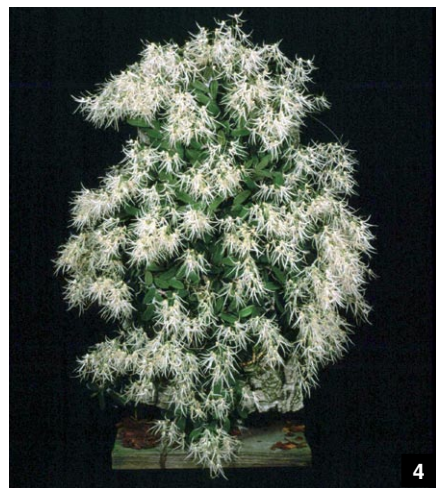
RAMON DE LOS SANTOS

botanists, especially Joseph Hooker in England. These “duplications” are not surprising since Fitzgerald did not have access to the earlier descriptions and dried specimens housed in England and other European herbaria.

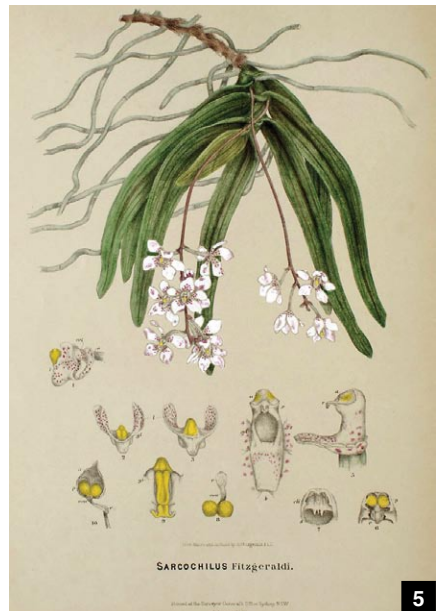
David Robert Fitzgerald was held in high esteem in both the Australian and world community of botanists. Australian botany (and orchids in particular) was fortunate that this Irish born civil engineer became entranced with the flora of the continent. The following excerpt of a letter written by his friend and botanist Ferdinand Mueller best illustrates the feeling of loss to the scientific community.

“It is indeed an irreparable loss, not only to our favourite [sic] science but to ourselves personally, who have learned to appreciate his sterling character in life.... So long as the lovely orchids of this part of the world embellish with singular and varied beauty the natural features of Australia, so long will the memory of our leading orchidologist be held dear in the study of God's works.” (Reinikka 1995, Messmer 1932).

— David Rosenfeld, MD, has been growing orchids with his wife Joan for 40 years. David is a retired professor of pediatric radiology at the Rutgers Medical School. They have a 700-square foot (about 65-sq m) greenhouse with both warm and cool sections where they grow a mixed collection of species and hybrids. Their skill as growers is illustrated by their 100 awards. David has written 22 articles for *Orchids* and last wrote about Carl Ludwig Blume in the August 2021 issue (90[8]:611–613) (email: orchidoc@comcast.net).



AWARD ARCHIVES



- [3] *Dendrobium tetragonum* 'Joan' AM/AOS grown by Joan Gunn.
- [4] *Dendrobium linguiforme* 'Parkview' CCM/AOS grown by Genie Hammond.
- [5] Fitzgerald's botanical painting of *Sarcochilus fitzgeraldii* in *Australian Orchids* Vol.1 pl. 19 (1882).
- [6] *Sarcochilus fitzgeraldii* 'Berg's Best' AM/AOS grown by James G. Morris. Photograph by Ramon de los Santos.

References

- Campbell, W.S. 1924. Seeking Australian Orchids – R.D. Fitzgerald's Great Work — Reminiscences From Field And Study. Daily Telegraph, Sydney. May 10.
- Messmer, C.A. 1932. The Biography Of Robert David Fitzgerald, F.L.S. and Arthur James Stopps, F.L.S. *Victorian Naturalist* 48: 233–242.
- Reinikka, M. 1995. *A History of the Orchid*. Timber Press, Portland, Oregon. p. 236–240.
- Rosenfeld, D. 2019. Who Were These Guys (WWTG). Part 9. Charles Robert Darwin (1809–1882). *Orchids* 88(9): 680–683.

Further Reading

- Anonymous. 1892. Obituary. *Victorian Naturalist* 9: 75.
- Mueller, F. 1892. Obituary. *Journal of Botany*. 30: 320.



Cypripedium calceolus L.

On Stamps

BY M. LOKESWARA RAO



CYPRIPEDIUM IS A genus of 58 species and nothospecies of hardy orchids; one of five genera that together compose the subfamily of lady's slipper (Cypripedioideae). *Cypripedium calceolus* is widespread, but often rare, across Europe, except the extreme north and south, and in the Crimea, Mediterranean, Asia Minor, western and eastern Siberia, Far East and south of Russia.

Country Occurrence

Austria, Bosnia and Herzegovina, Bulgaria, China (Heilongjiang, Jilin, Nei Mongol), Croatia, Czech Republic, Denmark, Finland, France (France, mainland), Germany, Hungary, Italy (Italy, mainland), Japan (Hokkaido), Democratic People's Republic of Korea, Latvia, Liechtenstein, Lithuania, Moldova, Montenegro, Norway, Poland, Romania, Russian Federation (Central European Russia, East European Russia, North European Russia, Northwest European Russia, South European Russia), Serbia, Slovakia, Slovenia, Spain, (Spain, mainland), Sweden, Switzerland, Ukraine (Krym [Crimea], Ukraine, main part) and United Kingdom. Regionally extinct: Luxembourg.

This is the largest orchid species in Europe, reaching nearly 2 feet (60 cm) tall with flowers as wide as 3½ inches (9 cm). Before it flowers, it is distinguished from other orchids by the large size and width of its ovate leaves, which like other orchids exhibit parallel venation. Each shoot has up to four leaves and one or two flowers, which have long, often twisted petals varying from red-brown to black (rarely green) and a slipper-shaped yellow pouch, within which red dots are visible. It is a long-lived perennial and spreads via horizontal stems (rhizomes).

POSTAGE STAMPS *Cypripedium calceolus* has appeared on postage stamps in a huge number of countries including Austria, the Czech Republic, Denmark, France, Grenadines, Hungary, Italy, Latvia, Madagascar, Moldova, Mozambique, Norway, Romania, Russia, Slovenia, Sweden, Uganda, Ukraine and the United Kingdom. The Norwegian municipality of Snåsa has a *Cyp. calceolus* in its coat-of-arms.

USES *Cypripediums* have a long history of use, dating back 2,500 years to the Far East, where they were used medicinally. Several orchid species thought to be extinct in the United Kingdom including one native species in this genus have been found in habitat and are currently the subject of aggressive conservation efforts to protect and restore these showy plants



to their native ranges.

THREATS *Cypripedium calceolus* is under numerous threats especially habitat destruction, agriculture intensification, inappropriate forest management such as clear cutting, use of herbicides and pesticides, equipment use that can severely compact the soil, road and trail construction and collection. In addition to browsing, grazing can pose a threat in two different ways: overgrazing affects the individuals whereas the abandonment of traditional grazing activities leads to natural succession processes and therefore increased competition for this orchid. The replacement of the natural

- [1] *Cypripedium calceolus* photographed by Johan Hermans, Vercors, France.
- [2] German Democratic Republic, 1976
- [3] Hungary, 1987
- [4] Sweden, 1982
- [5] Bulgaria, 1986
- [6] Sweden, 1999

forest with spruce plantations has caused habitat degradation as the soil is affected by decalcification processes and this species is linked to calcareous soils.

