

# ORCHIDS

THE BULLETIN OF THE AMERICAN ORCHID SOCIETY

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■ Exhibition Venue :  
Taichung Waipu  
Expo Site



# World Orchid Conference 23<sup>rd</sup>

2020 世界蘭花會議 Taichung

**Conference:**

**Date : March 9-12,2020**

**Exhibition :**

**Date : March 9-15,2020**



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# ORCHIDS

The Bulletin of the American Orchid Society

**RON MCHATTON**  
Chief Education and Science Officer  
Editor, *Orchids* Magazine  
rmchatton@aos.org

**AWARDS REGISTRAR**  
Laura Newton  
laura@aos.org

**ADVERTISING**  
Kevin Hall  
Advertising Sales Executive  
Allen Press  
810 East 10th Street  
Lawrence, Kansas 66044  
khal@allenpress.com  
785-865-9143

**SUBSCRIPTIONS AND MISSING ISSUES**  
Membership Services Department  
Tel 305-740-2010 Fax 305-747-7154  
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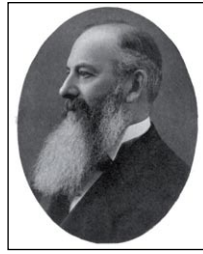
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## FRONT COVER

Commercially propagated orchid seedlings and mericlones spend at least the first year of their lives growing in sterile flasks on nutrient-laden agar medium. Very rarely, an occasional seedling will flower while still in the flask. *Cattleya* Bright Spark 'Precocious 1' (Tiny Rubies × *cernua*) received a Judges' Commendation and an Award of Merit. For perspective, the flask is about the size of a quart take-out container (4 × 6 inches [10 × 15 cm]) and the individual flowers are about 1.3 inch (3.4 cm) diameter.

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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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AMERICAN ORCHID SOCIETY

at Fairchild Tropical Botanic Garden

10901 Old Cutler Road, Coral Gables, Florida 33156

Mailing address: PO Box 565477, Miami, Florida 33256

Tel 305-740-2010

Email [theaos@aos.org](mailto:theaos@aos.org) Website [www.aos.org](http://www.aos.org)

Main Office Monday–Friday (by appointment only)

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Nomenclature

Orchid Information

*Orchids* — Editorial

Publications — Books, Calendar, *Orchid*

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**Naya Marcano** ([naya@aos.org](mailto:naya@aos.org))

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**Victor Parera (305-740-2010 ext 104)**

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**Affiliated Societies** ([bwalsh@aos.org](mailto:bwalsh@aos.org))

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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>.

*alba* (AL-ba)  
*alexandrae* (al-leks-AN-dree)  
*andigena* (an-DIH-jeen-a)  
 Angraecoid (an-GRAY-koyd)  
*aromatica* (air-oh-MAT-ih-ka)  
*Bartholina* (barth-oh-LEE-na)  
*bensoniae* (ben-SON-ee-eye)  
*Brassavola* (brass-AH-vol-lah)  
*Bulbophyllum* (bulb-oh-FILL-lum)  
*Catasetum* (kat-a-SEE-tum)  
*Cattleya* (KAT-lee-a)  
*Cattleychea* (kat-lee-KEE-a)  
*Caucaea* (KOW-kah-ee)  
*Chondrorhyncha* (kon-droh-RINK-ah)  
*Cochleanthes* (kok-lee-AN-theez)  
*cochleare* (kok-lee-AIR-ee)  
*Cochlezella* (kok-leez-ELL-la)  
*Coelogyne* (see-LOJ-ih-nee)  
*Corralorhiza* (kor-al-oh-RYE-za)  
*costaricensis* (kos-ta-ree-KEN-sis)  
*cucullata* (kew-kew-LAY-ta)  
 Cymbidieae (sim-BID-ee-ee)  
*Cymbidium* (sim-BID-ee-um)  
*Cynorkis* (sin-ORE-kiss)

*Dendrobium* (den-DROH-bee-um)  
*devonianum* (deh-vone-ee-AY-num)  
*discolor* (DISS-kuhl-ur)  
*Drakaea* (DRAYK-ee-a)  
*Epidendrum* (ep-ih-DEN-drum)  
*falcata* (fal-KAY-ta)  
*fimbriata* (fim-bree-AY-ta)  
*flabelliformis* (flab-ell-ih-FORE-mis)  
*guttata* (gut-TAY-ta)  
*Habenaria* (hab-ih-NARE-ee-a)  
*Holothrix* (hoh-LOH-thriks)  
*Huttonaea* (hut-TON-ee-a)  
*kunthiana* (koonth-ee-AY-na)  
*livida* (LIV-ih-da)  
*luzonica* (loo-ZON-ee-ka)  
*Lycaste* (lye-KASS-tee)  
*mariae* (MAR-ee-eye)  
*marshalliana* (mar-shall-ee-AY-na)  
*Maxillaria* (maks-ill-AIR-ee-a)  
*obscura* (ob-SKURE-a)  
*olivacea* (ol-lih-VAY-see-a)  
 Oncidiinae (on-sih-DEE-ih-nee)  
*Oncidium* (on-SID-ee-um)  
 Orchidaceae (or-kih-DAY-see-ee)

*Paphiopedilum* (paff-ee-oh-PED-ih-lum)  
*papilio* (pap-EE-lee-oh)  
*Phalaenopsis* (fail-en-OP-sis)  
*porpax* (PORE-paks)  
*Prosthechea* (pros-THEK-ee-a)  
*Rhizanthella* (rye-zan-THELL-a)  
*Rodriguezia* (rod-rih-GUESS-ee-a)  
*schilleriana* (shil-ler-ee-AY-na)  
*sichuanicum* (sih-SHWAN-ih-kum)  
*Thunia* (TOON-ee-a)  
*Tipularia* (tip-yew-LARE-ee-a)  
*universitas-cuencae* (yew-nih-ver-sih-tas-KWENK-eye)  
*urbanianum* (ur-ban-ee-AY-num)  
*Vanda* (VAN-da)  
*vexillarius* (veks-ill-LARE-ee-us)  
*Warszewiczella* (var-schuh-vitz-EL-la)  
*warszewiczii* (var-schuh-VITZ-ee-eye)  
*wendlandii* (wend-LAND-ee-eye)  
 Zygopetalinae (zye-go-pet-a-LEE-nee)  
*Zygopetalum* (zye-go-PET-a-lum)

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### Orchids in the Wild 2020



*P. bellatulum*

**Yunnan, China** Mar 14 – Mar 27. To follow the Taiwan WOC. Tour includes Jinghong Botanic Garden, Wild Elephant valley, and sites for *Paph. bellatulum*, *villosum*, and *wenshanense*. Other orchid genera will include *Coelogyne*, *Dendrobium*, *Holcoglossum*, *Phalaenopsis*, *Pleione*, *Vanda* and more.



*S. amabilis*

**Costa Rica** Dates TBA. Tour includes Lankester Botanical Garden, reserves at Bosque de Paz, Monteverde, and others. We expect to see *Brassavola*, *Brassia*, *Encyclia*, *Epidendrum*, *Masdevallia*, *Maxillaria*, *Pleurothallis*, *Sobralia*, and many others.



*Caladenia discoidea*

**Western Australia** September 19 - 28. Beginning in Perth, we will travel south to Albany, visiting many orchid rich sites along the way. We expect to see *Caladenia*, *Diuris*, *Prassophyllum*, *Pterostylis*, and *Thelymitra*, among others, many interesting flowering and carnivorous plants, and parrots, cockatoos, and kangaroos.

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— **Jack Bliss**  
 Deep Cut Orchid Society (Conservation)

— **James B. Coyner**  
 Carolyn Pedone and John Rose

— **Tom Errickson**  
 Deep Cut Orchid Society (Conservation)

— **John W. Wallace**  
 Orchid Society of the Palm Beaches  
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— **Research**

Anonymous  
 Englewood Area Orchid Society  
 Neblina Orchids and Tropicals  
 North Jersey Orchid Society

— **Technology**

Joyce Medcalf

**CORRIGENDA**

In the June issue of *Orchids* magazine, a gift from Motes Orchids, Inc. honoring Frank Smith was inadvertently listed as unrestricted. It should have been noted as a donation to the Permanently restricted - Motes Award fund. We regret the omission.

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## PRESIDENT'S MESSAGE

BACK IN THE early 1980s my local orchid society (Tropical Plant Society of Modesto) decided to have its first show. Not only did our show include lots of orchids, but there were bromeliads, African violets and carnivorous plants as well. It was decided to invite the American Orchid Society to judge the orchids as well as the other tropical plants exhibited in our show. This was my first exposure to the AOS judging program, and over the first couple of years of our show, it was so much fun to get to know those judges. But I found out not only was I getting to know them and enjoy watching them AOS award and ribbon judge, they were watching me back! One day at work, I received a call asking me to join the judging program. I was thrilled to be asked, but scared, because I felt I had way too much to learn. The person on the phone said, "We will see you on the first Tuesday of next month to start your journey into the judging program."

So, if you are wondering how to join the judging program, you should start by making a list of why you want to become a judge. Do you have the time to commit to the program? This involves going to monthly judgments at your closest judging center as well as show judgments, usually on the weekends, and the expense of travel to those events because AOS judges aren't reimbursed for their expenses. Are you thinking about the homework and presentations you will need to put together and then present to your judging center? Will you be able to take *constructive* criticism from "seasoned" judges that will help you to develop your "orchid judging mind"? You should already be active in your local orchid society and helping out at your shows, and also have a good basic understanding and experience with orchids. If you answer no to any of those questions, the judging program is not for you, at least at this time.

If you are thinking about entering the program, you should get to know a few (or more) of the judges from the center you are most likely to join. Let the judges also get to know you. Once you feel secure enough, ask if you can help with paperwork, called "clerking," or sit in on a team because you are interested in the judging program. Once you decide you want to start the formal process to become an AOS judge, fill out the application form and give it to the designated person for your center. The chair of the center should have application forms.

Back when I joined, I did not have OrchidPro or OrchidsPlus to rely on for research (or any of today's modern



Judges in the California-Sierra Nevada judging center examine a group of paphiopedilums submitted for an Award of Quality. Left to right: Nancy McClellan, Dennis Olivas, Ramon de los Santos (measuring) and Jeff Trimble behind de los Santos.

computer programs and the internet). We had to go through the printed *Awards Quarterly* (AQ, a blast from the past) to do our research and heaven help you if another student needed the same AQ for their research! It does take patience listening to the judging team, learning and also acknowledging that what you thought was right might not be so. I was a great one to get seduced by a spectacularly colored orchid, so I had to learn that just because the flower had great color, the rest of the flowers' characteristics such as form and arrangement, are equally important. Getting seduced by color was a hard habit I had to break but I did; just part of my learning curve. Now, I suggest you read articles in the *Orchids* magazine, review the latest awards in OrchidPro and visit well-known orchid growers in your area and when you travel. If you call and make an appointment to visit them and talk about orchids, they are willing to take the time and pass on their knowledge.

As of this past July, I have been in the AOS judging program for 32 years. Once again, where did the time go? I have enjoyed all 32 years — even those years when I was a student and, later a probationary (now Associate) judge. Yes, there were some judgments where I thought, "Boy I did not have a good

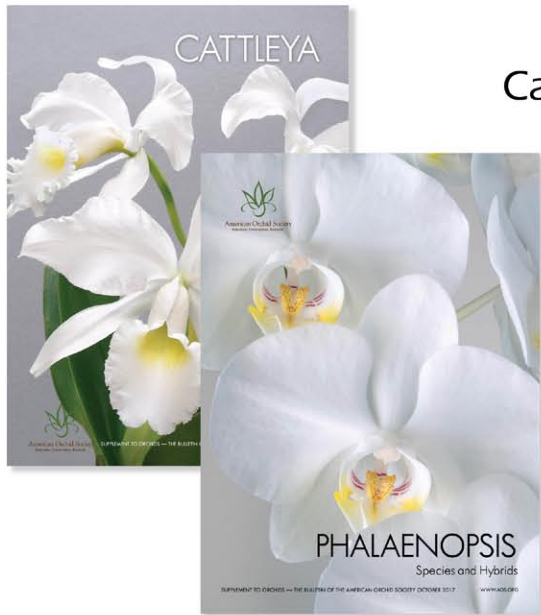
judging today," but you know what? We all have those judgments from time to time. I have friends across the United States and Canada and I can say they have enriched my life. Since becoming AOS President and traveling more internationally, I also now have judging friends in several other countries (England, Taiwan and Japan, for example).

The spring 2020 AOS Members' Meeting will be held in Sacramento, California, this coming April 15–19. The hotel location is just a few blocks away (within walking distance) from Old Town Sacramento where you can walk on wooden sidewalks and enjoy the cobblestone streets. There are some great restaurants in this area as well as a river walk just outside the hotel and the famous (at least in that area) Tower Bridge. Sacramento is less than a two-hour drive from Lake Tahoe and just over an hour drive to the Napa Valley. Plus, the gold country of our foothills surrounding Sacramento has a lot of wineries to enjoy. Consider coming to Sacramento for the Members' Meeting and add a few extra days to enjoy the scenery around it! At least mark your calendars now.

Until next time, happy growing!  
— Susan Wedegaertner, AOS President  
(email: susan@aos.org)



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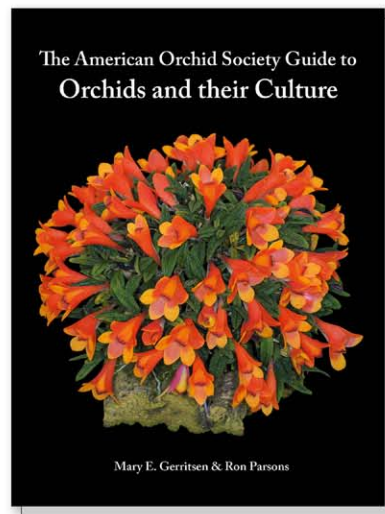
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# Form in Quality Award Descriptions

By Jean Allen-Ikeson

FORM IS THE Rodney Dangerfield of descriptions: we often do not give it enough respect. Shape receives as many points as color, more than floriferousness and size combined, and yet it is often minimized or ignored in descriptions, especially in quality awards (Highly Commended Certificate, Award of Merit, and First Class Certificate). So why are many of us so uncomfortable with adding anything more than adjectives such as flat or round? Or write "form typical for species" ... typical of what, *exactly*?

Habit possibly? Students, who often write the award descriptions, may be uncomfortable with obscure botanical terms. The judging resource, *Descriptive Terminology for the Orchid Judge*, is contained in both *OrchidPro* and its predecessor *OrchidsPlus*. It contains drawings of form and is followed by a glossary. Use it!

Judges who have been accredited for more than a decade were taught to be somewhat parsimonious in descriptions because there was a limit on space in the old print publication, *Awards Quarterly*. Old habits die hard.

Or is it getting late in the day and, after all, there is a photo? Photographs give us a wonderful sense of what the overall look of the flower was, but they can be deceptive. Notably, cupped flowers may appear to be nearly flat in a photo (that is why it is so important to put form in the description!). Color is often misleading as well, even from one computer to another or to a projection screen; this is particularly true for older slides that have been digitized.

The old saying, "more heads are better than one" could be changed to "more photographs tell a better story than one"! To help minimize any confusion brought about by photos, head judges of smaller shows should make sure that once-a-year photographers understand the importance of following the guidelines and not just taking multiple photos, but *delivering* multiple photos from different angles! Descriptions and photographs work in tandem. Both should be complete.

Descriptions should provide readers with a mental image of the flower. Otherwise, why write them? Wherever possible, use plain language. Common and intuitive botanical terms such as stellate,



DEBRA TRYON



TOM KULIGOWSKI

pendulous, lanceolate, or undulate are easy to understand, but how many of you know what distichous means, or what the difference between acicular and aculeate is. If in doubt, write it out! Canes with leaves alternate; leaf apex needle shaped; dorsal sepal apex pointed, erect.

So plant descriptions (the C awards: CBR, CHM, CCM, CCE), including

[1] *Bulbophyllum grandiflorum* 'Shaun Finch' AM/AOS

[2] *Laeliocatanthe* Inge Graf 'OMA' AM/AOS (*Cattlianthe* Gold Digger × *Laelia undulata*)



leaves, bracts and pseudobulbs, and flower descriptions for form, must be complete, accurate and relatively easy to understand. Form should be included with each section of the description such as overall form, form of the sepals, then form for sepals, petals, lip, etc. Form for flower segments includes overall shape (round with inferior edge recurved), the edges (undulate, notched), any fuzz, hairs, raised areas (warts, boss or umbo, keels), plaques, or structures with scent glands such as osmophores. If a species has a poor or nonexistent old CBM, CBR or CHM description and it is being given a quality award for the first time, then the plant should be fully described *even though it is a quality award* to get the description into the record for judges in the future.

When should form be mentioned at the end of a description? When it affects the score in a way that may not be obvious. "Petal notch precluded a higher score." For instance, notching of a petal in phalaenopsis or cattleya hybrids may indicate a defect or ploidy problem, especially if it occurs in multiple, but perhaps not all, flowers. However, irregular serration of the petals on complex, inbred *Oncidium alexandrae* hybrids would normally not be considered a fault, as it typically occurs in the species, although smoother margins may at times be more desirable. "Awarded for unusual glistening bronze on sepals and petals although open flower form precluded a quality award." A Judges' Commendation for color was given, although the form, but not the number of flowers or size, was not good enough to merit a quality award.

Although points are given to flower size, number of flowers and inflorescence or stem separately from form, these are aspects of form that have been singled out for special attention. Portrayal of other characteristics of form are just as important.

Overall flower form template: (Number of) (flower form such as stellate, tubular, cupped) flowers and (number and/or noting of immature) buds on (number of) (arrangement as in pendulous, branched, etc.) inflorescences (and developing or immature inflorescences where no flowers are open but bud count could be noted, or bud count cannot be yet determined) to (measurement of inflorescence). For example: "Thirty-three stellate flowers and 12 buds arranged in uniform shingles on three branched, pendulous inflorescences to 33 cm in length arising from both the leaf axils and the apex of



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a single pseudobulb plus two developing inflorescences on a second pseudobulb." Some well-grown hybrids, for example, in the oncidium alliance, have the genetic potential to produce inflorescences from both the base (leaf axils) and the apex of the pseudobulb. The occurrence of more than one inflorescence *per growth* is always worth noting.

— Jean Allen-Ikeson (email: Jean.ikeson@gmail.com)

- [3] *Vanda Herziana* 'Guisy Maffesanti' AM/AOS (*coerulea* × *sauvis*)
- [4] *Epidendrum nocturnum* 'Mattor's Maine Moonlight' AM/AOS
- [5] *Paphiopedilum Gloria Naugle* 'Krull's Sparkling Gloria' AM/AOS (*rothschildiana* × *micranthum*)

# November: The Month of Brothers (and Sisters)

By Thomas Miranda

ON A PERPETUAL quest for self-improvement, I have taken to rising before dawn to lightly exercise, journal, and express gratitude for all the good fortune in my life. In return, or maybe in response, I get to enjoy the delicious, crepuscular fragrances of my brassivolae and angraecoids, one of many daily joys I find in my orchid collection. Early this morning I noticed Orion floating above my head with his fierce stance and trim, narrow core. This iconic constellation can evoke jealousy in me sometimes. But is it really that? Or is it admiration for something that has become an eternal symbol of the warrior: fit and healthy and unstoppable, traversing the sky every night for eternity on a quest for greatness.



Thomas Miranda

Does he look down at us in judgement, in pity, or does he see the potential that still remains within us, hurling a gauntlet of challenge. No, we cannot actually fight each other; we are on different plains of existence. But if the universe is kind, benevolent and good, then perhaps he sees brothers and sisters in us, soldiers that can continue to fight the good fight together as a legacy into the future, to ensure that our world is fiercely protected from those that would exploit and ravage it.

If there is one overarching message I have received this year, a year where I have been so fortunate to travel the world in search of orchids, both wild and cultivated, it is that our planet is wildly beautiful, madly diverse and wholly worth preserving. In our own way, we must be fierce warriors to protect those things we love, whether it be family, friend, place, animal or plant. For a variety of reasons, many of our beloved wild orchids as well as their unique habitats, are gravely endangered and will need our intervention to survive for future generations, both theirs and ours! Dear brother Orion, inspire us from the heavens to be the warriors we need to be.

**THE FIGHT AHEAD** To be true stewards of the orchid world, we must learn the fine points of orchid culture. We cannot protect them without understanding their needs. Believe it or not, the plants in our collections can



Growing conditions are everything. This unnamed *Rhyncholaeliocattleya* seedling growing in the garden of Rick Kelley in Hawaii was purchased five or six years ago from a going-out-of-business sale as a 4- or 5-inch (10–12.5-cm) pot seedling.

instruct us about what orchids need to survive. Here we can explore options and discuss our successes as well as failures. November, a time of overcast skies and reduced watering, is a good month for self-assessment. Hopefully you all are keeping a log or some sort of record about your collection, documenting your plants' performance. Did your plants thrive? Make larger pseudobulbs? Bloom better? Was this due to regular repotting? Fertilizing? Watering? There is any number of parameters you can use to chart your progress as an orchid grower as well as a conservationist.

**SPIKES AND SPEARS** So many orchids are gearing up to bloom this month; phalaenopsis, cymbidiums, oncidiums, dendrobiums, lycastes, paphiopedilums and many others are all on their way to a glorious flowering season. Although these bloomings are more about "love" than "war," we should still prepare our plants for display. This involves grooming, and staking. If you show your plants (either informally on your societies' show table or at a monthly AOS judging), it is important to have your plants looking their best. Removal of unsightly, necrotic or damaged leaves will actually reduce plant stress and will then not distract from the fantastic flowers your plants will soon be bearing. Staking is also important for

a fine presentation, especially for plants in pots. Mounted or basketed plants are usually better allowed to let their spikes ramble and dangle naturally as they would in a tree in the wild.

**PHALAEOPSIS AND CYMBIDIUMS** Most of the plants in your collection in these genera are about midway to completion of their flower spikes this month. It might seem early to stake them, but now is the crucial time to do so. You want to steer the inflorescences in the right directions for best presentation. In nature, phalaenopsis in trees have pendent inflorescences, really lovely to see in the wild, but inappropriate for your windowsill or coffee table. Do not ignore this task because if you wait until they are in bloom, or just opening, your flowers may be presenting themselves upside down or "kapakahi" when staked too late in their development. Similar issues will happen with cymbidium spikes, which become very heavy as their magnificent buds develop. Support and guide your spikes now for best results.