CONSERVATION STATUS All orchids are included under Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). It is also listed on Annex II of the Habitats Directive and under Appendix I of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). This orchid is included in several national red lists as threatened:

- Regionally Extinct in Luxembourg
- Critically Endangered in Bulgaria, Serbia and the United Kingdom
- Endangered in Croatia, Czech Republic, Hungary, Russia and Spain
- Vulnerable in Austria, Belarus, Denmark, France, Germany, Lithuania, Slovakia and Switzerland
- Near Threatened in Finland and Norway
- Least Concern in Sweden

It is protected at the national level in most countries (e.g., France, Hungary) and collection of the species is forbidden in many (e.g., Lithuania). Many populations are included in Natura 2000 sites and other forms of protected areas. The protection of the sites and appropriate management are essential. However, the following actions are recommended to protect *Cyp. calceolus* from further pressure: Protection of the sites from habitat loss and disturbance, trampling and agriculture intensification; protection of the sites by avoiding activities that alter or remove soil, duff or the organic matter in the species habitat area; fencing the vulnerable sites to protect the species from collection and herbivores; sympathetic management of isolated populations; maintain sufficient light and solar radiation on the species and the forest floor; raising of public awareness; ex situ conservation, including artificial propagation, reintroduction and seed collections; monitoring and surveillance of the existing populations and sites and estimation of population sizes and studies of their dynamics.

Further Resources

Rankou, H. and M. Bilz. 2014. *Cypripedium calceolus*. The IUCN Red List of Threatened Species 2014: e.T162021A43316125. <http://dx.doi.org/10.2305/IUCN.UK.20141.RLTS.T162021A43316125.en>
 Lady's-Slipper Orchid *Cypripedium calceolus* Species Action Plan Yorkshire Dales National Park Authority Archived 2010-12-23 at the [Wayback Machine](#).
 Kew Science — *Cypripedium calceolus*
 Nature Gate — Ladys Slipper



Journal of Ecology — *Cypripedium calceolus*
 — M. Lokeswara Rao, IFS, retired principal chief conservator of forests and head of forest force, Bangalore, Kamataka, India. He enjoys collecting and exhibiting postage stamps of orchids.

- [7] United Nations, 1996
- [8] Ukraine, 2003
- [9] United Kingdom, 1998

Decline in sites

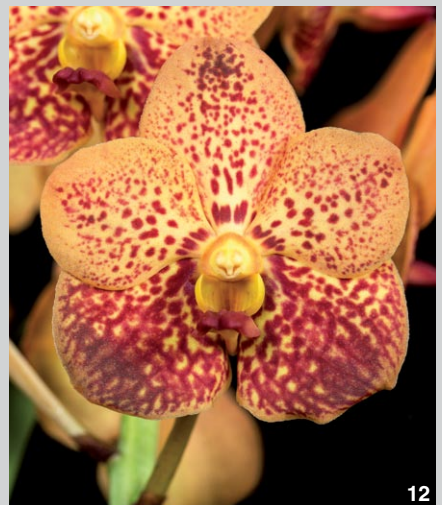
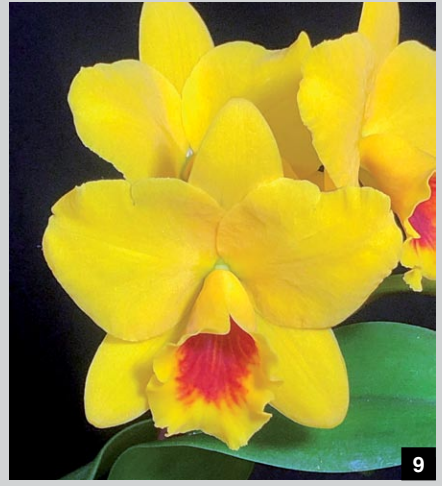


1998 ©

26 **ENDANGERED SPECIES**

Lady's slipper orchid
Cypripedium calceolus

9





- [1] *Cattleya Brabantiae* 'Corinne's Spots' AM/AOS (*aclandiae* x *loddigesii*) 83 pts. Exhibitor: Corinne Arnold; Photographer: Wes Newton. Florida North-Central Judging
- [2] *Cattleya amethystoglossa* 'Helen Rivensbark' CCM/AOS 81 pts. Exhibitor: Mac's Orchids; Photographer: Wes Newton. Florida North-Central Judging
- [3] *Phragmipedium schlimii* 'Whisper Lindsey's Signature Color' AM/AOS 84 pts. Exhibitor: Laura and Wes Newton; Photographer: Kay Clark. Florida North-Central Judging
- [4] *Renanstylis* Manoa Queen 'Kakaukani' HCC/AOS (Maui Queen x *Rhynchostylis gigantea*) 79 pts. Exhibitor: Naoki Kawamura; Photographer: Kay Clark. Florida North-Central Judging
- [5] *Encyclia randii* 'Palmer Orchids' HCC/AOS 76 pts. Exhibitor: Palmer Orchids; Photographer: Wes Newton. Florida North-Central Judging
- [6] *Renanstylis* Manoa Queen 'Kauakuahine' HCC/AOS (Maui Queen x *Rhynchostylis gigantea*) 76 pts. Exhibitor: Naoki Kawamura; Photographer: Glen Shellhammer. Florida North-Central Judging
- [7] *Dendrobium amethystoglossum* 'Leslie's Gem' CCM/AOS 83 pts. Exhibitor: Leslie Belew; Photographer: Glen Shellhammer. Florida North-Central Judging
- [8] *Cattleya lueddemanniana* 'Ponkan' HCC/AOS 78 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [9] *Rhynchoclanthe* Jack Crawford 'Crystelle' AM/AOS (Jim Krull x *Cattleya Beaufort*) 85 pts. Exhibitor: Krull-Smith; Photographer: Wes Newton. Florida North-Central Judging
- [10] *Rhyncholaeliocattleya* Electric Lady 'Effervescent' AM/AOS (Hawaiian Mini Island x Lydee Williamson) 83 pts. Exhibitor: Keith and Dina Emig - Winter Haven Orchid Nursery; Photographer: Glen Shellhammer. Florida North-Central Judging
- [11] *Rhyncholaeliocattleya* Snowy Owl 'Wingspan' AM/AOS (Mount Hood x Phil Andrews) 83 pts. Exhibitor: Keith and Dina Emig - Winter Haven Orchid Nursery; Photographer: Glen Shellhammer. Florida North-Central Judging
- [12] *Vanda* Miami Mandarin 'Chad's Sunset Spot' AM/AOS (Motes Mandarin x Motes Goldpiece) 80 pts. Exhibitor: Chad Whetstone; Photographer: Kay Clark. Florida North-Central Judging
- [13] *Cymbidium* Geno's Gem 'Emerald Fire' CCE-FCC/AOS (Mad Hatter x Kalimpong) 97-91 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [14] *Vanda* Fulford's Gold 'Krull-Smith' AM/AOS (*lamellata* x *Udomchai*) 81 pts. Exhibitor: Krull-Smith; Photographer: Paul Osborn. West Palm Beach Judging
- [15] *Rhynchostele aptera* 'Bianchi Freckles' HCC/AOS 78 pts. Exhibitor: Carlos Bianchi; Photographer: Jorge Carlos. West Palm Beach Judging
- [16] *Paphiopedilum moquetteanum* 'Fajen's Orchids' HCC/AOS 75 pts. Exhibitor: Fajen's Orchids; Photographer: Glen Shellhammer. Florida North-Central Judging