**RESTING TIME** To be at our best, strongest and healthiest, we must get adequate rest. The same is true for many orchids, particularly those from seasonally dry habitats. By this month, a lot of orchids from such environments are showing signs of dormancy, which



often manifests itself as brown leaf tips or sloughing off of older leaves. Indeed, many plants such as catasetums, lycastes, soft-cane dendrobiums and terrestrials such as habennarias and cynorkis are almost completely deciduous and need that dry season to bloom properly next spring. Most other orchids, including phalaenopsis, cattleyas and angraecoids, prefer to be watered less often in the winter months as well. Observe your plants carefully this month for the hallmarks of dormancy and respond accordingly.

**LOOK TO THE STARS** I have no doubt that all orchid lovers want to be stewards of our incredible, fascinating world and may need occasional impetus to act. Whether that inspiration comes from a morning star in the sky or from a starry brassavola at dusk, never doubt that you can make a real difference in the world by advocating for the things that you are passionate about.

— *Tom Mirenda has been working professionally with orchids for over three decades. He is an AOS accredited judge and is the chairman of the American Orchid Society's Conservation Committee. He recently coauthored The Book of Orchids: A Life-Size Guide to 600 Species From Around the World (email: biophiliak@gmail.com).*

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## Fertilizer Baskets



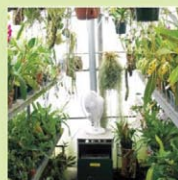
These little baskets were first introduced to me by Desert Valley Orchid Society (Phoenix) member Karla Velasco who was using them with a timed-release fertilizer. Because I was using a liquid fertilizer at the time, I put it aside for future use. Then I read about a fertilizer called Purely Organic 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.

## Webinars-Coming Attractions!



	November 07, 2019	November 12, 2019	January 16, 2020
<b>When</b>	8:30 EST Thursday	8:30 EST Tuesday	8:30pm EST Thursday
<b>Topic</b>	Greenhouse Chat (Orchid Q&A) <i>Send in your Questions!</i>	How to Buy and Grow Bulbophyllums	Greenhouse Chat (Orchid Q&A) <i>Send in your Questions!</i>
<b>Presenter</b>	Ron McHatton Chief Education and Science Officer	Charles Wilson Accredited AOS Judge and Education Committee Member	Ron McHatton Chief Education and Science Officer

**REGISTRATION REQUIRED:** <http://www.aos.org/orchids/webinars.aspx>

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COLLECTORS' ITEM

# Peristeria elata 'David's Dove AM/AOS

The Craziest Orchid Ever

Text and photographs by David Rosenfeld, MD





I HAVE BEEN asked many times over the 40 years that I have been growing orchids “Why did you purchase that weird species?” The answer was usually “It was new to me and looked interesting so I decided to give it a try.” That was not exactly the reason I bought *Peristeria elata*. I knew it has been called the “dove orchid” and was a species from Panama. That was all. I had never seen it offered until three years ago in July of 2016 by Seattle Orchids. So, as is often the case, I bought a small plant in a 4-inch (10-cm) pot. Little did I know what I was getting into.

I sort of ignored the plant for many months. It was dormant during the fall and winter. However in early spring of 2017 it began to put out a new pseudobulb that was eventually twice the size of the previous one, with large tobacco-shaped leaves. I slip potted it (placed the roots and medium into a larger pot with new medium around it) into a 5-inch (12.5-cm) pot, but soon realized that I had to slip pot it again in the fall into a 6.5-inch (16.5-cm) pot. I got more interested in the species and did a little reading which explained that this orchid could get very large. The pseudobulb again doubled in size during the growing season of 2018 and I slip potted it yet again that summer into still a larger pot. Then in late winter of 2018 amazing things began to happen. A gigantic pseudobulb was developing. It measured 12 inches (30 cm) in circumference and 7 inches (17.8 cm) tall. I had never seen such a pseudobulb. It was bigger than a cantaloupe. Again, I slip potted up into a 10-inch (25-cm) pot.

Then this May I saw four new growths emerging from the base of that pseudobulb. After a few weeks I realized that these were actually two inflorescences and two new growths. The inflorescences were growing very rapidly and I began measuring their growth rate. Astonishingly, they were elongating at an inch (2.54 cm) a day. They looked like asparagus spears. Buds did not start to appear until the inflorescences were more than 3 feet (almost a meter) tall. The final height of the longest inflorescence was 55 inches (1.4 m)! Not only that, the inflorescence had the greatest circumference I had ever seen in an orchid, 2 inches (5 cm) — by far the strongest inflorescence ever. The new growths developed much more slowly than the inflorescences. In fact, at the time of blooming the new growths were only about one-quarter developed. They had not yet produced their huge tobacco-



like leaves.

Now I did a lot more research on this “orchid of orchids.” I found out that only 6–8 flowers would be open and in good condition on an inflorescence at any one time. My plant eventually developed approximately two dozen buds on each inflorescence. Further checking amazingly revealed there had been no AOS flower quality awards and only a couple of cultural awards. This was very surprising to me because this species was described in 1831. I assume the lack of awards is because of its rarity in cultivation and possibly in part because of its immense size. My wife Joan and I decided to get this giant to judging. It did require some planning. We staked the inflorescences, although it was probably not necessary. We placed the plant on its side in our SUV and placed weights against the sides of the pot to ensure that it would not roll. The inflorescences extended to the back of the front seat but the plant arrived unscathed. The judges at the Mid-Atlantic

[1] P. de Pannemaeker’s painting of *Peristeria elata*, plate 680, from Linden’s *Lindenia: Iconographie Des Orchidées* 1898–1906.

[2] *Peristeria elata* ‘David’s Dove’ AM/AOS. The species gets its common name, the dove orchid, from then appear of the lip and column to a dove resting in the middle of the cup-shaped flowers (inset).

monthly judging in Philadelphia were agog. I think only one judge had ever seen the species before. There was a lot of discussion and much surprise that there were no flower quality awards. We were thrilled when they gave our *Peristeria elata* an Award of Merit of 81 points. I gave it the clonal name ‘David’s Dove’.

Now that I have described the saga of our *Peristeria elata* some botanical and historical information is in order. *Peristeria elata* arrived in England in 1826. The first blooming was in 1831, the same year the botanist Sir Thomas Hooker described the

species. He named the genus *Peristeria* after the Greek word *peristerian* (dove) because of the resemblance of a dove sitting on a nest in the interior of the flower. This orchid is a member of the tribe Cymbidieae and subtribe Coeliopsidinae. It is most commonly found in Panama, where it is the national flower, but also in adjacent Columbia, Costa Rica, Venezuela and Ecuador. *Peristeria elata* is a lowland species reported to be found at elevations between sea level and 3,000 feet (0–916 m). They have most commonly been described as terrestrial or humus epiphytes growing in a deep layer of rotting leaves and other debris with little root penetration into the ground below. They thrive in heavily shaded to semisunny locations with 1,500–2,300 foot-candles of light. Because they grow at low elevations they prefer year-round warm temperatures with essentially no variability throughout the year with a range of 87 F (29 C) during the day and 71 F (22 C) at night. Rainfall is quite uniform (7.7 inches [200 mm] per month) except for a drier period in the winter. All of this cultural information is interesting, especially considering the conditions under which I have been growing our plant. It is in our cooler room, which rarely gets above 80 F (26.7 C) in the summer and goes down in the winter to 57 F (13.9 C) at night. The amount of light our plant receives is also at the 1,500-foot-candle level. I have been growing it in New Zealand sphagnum moss to simulate the natural medium with obviously good success. Although it does appear to go dormant after maturing the leaves in the fall, I did not withhold water during the winter months.

If you look at the interior of the flower you can easily use your imagination to see a dove. The column is the head; the anther cap is yellow and pointed at the tip simulating a beak; and the sides of the labellum look like wings with red spots. There are other names for *Peristeria elata*: the Holy Ghost orchid or Flower of the Holy Spirit (in Spanish Flo del Espirito Santo). The flowers are powerfully fragrant and some say they smell like beer, although I think they have a pleasant spicy fragrance.

In Bateman's monumental tome *The Orchids of Mexico and Guatemala* (Bateman 1843; see also Rosenfeld 2019) *Peristeria elata* is described as "the most striking orchidaceous plant yet in our collections where it stands without a rival in the huge size of its leaves and pseudobulbs: its flower, also is celebrated



for the strong resemblance it bears to a dove ... and has procured for it the appellation of el Spirito Santo." Another noted description and lithograph is from the fifth volume of the magnificent *Lindenia: Iconographie Des Orchidées*. These five volumes were published between 1885 and 1906 by the notable Belgian orchid family of Jean Linden (Rosenfeld 2016). I own a recent high-quality reprint of an English translation (Linden et al. 1995). Interestingly, the French translation of "dove" in the book is "pigeon." *Peristeria elata* is described as having "a majestic appearance and is quite ornamental. Its pseudobulbs are voluminous ... The leaves are large and ample giving an impression of remarkable vigour ... With somewhat imagination, one can, in fact, discover a certain resemblance between the said bird."

*Peristeria elata* is not an orchid for everybody, but one that once seen will never be forgotten.

[3] Author with *Peristeria elata* in full flower. Note the size of the massive pseudobulb supporting these inflorescences.

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— 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 nearly 100 flower quality awards and numerous AOS cultural awards (email: orchiddoc@comcast.net).



# Hashtags and #Hothouses by Doug Land

## Meeting Fellow Orchid Growers Around the World Through Instagram

YOU MAY HAVE heard about this thing called Instagram. It has 500-million daily users and over one-billion monthly users. If you are unfamiliar with the app, it is similar to the phonebook, but with more pictures, videos, and live streaming phone to face conversations with any celebrity, politician, educator, gear head and plant nerd that you never knew existed. It may be hard to accept that so many people would want to invite you into their lives, but it is a thing now. Instagram is now owned by Facebook, so there is a lot of cross-pollination of content (photos of videos) between the two platforms (websites). But to simply understand the difference, think of Instagram being more used by the 18-35 crowd and Facebook being used by the 35-65 crowd.

As for accessing Instagram, you can check out the platform via the website portal, [www.instagram.com](http://www.instagram.com) but you will have limited access. You can search for Instagram users and hashtags, but you cannot direct message (DM), share your own photos, or save any images. However by downloading the Instagram App, you will have full access to the platform. You can find the app to download from the Google Play store or the Apple App Store. Once downloaded, you just need to tap and open the app. Some of you may already have a Facebook account, and if you do, you can tap the "Log in to Facebook" button, and you will be able to link your account to Instagram. Otherwise you can sign up with a phone number or simply create a new user account. The app is straightforward with a guided walk through during the initial account set-up process. Once you have an account, you can start searching for any of the hashtags mentioned in this article, including non-orchid themed hashtags.

The objective of most social media platforms is engagement through, smart phone, App only interactions. Facebook being one of the longest running social media platforms is still pc and App accessible, mostly because it predates predominant App usage (2004). Instagram, Snapchat and TikTok are all App only platforms which mean that you have to own a smart phone or tablet appropriate device in order to utilize the full features of the App. Any of the platforms allow you to use hashtags to search for content,

such as #orchidflowers.

Now to explain the concept of a hashtag. Merriam-Webster would define the word hashtag as: "a word or phrase preceded by a hash sign or pound sign (#) used on social media websites and applications, especially Twitter (and Instagram), to identify messages on a specific topic." Hashtags are a main component of the search function on Instagram. These hashtags are meant to direct more views at appropriately tagged content. However, in my experience, there are no taxonomic rules when it comes to using hashtags. It is a wild west of misused and irrelevant tags grouped with relevant tags. But if you are willing to scroll through a bunch of content, for example, with the hashtag #orchidmounts, you might find images of users creating interesting orchid mounts. The great thing about Instagram is that you can ask any one of these users how they made that mount.

Why is this important to me? Well, like a typical millennial, I work too much and I do not like making eye contact. Since I do not have an active social life, I maintain an active presence on social media. My activity on Instagram usually consists of aimless scrolling through posts about growing miniature orchids (#miniatureorchid). Or I may look at the posts of a specific orchid variety so that I can decide if the unflattering angles on Ebay of a plant are worth the price. But more often than not, I am harassing other introverted plant geeks about their orchid collections (#slideintomyDM). Often I can convince chatty growers to take me on a video tour of their growing setup. I absolutely love getting to see other people's setups and learn about new tools that they use to make growing easier. These interactions can happen with orchid growers all over the world, from Australia, Tasmania, Taiwan, Brazil, Sweden, Ontario, and even in my own state. Many people, all bitten by the orchid bug, want to meet other self-infected orchid enthusiasts.

This is where I can utilize my local orchid society to help grow more orchid lovers. When I attend my local society meeting, my husband and I have a running joke between the two of us that we will be the youngest people in the room. So to avoid this, I will invite one of our Instagram plant friends to come join us at

our orchid meeting. Sometimes it is nice to have a friend that is as obsessed with avocado toast as they are about collecting more orchids (#howbigdoesitget).

To recap, there are myriad ways to use hashtags on Instagram. Whether it is finding and combining hashtags or inventing your own; hashtags are just a tool to find new orchids and meet more orchid growers. If you want to know more about Instagram and hashtags, I suggest looking up some videos on YouTube. Or you can just ask the youngest person you know.

Here are some useful hashtags to get you started down the rabbit hole that is Instagram.

- #orchidarium
- #orchidgrower
- #orchidsofinstagram
- #slipperorchids
- #orchidsaremyfave

Almost any genus orchid is a hashtag

- #phragmipedium
- #phalaenopsis
- #dendrobium
- #oncidium
- #masdevallia

Even specific species can be found

- #mexipediumxerophyticum
- #anguloauniflora
- #lepanthescalodictyon
- #zygotelumlouisendorfi
- #vandalamellata

Even the different orchid conferences can have associated hashtags

- #worldorchidconference
- #orchidshow2019
- #chicagoorchidshow
- #sborchidshow
- #orchidland

Further Reading:

<https://www.instagram.com/>  
<https://www.omnicoreagency.com/facebook-statistics/>  
<https://www.brandwatch.com/blog/instagram-stats/>  
<https://www.omnicoreagency.com/instagram-statistics/>  
<https://help.instagram.com/155940534568753>

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Definition of a Hashtag, <https://www.merriam-webster.com/dictionary/hashtag>, Accessed May 4, 2019

— *Doug Land is a self-professed artist, floriculturist, and all around plant nerd. Land maintains a bedroom collection of microminiature orchids, along with a garden full of grazing tortoises. You can read more about his botanically-inspired art on his website [www.doug.land](http://www.doug.land) (@doug.land, dig@doug.land)*

# My Orchid is Growing — Why Is It Not Blooming?

By Barbara Schmidt

ORCHID GROWERS TELL me when I am teaching classes on orchids that their orchid is growing, just not blooming. This can be an extremely frustrating problem. Orchid owners often assume that once they get their orchid growing, blooming will just follow along naturally. In nature, this is an accurate statement. Contrary to what most people may think, orchids want to bloom. It is programmed into their DNA as a way to propagate their species. Most orchids are actually cyclic, and if they are given the correct conditions for growth and blooming, they will bloom around the same time every year.



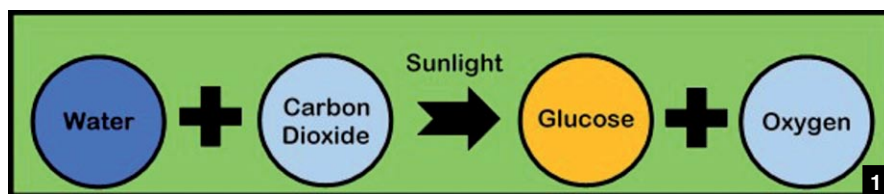
Barbara Schmidt

The reasons an orchid will not bloom fall into one of two categories. First, the orchid does not have the correct conditions for it to thrive. Orchids can grow, but not have the correct

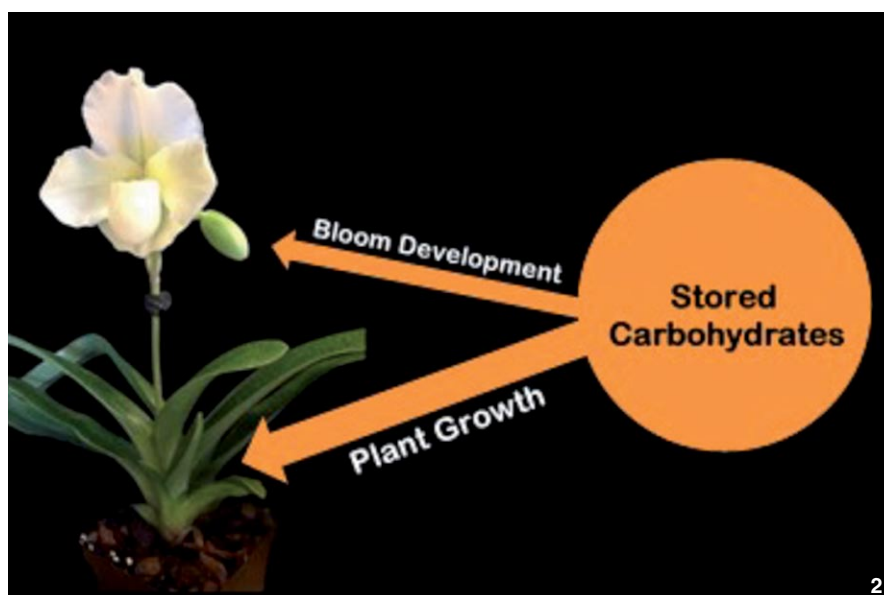
amount of sunlight, water, temperature, humidity or nutrients to be healthy enough to bloom. Second, the plant is not experiencing the environmental cues it needs to begin budding. These cues can be nighttime temperatures, daytime to nighttime temperature differentials, and the number of daylight hours or simply a mature growth.

First and foremost, an orchid needs to be healthy to bloom. A stressed orchid is less likely to flower, although some orchids do try to bloom when they are dying as a last gasp to propagate their species. Similar to other plants, the great majority of orchids make glucose, a simple sugar, by the process of photosynthesis. Photosynthesis needs water and air in the presence of sunlight to produce glucose and oxygen. Some of the glucose is used immediately for the day-to-day processes of the plant. Most, however, is stored as a carbohydrate for future use. The stored carbohydrates are then allocated for growth of the plant or blooming. If there are not enough stored carbohydrates (which are not limited to glucose) for both growth and blooming, in most cases, the orchid will default to growth and will not bloom.

The best way to assure that your



BARBARA SCHMIDT



BARBARA SCHMIDT

orchid has enough stored carbohydrates to bloom is to make sure you are giving it the correct conditions for growth. Research the growing conditions for that genus; i.e., if you are growing phalaenopsis (shade orchid) and vandas (high-light orchids) under the same conditions, at least one of the two of them will not be thriving. I should mention that it is equally important that you know whether you are growing a species or a hybrid. Species may be looking for specific growth and blooming cues. It is most important to make sure your orchid has the correct conditions when it is growing and when it is setting buds.

Sunlight is the driving factor in the photosynthesis reaction. Make sure that your orchid is getting the correct amount of sunlight, especially when it is growing. Too little sunlight means a low production of carbohydrates, which can lead to not enough left over to bloom. Too much sunlight can scorch or even kill the plant. Even if it survives, this can stress the plant, which will also limit blooming. Your

- [1] Plants, in the presence of sunlight, use water and carbon dioxide to produce glucose and oxygen.
- [2] The glucose produced in photosynthesis is converted to stored carbohydrates of various kinds. It is these stored carbohydrates that fuel plant growth and blooming.
- [3] Nutrients are essential to the well-being of our plants. These two seedlings are of comparable age. The one on the right has received sufficient fertilizer to grow to its potential while that on the left has received far less.
- [4] Light is also critical. These two plants are both flowering size. The one on the left has received ample light during the development of its recent growths while the one on the right has received insufficient light to prompt blooming.



plant will actually tell you if it is getting the correct amount of light. Chlorophyll is the pigment in plants that absorbs light. It is also green in color. If the leaves on your orchid become a darker green, it is the plant's way of telling you it needs more light. When the plant is not receiving enough light to make all of the glucose it needs, it will make more chlorophyll to try to capture as much of the available light as it can. This makes the leaves a darker green. Conversely, if the plant has more light than it needs, it will remove chlorophyll causing the leaves to become yellower. In extreme cases of too much sunlight, the leaves can become white and scorched.

Sufficient water is also needed for photosynthesis to occur. Too little water means low production of carbohydrates, and, in extreme cases, can lead to plant death. Too much water rots the roots of orchids and can also lead to plant death. Orchid roots are covered in a sponge-like substance called velamen that will rot in the continual presence of water.

Most orchids have a temperature range in which they can survive; however, they may only thrive and bloom in a narrower range of temperatures. Correct temperatures for orchids is crucial when they are growing and setting buds. For example, standard cymbidiums can survive temperatures between 40 F (4.4 C) or even lower and 85 F (29.4 C) and for short periods even higher. However, for optimal growth and blooming, the daytime temperatures should be between 75 F (23.9 C) and 85 F (29.4 C) in the summer when the plants are growing, and the nighttime temperatures should dip down to 40 F (4.4 C) in the fall when they are ready to set their inflorescences.

Additionally, all plants require certain inorganic elements for general plant health. These include nitrogen, potassium, phosphorus, and calcium as well as other micronutrients. The most important of these nutrients for blooming is potassium. It is important that you are feeding your orchids regularly to provide sufficient nutrients.

Finally, some orchids have unique growth habits that you need to be aware of in order to know when they may be ready to bloom. Cattleyas fall into this category and exhibit one of two types of growth and blooming patterns. In one type, the plant will begin growing in the spring and summer when they produce roots on new leads. These new leads and roots will fully mature over a period of a few months and then the plant enters a rest period until



3



4

it receives the necessary cues to bloom. These cattleyas typically bloom in the fall, winter or spring. It is easy to assume that something is wrong because the plant has produced new shoots and sheaths but does not bloom immediately.

Other cattleyas produce new leads in the late winter, spring or summer and bloom immediately on completion. After blooming, they produce new roots and then enter a sometimes lengthy rest period. Therefore, it is important to not only know that you have a cattleya orchid but you also need to know what type of cattleya you have to know when it should be growing, resting or blooming. As a side note about cattleyas, they also have

roots that are easily cracked or bruised. Repotting a cattleya at the wrong time can shock it and delay growth and blooming until the roots system reestablishes itself. This is particularly true of bifoliate cattleyas.