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- [1] *Paphiopedilum* Shun-Fa Golden 'James Krull' AM/AOS (*hangianum* x *mali-poense*) 83 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [2] *Clowesetum* Diane Drisch 'Corinne's Pink Cutie' HCC/AOS (*Clowesia* Grace Dunn x *Catasetum tigrinum*) 79 pts. Exhibitor: Corinne Arnold; Photographer: Kay Clark. Florida North-Central Judging
- [3] *Phalaenopsis* Nikolao 'MV Margo Pink' HCC/AOS (*japonica* x *philippinensis*) 78 pts. Exhibitor: Stuart Henderson; Photographer: Kay Clark. Florida North-Central Judging
- [4] *Rhyncholaeliocattleya* Chomthong Fancy 'Jackie's Dream' AM/AOS (Laddawan Beauty x Haadyai Delight) 80 pts. Exhibitor: Jackie Wood; Photographer: Tom Kuligowski. West Palm Beach Judging
- [5] *Paphiopedilum* Raingreen's Legend 'Krull-Smith' AM/AOS (The Detailer x Hsinying Maru) 84 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [6] *Guarianthe* Herbert Oesterreich 'Nicole Arias' AM/AOS (Guatemalensis x *aurantiaca*) 83 pts. Exhibitor: Anagracia de Reyes; Photographer: Jorge Carlos. West Palm Beach Judging
- [7] *Epidendrum marmoratum* 'Lukas' HCC/AOS 76 pts. Exhibitor: Regina A. DeCastejon; Photographer: Jorge Carlos. West Palm Beach Judging
- [8] *Cymbidium* Genevieve Bujold 'Crystelle' AM/AOS (Fifi x Memoria Marvin Gaye) 82 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [9] *Lycaste* Nathalie Cely 'Celia Alfaro' AM/AOS (Sunray x *guatemalensis*) 86 pts. Exhibitor: Celia Alfaro de Calderon; Photographer: Jorge Carlos. West Palm Beach Judging
- [10] *Guarianthe* Herbert Oesterreich 'Santiago' JC/AOS (Guatemalensis x *aurantiaca*). Exhibitor: Leslie B. de Cofino; Photographer: Jorge Carlos. West Palm Beach Judging
- [11] *Rhyncholaeliocattleya* Paradise Rose 'My Valentine' AM/AOS (*Cattleya* Pink Doll x Toshie Aoki) 81 pts. Exhibitor: Christine Morales and Alex Rodriguez; Photographer: Tom Kuligowski. West Palm Beach Judging
- [12] *Maxillaria sanguinea* 'Memoria Nette & Flo' CCM-AM/AOS 83-83 pts. Exhibitor: Karen Meiselman; Photographer: Tom Kuligowski. West Palm Beach Judging
- [13] *Paphiopedilum stoneri* 'Krull-Smith' AM/AOS 83 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [14] *Clowesetum* Melana's Daughter 'Denali' AM/AOS (*Catasetum* Melana Davison x *Clowesia* Rebecca Northen) 81 pts. Exhibitor: Stephen Van Kampen-Lewis; Photographer: Robert Bermea. Alamo Judging
- [15] *Vanda* Motes Adorbs 'Crownfox' CCE/AOS (*ampullacea* x *christensoniana*) 92 pts. Exhibitor: R.F. Orchids, Inc.; Photographer: Tom Kuligowski. West Palm Beach Judging
- [16] *Rhynchoatele stellata* 'Bianchi Sisters' HCC/AOS 77 pts. Exhibitor: Carlos Bianchi; Photographer: Jorge Carlos. West Palm Beach Judging





- [1] *Rechingerara* Apopka Sunrise 'Crystelle' AM/AOS (*Laeliocattleya* Ann Akagi x *Rhyncholaelanthe* Carolina Orange Glow) 80 pts. Exhibitor: Krull-Smith; Photographer: Tom Kuligowski. West Palm Beach Judging
- [2] *Rhyncholaeliocattleya* Mark's Valentine 'Krull-Smith' HCC/AOS (*Cattleya* Circle of Life x Little Toshie) 78 pts. Exhibitor: Krull-Smith; Photographer: Tom Kuligowski. West Palm Beach Judging
- [3] *Cattlianthe* Tropical Trick 'Krull-Smith' AM/AOS (*Cattleya* Tropical Sunset x Trick or Treat) 81 pts. Exhibitor: Krull-Smith; Photographer: Tom Kuligowski. West Palm Beach Judging
- [4] *Paphiopedilum* *insigne* 'TQ's First' CCM/AOS 82 pts. Exhibitor: Tony Quirk; Photographer: Scott Weber. Chicago Judging
- [5] *Vanda* Nanette Zapata AQ/AOS (Barbara Prozzillo 'Crownfox' AM/AOS x Adelaide Skoglund 'Bill's Delight' AM/AOS). Exhibitor and Hybridizer: R.F. Orchids, Inc.; Photographer: Tom Kuligowski. West Palm Beach Judging
- [6] *Vanda* Nanette Zapata 'Crownfox Burnt Sienna' AM/AOS (Barbara Prozzillo x Adelaide Skoglund) 88 pts. Exhibitor: R. F. Orchids, Inc.; Photographer: Tom Kuligowski. West Palm Beach Judging
- [7] *Dendrobium* *anosum* var. *album* 'Ben & Jared' AM/AOS 83 pts. Exhibitor: Karen Meiselman; Photographer: Tom Kuligowski. West Palm Beach Judging
- [8] *Vanda* Nanette Zapata 'Crownfox Raspberry Parfait' AM/AOS (Barbara Prozzillo x Adelaide Skoglund) 86 pts. Exhibitor: R. F. Orchids, Inc.; Photographer: Tom Kuligowski. West Palm Beach Judging
- [9] *Vanda* Nanette Zapata 'Crownfox Copper Penny' AM/AOS (Barbara Prozzillo x Adelaide Skoglund) 82 pts. Exhibitor: R. F. Orchids, Inc.; Photographer: Tom Kuligowski. West Palm Beach Judging
- [10] *Paphiopedilum* *richardianum* 'Maple Plain' HCC/AOS 78 pts. Exhibitor: Marriott Orchids; Photographer: James Curtis. Carolinas Judging
- [11] *Rhyncholaeliocattleya* Cordelia 'Bryce Evelyn' AM/AOS (*Rhyncholaelia* *digbyana* x *Cattleya* *intermedia*) 84 pts. Exhibitor: Sandi Block-Brezner; Photographer: Bein Marc. West Palm Beach Judging
- [12] *Dendrobium* *formosum* 'Odom's Orchids' AM/AOS 83 pts. Exhibitor: Odom's Orchids; Photographer: Bein Marc. West Palm Beach Judging
- [13] *Epidendrum* *stamfordianum* 'Crownfox Pinkie' CCE-AM/AOS 90-87 pts. Exhibitor: R.F. Orchids, Inc.; Photographer: Tom Kuligowski. West Palm Beach Judging
- [14] *Papilionanda* Corneels Cilliers 'Crystelle' AM/AOS (Mimi Palmer x *Vanda* Doctor Anek) 85 pts. Exhibitor: Krull-Smith; Photographer: Paul Osborn. West Palm Beach Judging
- [15] *Guaricattonia* Memoria Marcia Donaldson 'Odom's Orchids' AM/AOS (*Cattleytonia* Marley Beckford x *Guaricattonia* Jamaica Diva) 83 pts. Exhibitor: Odom's Orchids, Inc.; Photographer: Paul Osborn. West Palm Beach Judging
- [16] *Holcovanstylis* Redland Stars 'Crownfox' AM/AOS (*Holcostylis* Shih Wei Diamond x *Vanda* *falcata*) 83 pts. Exhibitor: R.F. Orchids, Inc.; Photographer: Tom Kuligowski. West Palm Beach Judging
- [17] *Laelia* *undulata* (Alba) 'Graf's Emerald' CCE-AM/AOS 91-87 pts. Exhibitor: R.F. Orchids, Inc.; Photographer: Tom Kuligowski. West Palm Beach Judging