Assuming you are aware of your orchid's growth requirements and you have an understanding of when it should be blooming, you should make sure that your orchid is receiving the cues it needs to begin blooming. Orchids have specific environmental cues that trigger the onset of flowering. For most orchids, this is one or more of the following cues: cooler nighttime temperatures, a larger daytime to nighttime temperature differential; or

changes in day length. A cooler nighttime temperature is the most important of these cues for many orchids and is the primary trigger in phalaenopsis.

The following two examples are questions I often get during my classes:

**EXAMPLE ONE — YOU HAVE A PHALAENOPSIS ORCHID THAT YOU KEEP ON A TABLE IN THE MIDDLE OF A ROOM. IT IS GROWING BUT WILL NOT BLOOM.** Phalaenopsis are shade orchids, so it may be getting the correct light levels on the table and will continue to grow. However, it is getting a constant temperature. The main environmental cue for phalaenopsis orchids is cooler nighttime temperatures. These orchids need nighttime temperatures down as low as 55 F (12.7 C) to 60 F (15.6 C) for a 10-day to two-week period in the fall. The plant in this example is not experiencing cooler nighttime temperatures. A secondary cue for some phalaenopsis orchids is shorter daylight hours. Even though it may be experiencing shorter days, without cooler nights, it will not flower.

**SOLUTION** Move the plant to a cooler nighttime and perhaps dark location for about two weeks in the fall. I live in southeastern Pennsylvania. I put my orchids outside for the summer and leave them outside until the nighttime temperatures dip down to about 55 F (12.8 C) in the fall. By November, all my phalaenopsis have set inflorescences. If you do not live in a location where putting your orchids outside is a viable option, you need to find or create a cooler nighttime space for the plants in your home.

**EXAMPLE TWO — (1) YOU HAVE A CATTLEYA THAT YOU ARE GROWING IN CONTROLLED CONDITIONS UNDER LIGHTS; HOWEVER, IT WILL NOT BLOOM; OR (2) YOU HAVE A CATTLEYA NEAR A WINDOW OR OUTSIDE IN A GREENHOUSE GETTING THE CORRECT LIGHT TO GROW.** The main environmental cue for cattleyas to flower is a change in day length. Recognize that any ambient light source can affect its internal cue to bloom. For some cattleyas, secondary cue for is cooler nights.

**SOLUTION (1)** Change the setting on your light timers to mimic light levels outside in the fall and drop the nighttime temperatures accordingly. By changing the amount of light over time, it will be cued to set bud.

**SOLUTION (2)** Make sure there are no street lights or outdoor house lights that come on at night. The light from these can be enough to prevent flowering; especially if close by. In this



case, you will need to move the plant to a dark location, for example, a closet in your home or under a plastic bucket in your greenhouse.

To summarize, getting your orchid to bloom begins with understanding what it needs to grow and set buds. If you do not have a climate and light-controlled location for your plants, you may have to accept that your choice of orchid genera may be limited. I grow my orchids inside my house. I tried for years to grow standard cymbidiums and could not get them to bloom. I switched to a miniature cymbidium that is more tolerant of warmer temperatures and had success. Once you understand what your plants need to bloom, you will enjoy beautiful flowers year after year. I am still amazed when I bring my orchids inside in the fall and watch all of the buds begin to appear!

— Barb Schmidt published her first book, *Orchid Care: For the Beginner*, in 2016 and is currently working on her second book, *Orchid Care: For the Experienced Grower*. She has a Bachelor of Science degree in biology and chemistry and a teaching certificate in secondary science. She's been raising orchids for over 15 years and is a member of the AOS Education Committee and she is a regular instructor at the Smithsonian Institute Associates Program, the U.S. Botanic Gardens and the New York Botanic Gardens. She maintains a website, [www.basorchidcare.com](http://www.basorchidcare.com), which provides orchid care information and hosts an orchid blog (email: [jentomsch@hotmail.com](mailto:jentomsch@hotmail.com) or [basorchidcare@gmail.com](mailto:basorchidcare@gmail.com)).



[5–6] The symptoms of over and under watering can appear very similar. The plant in [5] is seriously under watered while that in [6] has been over watered. Look carefully at the root systems of the two plants. In the under watered plant, viable roots, although short and stunted, are clearly present. In the over watered plant any roots present are completely black and rotted.



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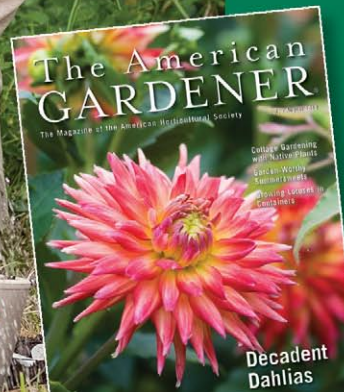
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*Sylvia strigari*



# *Cochleanthes aromatica*

Text by Grettel Salguero and Franco Pupulin/Watercolor by Sylvia Strigari

Tribe CYMBIDIEAE  
Sutribe ZYGOPETALINAE  
Genus COCHLEANTHES Raf.

***Cochleanthes aromatica*** (Rchb.f.) R.E.Schultes and Garay, *Botanical Museum Leaflets* 18(6):323. 1959. *Zygopetalum aromaticum* Rchb.f., *Botanische Zeitung (Berlin)* 10(39):668. 1852. *Warscewiczella aromatica* (Rchb.f.) Rchb.f., *Annales Botanicae Systematicae* 6:654. 1861. *Chondrorhyncha aromatica* (Rchb.f.) P.H.Allen, *Annals of the Missouri Botanical Garden* 36(1):85. 1949. TYPE: "Mittelamerika" (W, not located). *Zygopetalum wendlandii* Rchb.f., *Beitrag zu einer Orchideenkunde Central-Amerika's* 74.1866. *Bollea wendlandii* (Rchb.f.) Rchb.f., *Garden and Forest* 1:315. 1888. *Warscewiczella wendlandii* (Rchb.f.) Schltr., *Beihefte Botanischen Centralblatt* 36:494. 1918. TYPE: Costa Rica. "In monti Irazu pede" ex cult., *H. Wendland s.n.* (W).

Epiphytic, caespitose herb without pseudobulbs (rarely with very small pseudobulbs completely hidden by the leaf bases). Roots terete, produced from the rhizome, ca. 2 mm in diameter. Stem enclosed by six or seven imbricating sheaths, provided with hyaline margins, the upper ones foliaceous. Leaves conduplicate, articulate with the sheaths, membranaceous, oblanceolate to narrowly elliptic-obovate, acute, abaxially carinate, narrowed at the base into an indistinct, conduplicate petiole, grass green, 18–40 × 2–5 cm. Inflorescence lateral, stout, from the axil of the lower sheaths, unifloral; peduncle terete, suberect, to 15 cm long, provided with five papyraceous, imbricating, lanceolate, acute bracts, 2.0–2.5 cm long. Floral bracts double, conduplicate, shorter than the ovary, the external one loose, widely ovate, the subopposite internal bractlet ligulate. Ovary pedicellate, terete, to 2.7 cm long including the pedicel. Flower resupinate, large, usually strongly and sweetly scented, the sepals and petals pale greenish cream to pale green, the lip whitish cream, with a large violet-purple median blotch, the callus white, spotted purple-violet. Dorsal sepal free, lanceolate-elliptic, acuminate, slightly reflexed at the base, 4.5–5.5 × 1.3–

1.6 cm. Lateral sepals basally adnate to the column foot, lanceolate-elliptic, acute to acuminate, strongly reflexed-folded toward the base, 4.5–5.5 × 1.5–1.7 cm. Petals narrowly elliptic, acute, 4.0–4.5 × 0.9–1.1 cm. Lip with a short claw, articulate with the column foot, trilobed, pandurate, 4.0–4.5 × 2.8–3.8 cm, the base cordiform, notched-bilobed and often reflexed at the apex, the apical margins strongly crisped; disc with a semilunate, multiseriate callus, composed of 14–18 low, radiating, rounded ridges, protruding apically into rounded keels, the central ones longer, ca. 1.0 × 1.8 cm. Column slightly curved, clavate, ca. 2.0 cm long, provided with a foot, with transverse, narrow stigma, the ventral surface basally provided with a low, rounded keel. Anther cap cucullate, ovate to transversely elliptic, bilocular. Pollinia four, in two subequal pairs, on a stipe scarcely distinct from the elliptic-ovate, hyaline viscidium.

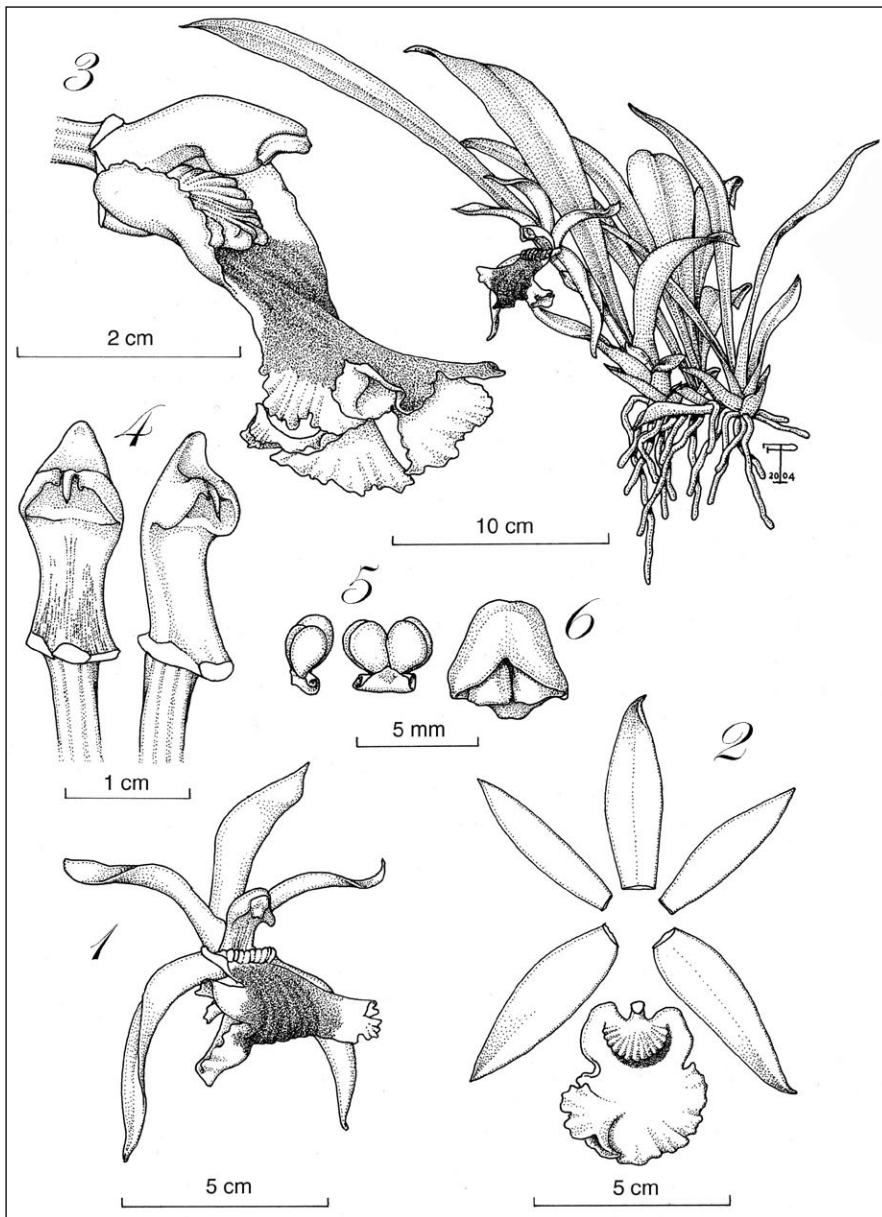
The genus *Cochleanthes* was originally created to house a single, unusual "Zygopetalum" species from Jamaica and subsequently it grew to include about 15 nonpseudobulbous species (Pupulin 2006). At present, the phylogenetic reconstruction supports a narrow definition of *Cochleanthes*, including only two species, *Cochleanthes flabelliformis* and *Cochleanthes aromatica*, distributed from Guatemala and the West Indies to northern South America (Whitten et al. 2005, Pupulin 2009).

The first species of this genus appeared in 1788, but it was first described as *Epidendrum flabelliforme* by the Swedish botanist, and first orchid taxonomist, Olof Swartz (1760–1818), who in 1799 transferred it to *Cymbidium* (Swartz 1799). Next, in 1863, Reichenbach noticed the close relationship of *Epidendrum flabelliforme* with the genus *Zygopetalum* and included it in that genus as *Zygopetalum flabelliforme* (Reichenbach 1863). Meanwhile, this same species was described by John Lindley in 1836 as *Zygopetalum cochleare*, or the "spoonlipped Zygopetalum," based on a specimen from Trinidad (Lindley 1836). Around the same time the Turkish botanist and professor of natural history in the United States, Constantine Samuel

Rafinesque-Schmalz (1783–1840), noted that *Z. cochleare* was distinct enough from typical species of *Zygopetalum* to deserve a genus of its own. He selected Lindley's *Z. cochleare* as the type of the new genus *Cochleanthes*, proposing for it the new specific epithet *fragrans*, in reference to the species sweetly scented flowers (Rafinesque 1837). This "updating" of the original name is, of course, not allowed under the rules of botanical nomenclature.

The generic name was derived from the Latin *cochlea* (= shell), and the Greek *anthos*, flower, probably in allusion to the cochleate, shell-shaped callus of the lip, also in this case contravening the suggestions of botanical nomenclature, which are aimed at preventing the use of Latin and Greek roots together in the same name. Rejected by the academic community in the United States due to his propensity to publish spurious taxa, and banned by the scientific journals of his time, Rafinesque published with its own funds — among other things — a series of four volumes titled *Flora Telluriana*, where he described thousands of new genera and species of "trees, palms, shrubs, vines, plants, lilies, grasses, ferns, algae, fungi and c." (Rafinesque 1837). However, due to the limited circulation of his work, the name *Cochleanthes* was almost completely neglected in orchidological literature. The true phylogenetic relationships of the two species of "Cochleanthes" remained unclear, and they were moved around into different genera, until Schultes and Garay resurrected the genus *Cochleanthes* in 1959.

The second species in the genus, *Cochleanthes aromatica*, was first described by Reichenbach in 1852 as *Zygopetalum aromaticum*. According to Reichenbach's description, the type specimen was from "Mittelamerika" (likely from Costa Rica or Panama, where the species is endemic). In 1866 Reichenbach described the same species with the name *Zygopetalum wendlandii*, on the basis of a plant collected by Herman Wendland along the lower slopes of the Irazú Volcano in Costa Rica (Pupulin 2006). Both names were treated under different genera of the



the column, with a multiseriate callus, laterally fused with the lip, and the column with a ventral keel (Dressler 2000, Whitten et al. 2005, Pupulin 2005, 2006).

The two species of *Cochleanthes* can be recognized by the morphology of the lip, which in *Cnths. aromatica* is pandurate, distinctly trilobed, flat to slightly convex, with a single, large purple blotch in the center, while in *Cnths. flabelliformis* it is suborbicular-flabellate, obscurely trilobed, concave at the base, with many radiating, violet stripes from the base, sometimes solidly violet-purple at apex (Pupulin 2006). Although both species of *Cochleanthes* usually have strongly scented flowers, Fowlie (1961) and Ackerman (1995) recorded nonfragrant, self-pollinating plants of *Cnths. flabelliformis* from the Greater Antilles.

*Cochleanthes aromatica* is relatively common in the tropical and submontane wet forests of Costa Rica and Panama, where it forms populations on both the Caribbean and Pacific sides of the main cordilleras at elevations between 400 and 1,200 m (Pupulin 2006). Flowering has been recorded from July to December, during the months of the rainy season in Costa Rica.

The species is pollinated by male euglossine bees of the genera *Euglossa* and *Eulaema*, which places the pollinarium behind the head. Although natural hybridization in the Zygopetalinae is infrequent and still less common the occurrence of natural hybrids involving two different genera, a rare natural hybrid is produced between *Cnths. aromatica* and *Warszewiczella discolor* where populations occur sympatrically in Costa Rica. The hybrid has flowers with a widely opening lip, uniformly tinged with dark red or purple-red and was named *×Cochlezella costaricensis* in reference to the country where the hybrid as well as both parents are found (Pupulin 2015).

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*Cochleanthes aromatica*. The plant.

1. Flower.
2. Dissected perianth.
3. Column and lip, lateral view.
4. Column, ventral and three quarters views.
5. Pollinarium, lateral and ventral views.
7. Anther cap

All drawn from JBL-09426 by Franco Pupulin.

Zygopetalinae, before Schultes and Garay (1959) formally assigned *Z. aromaticum* to *Cochleanthes*.

Schultes and Garay (1959), included in *Cochleanthes* all the species previously described under *Warszewiczella*, but the floral morphology differs in the two groups, as Fowlie (1969) clearly saw, when he separated both genera on the basis of the morphology of the column and the lip. Nevertheless, the broad concept of *Cochleanthes* prevailed in taxonomic literature for a long time; until DNA studies were used to show that *Cochleanthes* is effectively only distantly related to *Warszewiczella*, confirming Fowlie's suggestion. As it is currently understood, *Cochleanthes* can be distinguished by the relatively large plants and flowers, the lip flat or only slightly concave, not enfolding



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### Selected Botanical Terms

abaxial - lower surface of a leaf  
 acuminate - tapered to a point  
 acute – pointed  
 adaxial - upper surface of a leaf  
 adnate - fused  
 articulate - jointed  
 bilobed - having two parts  
 bilocular - having two chambers  
 caespitose - clumped, tufted, clustered  
 carinate - having a keel-like ridge  
 clavate – club-shaped  
 claw - narrowed basal portion  
 cochleate - formed like a spiral shell  
 column foot - extension of the basal part of the column  
 concave – bowl-shaped  
 conduplicate - folded lengthwise along the middle  
 connate – fused to form a single part  
 convex - curved outward like the surface of a sphere  
 cordiform - heart-shaped  
 coriaceous – leathery  
 cucullate – hooded  
 deflexed - downturned  
 epiphyte - growing on another plant for support and not as a parasite  
 erose - irregularly notched  
 foliaceous - resembling a leaf or leaves

glabrous - smooth  
 hyaline - glassy, translucent  
 imbricate - overlapping  
 lanceolate – a narrow oval tapering to a point at both ends  
 ligulate – strap-shaped  
 membranaceous - thin, membrane-like  
 multiseriate - arranged in rows or layers  
 oblanceolate - narrow at attachment, rounded apically  
 obovate – egg-shaped with the wide end up  
 obtuse – blunt or rounded  
 ovate – egg-shaped with the narrow end up  
 pandurate - fiddle-shaped  
 papyraceous - papery  
 pedicel – a stem carrying a single flower  
 peduncle – the lower part of the inflorescence below the first bud  
 perianth - sepals and petals together  
 petiole - the stalk joining a leaf to a stem or pseudobulb  
 phenology -seasonality, especially flowering or growing cycles  
 phenotype - observable characteristics of an individual  
 phylogenetic - relating to the evolutionary development of a group of

organisms  
 pubescent - covered in short, soft hair; downy  
 pyriform - pear-shaped  
 raceme – flowers arranged along a central stem  
 reflexed - bent backward  
 resupinate - rotated to bring lip lowermost  
 revolute - rolled backward or inward  
 rhizome - horizontal stem  
 semilunate - crescent-shaped  
 stipe - a small stalk  
 subopposite - arranged in nearly opposite rows  
 subpyriform - almost pear-shaped  
 terete - cylindrical or pencil-shaped  
 tetralocular - four-chambered  
 trilobed - having three parts  
 triquetrous - triangular in cross-section  
 truncate - abruptly terminated as if cut off  
 type - specimens on which a description is based  
 viscidium – the sticky pad on the caudicle or stipe of the pollinarium that attaches the pollinarium to a pollinator



JULY 1, 1838

*Phajus albus.*

1



# *Thunia* by Peggy Alrich and Wesley Higgins

A Southeast Asian Genus



**Thunia Reichenbach** *filius* Bot. Zeitung (Berlin) 10:764 (1852).

**ETYMOLOGY** In honor of Leo Friedrich Thun-Hohenstein (1811–1888), an Austrian count from Tetschen (located in the present-day Czech Republic). He helped Austria become a constitutional monarchy and was an activist for educational causes and religion reform.

**GENERITYPE** *Thunia alba* (Lindley) Reichenbach f. (*Phaius albus* Lindley).

Five sympodial epiphytes, lithophytes or terrestrial species are found in low to upper elevation, rocky humus, hillside scrub, mossy cliff faces to montane forests from northern India (Kashmir to Sikkim), Nepal, southern China (Xizang to Sichuan), Myanmar to northern Vietnam and northern Malaysia.

These tall, leafy, pale green plants have stout, clustered, erect or spreading,

cane-like stems, each with the several deciduous leaves arranged in two ranks. The short-lived canes shrivel and die after just one season, and the foliage turns from a deep green to golden yellow before being discarded. The short, drooping, few-flowered inflorescence, borne at the tip of the stem, has large, short-lived, fragrant flowers, superficially resembling those of *Phaius*. They are papery thin and do not open widely. The bright white or purple flowers have lips with fringed ridges of orange–yellow or purple. The trumpet or bell-shaped, simple lip is irregularly notched or frilled and has a short spur. The flowers have a slender, hood-like, club-shaped, winged, footless column that has a flattened tip. Pollinia, four, are club-shaped, deeply bilobed, without a conspicuous caudicle, and commonly attached to a sticky substance.

The centuries-old traditional Himalayan medical system used *Thunia alba* as medicine. The whole fresh plant was used for bone-break injury and treatment. Investigations of phenols in medicinal plants have identified a new stilbene derivative, thunalbene, the first such derivative isolated from an Orchidaceae plant.