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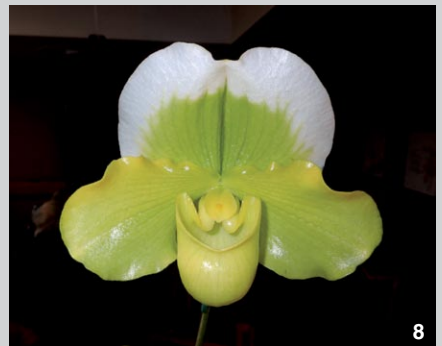


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- [1] *Cattleya* Diamond Girl 'Rod Lewis Sweet Fragrance' HCC/AOS (*Jungle Flare* x *jongheana*) 79 pts. Exhibitor: Roderick Lewis; Photographer: Tom Kuligowski. West Palm Beach Judging
- [2] *Vanda* Motes Adorbs 'Harri's Pink Delight' HCC/AOS (*ampullacea* x *christen-soniana*) 78 pts. Exhibitor: Harriet Davis; Photographer: Michele Bennett. Alamo Judging
- [3] *Maxillaria schunkeana* 'Barbara' HCC/AOS 75 pts. Exhibitor: Galen Carpenter; Photographer: Ramon de los Santos. California Sierra Nevada Judging
- [4] *Paphiopedilum* Oriental Charisma 'Slipper Zone Not Expected' HCC/AOS (*Spring Fever* x *Oriental Jewel*) 75 pts. Exhibitor: Lehua Orchids; Photographer: Ramon de los Santos. California Sierra Nevada Judging
- [5] *Rhyncholaeliocattleya* First Class 'Snowlets' AM/AOS (*Tokyo Bay* x *Cattleya* Winter Gift) 85 pts. Exhibitor: Jeanne Buchanan; Photographer: Charlotte Randolph. Alamo Judging
- [6] *Lysudamuloa* Red Jewel 'Elsie's Pride' AM/AOS (*Lycamerlycaste* Geyser Gold x *Angulocaste* Red Jade) 80 pts. Exhibitor: Jim Keplinger; Photographer: Carson Barnes. Atlanta Judging
- [7] *Vanda Orea's* Beauty 'Delta Dawn' AM/AOS (*merrillii* x *Doctor Anek*) 80 pts. Exhibitor: Trey Thigpen; Photographer: Joseph Paine. Atlanta Judging
- [8] *Vandachostylis* Christy McGunagle 'Crownfox' AM/AOS (*Nong Kham* x *Vanda vietnamica*) 81 pts. Exhibitor: R.F. Orchids, Inc.; Photographer: Tom Kuligowski. West Palm Beach Judging
- [9] *Rhyncholaelia* Aristocrat 'Leslie Dawn' AM/AOS (*glauca* x *digbyana*) 81 pts. Exhibitor: Beverly Stephens; Photographer: Joseph Paine. Atlanta Judging
- [10] *Phalaenopsis* Sunrise Goldamour 'Joy's Delight' AM/AOS (*Brother Lawrence* x *Buena Jewel*) 84 pts. Exhibitor: Larry Hennessey; Photographer: Joseph Paine. Atlanta Judging
- [11] *Clowesia* Rebecca Northen 'Grapefruit Pink' CCM/AOS (*Grace Dunn* x *rosea*) 82 pts. Exhibitor: Lynne Murrell; Photographer: Ramon de los Santos. California Sierra Nevada Judging
- [12] *Paphiopedilum* Jerry Spence 'Memoria Damian Cooke' AM/AOS (*rothschildianum* x *Berenice*) 82 pts. Exhibitor: Carolyn Fuentes; Photographer: Robert Bermea. Alamo Judging
- [13] *Cymbidium* Movella's Canary 'Caroline' AM/AOS (*Brook no Greenies* x *Summer Sue*) 84 pts. Exhibitor: Jo Ann Vaz; Photographer: Joseph Paine. Atlanta Judging
- [14] *Catasetum planiceps* 'Tony Jo' AM/AOS 83 pts. Exhibitor: Jo Ann Vaz; Photographer: Joseph Paine. Atlanta Judging
- [15] *Paphiopedilum* Lazaro Lopez 'Elaine' HCC/AOS (*Transvaal* x *Shin-Yi's Pride*) 79 pts. Exhibitor: Derek Lowenstein; Photographer: Michele Bennett. Alamo Judging
- [16] *Rhyncattleanthe* Cherry Suisse 'Kauai' AM/AOS (*Cattlianthe* Chocolate Drop x *Rhyncholaeliocattleya* Oconee) 82 pts. Exhibitor: Sung Han Lee; Photographer: Jamie Wasson. California Sierra Nevada Judging
- [17] *Paphiopedilum vejvarutianum* 'Honey' AM/AOS 82 pts. Exhibitor: Carol R. Stauder; Photographer: Joseph Paine. Atlanta Judging





- [1] *Masdevallia schroederiana* 'Goodstuff' HCC/AOS 76 pts. Exhibitor: Tom Pickford; Photographer: Ramon de los Santos. California Sierra Nevada Judging
- [2] *Phragmipedium* QF Halia 'Cheri' HCC/AOS (QF Kamakakilo Tyler x *kovachii*) 78 pts. Exhibitor: Dave Wujek; Photographer: Cheryl Erins. Chicago Judging
- [3] *Phragmipedium* Perufflora's Spirit 'Twin Sisters' AM/AOS (*kovachii* x Eric Young) 80 pts. Exhibitor: Terry Partin; Photographer: Cheryl Erins. Chicago Judging
- [4] *Maxillaria dichaeoides* 'David Haelterman' CBR/AOS. Exhibitor: Eric Sauer; Photographer: Richard Noel. Cincinnati Judging
- [5] *Clowesia* Kengar 'Mother of Pearl' CCM-AM/AOS (*rosea* x Rebecca Northen) 87-82 pts. Exhibitor: Woodland Orchids; Photographer: James Curtis. Carolinas Judging
- [6] *Paphiopedilum* Austin Cash 'Winter Sun' AM/AOS (Elfstone x Alchemy) 87 pts. Exhibitor: Marriott Orchids; Photographer: James Curtis. Carolinas Judging



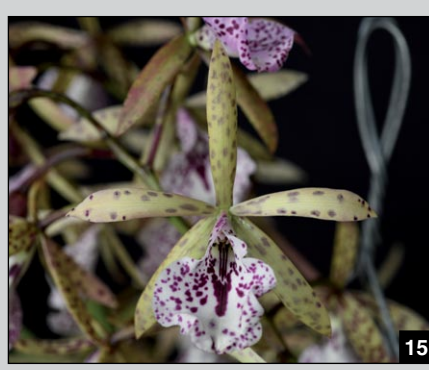
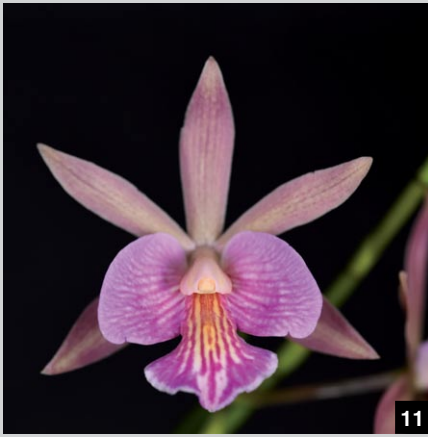
- [7] *Dendrobium* Pittero Gold 'Diamond Ring' JC/AOS (Golden Blossom x Oborozuki). Exhibitor: Pat Calvey; Photographer: Lois Cinert and Scott Weber. Chicago Judging
- [8] *Paphiopedilum* Deno's Success 'Forest Park' AM/AOS (Emerald Lake x Satin Stone) 86 pts. Exhibitor: Deno Kandis; Photographer: Nile Dusdieker S Weber L Cinert. Chicago Judging
- [9] *Paphiopedilum* Stargate 'Cosmic Storm' AM/AOS (Friendship x Skip Bartlett) 81 pts. Exhibitor: Marriott Orchids; Photographer: James Curtis. Carolinas Judging
- [10] *Nottara* Lucy's Sassafras 'Judy' HCC/AOS (*Galabstia* Green Tyger x *Zyogardmannia* Dynamite Peru) 79 pts. Exhibitor: Dave Grieve; Photographer: James Curtis. Carolinas Judging
- [11] *Phragmipedium* Acker's Starlight 'Wauaukee' AM/AOS (Twilight x *besseae*) 85 pts. Exhibitor: Chuck Acker; Photographer: Scott Weber. Chicago Judging



- [12] *Paphiopedilum* Magical Contrasts 'OK Two' AM/AOS (Love Song x Magic Pulsar) 86 pts. Exhibitor: Stephen and Jeanette Benjamin; Photographer: Richard Noel. Cincinnati Judging
- [13] *Paphiopedilum* Memoria Vickie Lynn Nagy 'OK' HCC/AOS (Odette's Fantasy x Gyorgy Nagy) 76 pts. Exhibitor: Stephen and Jeanette Benjamin; Photographer: Richard Noel. Cincinnati Judging
- [14] *Paphiopedilum herrmannii* 'Oakwood Shocked' HCC/AOS (*helenae* x *hirsutissimum*) 75 pts. Exhibitor: Oakwood Orchids; Photographer: Richard Noel. Cincinnati Judging
- [15] *Schoenorchis buddleiflora* 'Silas' CCM/AOS 85 pts. Exhibitor: Walter E. Crawford; Photographer: Lois Cinert. Chicago Judging
- [16] *Phragmipedium* QF Walter Scheeren 'Little Michele' AM/AOS (Memoria Julius Dixler x *boisserianum*) 81 pts. Exhibitor: Stephen Helbling; Photographer: Richard Noel. Cincinnati Judging





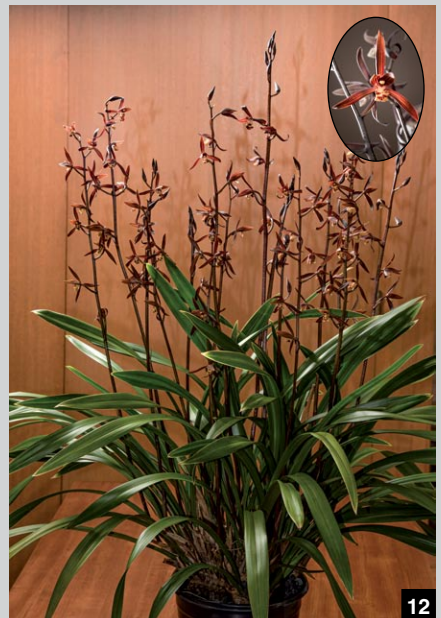


- [1] *Paphiopedilum* Anita Baby 'Baby Anita' AM/AOS (Hsinying Anita x *rothschildiana*) 82 pts. Exhibitor: Orchid Inn, Ltd.; Photographer: Richard Noel. Cincinnati Judging
- [2] *Phalaenopsis* Yaphon Gelacea 'Peter #3' AM/AOS (Yaphon Gelblitz x Chang Maw Jade) 82 pts. Exhibitor: Big Leaf Orchids; Photographer: David Gould. Dallas Judging
- [3] *Phalaenopsis* Yaphon Gelacea 'Emerald' HCC/AOS (Yaphon Gelblitz x Chang Maw Jade) 78 pts. Exhibitor: Big Leaf Orchids; Photographer: David Gould. Dallas Judging
- [4] *Phalaenopsis* Yaphon Gelacea 'Green' AM/AOS (Yaphon Gelblitz x Chang Maw Jade) 81 pts. Exhibitor: Big Leaf Orchids; Photographer: David Gould. Dallas Judging
- [5] *Phragmipedium* Saint Peter 'Teresa' AM-CCM/AOS (Eric Young x *longifolium*) 85-83 pts. Exhibitor: Stephen Helbling; Photographer: Richard Noel. Cincinnati Judging
- [6] *Paphiopedilum* Hsinying Majakun 'Hayden's Dream' HCC/AOS (Janet Kunkle x *Maudiae*) 77 pts. Exhibitor: George A. Bogard; Photographer: David Gould. Dallas Judging
- [7] *Eulophia* Shamara 'Isabel Adriana' AM/AOS (*euglossa* x *guineensis*) 82 pts. Exhibitor: Ruth Lopez Ramos; Photographer: Raul Emilio Asencio Moris. Dallas Judging
- [8] *Dendrobium* Ekapol 'Panda Splash' HCC/AOS (Lim Hepa x Tomie Drake) 78 pts. Exhibitor: Maritza Camacho; Photographer: Raul Emilio Asencio Moris. Dallas Judging
- [9] *Tetracattleya* Paola Mari 'Antonio' HCC/AOS (*Tetramicra canaliculata* x *Cattleya forbesii*) 78 pts. Exhibitor: Balbina Altagracia Cabrera; Photographer: Raul Emilio Asencio Moris. Dallas Judging
- [10] *Brassomicroa* Doña Estela 'Doña Luz Altagracia' CCE/AOS (*Tetramicra canaliculata* x *Brassavola nodosa*) 90 pts. Exhibitor: Yaquela Liriano; Photographer: Raul Emilio Asencio Moris. Dallas Judging
- [11] *Tetronichilis* Navarrete 'Leslie German' AM/AOS (*Psyttonia* Santo Domingo x *Tetramicra canaliculata*) 81 pts. Exhibitor: Angeles Martinez; Photographer: Raul Emilio Asencio Moris. Dallas Judging
- [12] *Laelia elata* 'Patt Lindsey' AM/AOS 82 pts. Exhibitor: Wayne T. Green; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [13] *Aranda* Happy Beauty 'Hamsville's Delight' AM/AOS (Christine x *Vanda Bonanza*) 81 pts. Exhibitor: Ernest and Monica Hamilton; Photographer: Claude W. Hamilton. Florida-Caribbean Judging
- [14] *Phalaenopsis* LD Giga King 'Mituo #1' HCC/AOS (*gigantea* x LD's Bear King) 76 pts. Exhibitor: Big Leaf Orchids; Photographer: David Gould. Dallas Judging
- [15] *Guarvolcilia* Werner 'Alexa' AM/AOS (*Encyvolia* Phoenix x *Brassanthe* Maikai) 80 pts. Exhibitor: Maritza Camacho; Photographer: Raul Emilio Asencio Moris. Dallas Judging
- [16] *Vandachostylis* Angeles Martinez 'Marielle German' AM/AOS (Thailand x *Vanda Rasri Gold*) 81 pts. Exhibitor: Angeles Martinez; Photographer: Raul Emilio Asencio Moris. Dallas Judging
- [17] *Cattlianthe* Gold Digger 'Orglades Mandarin' CCM/AOS (Red Gold x Warpaint) 82 pts. Exhibitor: Karen Davenport; Photographer: Carmen Johnston. Florida-Caribbean Judging