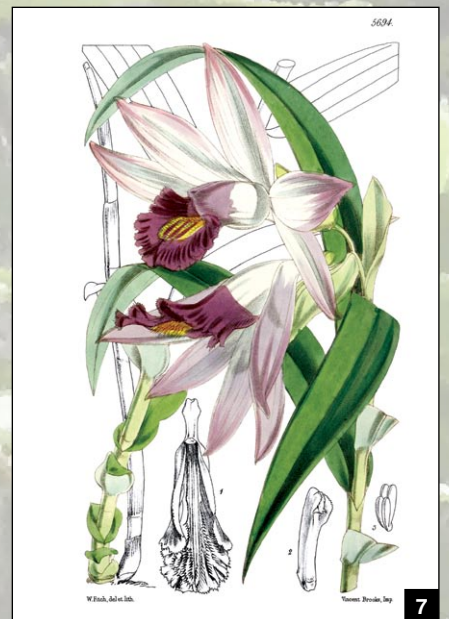
**CULTURE** These species grow best in a terrestrial mixture. Give them a shady area; water heavily until leaves wither and fall. Keep plants dry until new shoots appear. Provide warm to intermediate conditions and moderate shade.

— Peggy Alrich is a freelance graphic designer (email: [sunflowerltd@earthlink.net](mailto:sunflowerltd@earthlink.net)).

— Wesley Higgins is an AOS accredited judge (email: [higgins@ufl.edu](mailto:higgins@ufl.edu))







**Antique Plates Thunia**

[1] *Thunia alba* as *Phaius albus* - *Paxton's Magazine of Botany*, 5:125 (1838).

[2] *Thunia alba* as *Phaius albus* - *Botanical Register*, 24:t.33 (1838).

[3] *Thunia alba* as *Thunia marshalliana* - *Gartenflora*, 31:t.1098 (1882).

[4] *Thunia alba* - *A Second Century of Orchidaceous Plants*, t.39 (1867).

[5] *Thunia alba* - *Revue Horticole*, 46:458 (1874).

[6] *Thunia bensonia* - *Orchis*, t.35 (1875).

[7] *Thunia bensonia* - *Botanical Magazine*, 94:t.5694 (1868).

[8] *Thunia bensonia* - *Floral World Garden Guide*, t.14 (1871).

[9] *Thunia bensonia* - *Orchid Album*, 2:t.67 (1883).





# Growing With LED Lights

More than Footcandles and Lux: New Ways to Think About Indoor Orchid Growing

TEXT AND PHOTOGRAPHS BY A'NA SA'TARA

FOR A NUMBER of years, my handheld light meter puzzled me when it came to indoor orchid growing with fluorescent lights. I used it to adjust the height of lights above our phalaenopsis, only to see the leaves redden up notably at just 600 footcandles (fc) on the light meter. That should be quite a low light intensity. Dropping the light into the 300–400 fc range brought back the green — with still profuse growth and blooms.



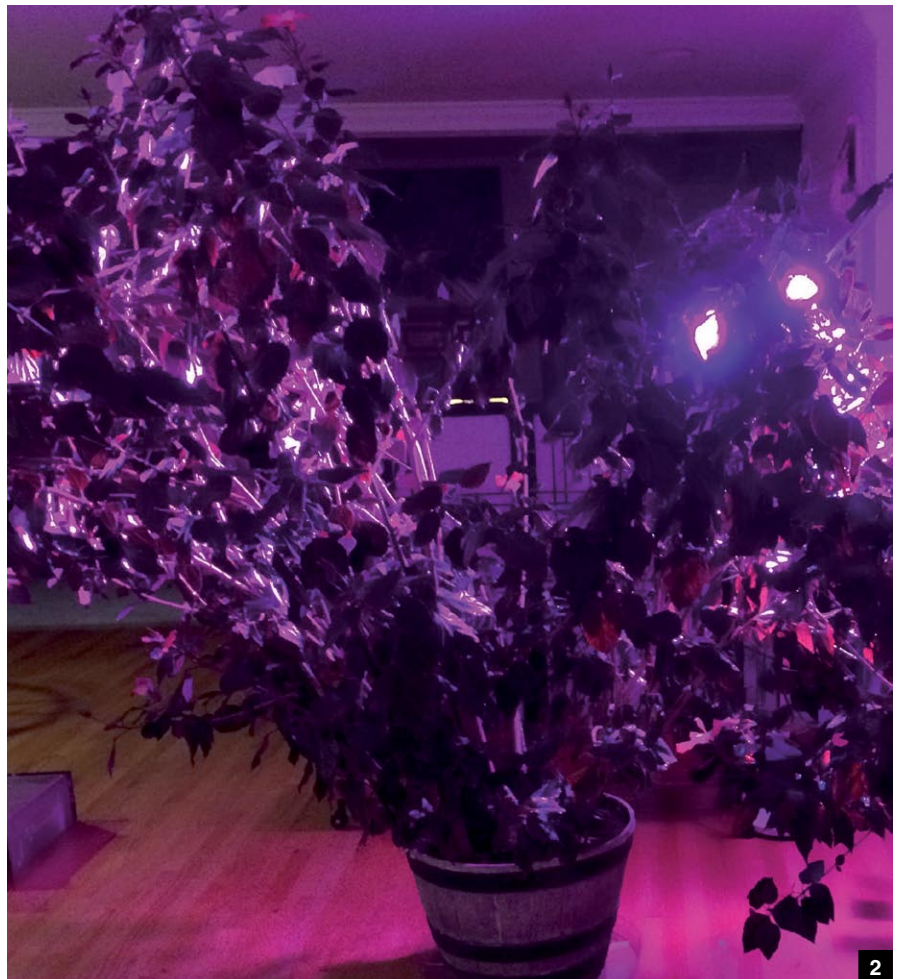
A'na Sa'tara

The light meter itself was not the problem. It was good quality and read consistently outside. In direct sun at midday, the reading would be 9,000–10,000 fc and drop to 4,500–5,000 fc with 50 percent shade cloth, as expected. I tested different percentages of shade cloth, and it was consistently accurate. Over many seasons, arranging the outdoor growing areas with footcandle readings produced predictable results.

Eventually, I gave up on the light meter for indoor orchid growing, determining that mine just did not measure footcandles accurately for nonsolar light sources for some (unknown) reason. I worked out the locations of plants and heights of our T5 HO fluorescent lights by observation. I have had excellent indoor orchid-growing results, both for growing under lights full time, as well as with supplemental lighting.

But I still have always been bothered by the poor correlation between the light meter and the T5 HO fluorescent lights. There was something that I did not understand. Then came light-emitting diode (LED) lighting — and with it, a more comprehensive way of understanding indoor horticultural lighting. I intuited most of these concepts by trial and error, but it was gratifying to see the technical descriptions.

LED lights can take indoor orchid growing to a new level of quality and consistency. There are opportunities for creating orchid growing areas beyond





the scope of what has been possible with T5 HO fluorescent lights and their predecessors like sodium and metal halide lights.

In this article, I explain key differences relevant to orchid growing under LED lights and new ways to think about growing under lights. With some simple shifts in how you think about nonsolar light sources, you can greatly improve the design of your orchid growing area and improve the well-being of your plants.

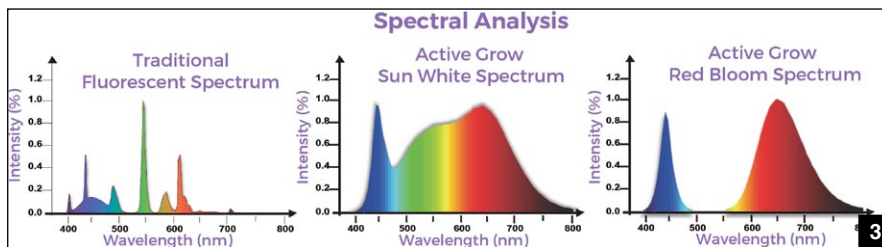
**LIGHT SPECTRUM** The best place to start our discussion is at the source of photosynthesis: the wavelengths of light stimulating the metabolism of orchid growth and flowering. In the early days of horticultural LED light production, it was economical — and seemed practical — to primarily use select wavelengths of red (mid-400s nm) and blue (mid-600s nm) light with the strongest stimulation of photon receptors in plants. These lights produced a quite unique growing area: everything was bathed in a disco-like pink and purple glow.

Technology and thinking have co-evolved in the past few years to enable the production of white-light LEDs that more closely match the full suite of natural sunlight and appear to human vision like normal light. While certain wavelengths of light might be more significant, it is recognized that plants have evolved with the full solar spectrum for millions of years, and therefore, it would make more sense to replicate that light spectrum than expect an optimal result from a subset of natural sunlight.

The concept of full spectrum is a bit muddy, however, for orchid growing under lights. Are T5 HO fluorescent lights full spectrum? It says so on the bulb and the box. But have you ever seen a spectrograph of T5 HO fluorescent lights? I have only seen general references to the wavelengths emitted, which include the full spectrum from 400 to 700 nm.

When I saw the series of comparative spectrographs from Active Grow LED Horticultural Lighting ([www.activegrowled.com](http://www.activegrowled.com)), then I understood! There's a big difference between a LED light source that provides a continuous full spectrum of natural light and a fluorescent bulb that provides some isolated wavelengths within the full natural light spectrum.

I have searched for other spectrographs for the T5 HO fluorescent lights that I have used from Hydrofarm and Sun Blaster, but have not been able to find any information or comparative



testing. There are definite differences between different T5 HO fluorescent light manufacturers. For instance, Hydrofarm Agrobrite lighting appears more blue than the comparable 54W Sun Blaster fluorescent bulb. However, I suspect that the general pattern is similar to the spectrograph mentioned previously.

The significant difference between the “real” solar full spectrum and fluorescent full-spectrum lighting offers a plausible explanation why my light meter did not produce the same results for natural sunlight as indoor orchid lighting. The source spectra are radically different and cannot be measured in the same way.

We need a new way to think about growing orchids under lights — more than footcandles or lux from the light meter, as I titled this article. The key is to consider the source light spectrum and how much of it can actually be used by your orchids.

**MEASURING PHOTOSYNTHETICALLY VALUABLE LIGHT** When using footcandles or lux to assess the amount of light needed by an orchid, we take the light spectrum for granted. The solar light spectrum is a planetary constant with some shifts in wavelengths by season

- [1] *Dendrobium papilio*, a cooler-growing, moderate-light species from the Philippines, grew from a large-seedling size to flowering under year-round LED lights.
- [2] First-generation LED grow lights provided only the blue and red photosynthetic spectrum, creating a uniquely colored growing environment.
- [3] Comparison of light spectra between T5 HO fluorescent lights and Active Grow LED T5 HO replacement bulbs. Used with permission from Active Grow Sustainable Horticultural Lighting.
- [4] *Cymbidium devonianum* grown and flowered (year round) under LED lights. Other *Cymbidium* species spend the winter (November–March) under LED lights and summer outdoors; several bloom indoors in winter.

(in temperate locations) and at different times of day.

Simply speaking, there are more blue wavelengths at midday and in the spring and early summer when the sun is higher in the sky. Later in the day, and later in the summer and autumn, there are more red wavelengths. (While considered

important for the seasonal cycles of growth and flowering for temperate crops, it is questionable how significant the blue and red shifts are for orchid species native to subtropical and tropical regions closer to the equator.)

These shifts aside, orchids grown with natural sunlight receive a full breadth of the light spectrum. In the spectrograph above, this is obviously not available from fluorescent lights. However, now, with the advent of white-light, full-spectrum LED horticultural lighting, indoor orchids have the opportunity to receive a light spectrum much closer to natural sunlight. I have observed no growth or bloom disruption to orchids transitioning to/from growing in a LED light environment.

So it is easy, right? We can just stick the light meter under the LED lights and carry on like the outdoor shade house or greenhouse? Not so easy, actually. While sunlight has one manufacturer, that is not the case for LED lights.

Different manufacturers of LED lighting make very different strips and panels of LED horticultural lights. Check out an online LED light or hydroponics store and you will be dizzy with the selection.

The good news is that there is more transparency and standardization for horticultural LED lighting than “full-spectrum” T5 HO fluorescent tubes. There are several widely used terms and concepts that describe the light output of horticultural LEDs. With these specifications and a calculator, you will be better able to evaluate what light your orchids will actually be receiving.

**PHOTOSYNTHETICALLY ACTIVE RADIATION (PAR)** The first building block of an LED light source is PAR. As the term suggests, these are the light wavelengths used for photosynthesis. It describes the quality — not the quantity or intensity — of light from a source. Said another way, PAR is what a plant sees and, hence, uses for growth.

PAR is not what a human sees (and values) in the visible light spectrum. Humans are most visually sensitive to green light, which is of low photosynthetic value (green wavelengths are mostly reflected rather than absorbed by plants).

Lumens and lux are weighted for brightness to human eyes. Therefore, values relevant for human indoor lighting are not indicative of the quality of light for plant indoor lighting. This is a significant distinction. The lumens from a grow light (or the wattage consumed) are not telling you anything about the light that an



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orchid can use for growth (PAR).

When selecting an orchid grow light, suffice to say, you will want to have a high PAR.

**PHOTOSYNTHETIC PHOTON FLUX (PPF)** The PAR (quality of the light spectrum for plant growth) is measured by photon flux. Photon flux is a measure of intensity. Again, intensity for the purposes of plant growth is NOT the same as visible brightness to people. In fact, plants even utilize some ultraviolet and infrared wavelengths as part of their growth regulation. When calculating the PPF, the human-observed brightness bias is corrected by effectively equalizing the measurement of all wavelengths present.

[5] A view of our warm room, designed primarily for growing seedlings and paphiopedilums. Shelves illuminated with Active Grow 40W ballast-free LED light fixtures (three-shelf unit) and T5 HO LED 24W bulb replacements (two-shelf unit). Vertical-growing LED light setups for indoor agriculture are becoming increasingly popular for quality light, low heat, and energy efficiency.

[6] *Vanda falcata* ‘Amami Island Hiroba’. All our *Vanda falcata* were relocated to grow indoors under LED lights year round. We had the best growing season ever, likely due to higher humidity, consistent light, and warmer nights.



PPF is measured in micromoles per second ( $\mu\text{mol/s}$ ). It is the total light output reading from a photon source. But the total light output does not tell us how much of that light output is actually reaching the plants. For that, we want to know the photosynthetic photon flux density (PPFD).

PHOTOSYNTHETIC PHOTON FLUX DENSITY Now we reach the key measurement: how many photons are reaching a given area each second. For the purposes of orchid growing, it does not matter how much light is sent from the source, but how much is received by the orchid. Of course, greater intensity (PPF) will make more photons available. But available photons diminish based upon how far the light source is from the plant.

This concept is familiar from growing orchids under fluorescent tubes. Less light is available if the tubes are farther away. One of the benefits of LED lighting is the ability to place LED lights closer to plants with less risk of damage from heat.

PPFD is measured as micromoles per meter squared per second ( $\mu\text{mol/m}^2/\text{sec}$ ).

Since distance between the light source and orchid is so important, the most valuable measurements with which to compare LED lights are the PPFDs at a given distance. It is common to see a product specification such as 400  $\mu\text{mol/m}^2/\text{sec}$  at 24 inches (61cm), which indicates how many photons are reaching the plant surface (canopy) at 24 inches (61cm) from the LED light.

DAILY LIGHT INTEGRAL (DLI) This final calculation of measuring indoor light is the culminating goal for orchid growing: how much photosynthetically useful light does the orchid receive in a day? The concept of the DLI is very familiar, as it underlies the optimal footcandle or lux levels that many report for different genera; e.g., 500–1,500 fc for *Paphiopedilum*, 2,500–4,000 fc for *Cymbidium*, etc. At a given natural sunlight intensity, an orchid will receive enough energy to support healthy growth and flowering.

It is notable, though, that you rarely see a time period associated with these footcandle or lux recommendations. I speculate that it is assumed that a greenhouse will receive around eight hours of light per day, with less in winter and more in summer. If you have ever had a growing area with partial-day shade, or seasonal variability like fog on the coast, you will have quickly realized that these



idealized footcandle values are just that — ideals which, in practice, may result in too much or not enough light for your orchids.

In a synthetic growing environment such as indoors under lights, there is considerably more control and conscious design of the amount of light reaching the orchids each day. No clouds or rainy days! To compensate for lower light levels emitted by artificial sources, growers often run their lights much longer each day than would be expected from natural sunlight.

The goal is to reach the total number of

[7] *Dendrobium vexillarius*, a high-altitude species from New Guinea. Under a high-intensity LED fixture (2017–2018), this species received 6–7 hours of light per day; under regular LED lights (2019), it grew and bloomed with 7–8 hours light per day.

[8] *Epidendrum porpax* 'St. Nancy' blooming profusely under LED lights. Under high-intensity LED lights, leaves and flowers were noticeably more red than under regular-intensity LED lights; however, the total number of flowers produced was similar each year.

photons per day needed by the plant: you can provide higher intensity for a shorter period or lower intensity for a longer period. It is like having a set distance to walk. If you walk faster (more intensity), then you can reach the destination in a shorter period of time. Yet you cannot go so fast that your body is unable to keep up with your metabolic demands for air, water and energy conversion.

An orchid is similar: too much light and its photosynthetic metabolism cannot sustain itself, and chlorophyll molecules begin to break down (seen as leaf reddening from anthocyanin pigmentation). Different genera have different optimal levels of workout intensity for photosynthesis. More (light) is not necessarily better if the quantity exceeds the capacity of the orchid to make use of it without incurring cellular damage.

While the recommendations for daily photons are somewhat variable and vague in outdoor or greenhouse contexts, for the indoor growing area, they can be much more precisely quantified using the measurements described above. The sum total of photosynthetically active photons reaching an orchid each day is the DLI.

The DLI is measured as mol/m<sup>2</sup>/day.

This is the calculation:

$$\text{DLI} = \text{PPFD} \times (3,600 \times \text{photoperiod}) / 1,000,000$$

3,600 = seconds in an hour

Photoperiod = number of hours of light

1,000,000 μmol = 1 mol

There are several online DLI calculators available (for example, [www.activegrowled.com/daily-light-integral-dli-calculator](http://www.activegrowled.com/daily-light-integral-dli-calculator)). All you need to do is input the PPFD of your light source and the number of hours that you will run it.

**OPTIMAL DLI FOR ORCHIDS** What is the optimal DLI? I have researched for orchids, and the only reference ([www.extension.purdue.edu/extmedia/ho/ho-238-w.pdf](http://www.extension.purdue.edu/extmedia/ho/ho-238-w.pdf)) that I found was for *Phalaenopsis*, which have DLI range of 4–10, with a DLI of 4–6 as good for commercial production. I have calculated the DLI in our growing area for *Phalaenopsis* and *Paphiopedilum*, where I have observed good growth and flowering over several years, and I have found it to be 4–6, depending upon where the orchid is sitting under the fixture.

From this starting point, it should be possible to generate some initial estimates for other genera. I calculated a DLI of 10–15 for flowering *Cattleya* under lights based upon the success that one online reviewer reported using a particular brand of LED



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lights for 16 hours/day. Hopefully, in time, there will be an accumulation of growing experience to offer recommended DLI values much like those commonly shared for footcandles and lux.

One of the benefits of LED lights is that there is more uniformity along a given strip, unlike the higher light found in the center of a fluorescent light tube, tapering to the edges. Depending upon the distribution of the LEDs, the area under a panel will vary, with the edges receiving less light than the center. DLI is a spot value, and you will need to take the variations in light distribution across your growing area into account.

If you would like to delve into more technical details of horticultural LED lighting values, there are comprehensive and technical reviews available. I have done my best to summarize and select the most relevant factors for orchid growing under lights, to provide clear and basic concepts for designing an effective

growing area and evaluate LED lighting options for orchid culture.

**ENERGY EFFICIENCY OF LED LIGHTS** One of the very attractive aspects of LED lighting (for all purposes) is their notably lower use of electricity compared to the previous generations of lighting sources. The wattage of the light, however, does not tell us anything directly about the useful photons produced for the orchids, as described previously.

The measurement that connects the electricity usage of the light to the useable photosynthetic energy produced is called PPF efficiency and is reported as micromoles per joule (μmol/J). The higher the PPF efficiency, the more potential photosynthesis that can come from the electricity input.

For reference, an efficient level of energy production would be 1.5 μmol/J, with values greater than 2.0 μmol/J being very efficient. This is a moving target as LED technology advances and becomes



more energy efficient.

**“REGULAR” AND “HIGH-INTENSITY” LED LIGHTS** When considering PPF and available photosynthetic energy, in general, there are two different types of LED lights: regular and high intensity. That is not an official commercial designation, but it is a practicable one. By regular intensity, I am referring to LED light strips, bulbs and panels that do not require additional cooling. There is no fan, and they are effectively silent like a regular light bulb.

High-intensity LED lights require some sort of cooling, either onboard with a fan or attached to a ventilation duct, to accommodate the heat output of the fixture. These high-intensity LED lights are generally used for full-sun plants like cannabis and have developed sophisticated technology for a rapidly expanding commercial marketplace. They are also used for indoor rainforest or museum environments to provide a powerful light source with significant canopy penetration; that is, photosynthetically useful light reaching several feet (meters) below the LED light source.

Regular-intensity LED panel and strip lights are commonly used in vertical-growing setups (stacked shelving units), such as for microgreens and lettuce. They are becoming more and more in demand as indoor agriculture increases.

While we have had excellent results with high-intensity LED light fixtures, I have determined that the high output is not necessary for excellent orchid blooming and growth. Even our higher-light species have thrived under newly available, fanless LED fixtures. In 2019, I swapped out our original high-intensity Amare Technology light fixtures for a replaceable, eight-bulb LED fixture from Active Grow using their new bright-white light spectrum. The results? Equal or better growth and blooming, a quieter grow room, cooler summer temperatures, more even light distribution for easier orchid placement and less energy used!

**A NEW ERA OF POSSIBILITY** LED lighting has opened up a new era of orchid growing under lights. With diverse options for shelving, supplemental lighting and free-standing growing areas, many more species can be accommodated, allowing for specialized environments to be created and the ability to grow many orchids without a greenhouse. A spare room or basement can become a small orchid nursery. Compared to previous horticultural lighting sources, LED lighting



makes this possible by providing 1) full natural light spectra, 2) high-to-low light intensity options for different orchids, and 3) energy and heat efficiency.

It is my hope that this article provides an introduction to the new concepts and terms associated with LED lighting so that you can make quality choices in lighting purchases and design an effective indoor growing area for your orchids.

— *A'na Sa'tara, DPhil, grows 700 orchids with her husband Paul in the San Francisco Bay area of California, both outdoors and in three indoor growing areas with LED lights. She brings her love of wild nature, worldwide travels and decades of photography, combined with her earlier scientific research as a geographer at Oxford and Stanford universities, to orchid growing with heart, purpose and a passion for the deep essence of orchids (website: aeorchids.com, email: aeorchids1@gmail.com).*

[9] *Paphiopedilum urbanianum*. Our *Paphiopedilum* species (seedlings to flowering size) grow and flower with nine hours of LED light per day in summer and 7.5 hours in winter. This equates to a DLI of 4–6.