- [1] *Phragmipedium* Margo's Pinky 'Eve's Angel' AM/AOS (Cahaba Morning Mist x *schlimii*) 83 pts. Exhibitor: Darlene Thompson; Photographer: Eileen Findak. Great Lakes Judging
- [2] *Paphiopedilum* Gigi's Charm 'Julie's Choice' CCM/AOS (In Shape x Gigi) 85 pts. Exhibitor: Julie Clayman; Photographer: Eileen Findak. Great Lakes Judging
- [3] *Bulbophyllum taiwanense* 'Bryon' CCM/AOS 88 pts. Exhibitor: Bryon K. Rinke; Photographer: Bryon K Rinke. Great Plains Judging
- [4] *Phragmipedium* Amitabha 'Tika' CCM-AM/AOS (Patti MacHale x *besseae*) 84-82 pts. Exhibitor: Michael Weber; Photographer: Lynn O'Shaughnessy. Great Lakes Judging
- [5] *Vanda* Sandra Dixon 'Star Light' AM-CCM/AOS (Boonchoo x Robert's Delight) 83-84 pts. Exhibitor: John Rini; Photographer: Eileen Findak. Great Lakes Judging
- [6] *Paphiopedilum* Hung Sheng Eagle 'Pow Wow Jack' AM/AOS (*gigantifolium* x *rothschildianum*) 85 pts. Exhibitor: Bill and Marilyn Porter; Photographer: Lynn O'Shaughnessy. Great Lakes Judging
- [7] *Dendrobium* Aussie Firefly 'Bryon' HCC/AOS (*striolatum* x Falling Embers) 77 pts. Exhibitor: Bryon K. Rinke; Photographer: Bryon Rinke. Great Plains Judging
- [8] *Phragmipedium* Sara Beth 'Fairy Wings' JC/AOS (Magdalene Rose x *schlimii*). Exhibitor: Carol Stuhlt; Photographer: Lynn O'Shaughnessy. Great Lakes Judging
- [9] *Gastrochilus* Micro Burst 'Syzygy' CCM-AM/AOS (*Gastrochilus pulchra* x *Phaius tankervilleae*) 89-83 pts. Exhibitor: Peter Ostlund; Photographer: Lynn O'Shaughnessy. Great Lakes Judging
- [10] *Phalaenopsis* Yaphon Oh Mygod 'Susan's Valentine' AM/AOS (KS Happy Eagle x *tetraspis* f. *speciosa*) 81 pts. Exhibitor: Susan Tompkins; Photographer: Bryon Rinke. Great Plains Judging
- [11] *Cattleya* Cosmic Delite 'Edmond Glenn' HCC/AOS (Bright Angel x Batemanniana) 78 pts. Exhibitor: Jay C. Simon; Photographer: Bryon K Rinke. Great Plains Judging
- [12] *Paphiopedilum* Deena Nicol 'Black Eye' CCM-AM/AOS (*philippinense* x *glanduliferum*) 86-84 pts. Exhibitor: Dot Potter Barnett; Photographer: Lynn O'Shaughnessy. Great Lakes Judging
- [13] *Dendrobium* Bruce Gordon 'Bryon' AM/AOS (*alexandrae* x *eximium*) 82 pts. Exhibitor: Bryon K. Rinke; Photographer: Bryon Rinke. Great Plains Judging
- [14] *Paphiopedilum* Liberty Taiwan 'Full Moon' AM/AOS (*micranthum* x *hangianum*) 87 pts. Exhibitor: Orchid Inn, Ltd.; Photographer: Lynn O'Shaughnessy. Great Lakes Judging
- [15] *Caulaelia* Snowflake 'Bryon' CCM-AM/AOS (*Caularthron bicornutum* x *Laelia albida*) 87-82 pts. Exhibitor: Bryon K. Rinke; Photographer: Bryon Rinke. Great Plains Judging





13



14



15



16



17

- [1] *Cattleya* Pink Pearl 'St. Peter' AM/AOS (*alaorii* x *wittigiana*) 81 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [2] *Cattleya loddigesii* (Punctata) 'Tete'ia' AM/AOS 80 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [3] *Cattleya lueddemanniana* (Concolor) 'Pink Lemonade' AM/AOS 82 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [4] *Cattleya lueddemanniana* (Concolor) 'Incredible' AM/AOS 80 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [5] *Paphiopedilum* Petula's Flare 'Slipper Zone Striking Stripes' AM/AOS (Magical Contrasts x Petula's Flame) 80 pts. Exhibitor: Lehua Orchids; Photographer: Roy Andrade. Hawaii Judging
- [6] *Cattleya quadricolor* 'Seb Man' AM/AOS 81 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [7] *Rhyncholaeliocattleya* Emerald Paradise 'Green Giant' AM/AOS (Exotic Emerald x Xanthette) 83 pts. Exhibitor: Exotic Orchids of Maui; Photographer: Michael Blietz. Hawaii Judging
- [8] *Cattleya lawrenceana* (Flamea) 'Sebastian Ferrell' CCM-AM/AOS 86-84 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [9] *Dendrobium* Sailor Boy 'Makawao Dream' CCE/AOS (Fortune x Beautiful Egg) 90 pts. Exhibitor: Andrew Okada; Photographer: Michael Blietz. Hawaii Judging
- [10] *Paphiopedilum* Emma Decker 'Windy Hill' AM/AOS (*malipoense* x Fumi's Delight) 82 pts. Exhibitor: Marilyn LeDoux; Photographer: Melissa Garner. Mid-America Judging
- [11] *Rhynchobrassoleya* Spotted Charm 'Light Touch' AM/AOS (*Rhyncholaeliocattleya* Sun Spots x *Brassavola nodosa*) 82 pts. Exhibitor: Exotic Orchids of Maui; Photographer: Michael Blietz. Hawaii Judging
- [12] *Cymbidium sinense* 'Chin Hua San' CCM/AOS 84 pts. Exhibitor: Steve Mofitt; Photographer: Malcolm McCorquodale. Houston Judging
- [13] *Brassidium* Gilded Rex 'Aka's Origin' AM/AOS (Gilded Urchin x *Brassia* Rex) 81 pts. Exhibitor: Art Buckman; Photographer: Glen Barfield. Hawaii Judging
- [14] *Maxillaria* Maui Coconut 'Exotic Orchids' CCM/AOS (*sanguinea* x *tenuifolia*) 88 pts. Exhibitor: Andrew Okada; Photographer: Michael Blietz. Hawaii Judging
- [15] *Dendrobium laterale* 'Lissabug' CHM/AOS 85 pts. Exhibitor: Melissa Garner; Photographer: Melissa Garner. Mid-America Judging
- [16] *Paphiopedilum* QF John Fields 'Mahina' AM/AOS (*parishii* x *praestans*) 80 pts. Exhibitor: Roy Andrade; Photographer: Roy Andrade. Hawaii Judging
- [17] *Cymbidium sinense* var. *album* 'Dark Mountain' AM/AOS 80 pts. Exhibitor: John Dunkelberger; Photographer: Bryan Ramsay. National Capital Judging

NOVEMBER

5-7—1st International Vanda & Slipper Orchid Symposium, Highland Manor, 604 E. Main, Apopka, FL; Contact: Julio Hector, 813-765-9271; j.hector@verizon.net

6-7—Kansas Orchid Society Fall Show and Sale, Botanica, the Wichita Gardens, 701 Amidon St, Wichita, KS; Contact: Sarah Pratt, 316-655-0572; svcsjp@gmail.com

13-14—Deerfield Beach Orchid Society's "Orchid Obsession," Safe Schools Institute, 1790 Spanish River Blvd, Boca Raton, FL; Contact: Cheryl Babcock, 954-464-8996; babcockc@nova.edu

13-14—Fort Pierce Orchid Society Show and Sale, Riverwalk Center 600 Indian River Drive, Fort Pierce, FL; Contact: Rita Zebelin, 772-418-7426 (text only), rita2zfpos@gmail.com

13-14—Niagara Frontier Orchid Society's "Orchids Under the Dome," Buffalo & Erie Co. Botanical Gardens, 2655 South Park Ave, Buffalo, NY; Contact: Donna Lipowicz, 716-479-7698, ladysliper@roadrunner.com

19-21—Atlanta Orchid Society Show and Sale, Atlanta Botanic Garden, 1345 Piedmont Ave NE, Atlanta, GA; Contact: Danny Lentz, 770-362-0575; dblgongora@bellsouth.net

DECEMBER 2022

4—Baton Rouge Orchid Society's "Louisiana December Short Course," Burden Museum and Gardens (Conference Center), 4560 Essen Lane, Baton Rouge, LA; Contact: Frank Zachariah, 225-202-0377; lousid8@gmail.com

12—East Everglades Orchid Society's Holiday Orchid Event, R.F. Orchids (in the Banyon Pavilion), 21800 SW 182nd Ave, Homestead, FL; Contact: Kim Belisle, 786-367-7177; concept22@aol.com

18—Northeast Judging Center Annual Auction, First Presbyterian Church, 14 Hanover Road, East Hanover, NJ; Contact: Wayne Wiegand, 781-856-1652; weulerw@msn.com; nejcaos.org for details.

JANUARY 2022

8-9—Sarasota Orchid Society's, "Orchids in Paradise," Sarasota Municipal Auditorium, 801 N Tamiami Trail, Sarasota, FL; Contact: Larry Desiano, 941-724-6683; larrydesiano@gmail.com

21-23—Fort Lauderdale Orchid Society's "Orchids Rock," The Greater Ft Lauderdale Broward City Convention Center, 1950 Eisenhower Blvd, Ft Lauderdale, FL; Contact: Michael Schaberl, 954-683-9615; michaelschaberl@comcast.net

22-23—Cape and Islands Orchid Society Show, Resort and Conference Center, 35 Scudder Ave, Hyannis, MA; Contact: Tina Balog, 508-540-5006; tina@plaid.whoie.edu

28-30—Gulf Coast Orchid Society Show and Sale, Gautier Convention Center, 2012 Library Lane, Gautier, MS; Contact: Jo Ann Vaz, 601-530-8778; joannvaz@bellsouth.net

29-30—Florida West Coast Orchid Society's "Orchids Unmasked," City of

Seminole Recreation Center, 9100 113th Street North, Seminole, FL; Contact: Bill Nunez, 727-239-2700; biddison22@aol.com

29-30—Orchid Society of Minnesota's "Winter Carnival Orchid Show," Marjorie McNeely Conservatory, 1225 Estabrook Park, St. Paul, MN; Contact: Michael Dyda, 612-223-4059; michael1027us@yahoo.com

29-30—Peninsula Orchid Society Show & Sale, Community Activities Building, 1400 Roosevelt Ave, Redwood City, CA; Contact: Chaunie Langland, 510-364-2274; chaunieaos@gmail.com

29-30—Grand Valley Orchid Society's Annual Orchid Show, Frederik Meijer Gardens & Sculpture Park, 1000 East Beltline Ave NE, Grand Rapids, MI; Contact: Mei Ling Clemens, 231-557-2647; meilingclemens@gmail.com

FEBRUARY 2022

4-6—Susquehanna Orchid Society's "For the Love of Orchids," Milton and Catherine Hershey Conservatory at Hershey Gardens, 170 Hotel Road, Hershey, PA; Contact: Lorna Deibert, 717-825-7827; lornadeibert@aol.com

5-6—Orchid Growers Guild's "Orchid Quest," Olbrich Botanical Gardens, 3330 Atwood Ave, Madison, WI; Contact: Terri Jozwiak, 608-592-7906; lodijoz@charter.net

5-6—Venice Area Orchid Society Show & Sale, Venice Community Center, 326 S Nokomis Ave, Venice, FL; Contact: Carol Wood & Judy Loeffler, 941-497-4995; showchair@vaos.org

12-13—Boca Raton Orchid Society's "In Love With...Orchids," Safe Schools Institute, 1790 NW Spanish River Blvd, Boca Raton, FL; Contact: Kathy Kersey, 954-802-3575; kathykbros@gmail.com

12-13—Port St. Lucie Orchid Society's "Orchid Village," Port St. Lucie Botanical Gardens, 2410 SE Westmoreland Blvd, Port St. Lucie, FL; Contact: Andrea Heitfeld, 772-528-1955; tazzette55@gmail.com

18-20—Deep Cut Orchid Society Show, Dearborn Market, 2170 State Route 35, Holmdel, NJ; Contact: Helen Kroh, 732-241-2483; krohstn68@gmail.com

19-20—Batavia Orchid Society Show, DuPage County Fairgrounds, 2015 Manchester Rd, Wheaton, IL; Contact: Larry Sexton, 630-406-8460; orkiddoc@aol.com

25-27—San Francisco Orchid Society's "69th Annual Pacific Orchid Exposition - Orchid Masquerade," Hall of Flowers at Golden Gate Park, 1199 9th Ave, San Francisco, CA; Contact: Cori Majewski, 864-663-6035; info@orchidsanfrancisco.org

26-27—Greater Lansing Orchid Society Orchid Show, Michigan State University Plant and Soil Sciences Bldg, 1066 Bogue St, E Lansing, MI; Contact: Ioana Sonea, 517-614-9120; ioanamsona@gmail.com

26-27—Amherst Orchid Society Show, Smith Vocational and Agricultural High

School, 80 Locust St Rt 9, Northampton, MA; Contact: Marc Gray, 802-346-7926 (landline) or 802-258-8406 (cell); bulbophyllum@myfairpoint.net

MARCH 2022

4-5—Englewood Area Orchid Society's "Orchids to the Rescue," Tringali Gym, 3460 N Access Rd, Englewood, FL; Contact: Mary Anne DiGrazia, 941-697-9237; tommaryanne@centurylink.net

4-6—Virginia Orchid Society Show, Lewis Ginter Botanical Garden, 1800 Lakeside Ave, Henrico, VA; Contact: Donna Poland, 757-846-0981; in2gifted@gmail.com

4-6—Martin County Orchid Society's "Orchid Safari," Martin County Fairgrounds, Bldg. G, 2616 SE Dixie Hwy, Stuart, FL; Contact: Nancy Speedy, 772-485-5310; aspeedy@bellsouth.net

5-6—Tampa Bay Orchid Society's "Orchids by the Bay," Tampa Scottish Rite, 5500 Memorial Hwy, Tampa, FL; Contact: Pat Solakian, 203-214-7042; psolakian@gmail.com

19-20—Nature Coast Orchid Society Spring Show 2022, VFW Post 8681, 18940 Drayton Street, Spring Hill, FL; Contact: Steve Mattana, 218-556-1895; stevemattana123@gmail.com

19-20—Jacksonville Orchid Show 2022, Mandarin Garden Club, 2892 Loretto Rd, Jacksonville, FL; Contact: Lorraine Conover, 561-302-6010; lorrainesorchids@gmail.com

25-27—Calcasieu Orchid Society's "ORCHIDS Go To The Movies - Cinematic Spectacles," Historic City Hall, 1001 Ryan Street, Lake Charles, LA; Contact: R. Keith Joiner, 318-614-3516; kjoiner2000@yahoo.com

25-27—New Hampshire Orchid Society's "A Bounty of Orchids," The Event Center at the Courtyard Marriott, 2200 Southwood Drive, Nashua, NH; Contact: Brenda Campbell, 603-540-8195; Bbcampbell139@comcast.net

25-27—Gulf Coast Orchid Society's "Galaxy of Orchids," North Collier Regional Park, 15000 Livingston Rd, Naples, FL; Contact: Jim Longwell, 239-340-5520; jlongwell1@comcast.net

26-27—The Central Pennsylvania Orchid Society's 55th Annual Orchid Show, Penn State University, Ag Arena, University Park, PA; Contact: Wade Hollenbach, 570-837-9157; wadeh@ptd.net

26-27—Orchid Society of Highlands County's "Pete's Magical Orchid Show," Agri-Civic Center, 4509 George Blvd, Sebring, FL; Contact: Susie Whitehead, 863-381-0522; susan_whitehead@hotmail.com



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"Soroa 2022"

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This second postponement has become necessary due to damage caused by a recent tropical weather system as well as the COVID-19 pandemic situation in Cuba. Vaccinations are underway in Cuba but February will be too soon to safely hold the Conference.