[10] The “indoor sun” provided by a high-intensity LED light fixture from Amare Technology. I used two of these fixtures for two 4- × 4-foot (1.2- × 1.2-m) growing areas: one year round and one for indoor wintering of cymbidiums and dendrobiums. In 2019, I replaced both with lower wattage, fanless LED fixtures.

## CONVERTING T5 FLUORESCENT FIXTURES TO LED

The DIY conversion of T5 fluorescent fixtures to LED's can sometimes be dangerous if not properly done. The author has submitted an article detailing the process and what to look out for that will follow in an issue of *Orchids* magazine as quickly as it can be scheduled. — *Editor*

# Who Were These Guys, Part 10

Sir Harry Veitch, John Dominy and the Veitchs of Chelsea

BY DAVID ROSENFELD, MD





THE *GARDENERS' CHRONICLE* obituary for Sir Harry Veitch of July 12, 1924 (Editor 1924) stated "Sir Harry Veitch may be regarded as the most outstanding figure in contemporary horticulture, and during the last 50 years no one has exercised so great an influence on all things pertaining to gardening." Many orchid and nonorchid genera bear his name, including the magnificent *Masdevallia veitchiana*. The life of Harry Veitch cannot be told without discussing his interrelationship and management of the vast Veitch nurseries in Chelsea. Entwined in the saga of Harry Veitch and the Veitch nursery was the momentous achievement of the first successful manmade orchid hybrid, *Calanthe Dominyi*, by Veitch's foreman John Dominy, in 1856. This is the story of the preeminent horticultural establishment in the world in the 19th century.

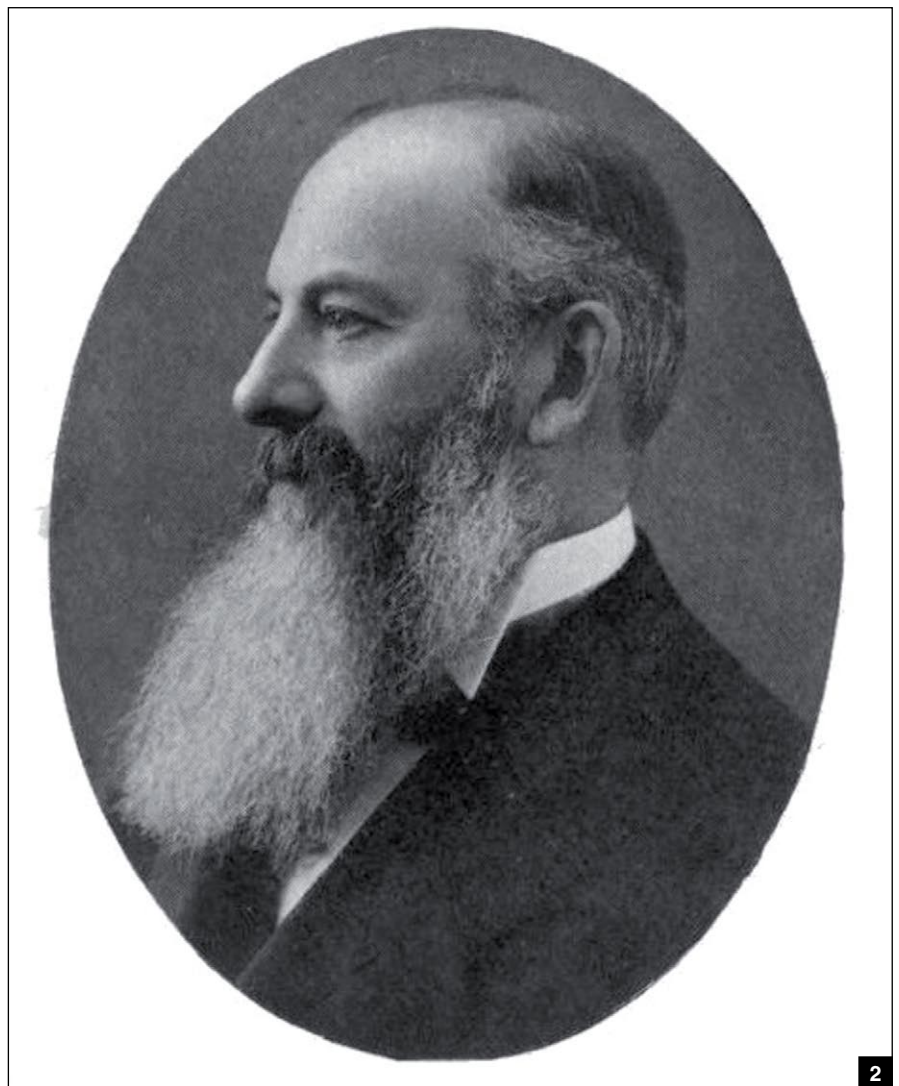


David Rosenfeld

The Veitch family migrated to England from Scotland in the late 18th century and soon after entered the horticultural business in Exeter in western England. By the 1830s Harry Veitch's father, James, was already a third-generation botanist and had established a large nursery in Exeter. In the 1840s James realized that Veitch Company could not compete with the large firms in London, and in 1853 he purchased the nursery of Messrs. Knight and Perry in the Chelsea area of London.

Harry James Veitch (1840–1924) was the second son of three born to James Veitch in Exeter, England. He began his botanical education at a young age. As a teenager he attended lectures given by the eminent botanist and orchidist John Lindley (Rosenfeld 2018) at University College, London. Soon after he was employed by the French nursery firm of Vilmorin-Andrieux, where he enhanced his knowledge of the seed business. Veitch returned to England at age 18 to assist his father in the management of the recently acquired Chelsea nurseries. Harry Veitch rapidly became integral in the management of the renamed Messrs. James Veitch & Sons. In 1870, within a year's time (following the deaths of his father and brother, James Gould Veitch), Harry Veitch inherited the nurseries. With his keen business sense the establishment soon became the leading horticultural firm in the world and remained so into the early 20th century.

During Harry's long reign as head



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of the nursery there was enormous expansion, with multiple new nurseries in England growing and hybridizing trees, shrubs, garden plants, fruit trees, seed production and, of course, orchids. Among the genera that were hybridized were *Begonia*, *Streptocarpus*, *Hippeastrum* and *Nepenthes*. Harry was a leader of the Great International Horticultural Exhibition of 1866 in London. The proceeds were used to purchase the Lindley Library for the Royal Horticultural Society. Almost 50 years later Harry restaged the Second Great International Horticultural Exhibition in 1913. The legacy of the exhibition was the formation of the annual Chelsea Flower Show, now over 100 years old. Harry Veitch was a member and supporter of numerous benevolent gardening societies, including the Royal Gardener's Orphan Fund. For his leadership in the second exposition and service to horticulture Harry was knighted by King George V in 1912. He also received the Victoria Medal

[1] The stunningly beautiful *Masdevallia veitchiana* was named by Reichenbach filius in 1868 to honor Harry Veitch. Pictured is 'Chris Prince' AM/AOS photographed by Jerry Suffolk.

[2] Photograph of Harry Veitch. Author unknown.

of Honor in 1906 from the RHS. Upon Harry's retirement in 1914 at age 74 he sold Messrs. Veitch & Sons, a fortunate decision with World War I looming. There were numerous publications by Harry and the firm, including the two-volume *Manual of Orchidaceous Plants Cultivated under Glass in Great Britain*, published between 1887 and 1894. During his retirement years he kept active in the many societies of which he was a member. Sir Harry died at age 84 in 1924.

John Dominy (1816–1891) decided at a young age that horticulture would be his profession. By 18 he had completed an apprenticeship and, for almost all of his

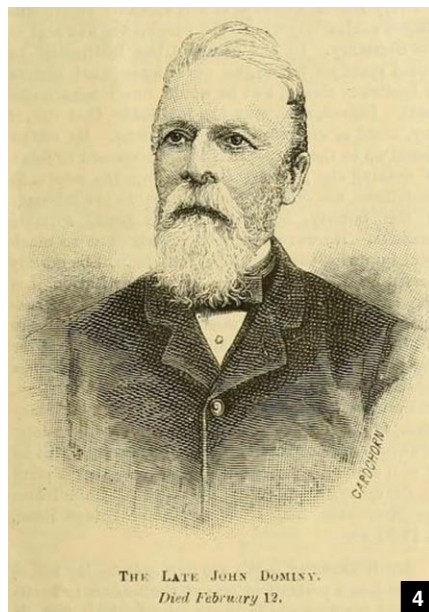




working years, was employed by Messrs. Veitch & Company, first at their Exeter establishment and then as the head gardener at the Chelsea greenhouses. His fame is mostly related to his success in 1856 in creating the first orchid hybrid. Plant hybridization had been going on for many centuries, but orchids initially had proved to be difficult to hybridize. This was because of a lack of understanding of the different sexual anatomy of the orchid flower. There were no stamens or pistils. The fused sexual components of the column puzzled botanists. It was a surgeon, Dr. John Harris, who first solved the riddle of the orchid column. He realized that the column was a more complex botanical modification of the stamens and pistils of regular flowers, and by removing the anther cap and placing the pollen masses on the viscid stigmatic surface the orchid could be pollinated. He conveyed his conclusions to his friend, John Dominy, who started pollinating cattleyas and calanthes in 1853. To his astonishment he watched a seed capsule develop on a cross of *Calanthe furcata* and *Calanthe masuca*. The seed was sown in 1854 and the first blooming occurred in 1856. The orchid world was changed forever. When he saw the hybrid, John Lindley exclaimed to John Dominy, "You will drive botanists mad." An excited Lindley wrote in the January 2, 1858 edition of the *Gardeners Chronicle* "We therefore propose that the name of the hybrid be *Calanthe Dominyi* in order to put upon permanent record the name of the first man who succeeded in this operation."

Dominy in 1859 also had the distinction of displaying the first five *Cattleya* hybrid seedlings and became the preeminent authority on orchid hybridization. For 15 years Dominy and the Veitch Company were the sole producers of orchid hybrids. In 1869 the first *Paphiopedilum* hybrid was successfully bred by Dominy, and he named it *Paphiopedilum Harrisianum*, in honor of his friend and orchid anatomist Dr. John Harris. Divisions of the original cross are still in cultivation today. During his lifetime John Dominy created 25 orchid hybrids. Included among the hybrids were multiple genera, including *Dendrobium*, *Laelia*, *Aerides*, *Phaius*, *Cattleya* and *Cypripedium* (today recognized as *paphiopedilums*). During his retirement years, John Dominy was honored by many British horticultural societies for his groundbreaking work in hybridization of orchids and other genera.

The legacy of Sir Harry Veitch and Messrs. James Veitch & Sons extends



- [3] *Calanthe Dominyi* can still be found in collections today. The hybrid exists in three color forms — white (pictured here by 'Chasus' AM-CCM/AOS), pink forms (inset) and dark purple forms. 'Chasus' AM-CCM/AOS photographed by Marcus Valentine. Inset photographer unknown.
- [4] Photograph of John Dominy ca. 1891.
- [5] *Calanthe Dominyi* from Cogniaux and Goossens' *Dictionnaire Iconographique des Orchidées*.
- [6] *Angraecum Veitchii* (*sesquipedale* × *eburneum*) was registered by Veitch in 1899. Pictured is 'African Vision' AM/AOS photographed by Lynn O'Shaughnessy.

way beyond just orchids. That being said, approximately 225 orchid species and over 300 hybrids were introduced into cultivation over the lifetime of the business. Thousands of other genera from conifers to flowering plants were successfully collected and grown in the nurseries, as well as innumerable hybrids. In 2019 the annual Chelsea flower show remains an enduring legacy of the Veitch family.

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— 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 AOS awards including many cultural awards. David wrote about Charles Darwin (the 9th article in this series) in the September 2019 issue of *Orchids magazine* (88[9]:680–683) (email: orchiddoc@comcast.net).



# *Cattleya warscewiczii* 'Pauline'

## Cultivating a Champion

BY THOMAS MIRENDA  
PHOTOGRAPHS COURTESY  
OF MATTHIAS SEELIS





# Brault' CCE/AOS

AS A LONG-TIME orchid judge, I have often pondered the competitive aspects of the orchid world. Do not get me wrong, I think all orchids are beautiful but there is no doubt that some are more satisfying to grow than others, and that judging them for flower quality and culture helps us to recognize and identify these exceptional plants to add to our burgeoning collections. Orchid shows are a bit like exhibition matches at sporting events, and the big shows, such as the shows at World Orchid Conferences, the Tokyo Dome Show and the Medellín show are akin to the Olympics. Except in this case, the athletes are the plants and the coaches are their growers. Champion tennis players such as Rafael Nadal and Serena Williams did not just emerge out of nowhere: They were cultivated by loving, focused families that had the vision to see that their charges had the potential for true greatness.



The same is true for certain orchids. If you collect exceptional plants, give them excellent growing conditions, and feed them a balanced diet, you can have some outstanding results. But the cultivation of truly champion plants might involve going that extra mile to achieve excellence. Some might call it “training.”

The Big Island, particularly the eastern side of the island, is home to some of the greatest orchid nurseries on the planet. The combination of fantastic, if humid and rainy, weather and a year-round growing season make this area home to some of the most exceptional specimen plants. Recently, Matthias Seelis, the owner of Shogun Orchids here on the Big Island showed an extraordinary plant of *Cattleya warscewiczii*. With 16 inflorescences, most with five flowers per inflorescence (only 12 of which were open at the time of judging), this specimen put on an incredible, unprecedented show with 67 simultaneous, glorious flowers. But this did not just happen. I wanted to know how Matthias got this incredible result so I asked him some questions.

It turns out that this clone has a very interesting history. Pauline Brault, for whom the clonal name was given, received a division of this plant, thought to be wild-collected decades before, as a gift from visiting orchid expert, Michael Sinn. At the time, Pauline was the speaker-coordinator for the Hilo Orchid Society, and was well known for her spectacular hospitality in her lovely home in Hawaii Paradise Park. She grew this plant for many years and ended up giving a five-pseudobulb division to Matthias in 2014, again as a thank-you gift for some website work he did for her. He could see immediately that it was an exceptionally vigorous grower. By 2016 it had quadrupled in size and Matthias suspected he had something truly special. Most *Cattleya* cultural manuals admonish us to give this species a fairly prolonged winter rest, but things are often different in our climate here in the islands. This plant would produce a second new flush of “eyes” every February. This plant clearly had not read the books and resisted the conventional wisdom. Matthias continued to water and fertilize it through several winters until the plant reached a mammoth size, so much so that it had to be planted in a large 18-inch × 18-inch (45.7-cm × 45.7-cm) tray to accommodate its tremendous girth.

By February of 2019, when it initiated its extra winter growth, Matthias realized he should put in a little extra effort in order to cultivate a champion plant.





He placed the specimen far from other plants so that it would receive light from all directions and started to pay special attention to fertilizing it using drenches and sprays of Mega-Thrive. By spring it was clear that if all went well it would be a very special blooming. But, despite his efforts up to that point, he noticed that the inflorescences were not evenly distributed around the plant. He knew the judges would see this as a fault. So, he started to guide the inflorescences with stakes so they would display evenly and to best advantage. Every week, as the buds started to enlarge, he had to restake so that each would be displayed to perfection. He estimates that he had to do this at least five times during the spike development process. This is painstaking work as inflorescences can be very delicate and brittle at this stage. Damaging even one could be devastating to the final result, much like a sports injury to a young athlete!

In the end, all of this loving cultivation and meticulous training resulted in a very well-deserved and totally earned CCE of 94 points. Congratulations Matthias on a fantastic achievement. *Cattleya warscewiczii* 'Pauline Brault' CCE/AOS is an Olympian.

— Tom Mirenda has been working professionally with orchids for over three decades. He is an AOS accredited judge and is the chairman of the American Orchid Society's Conservation Committee. He recently coauthored *The Book of Orchids: A Life-Size Guide to 600 Species From Around the World* (email: [biophiliak@gmail.com](mailto:biophiliak@gmail.com)).



- [1–3] *Cattleya warscewiczii* 'Pauline Brault' as the point of full bloom approached this June. Careful staking maximized the uniformity of bloom presentation.
- [4] On the judging table being carefully scrutinized by the judges.
- [5] *Cattleya warscewiczii* 'Pauline Brault' CCE/AOS posed with its proud owners. The Certificate of Cultural Excellence (CCE) is the highest recognition the AOS can bestow on an orchid grower.
- [6] The same plant only three short years ago.

# Orchids in Watercolor

## *Cattleychea* Siam Jade

Marcia Whitmore

*CATTLEYCHEA* SIAM JADE 'Sweet Fragrance' is a yellow-green to green hybrid of *Cattleya* Penny Kuroda and *Cattleychea* Vienna Woods (*Cattleya guttata* × *Prosthechea mariae*). It is a medium to small plant and has a lovely fragrance. My plant usually blooms in the fall but it may also put up an inflorescence at random times. The flowers are pleasantly arranged on the stem and the plant often carries five to seven flowers on each stem. The flowers are long lasting...often up to two months.

This painting was made directly from my plant and I suspect it is not a true Siam Jade 'Sweet Fragrance' as the flowers are more yellow than green and there is no fragrance. I know where I obtained the plant. When it flowered for the first time I had my suspicions as to its true parentage....a lesson when purchasing a plant from any vendor. However, the plant is lovely, very healthy and blooms regularly under typical cattleya conditions...bright light, good air movement and medium to high humidity. I painted the plant on Arches 300 lb. cold pressed paper.

Marcia Whitmore began growing orchids in a basement room under fluorescent lights in 1972 and moved into a 14-ft × 18-ft (4.3 m × 5.5 m) greenhouse in 1984. Marcia is a retired teacher and fine arts coordinator and taught in public schools for 35 years. She has earned many AOS awards and is a member of the Illowa Orchid Society, Eastern Iowa Orchid Society, American Society of Botanical Artists and the Great River Chapter of Botanical Artists (whitbrits@gmail.com, <https://asba-art.rog/member-gallery/marcia-whitmore>, [www.marciawhitmore.com](http://www.marciawhitmore.com)).





Epc. Siam Jade 'Sweet Fragrance'  
N. Whitmore '19



# *Tipularia discolor*

The Undercover Orchid

BY SORAYA GATES PARR/PHOTOGRAPHS BY THE AUTHOR  
UNLESS CREDITED OTHERWISE





PICTURE A PLACE of deciduous forests and cedar glades, raccoons and bobcats, dandelions and orchids. Did someone say orchids? Yes! This particular place can boast of having some of the most beautiful and mysterious native terrestrial orchids in our country. The place is Middle Tennessee.

The Cumberland River sweeps across the downtown music venues and the Southern-style home cookin' restaurants of Nashville, Tennessee. This is a region called the Central Basin, famous for its rolling hills and creeks. Only a few miles away, an abundance of native plants and shrubs grow. Folkloric tales of plants with amazing qualities are nestled in "them, there hills." Some of the native vegetation has legendary stories marking them as local heroes (ginseng), or herbal miracle cures (goldenseal). Then, there are some plants that use disguise and surprise. One such plant is the elusive *Tipularia discolor*.

**LOCATION OF TIPULARIA DISCOLOR** *Tipularia discolor* is the only species in the genus found in North America. The plants observed for this article are located in a mature deciduous forest. The woodlands are dominated by *Liquidambar styraciflua* (Sweetgum), *Liriodendron tulipifera* (Tulip Poplar), *Quercus alba* (White Oak), and members of the *Betulaceae* (Birch) family. It is interesting to note that the plants of *Tip. discolor* in Middle Tennessee have the same "tulip poplar association" as described by Brush et al. (1980). These forests have a long history, being the location of many battles of the Civil War. Ghostly tales of roaming soldiers looking for their sweethearts are mingled with stories of a peculiar phantom light seen on deserted railroads in the Deep South. Maybe the ancient story-tellers were seeing the columns of *Tip. discolor* which takes on a glowing quality of phosphorescent green when observed in the late afternoon sky, like a phantom will-o'-wisp waiting for All Hallow's Eve.

As a member of the Orchidaceae, *Tip. discolor* is a perennial native to the eastern part of the United States. If you can attach an adjective to describe this orchid, "undercover" rings true. Two aspects of its life cycle make this an orchid incognito. Number one is that it produces a solitary leaf in the autumn. This comes at a time when most plants are saving their metabolic energy for producing spring vegetation. The single, cordate leaf, persist throughout the winter. This is an easy way to identify *Tip. discolor* in the



wilderness on a bleak day. Many variations in leaf color and texture can occur in the same species within inches of each other. The emergence in the summer is much like a dragon-head rising out of a sheath of thin, membranous tissue. Numerous buds portray the blooms to come in the next few weeks.

The second aspect is when in full bloom, it mimics a group of hovering summer crane flies, hence its nickname the crane fly orchid. There are no vegetative leaves at the time of flowering. The flowers appear as if a tiny tornado is spiraling about a slim, leafless stalk. The raceme carries many transparent nodding flowers. They complete their flowering in late July through August. The blooms are pale to bold purple, gently intertwined with deep green and cream. The sepals are longer than the petals and are in a unique asymmetrical position. The lip is trilobed and has a long midlobe. A curved spur originates from the base of the lip. The column takes on a glowing quality of light green when observed in the late afternoon sky in Middle Tennessee.

**POLLINATORS AND POLLINATION** The spurs of *Tip. discolor* flowers

- [1] A colony of *Tipularia discolor* in full flower can still be hard to spot because of the absence of any visible leaves. This photograph was taken by Greg Allikas in the mountains of North Carolina. Inset close-up photograph by Eric Hunt.
- [2] The corms of *Tipularia discolor*, leafless when in flower are completely covered by the forest-floor leaf litter.
- [3] *Tipularia discolor* is pollinated by small powder-covered moths such as this *Protoboarmia porcelaria* (porcelain gray moth or dash-lined looper), common in most of North America.
- [4] Most *Tipularia discolor* inflorescences rarely exceed 6–8 inches (15–22.5 cm) tall although some robust clones such as the one pictured here can produce impressive spikes that exceed a foot (30 cm).



are translucent, with noticeable nectar contained within. The meniscus of the nectar column is clearly visible, nearest the throat. (Whigham, and McWhethy 1980). This spur structure is said to have evolved in the same manner as the Madagascar orchid described by Darwin (1887). He predicted that the insect is adapted to the flower structure. After probing for the nectar in the spur, the pollinia attaches to the left or right compound eye of the moth. The left or right side depends on the asymmetrical arrangement of the sepals, unique to *Tip. discolor*.