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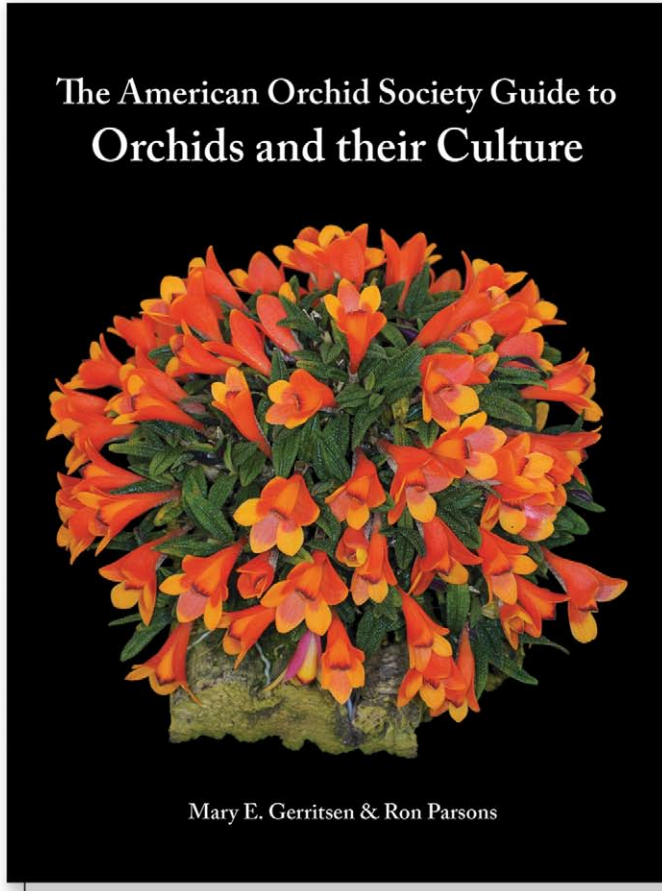
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2021 Dillon/Peterson Essay Prize

THE AOS IS celebrating its Centennial Anniversary in 2021. To join in the fun, the Dillon-Peterson Essay Contest is asking for in-depth articles relating to significant people, events, programs or even plants or technology changes that have helped shape the direction of the AOS or are likely to in the future. Was there someone special in the AOS who mentored and inspired you and others? Did an AOS award you received plant the seed that resulted in you becoming involved in judging—could you tie that into how the judging program has helped shape the AOS and Affiliated Societies? Perhaps it is technological changes that the AOS has adopted that have changed and will change the AOS and your enjoyment of orchids? Share why the AOS has had and will have an enormous influence over lifetimes.

Membership in the American Orchid Society is not necessary to enter the contest.

The deadline is November 30, 2021. The winning entry, if any, will be published in the June issue of the following year. For complete contest rules see <http://www.aos.org/about-us/article-submissions/essay-contest-winners.aspx>

Submit all entries to the Dillon/Peterson Memorial Essay Prize at AOS headquarters: Ron McHatton, American Orchid Society at Fairchild Tropical Botanic Garden, PO Box 565477, Miami, Florida 33256 (email rmchatton@aos.org).

Submission of articles for

ORCHIDS magazine

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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James Fowler

(1946–2021)

BY THOMAS MIRENDA

KNEE-DEEP IN the Green Swamp of North Carolina, on a beautiful, if slightly overcast, spring morning, I encountered one of the most incredible, and fascinating of creatures roaming amidst the ravenous sarracenias and pinguiculas. Jim Fowler was in his glory, in his element, his natural habitat. Having emailed him in advance, I knew we would meet that day to search for the plentiful wild orchids that occurred there. Indeed, that day was punctuated by many awesome sights and excited utterances as we slogged around the wetlands and came across exuberant patches of *Calopogon*, *Pogonia* and stately *Cleistosiopsis* in full bloom. What a wonderful introduction to someone who would become one of my favorite people on the planet.

The author of two books: *Wild Orchids of South Carolina*, as well as *Orchids, Carnivorous Plants, and Other Wildflowers of the Green Swamp, North Carolina*. Jim was dedicated to capturing superb images and spreading knowledge of the spectacular flora of the region in which he lived. He loved them so much that he never really had the need to travel the world to see the ~30,000 other species in the Orchidaceae known from this planet. I believe he felt that stewardship begins with your own home, your own heritage and your own native species. Instinctively he knew that if conservation was to work, it had to be local stakeholders taking the lead, and that this is a model for native plant conservation across the world.

Jim was an avid member of the Native Orchid Conference (NOC) and a contributor to Smithsonian's North American Orchid Conservation Center (NAOCC). I would look forward to reconnecting with him, his beloved partner Walter, and so many other likeminded individuals at the NOC's annual conference, held in orchid hotspots throughout North America and scheduled at peak blooming times for local native species. Many of his photos are featured on the GoOrchids website (goorchids.northamericanorchidcenter.org), but especially on his excellent blog to be found at jfowlerphotography.com, which is laden with outstanding images



Jim Fowler sits amid an extraordinary patch of exquisite fringed orchids: *Platanthera psycodes* halfway up Mount Mitchell in North Carolina. The inset photograph is one of Jim's incredible close-up pictures of this exquisite species.

from close to 10 years of sublime botanical adventures and insightful commentary about ecology and habitat for virtually every plant depicted. It is a priceless resource.

For those that did not know him well, you have probably seen the superb Native Orchid Stamp Collection released last year by the United States Postal Service. I believe this was a source of great pride for him as he was a stamp collector long before he became an orchid expert. One image among the stamps, of the critically endangered *Platanthera leucophaea*, or eastern prairie fringed orchid, inspired the AOS to contribute a sizable grant to The Orchid Recovery Program at Illinois College, to be dedicated to conservation research of this wildly beautiful native orchid and unlocking the secrets of its culture. Since then, seeds and mycorrhizal fungi for this species have been collected and much progress made by Dr. Larry Zettler and his students toward successful propagation and reintroduction of this natural wonder of the Midwest.

Although his passing at 3:15 pm on Friday June 25, 2021 saddens many of us who loved and shared idyllic days with him searching for lovely rare plants, we can take some comfort in the fact that he passed peacefully doing something he truly loved in a miraculous place he cherished and shared with so many of his friends. You see, Jim Fowler's last photo was taken precisely at 3 pm on the road ascending Mount Mitchell. Near that summit lives an extraordinary colony of purple fringed orchids, *Platanthera psycodes* that he especially treasured. Jim would photograph the spectacle there every year, and he helped unlock the species' botanical secrets by collecting mycorrhizal and seed samples for researchers at NAOCC in the quest to preserve the species through the many challenges faced by locally endemic plants in this age of shifting climates.

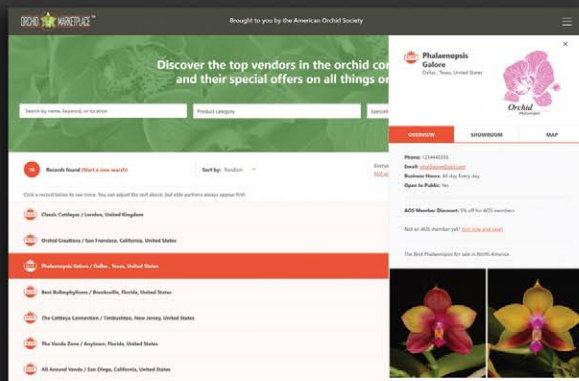
Personally, I think he will continue to return there in perpetuity.


— Thomas Mirenda (biophiliak@gmail.com).

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