Pollinators for this orchid are varied. Here in Middle Tennessee, pollinators include *Protoboarmia porcelaria*, the porcelain gray moth and *Mythimna unipuncta* or *Pseudaletia unipuncta*, the true army worm. Other pollinators include the large Noctuidae Family, many of which are moths. As their name implies, they are nocturnal in their feeding habits. However in Middle Tennessee, I have observed various metallic bees and flies hovering and landing on the flowers. Whether pollination is achieved by these particular bees is unknown, however this year, plants in the same location, yielded more complete and earlier pollination than in 2018.

**SEED DISPERSAL** By the time shadows grow long in the late summer, the inflorescence of *Tipularia discolor* begins to change, becoming an infructescence of mature seed capsules. Seams are split vertically on each capsule to send the seeds, like super fine dust, into the air.

Because the infructescence and capsules are paper dry, these seeds scatter easily. There are several mechanisms that aid seed dispersal: A brief ride on a woodchuck's back could prove fruitful. Wind and rain could scatter them down into a valley. The slightest air current can carry hundreds. Seeds can fall and be lodged on insects and spiders. They in turn, scatter the seeds near their surroundings. Most seeds fall to the ground within the area of the colony and beyond. They become scattered among the rhizomes of the parent plants. This is a lucky draw for the undercover orchid. The necessary mycorrhizal fungi are most likely to be present where the parent plant colonies are located. To germinate, the seeds must depend on the fungus to invade the seed coat. This is called a symbiotic relationship. The fungus must be present in the surrounding humus for the orchid to survive.

A new corm develops in the summer and into the autumn. Corms are fleshy,



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and bulblike, serving as storage organs of nutrients and starches for the plant throughout the winter much like the pseudobulbs of our familiar tropical orchids. From this, the solitary leaf develops. A leaf in the winter, raceme in the summer. A complicated plant with intricate design.

A CALL FOR CONSERVATION *Tipularia discolor* is considered common in many areas of the Southeastern United States. Still, it is important to guard and protect native orchids in their habitat. Each habitat is specialized with a balance of growing matter, fungi and other nutrients available for the plant. It requires the fungi to grow and develop.

There are many threats to terrestrial orchid survival: for-profit plant collectors, habitat destruction through growth of urban areas, run-off from pesticide usage, climate change, and lack of conservation strategies on a government or state level. This article was presented for the reader to become aware of these marvelous treasures in our North American woods. We must work together for conservation. Join in conservation efforts in your area and write letters to appeal for new legislation for preserving the natural habitats that surround your state. Support the American Orchid Society. They provide many ways in which to support

conservation of our native orchids we are so graced to have. The call for action from orchid hobbyist to the most skilled orchid researcher is now!

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— Soraya Cates Parr pursues life-long learning! She was the Orchid Specialist at Cheekwood Botanical Gardens, Nashville

[5–7] Leaves vary in the extent to which they are pleated and whether or not they are unspotted, spotted with silver or spotted with purple.

[8] The undersides of the leaves, regardless of the extent to which the top surfaces are spotted, is suffused with purple.

TN; appointed member of The Governor's Council on Physical Fitness and Health for the State of Tennessee, author and speaker, degreed scientist, professional fitness instructor with BellyTone® and a professional teaching/performing musician. She is the facilitator with the American Lung Association's Better Breathers Club and has written a course on COPD with Fitness Learning Systems. She is a member of the Orchid Society of Middle Tennessee and the winner of the AOS 2017 Dillon/Peterson essay prize (email: [uptoparr747@gmail.com](mailto:uptoparr747@gmail.com)).



# Update on Project Rooting:

## World Orchid Collections 2020 WOC Taiwan

CLARE HERMANS AND JOHAN HERMANS/PHOTOGRAPHS BY JOHAN HERMANS UNLESS OTHERWISE CREDITED.

PROJECT ROOTING IS one of five exciting Taiwan Orchid Growers Association (TOGA)–led projects for the World Orchid Conference (WOC) in Taichung, Taiwan (conference March 9–12 and show March 9–18, 2020; <https://www.woc23.com/>).

**BACKGROUND** The project highlights ex situ conservation through the gathering of data on orchid genera in botanic gardens and other curated collections around the world. In addition, it is hoped that an exchange of information and a coherent system of plant exchange can greatly enhance and integrate conservation. Through the WOC conference, Project Rooting brings together representatives from ex situ orchid collections to discuss the purpose and potential of their work.

This valuable project was taken a step further, when TOGA, in collaboration with the Dr. Cecilia Koo Botanic Conservation Center (KBCC), offered support for producing a lavishly illustrated book. It will illuminate a cross-section of collections around the world, and provide a means to showcase current work, demonstrate diversity, and share information about the orchids housed in these collections. The publication date is in time for the WOC and all delegates will receive a copy.

**THE COLLECTIONS** Thirty-one organizations have submitted texts and photographs; they each tell the story of their garden and collection in their own way. The variety of contributions is interesting and ranges from very large and often historical collections such as the Atlanta Botanical Garden in the United States, Herrenhausen and Munich Gardens in Germany, Lankester Gardens in Costa Rica, the Singapore Botanic Gardens, Tsukuba Botanical Garden in Japan, the Botanical Garden of the University of Vienna and The Royal Botanic Gardens Kew, United Kingdom, to name just a few. There are also the more specialized collections such as the Jardin de Luxembourg in Paris, Kadoorie Farm and Botanic Garden of Hong Kong, China and the National Botanic Gardens



Glasnevin, Ireland. There are relative newcomers such as Shanghai Chenshan Botanical Garden in China, the Gardens by the Bay in Singapore, the KBCC in Taiwan, the Botanical Garden of the Soconusco in Mexico and Botanical Garden of Quito in Ecuador. Six gardens from the United States are represented: the Atlanta Botanical Garden, the University of California Botanical Garden at Berkeley, Huntington Botanical Gardens,

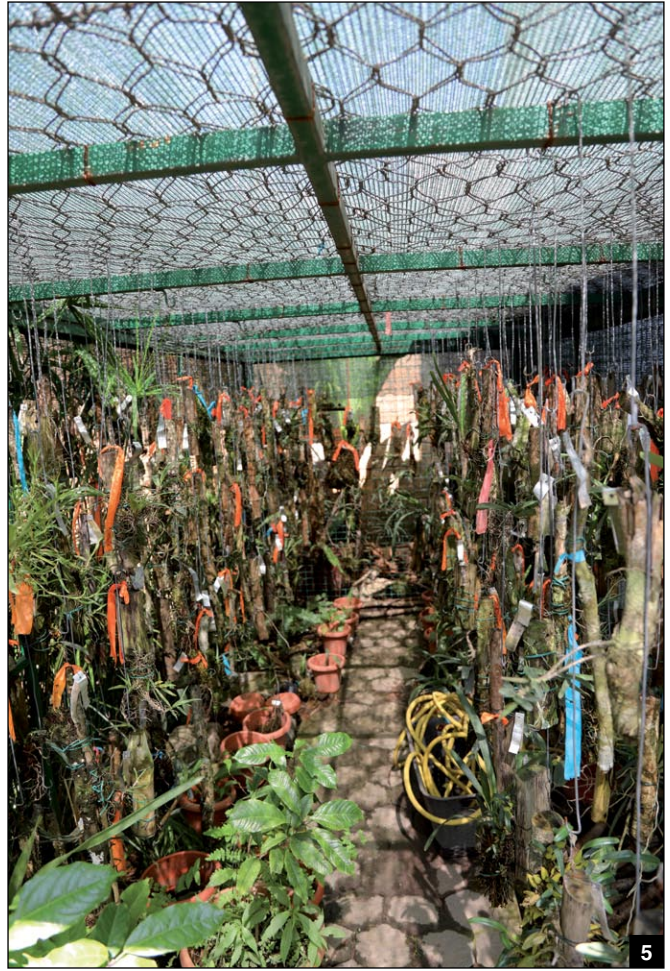
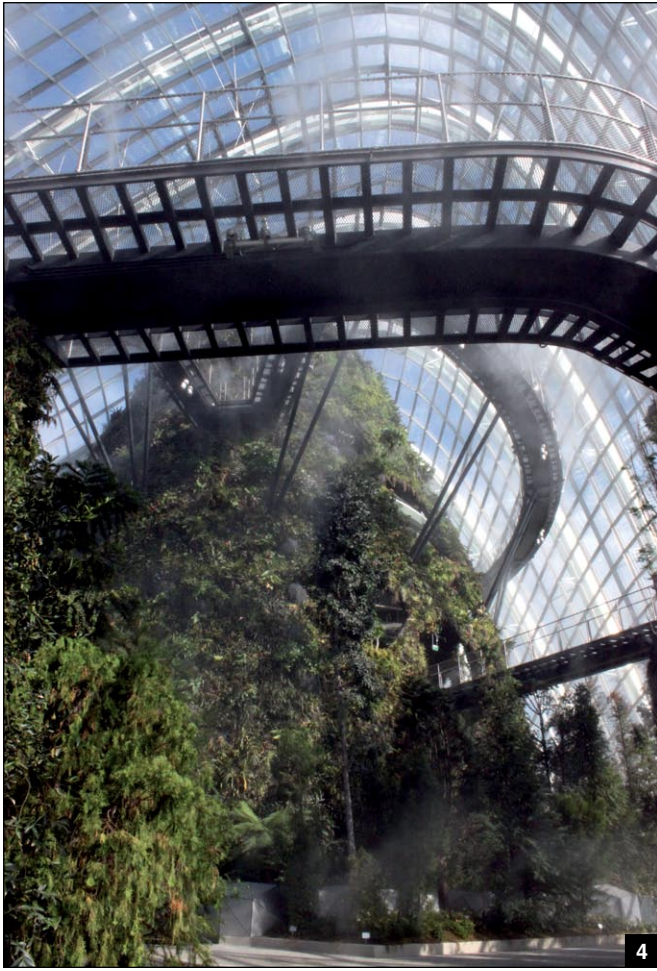
[1–2] The Dr Cecilia Koo Conservation Center in Taiwan has one of the highest numbers of orchid genera. Photographs by Chen Chun-Ming.

[3] Although many genera are well-represented in the world's botanical gardens, many are completely missing. Pictured here are *Drakaea livida* from Australia and *Huttonaea fimbriata* (inset) from South Africa.













Longwood Gardens and the San Diego Zoo Orchid Collection. In addition, Missouri Botanical Garden was given additional space, as they cover a network of several shade houses across Africa and Madagascar, representing an important approach to conservation wherein the plants are housed in their home country and environment.

**THE ORCHIDS** The Project Rooting concept is aligned with a Botanic Gardens Conservation International–United States Botanical Garden joint publication *Orchids: 2017 Global Ex situ Collections Assessment*. The lists of genera provided for each collection were checked against the *World Checklist of Selected Plant Families* and the RHS International Orchid Register. A cumulative list was then built and integrated into the latest extract of accepted genera, distribution and number of species from the *World Checklist of Selected Plant Families*. Although the project mainly concerns natural genera, it was also considered important to include manmade hybrid orchids. They are now a major industry and are often overlooked by botanic garden collections, but they are also widely used in public displays, where they help to entertain and educate the public. In many ways hybrids promote the cultivation of orchids in general and thereby may reduce pressure on natural species.

**MISSING AND WANTED** The 2017 BGCI analysis of genera reported that 65% of all orchid genera were recorded in ex situ collections on the BGCI PlantSearch database. An updated version of the 2017 list, with hybrid and synonymous genera removed, was then combined with the new Project Rooting data, and showed that more than 85% (647 out of 760) of all genera are represented in collections. Fifteen percent (113) of the genera are not represented in collections. Many of these

[4] The Gardens by the Bay in Singapore will be one of the newer gardens featured in Project Rooting.

[5] Ex situ collections in their home country, such as this one in Antananarivo in Madagascar is curated by Missouri Botanical Garden.

[6] The historical collections of the Jardin du Luxembourg in Paris, France will be featured in Project Rooting.

[7–9] Many genera are highly represented in botanical gardens.

Pictured here are: [7] *Cymbidium sichuanicum* from China, [8] *Coelogyne schilleriana* from Myanmar and Thailand and [9] *Vanda luzonica* from the Philippines.

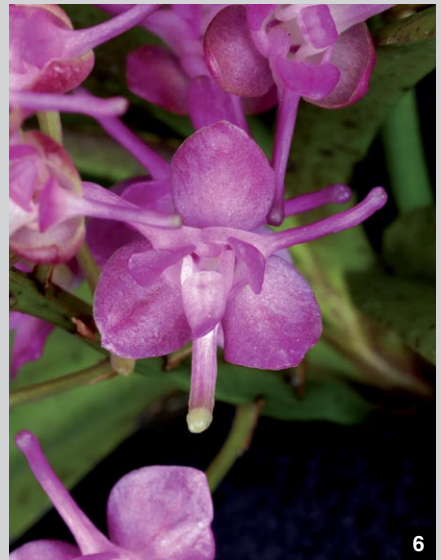
are undoubtedly a challenge to keep alive in cultivation; this includes genera such as *Bartholina* (paradoxically one of the first tropical species to flower in Kew, in 1778), *Corallorhiza*, *Drakaea*, *Holothrix*, *Huttonaea*, *Rhizanthella* and several other terrestrial Australian natives; these may be more suitable for in situ conservation.

**THE TOP TEN** The new list of orchid genera in international collection also gave us a chance to calculate which genera are the most widely grown and popular: one genus is represented in all 31 Project Rooting collections, closely followed by *Bulbophyllum*, *Epidendrum*, *Maxillaria*, and *Oncidium*, which can be found in all but one collection. The book will reveal the overall winner and also the collection with the largest number of genera, the answers to both may surprise people.

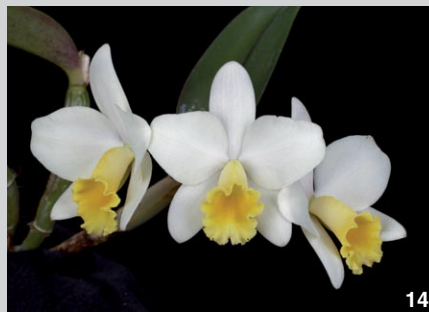
— Clare Hermans is chairman of the RHS Orchid Committee. (email: [clare.jepson@btinternet.com](mailto:clare.jepson@btinternet.com))

— Johan Hermans is an honorary research associate of the Royal Botanical Gardens, Kew and vice-chairman of the RHS Orchid Committee (email: [orchids1@btinternet.com](mailto:orchids1@btinternet.com))



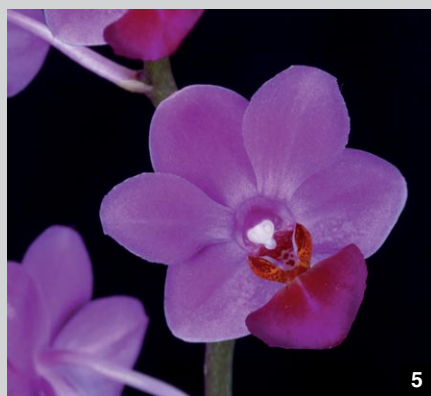
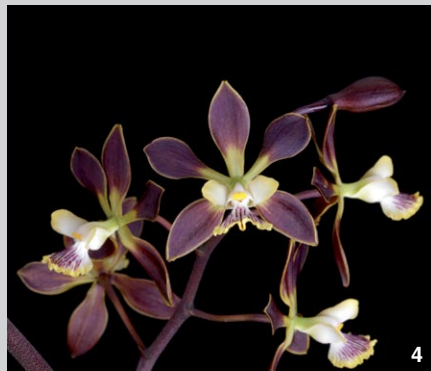




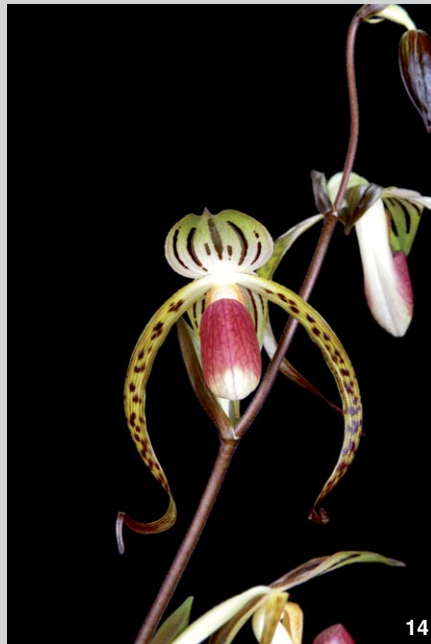


- [1] *Encyclia randii* 'Huntingtons Perfume Beauty' HCC/AOS 76 pts. Exhibitor: Huntington Botanical Gardens; photographer: Arthur Pinkers. Pacific South Judging Ctr.
- [2] *Prosthechea mariae* 'Maggie' AM/AOS 82 pts. Exhibitor: William and Margaret Loy; photographer: Arnold Gum. Pacific South Judging Center
- [3] *Paraphalaenopsis labukensis* 'Huntington's Fireworks' AM/AOS 82 pts. Exhibitor: Huntington Botanical Gardens; photographer: Arthur Pinkers. Pacific South Judging Center
- [4] *Dendrobium parishii* 'Geneva's Cherry Blossom' HCC/AOS 76 pts. Exhibitor: Thornton Conservatory; photographer: Arthur Pinkers. Pacific South Judging Center
- [5] *Phragmipedium* Les Dirouilles 'Miracles' HCC/AOS (Sorcerer's Apprentice x Leslie Garay) 76 pts. Exhibitor: Deborah Halliday; photographer: Arnold Gum. Pacific South Judging Center
- [6] *Vanda* Cherry Blossom 'Pink Spider' JC/AOS (*falcata* x *ampullacea*). Exhibitor: Peter T. Lin; photographer: Arthur Pinkers. Pacific South Judging Center
- [7] *Paphiopedilum* Ho Chi Minh 'Huntington's Cotton Candies' AM/AOS (*delenatii* x *vietnamense*) 83 pts. Exhibitor: Huntington Botanical Gardens; photographer: Arthur Pinkers. Pacific South Judging Center
- [8] *Phalaenopsis* Liu's Hua Lien Red-Carpet 'Los Robles' AM/AOS (Liu's Twilight Rainbow x *celebensis*) 80 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging Center
- [9] *Tolumnia* SIO's June Marie 'Oceanview' FCC/AOS (Buck Hollow x Anita) 91 pts. Exhibitor: Alex Nadzan; photographer: Arnold Gum. Pacific South Judging Ctr.
- [10] *Cattleya purpurata* (Carnea) 'Tico Tico' AM/AOS 84 pts. Exhibitor: Dave and Judy Smith; photographer: Arnold Gum. Pacific South Judging Center
- [11] *Phalaenopsis violacea* 'Montclair Indigo' AM/AOS 80 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging Center
- [12] *Paphiopedilum* Bel Royal 'Huntington's Tiger' AM/AOS (*rothschildianum* x *kolopakingii*) 82 pts. Exhibitor: Huntington Botanical Gardens; photographer: Arthur Pinkers. Pacific South Judging Center
- [13] *Cymbidium* Little Beauty 'Malia' AM/AOS (Cricket x *canaliculatum*) 82 pts. Exhibitor: Art Mendoza; photographer: Arthur Pinkers. Pacific South Judging Ctr.
- [14] *Rhyncattleanthe* Minisun 'Merle Connell' HCC/AOS (Sakurahime x *Cattleya* Beaufort) 77 pts. Exhibitor: Linda Connell; photographer: Arthur Pinkers. Pacific South Judging Center
- [15] *Cymbidium* Kuranda 'Chu-Wai' AM/AOS (*madidum* x *suave*) 86 pts. Exhibitor: Art Mendoza; photographer: Arthur Pinkers. Pacific South Judging Center
- [16] *Cymbidium* Devon Shell 'New Horizon' AM/AOS (Gladys Whitesell x *devonianum*) 82 pts. Exhibitor: Art Mendoza; photographer: Arthur Pinkers. Pacific South Judging Center



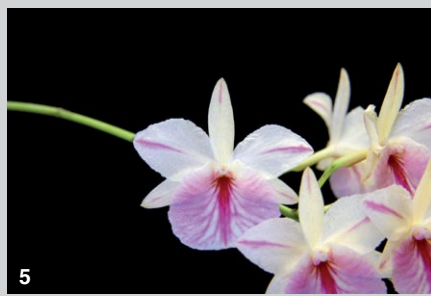






- [1] *Rhyncattleanthe* Maxima's Effect 'Pale Moon' AM/AOS (Orange Butter x *Cattleya* Horace) 81 pts. Exhibitor: Donna Ballard; photographer: Arthur Pinkers. Pacific South Judging Center
- [2] *Capanemia superflua* 'Diamond Orchids' AM/AOS 84 pts. Exhibitor: Peter T. Lin; photographer: Arthur Pinkers. Pacific South Judging Center
- [3] *Phragmipedium x richteri* 'Hong Le' HCC/AOS (*boissierianum* x *pearcei*) 77 pts. Exhibitor: Vinh Huy Nguyen; photographer: Arthur Pinkers. Pacific South Judging Center
- [4] *Encyclia* Cynthia 'Dark Beauty' HCC/AOS (*Sietetrescuartos* x *Dicky Bird*) 79 pts. Exhibitor: Ruben Colmenares; photographer: Arthur Pinkers. Pacific South Judging Center
- [5] *Phalaenopsis* Annie Van Tweel 'Donna' HCC/AOS (*pulcherrima* x *lobbii*) 76 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging Center
- [6] *Phalaenopsis* Germaine Vincent 'Fangtastic' AM/AOS (*violacea* x *tetraspis* f. *speciosa*) 80 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging Center
- [7] *Cattleya purpurata* (Schusteriana) 'Sunset Valley Orchids' AM/AOS 84 pts. Exhibitor: Fred Clarke; photographer: Arthur Pinkers. Pacific South Judging Center
- [8] *Paphiopedilum* Tristar Ruby 'Lawrence Feldman' AM/AOS (*Susan Booth* x *micranthum*) 83 pts. Exhibitor: Vinh Huy Nguyen; photographer: Bill Coty. Pacific South Judging Center
- [9] *Vandaenopsis* Piliialoha 'Judy Su' HCC/AOS (*Phalaenopsis pulcherrima* x *Vanda falcata*) 78 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging Center
- [10] *Sarcochilus ceciliae* 'Diamond Orchids' AM/AOS 80 pts. Exhibitor: Peter T. Lin; photographer: Arthur Pinkers. Pacific South Judging Center
- [11] *Phalaenopsis* Amblearis 'Norman's Peloric' JC/AOS (*amboinensis* x *cochlearis*). Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging Center
- [12] *Paphiopedilum* Memoria Joan Levy 'Justin Phantacy' AM/AOS (*stonei* x *gigantifolium*) 84 pts. Exhibitor: Harold Koopowitz- Paph Factory; photographer: Arthur Pinkers. Pacific South Judging Center
- [13] *Phalaenopsis* Germaine Vincent 'Eric' AM/AOS (*violacea* x *speciosa*) 80 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging Center
- [14] *Paphiopedilum* Memoria Joan Levy 'Huntington's Delight' AM/AOS (*stonei* x *gigantifolium*) 83 pts. Exhibitor: Huntington Botanical Gardens; photographer: Arthur Pinkers. Pacific South Judging Center
- [15] *Cymbidium* Abundance 'Mary Lee Gray' AM/AOS (*Lyoth* x *canaliculatum*) 82 pts. Exhibitor: Mary Lee Gray; photographer: Arthur Pinker. Pacific South Judging Center
- [16] *Paphiopedilum* Julius 'Tall Boy' AM/AOS (*lowii* x *rothschildianum*) 82 pts. Exhibitor: Harold Koopowitz- Paph Factory; photographer: Arthur Pinkers. Pacific South Judging Center

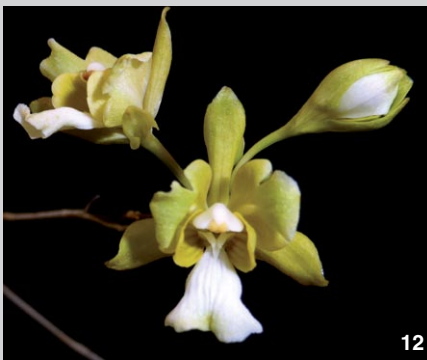








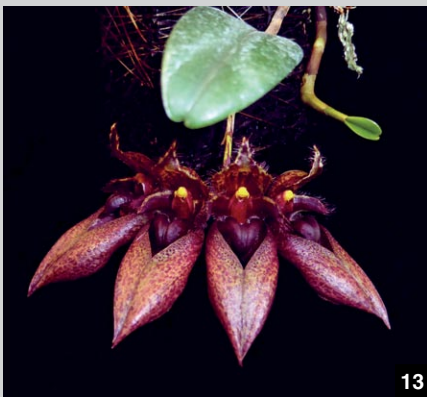
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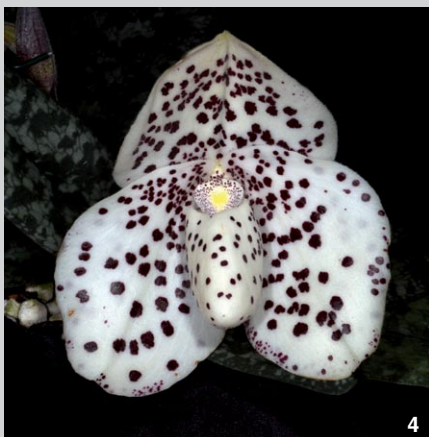
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- [1] *Paphiopedilum* Shin-Yi Formosa 'Justin' HCC/AOS (Lady Isabel x *gigantifolium*) 78 pts. Exhibitor: Harold Koopowitz-Paph Factory; photographer: Arthur Pinkers. Pacific South Judging Center
- [2] *Cattleya* Caitlin Joan 'Pink Pet' AM/AOS (*pumila* x Rosemary Upton) 80 pts. Exhibitor: Thornton Conservatory; photographer: Arthur Pinkers. Pacific South Judging Center
- [3] *Clowesetum* Melana's Daughter 'Ana Rosa Nuñez' AM/AOS (*Catasetum* Melana Davison x *Clowesia* Rebecca Northen) 80 pts. Exhibitor: Ramonita Vargas Nuñez; photographer: Irma Saldaña. Puerto Rico Judging Center
- [4] *Rhyncholaeliocattleya* My Precious 'Memoria Meg Rich' AM/AOS (Oconee x *Cattleya* Precious Katie) 83 pts. Exhibitor: Ian Rich; photographer: Mark Van der Woerd. Rocky Mountain Judging Center
- [5] *Broughtonia sanguinea* 'Louisiana' HCC/AOS 79 pts. Exhibitor: Al Taylor; photographer: Charlie Riner. Shreveport Judging Center
- [6] *Paphiopedilum* Parish Amble 'Louisiana' HCC/AOS (William Ambler x *parishii*) 79 pts. Exhibitor: Al Taylor; photographer: Charlie Riner. Shreveport Judging Center
- [7] *Paphiopedilum* Shen-Liu Peri 'Dark Phantasy' HCC/AOS (*moquetteamum* x *anitum*) 78 pts. Exhibitor: Harold Koopowitz-Paph Factory; photographer: Arthur Pinkers. Pacific South Judging Ctr
- [8] *Paphiopedilum godefroyae* 'Julio David' HCC/AOS 78 pts. Exhibitor: Dr. Julio D. Rios; photographer: Irma Saldaña. Puerto Rico Judging Center
- [9] *Trichoglottis smithii* 'Dude' HCC/AOS 75 pts. Exhibitor: Mary Mancini; photographer: Charlie Riner. Shreveport Judging Center
- [10] *Phalaenopsis* Mancervi 'Louisiana' HCC/AOS (*mannii* x *cornu-cervi*) 78 pts. Exhibitor: Al Taylor; photographer: Charlie Riner. Shreveport Judging Center
- [11] *Anguloa* x *ruckeri* 'Denver Botanic Gardens' AM/AOS 84 pts. Exhibitor: Denver Botanic Gardens; photographer: Larry Livingston. Rocky Mountain Judging Center
- [12] *Psychilis krugii* 'Memoria Victor Ortiz II' JC/AOS. Exhibitor: Luis M. Ortiz Jordan; photographer: Irma Saldaña. Puerto Rico Judging Center
- [13] *Bulbophyllum* Memoria Luis Rivero 'Julio David' AM/AOS (*frostii* x *pingtungense*) 83 pts. Exhibitor: Dr. Julio David Rios; photographer: Irma Saldaña. Puerto Rico Judging Center
- [14] *Encyclia* Tamcorata 'EpiJim' HCC/AOS (Atropine x *alata*) 75 pts. Exhibitor: James Jeansonne; photographer: Charlie Riner. Shreveport Judging Center
- [15] *Myrmecocattleya* Alice 'EpiJim' HCC/AOS (*Cattleya* Little Intermezzo x *Myrmecophila exaltata*) 79 pts. Exhibitor: James Jeansonne; photographer: Charlie Riner. Shreveport Judging Center
- [16] *Phragmipedium* Acker's Ornament 'ThienNgo Le' HCC/AOS (Eric Young x Asuko Fischer) 76 pts. Exhibitor: Thien Ngo Le; photographer: J. Bruce Embury. Rocky Mountain Judging Center









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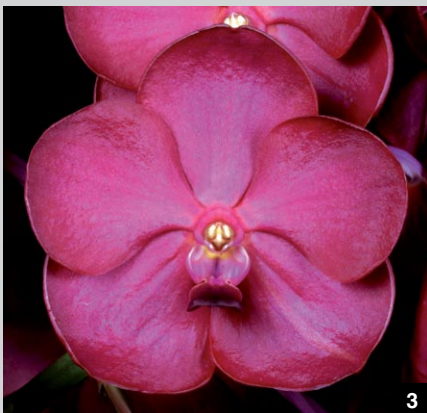
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- [1] *Aeranthus* Hsinying Ramosa 'Elizabeth Grace' AM/AOS (Grandiose x *ramosa*) 82 pts. Exhibitor: Eron Borne; photographer: Charlie Riner. Shreveport Judging Center
- [2] *Paphiopedilum* Avalon Delight 'Dr. Leanne' HCC/AOS (Nike's Sunny Delight x Avalon Mist) 78 pts. Exhibitor: David James Medus; photographer: Charlie Riner. Shreveport Judging Center
- [3] *Paphiopedilum* *thaiantum* 'Wedding Bells' AM/AOS 85 pts. Exhibitor: Stanley Luk; photographer: Robin McLaughlin. Toronto Judging Center
- [4] *Paphiopedilum* Sakaki 'Synea' AM/AOS (*bellatulum* x *wenshanense*) 80 pts. Exhibitor: Synea Tan; photographer: Jay Norris. Toronto Judging Center
- [5] *Phalaenopsis* *bellina* 'Brazos' HCC/AOS 75 pts. Exhibitor: Mitsi Runyan; photographer: Charlie Riner. Shreveport Judging Center
- [6] *Dendrobium* Memoria Marjorie Morton 'Memoria Frank Cott' JC/AOS (Thailand x Suzanne Neil). Exhibitor: Ed Cott; photographer: Ed Cott. Toronto Judging Center
- [7] *Bulbophyllum* More Than Aghast 'Louisiana' HCC/AOS (*agastor* x *echinolabium*) 75 pts. Exhibitor: Al Taylor; photographer: Charlie Riner. Shreveport Judging Center
- [8] *Catasetum* Christine Chowning 'B-C' HCC/AOS (Susan Fuchs x Portagee Star) 76 pts. Exhibitor: B. Butts - C. Lefaive; photographer: Ed Cott. Toronto Judging Center
- [9] *Cattleya* Memoria Robert Strait 'Blues' AM/AOS (*walkeriana* x Wayndora) 82 pts. Exhibitor: David Bryan; photographer: Jay Norris. Toronto Judging Center
- [10] *Pleurothallopsis* *inaequalis* 'Eugene Banziger' CCM/AOS 80 pts. Exhibitor: Eugene Banziger; photographer: Judith Higham. Western Canada Judging Center
- [11] *Brassocattleya* Rustic Spots 'Brazos' AM/AOS (Richard Mueller x *Cattleya* Landate) 81 pts. Exhibitor: Mitsi Runyan; photographer: Charlie Riner. Shreveport Judging Center
- [12] *Rodrumnia* Apple Hollow 'Velvet Ruffles' AM/AOS (Hare Hollow x Sycamore Hollow) 80 pts. Exhibitor: Jeanne Kaeding; photographer: Ed Cott. Toronto Judging Center
- [13] *Phalaenopsis* LD's Bear Queen 'Frostbite' AM/AOS (*bellina* x Dragon Tree Eagle) 81 pts. Exhibitor: Pat Van Adrichem; photographer: Judith Higham. Western Canada Judging Center
- [14] *Bulbophyllum* *speciosum* 'Kittiwake' AM/AOS 81 pts. Exhibitor: Leda Bower; photographer: Judith Higham. Western Canada Judging Center
- [15] *Catasetum* Dark Odyssey 'B-C 35' AM/AOS (Karen Armstrong x Darkness) 84 pts. Exhibitor: B. Butts - C. Lefaive; photographer: Jay Norris. Toronto Judging Center
- [16] *Paphiopedilum* Kemp Tower 'Dr. John' CCM/AOS (Prince Edward of York x *philippinense*) 82 pts. Exhibitor: John Doherty; photographer: Jay Norris. Toronto Judging Center









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- [1] *Habenaria medusa* 'Marissa Gittelman' CCE/AOS 91 pts. Exhibitor: Stelmar Gardens; photographer: Tom Kuligowski.
- [2] *Phalaenopsis* Mainshow Dragon King 'Longster' HCC/AOS (LD's Bear King x Dragon Tree Eagle) 78 pts. Exhibitor: Pat Van Adrichem; photographer: Judith Higham. Western Canada Judging Center
- [3] *Vanda* Parinlada 'Red Lizzy' AM/AOS (Rose Gem x Korb Fah) 83 pts. Exhibitor: Wayne Green; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [4] *Vanda* Kulwadee Fragrance 'Crownfox' AM/AOS (Gordon Dillon x Guo Chia Long) 83 pts. Exhibitor: R.F. Orchids, Inc.; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [5] *Brassavola nodosa* 'Big Jim' CCM/AOS 81 pts. Exhibitor: Wayne Green; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [6] *Brassavola nodosa* 'Claire de Lune' CCM/AOS 86 pts. Exhibitor: Claire Garrett; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [7] *Lepanthes estrellensis* 'Monkey's Butterfly' CBR/AOS. Exhibitor: Abu Salleh; photographer: Judith Higham. Western Canada Judging Center
- [8] *Miltoniopsis vexillaria* (Albescent) 'Summer's Edge' HCC/AOS 79 pts. Exhibitor: Poul Hansen; photographer: Alexey Tretyakov. Western Canada Judging Center
- [9] *Lepanthes maxillaris* 'Monkey's Tron' CBR/AOS. Exhibitor: Abu Salleh; Photographer: Judith Higham. Western Canada Judging Center
- [10] *Cypripedium* x *ventricosum* nothovar. *virescens* 'Midas' CHM/AOS 80 pts (*calceolus* x 4). Exhibitor: Shawn Hillis; Photographer: Doug Savage. Western Canada Judging Center
- [11] *Cypripedium* Victoria 'Secret' HCC/AOS (*parviflorum* var. *pubescens* x *fasciolatum*) 78 pts. Exhibitor: Shawn Hillis; photographer: Doug Savage. Western Canada Judging Center
- [12] *Cypripedium* Monto 'Barb's Good Buy' HCC/AOS (*macranthos* {var} *hotei-atsumorianum* x *fasciolatum*) 75 pts. Exhibitor: Barbara Podmore; photographer: Doug Savage. Western Canada Judging Center
- [13] *Vanda* Wayne Green 'Stuart's Gift' AM/AOS (Yellow Pacific x Kultana Fragrance) 82 pts. Exhibitor: Wayne Green; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [14] *Acineta superba* 'Eugene Banziger' CCM/AOS 84 pts. Exhibitor: Eugene Banziger; photographer: Judith Higham. Western Canada Judging Center
- [15] *Miltoniopsis* Les Dirouilles 'Lone Survivor' AM/AOS (Five Oaks x Portelet) 80 pts. Exhibitor: Poul Hansen; photographer: Alexey Tretyakov. Western Canada Judging Center
- [16] *Phalaenopsis honghenensis* 'Evguenia' CHM/AOS 81 pts. Exhibitor and photographer: Alexey Tretyakov. Western Canada Judging Center









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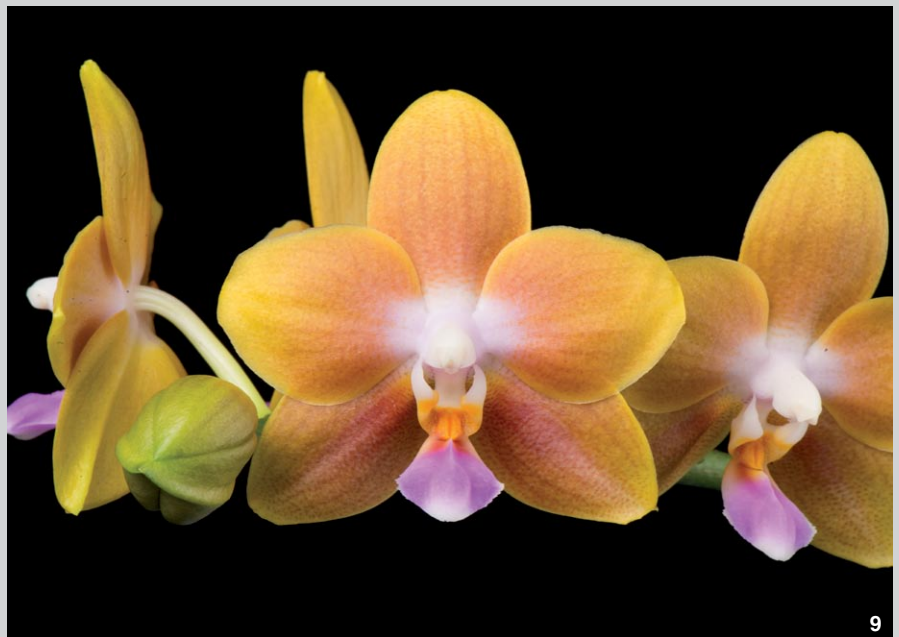
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- [1] *Masdevallia* Duchess of Dilworth 'Duchess of Dilworth' AM/AOS (Redwing x *ayabacana*) 82 pts. Exhibitor: Marc Burchette; photographer: James Curtis. Carolinas Judging Center
- [2] *Cattleya labiata* 'Sofia's Choice' JC/AOS. Exhibitor: Luiz Hamilton Lima; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [3] *Rhyncholaeliocattleya* Nancy Forrest 'Looking Glass Orchids' AM/AOS (Ronald Hausermann x Mac Holmes) 83 pts. Exhibitor: Looking Glass Orchids; photographer: James Curtis. Carolinas Judging Center
- [4] *Habenaria rhodocheila* subsp. *rhodocheila* 'Hab Haven' AM/AOS 81 pts. Exhibitor: Joel Edwards; photographer: Nile Dusdieker. Chicago Judging Center
- [5] *Cycnoches* Jean E. Monnier 'Charlie' AM/AOS (*barthiorum* x *cooperi*) 83 pts. Exhibitor: Looking Glass Orchids; photographer: James Curtis. Carolinas Judging Center
- [6] *Cattleya* Raspberry Smoke 'Judy Arriola' AM/AOS (Allen Condo x Maui Plum) 80 pts. Exhibitor: Jeanne Buchanan; photographer: Charlotte Randolph. Alamo Judging Center
- [7] *Habenaria* Regnieri 'Gabby' CCE-AM/AOS (*carnea* x *rhodocheila*) 90-86 pts. Exhibitor: Joel Edwards; photographer: Nile Dusdieker. Chicago Judging Center
- [8] *Phalaenopsis cornu-cervi* f. *chattaladae* 'Livingston' CCM/AOS 84 pts. Exhibitor: Steve and Kim Livingston; photographer: Nile Dusdieker. Chicago Judging Center
- [9] *Bulbophyllum karenkoensis* var. *punicum* 'Fran' CHM/AOS 84 pts. Exhibitor: Emily Quinn; photographer: David Gould. Dallas Judging Center
- [10] *Catasetum* Charles Fouquette 'Erin' AM/AOS (*expansum* x *osculatum*) 86 pts. Exhibitor: Jordan Hawley; photographer: Ann DePrez. Cincinnati Judging Center
- [11] *Coelogyne* Lurline 'Emily' HCC/AOS (*pandurata* x *confusa*) 76 pts. Exhibitor: Emily Quinn; photographer: David Gould. Dallas Judging Center
- [12] *Perreiraara* Mu Qi Malisa Wendy 'Soroa Pink Perfection' AM/AOS (*Vandachostylis* Pine Rivers x *Vanda* Peggy Foo) 83 pts. Exhibitor: Soroa Orchids; photographer: Brian Monk. Florida-Caribbean Judging Center
- [13] *Rhyncholaeliocattleya* Carolina Splendor 'Smokey Vision' AM/AOS (Waikiki Splendor x *Oconee*) 86 pts. Exhibitor: New Vision Orchids; photographer: Ann DePrez. Cincinnati Judging Center
- [14] *Rhyncholaeliocattleya* Stippled Sunset 'Big Sun' AM/AOS (*Cattleya* Katherine Clarkson x SunCoast Sunspots) 84 pts. Exhibitor: New Vision Orchids; photographer: Ann DePrez. Cincinnati Judging Center
- [15] *Rhynchovanda* Dr Sally Meiners 'Motes Ever Bloom' AM/AOS (*Vandachostylis* Thai Noi x *Vanda testacea*) 80 pts. Exhibitor: Motes Orchids, Inc.; photographer: Brian Monk. Florida-Caribbean Judging Center
- [16] *Perreiraara* LeBeau Blue 'Soroa Blue Sky' AM/AOS (*Aerides lawrenceae* x *Vandachostylis* Sasicha) 80 pts. Exhibitor: Soroa Orchids; photographer: Brian Monk. Florida-Caribbean Judging Center









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- [1] *Paphiopedilum* In-Charm Cloud 'Oakwood's Charm' HCC/AOS (In-Charm White x *godefroyae*) 79 pts. Exhibitor: Oakwood Orchids; photographer: Ann DePrez. Cincinnati Judging Center
- [2] *Rhyncattleanthe* Gail Hutchinson 'Winter Haven' HCC/AOS (*Cattleya* Allen Condo x Cherry Suisse) 76 pts. Exhibitor: Keith and Dina Emig - Winter Haven Orchid Nursery; photographer: Kay Clark. Florida North-Central Judging Center
- [3] *Clowesetum* Doctor Lynn Damitz 'Memoria Elinor Ribner Kaiser' HCC/AOS (Black Jade x *Catasetum* Frilly Doris) 76 pts. Exhibitor: Mark Margolis; photographer: Brian Monk. Florida-Caribbean Judging Center
- [4] *Catamodes* Dragons Glade 'Robin's Sunspot' AM/AOS (Dragons Tail x *Catasetum* Orchidglade) 83 pts. Exhibitor: Sandra Dixon; photographer: Katie Payeur. Great Lakes Judging Center
- [5] *Catasetum* Melana Davison 'Maximus' AM/AOS (*denticulatum* x Penang) 83 pts. Exhibitor: Lois Posey; photographer: Kay Clark. Florida North-Central Judging Center
- [6] *Bulbophyllum* Herkules 'M and B' HCC/AOS (*macrobulbum* x *phalaenopsis*) 78 pts. Exhibitor: Max C. Thompson; photographer: Bryon Rinke. Great Plains Judging Center
- [7] *Pectabenaria* Maxdusa 'Snake Charmer' AM/AOS (Wow's White Fairies x *Habenaria medusa*) 82 pts. Exhibitor: Keith and Dina Emig - Winter Haven Orchid Nursery; photographer: Kay Clark. Florida North-Central Judging Center
- [8] *Bulbophyllum* Walnut Valley Jersey 'M and B' AM/AOS (Jersey x *reticulatum*) 83 pts. Exhibitor: Max Thompson and Bryon Rinke; photographer: Bryon Rinke. Great Plains Judging Center
- [9] *Phalaenopsis* Pylo's Forever 'Lady Stella' AM/AOS (Tying Shin Forever Love x Yungho Gelb Canary) 80 pts. Exhibitor: Yife Tien; photographer: Brian Monk. Florida-Caribbean Judging Center
- [10] *Vandachostylis* Blue Gem (2012) 'Lady Stella' AM/AOS (*Vanda* Baby Blue x *Rhynchostylis coelestis*) 83 pts. Exhibitor: Yife Tien; photographer: Brian Monk. Florida-Caribbean Judging Center
- [11] *Vandachostylis* Blue Gem (2012) 'Glen Gary - Cottage Orchids' AM/AOS (*Vanda* Baby Blue x *Rhynchostylis coelestis*) 82 pts. Exhibitor: Glen Gary; photographer: Kay Clark. Florida North-Central Judging Center
- [12] *Dracula* Swamp Fox 'Timbucktoo' AM/AOS (*cordobae* x *bella*) 81 pts. Exhibitor: Sarah Pratt; photographer: Bryon Rinke. Great Plains Judging Center
- [13] *Vanda tessellata* 'Bartholomew Motes' AM/AOS 84 pts. Exhibitor: Motes Orchids, Inc.; photographer: Brian Monk. Florida-Caribbean Judging Center
- [14] *Paphiopedilum* Magic Lantern 'Springwater Bubblegum' AM/AOS (*micranthum* x *delenatii*) 81 pts. Exhibitor: Springwater Orchids and Thanh Nguyen; photographer: Wes Newton. Florida North-Central Judging Center
- [15] *Paphiopedilum* Magic Lantern 'Springwater' AM/AOS (*micranthum* x *delenatii*) 83 pts. Exhibitor: Springwater Orchids and Thanh Nguyen; photographer: Wes Newton. Florida North-Central Judging Center
- [16] *Encyclia phoenicea* 'Fajen's Orchids' HCC/AOS 77 pts. Exhibitor: Fajen's Orchids; photographer: Wes Newton. Florida North-Central Judging Center









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- [1] *Paphiopedilum* Uneme 'Littlefrog Alex' AM/AOS (S. Gratrix x *delenatii*) 83 pts. Exhibitor: Rob Halgren; photographer: Katie Payeur. Great Lakes Judging Center
- [2] *Habenaria carnea* var. *nivosa* 'Bryon Rinke' CHM/AOS 83 pts. Exhibitor: Bryon K. Rinke; photographer: Bryon Rinke. Great Plains Judging Center
- [3] *Paphiopedilum* Macabre Hawaiian 'Slipper Zone Form Fantasy' HCC/AOS (Hawaiian Illusion x Macabre Pops) 78 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [4] *Cymbidium ensifolium* 'Alice' CCM/AOS 85 pts. Exhibitor: Yves Renaud; photographer: Thang Dam. Toronto Judging Center
- [5] *Habenaria medusa* 'Natural World' AM/AOS 81 pts. Exhibitor: Tropical Orchid Farm; photographer: Michael Blietz. Hawaii Judging Center
- [6] *Rhyncattleanthe* Happy Joy Joy 'Pele' HCC/AOS (Demi Deva x *Cattleya* Seagulls Apricot) 78 pts. Exhibitor: Orchid Eros; photographer: Glen Barfield. Hawaii Judging Center
- [7] *Cattleya* Raspberry Smoke 'Dragon Fruit' AM/AOS (Allen Condo x Maui Plum) 80 pts. Exhibitor: David Off; photographer: Glen Barfield. Hawaii Judging Center
- [8] *Cattleya milleri* 'Fissure 8' HCC/AOS 78 pts. Exhibitor: Orchid Eros; photographer: Glen Barfield. Hawaii Judging Center
- [9] *Brassocattleya* Seagulls Yellowbug 'Bryon' AM/AOS (*Cattleya briergeri* x *Brassavola nodosa*) 80 pts. Exhibitor: Bryon K. Rinke; photographer: Bryon Rinke. Great Plains Judging Center
- [10] *Paphiopedilum* Memoria Robert Wimmer 'Maxine' AM/AOS (Rainbow Sky x Coconut Candy) 80 pts. Exhibitor: Max C. Thompson; photographer: Bryon Rinke. Great Plains Judging Center
- [11] *Pleurothallis hitchcockii* 'Tomo' CCE/AOS 90 pts. Exhibitor: Andrew Okada; photographer: Michael Blietz. Hawaii Judging Center
- [12] *Catasetum* Fanfair 'Fran Stuler' HCC/AOS (*expansum* x *saccatum*) 79 pts. Exhibitor: Dennis Wollard; photographer: Malcolm McCorquodale. Houston Judging Center
- [13] *Dendrobium elongatum* 'Jardin botanique de Montréal' CCM/AOS 82 pts. Exhibitor: Jardin botanique de Montréal; photographer: Thang Dam. Toronto Judging Center
- [14] *Cattleya* Elegans (1917) 'Moonbeam' AM/AOS (*dowiana* x Rembrandt (1932)) 81 pts. Exhibitor: Mark Nelson Werther; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [15] *Paphiopedilum* Chou-Yi Anigode 'Maxted' AM/AOS (*godefroyae* x *adductum*) 86 pts. Exhibitor: Catherine Higgins; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [16] *Cynoches cooperi* 'Gabriel Amaru' AM/AOS 83 pts. Exhibitor: Orchid Eros; photographer: Glen Barfield. Hawaii Judging Center



# New Ecuadorian Orchids, Part 3

A New Species of *Caucaea* (Orchidaceae: Oncidiinae) From Southwestern Ecuador

HUGO MEDINA, JOSÉ PORTILLA AND ALEXANDER HIRTZ





**ABSTRACT** The new species, *Caucaea kunthiana*, is described and illustrated through the collaborative efforts of the Ecuagenera project “Rescate, Conservación, Reproducción y Manejo ex situ de la flora del Ecuador,” authorization number No. 004-2016-IC-FLO-DNB/MA from the Ministerio de Ambiente (Ministry of Environment; MAE 2016). The new species is compared with *Caucaea andigena*, but differs in the size and color of the flower and in the lip and column morphology. The lip of the new species is notable in being pyriform with the central portion reflexed to form a tubular structure.

**KEYWORDS** Ecuador, new species, Oncidiinae, *Caucaea*, *Caucaea kunthiana*

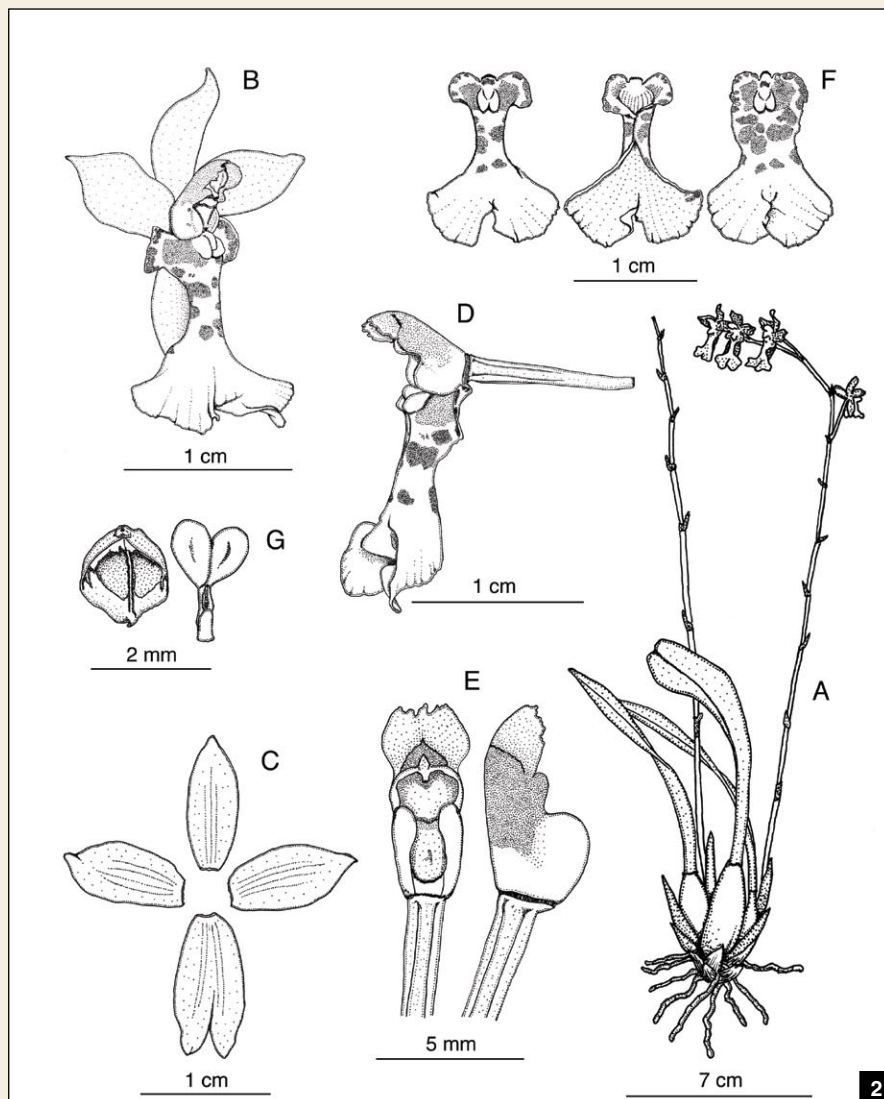
**INTRODUCTION** The genus *Caucaea* was first described by Rudolf Schlechter in 1920, based on *Rodriguezia obscura* F. Lehm. and Kraenzl. The generic name *Caucaea* is in reference to the Valle del Cauca, Colombia, where the type species was first found (Schlechter 1920).

The highest concentration of species are reported from Ecuador (WCSP 2019), with about 13 of the 16 accepted species. In total, about 30 names are attributed to the genus, but these are recognized as heterotypic synonyms as in the case of *Caucaea cucullata* Lindl. (= *Caucaea olivacea* (Kunth) N.H. Williams and M.W. Chase) or were transferred to *Oncidium* as in the case of *Caucaea universitas-cuencae* Königer (= *Oncidium universitas-cuencae* Königer and D. Vázquez). The taxonomy of the genus is further complicated by a high degree of phenotypic plasticity in the flowers among, and even within, individuals; there are some reports of morphologically distinctive flowers occurring on the same inflorescence.

The new species described here superficially resembles *Caucaea phalaenopsis* (Linden and Rchb.f.) N.H. Williams and M.W. Chase in the similar coloration of the flowers, but the morphology is most similar to *Cauc. andigena* Linden. We describe and illustrate the new species below.

**TAXONOMY** *Caucaea kunthiana* H. Medina, J. Portilla and A. Hirtz sp. nov. Type: ECUADOR. Azuay: the upper part of the road leading from Soldados to Chaucha, 2°53'49.14"N, 79°19'39.70"W, 3,400 m, flowered in cultivation at Ecuagenera, Gualaceo, January 2017, H. Medina 0292 (holotype: HA).

*Species novae similis est Cauc. andigena* Linden: Cum flores, tanto minor in hoc genere differat, sepalis petalisque



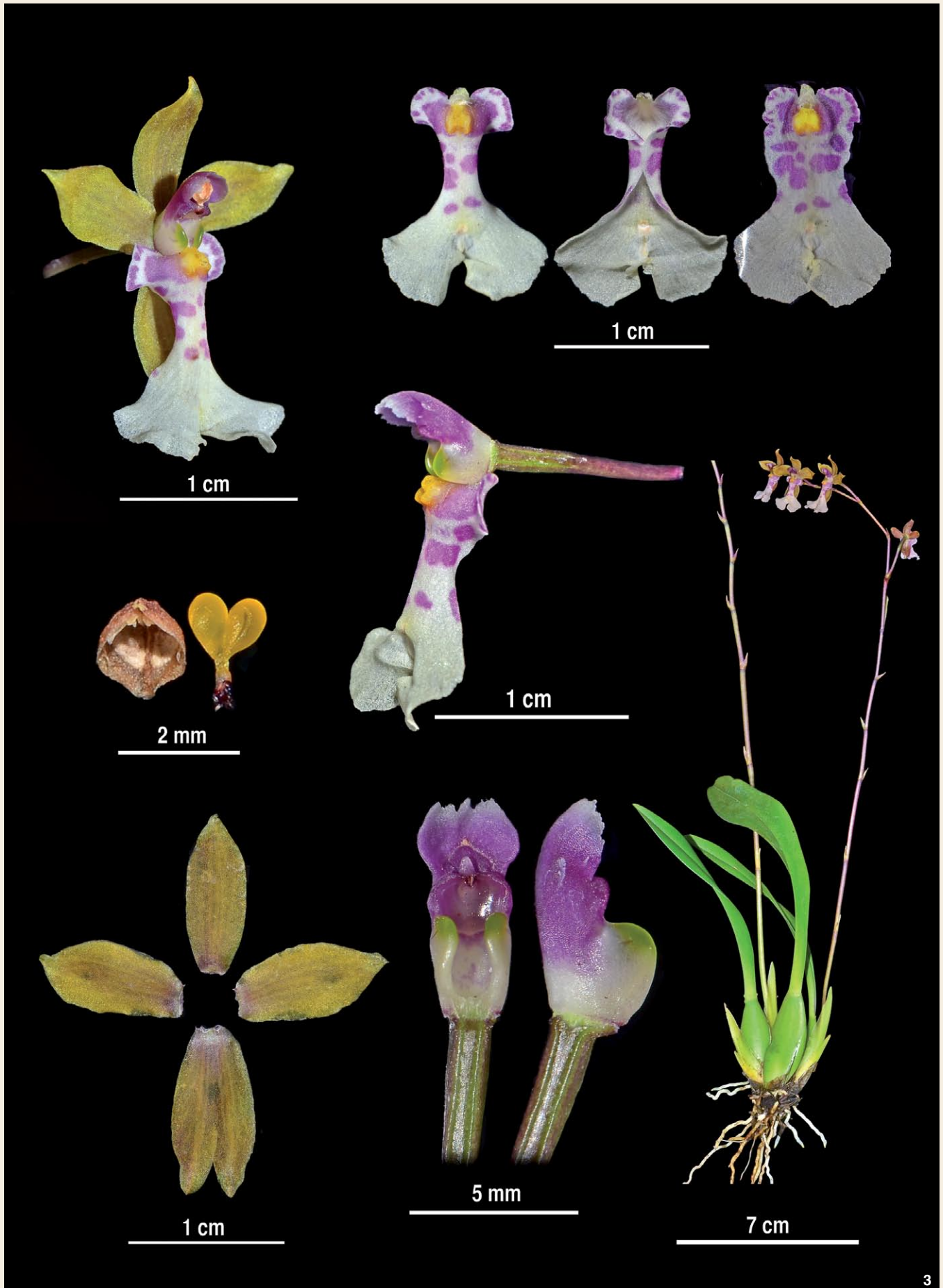
*in margine plana totum-capulus color viridis vs. sepalis petalisque margine undulatis densis flavo rubescens macules, retro deflexis pyriforme rursus fistulam disco parte labium cum basi parva flavo rubescente tribus albis macules vs. labium obscure flavum sicut semi piriformis deflexis luteum maculas duas lobis oblongo gynostermium conspicue magis tenue, pallide viridibus pennis margine albo puniceo vs. alis maculas latius albido apice brevius gynostermium roseo.*

**DESCRIPTION** Epiphytic caespitose plants to 19 cm tall, and up to 26 cm including the inflorescence; roots, white, cylindrical, 17 cm long, 0.15 cm in diameter; stem developed into a cylindrical pseudobulb 3–4 cm long, 0.70–1.4 cm in diameter, enveloped by four imbricating leaf sheaths 0.10–0.40 cm long, 0.60–1.0 cm wide; leaves, two, apical, lanceolate, coriaceous, conduplicate, olive green, glabrous, 8–15.3 cm long, 0.90–1.2 cm wide. The inflorescence is basal, simultaneously four to five flowered

- [1] *Caucaea kunthiana* photographed by Alexander Hirtz. Inset close-up of the lip crest.  
 [2] *Caucaea kunthiana* H. Medina et al. A. Habit. B. Flower three quarter view. C. Perianth dissected. D. Column and lip, side view. E. Column, ventral and lateral view. F. Lip (three views) normal, rear and expanded. G. Layer of the anther and pollinium. Illustration of the plant that served as holotype, by Hugo Medina.

racemes or panicles, produced from developing or mature pseudobulbs, 21.6–30 cm long, 0.10–0.20 cm diameter; bracts lanceolate, truncate, 0.3 cm long base, 0.2 cm wide. The flowers 1.7–2.3 cm in diameter, fragrant, white to brown-green with light pink spots; dorsal sepal elliptic, brownish green, acute, truncate, arched forward, glabrous, entire, 1.0 cm long, 0.40 cm wide; lateral sepals similar to the dorsal sepal, elliptic, connate, free toward the apex, slightly concave, 1.0 cm long,







0.50 cm wide; petals lanceolate, brown to greenish brown, obtuse, glabrous, slightly concave, 0.10 cm long, 0.50 cm wide; lip pyriform, the margins reflexed around the middle forming a tube, light pink fading to white at the apex, with large pink spots, the apical lobes broad, margins minutely erose, with a three-crested, bright yellow callus at the base, minutely pubescent at the base, 0.70 cm long, 1.0 cm wide; the column semiterete, white suffused with pink, with two winglike lobes at the base suffused green, the apex hooded and erose, 0.80 cm long, 0.20–0.30 cm wide, stigmatic cavity concave, 0.15–0.20 wide; anther cap, cucullate, the two yellow pollinia provided with a dark brown stipe, 0.20 cm long, 0.10 cm wide; ovary terete, becoming slightly broader toward the connection to the perianth, 1.40 cm long, 0.10–0.15 cm wide; fruit unknown.

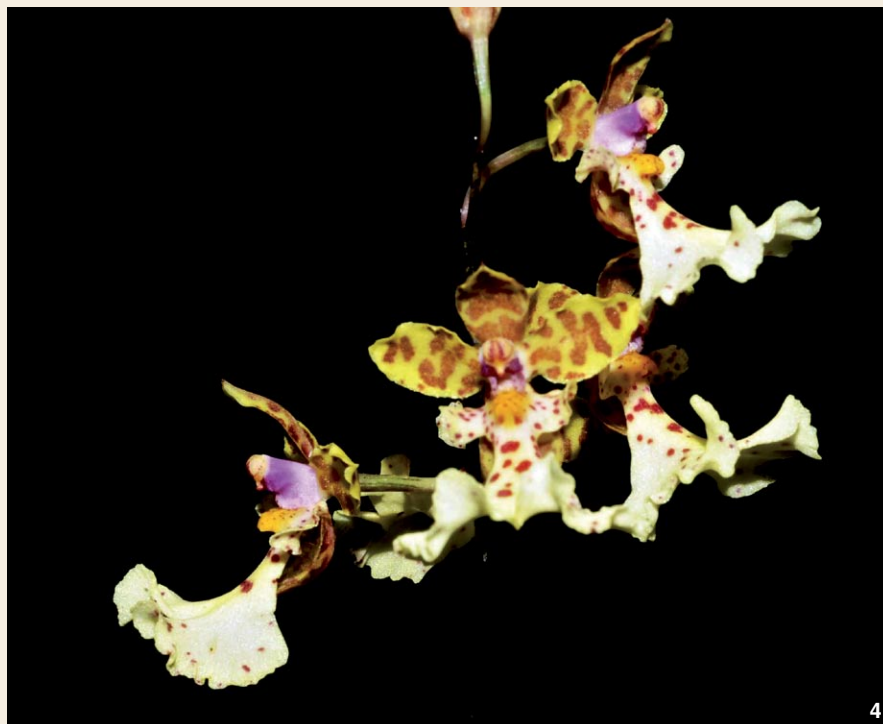
**ETYMOLOGY** Named after the Leipzig-born German botanist Carlos Segismundo Kunth who classified the plants brought from the Americas by Humboldt and Bonpland; Professor of Botany at the University of Berlin and Director of the Botanical Garden (Jørgensen and León-Yáñez 1999).

**DISTRIBUTION** *Caucaea kunthiana* is distributed in the Andes of southwestern Ecuador in the province of Azuay, in the upper part of the highway that leads from the community of Soldados to Chaucha town around 3,400 meters and has also been reported from the province of Cañar, along the highway that leads from the city of Cañar to Gualleturo at 3,100 m, A.Hirtz 2017, 10525, and 10669 samples in alcohol.

**PHENOLOGY** In cultivation the plants bloom sporadically between the months of April and August.

**HABITAT AND ECOLOGY** Generally found growing epiphytically in cold, secondary, cloud forests, occasionally in exposed sites, between 3,000 and 3,500 meters.

**DISCUSSION** *Caucaea kunthiana* is unique in having the smallest flowers in the genus. It is most similar to *Cauc. andigena*, but can be distinguished by the sepal, petal, lip and column morphology. The sepals and petals of *Cauc. kunthiana* are flat with an entire margin (vs. undulate) and greenish brown in color (vs. yellow with broad reddish spots). The lip of the new species can be distinguished by its pyriform (vs. subpyriform) shape, the revolute margins of the disc portion of the lip (vs. weakly revolute) forming a tube (vs. not forming a tube), a callus with three (vs. two) crests, and the white color



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with pinkish spots (vs. yellow with reddish spots). The column of the new species is longer and narrower, a clear pinkish color (vs. white spotted pink), with basal wings that are white with a green margin (vs. white and spotted pink).

**Acknowledgments**

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[3] *Caucaea kunthiana*, prepared sheet of the plant that served as holotype, by H. Medina.

[4] *Caucaea andigena* (Linden and Rchb. f., a species used to compare the new species.

[5] Photograph of *Caucaea* sp. with two flower shapes and colors on the same inflorescence, photographed by H. Medina.

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Williams, N.H. and M.W.Chase. 2001. *Caucaea cucullata*. *Lindleyana* 16(4):283.



NOVEMBER

**2–3—Kansas Orchid Society Fall Show & Sale**, Botanica, The Wichita Gardens, 701 Amidon St., Wichita, KS; Contact: Sarah J. Pratt, 316-655-0572; svcsjp@gmail.com

**2–3—Utah Orchid Society Show**, Red Butte Gardens, 303 Wakara Way, Salt Lake City, UT; Contact: Shawn Quealy, 801-831-7359; shquealy@comcast.net

**8–9—\*Carmel Orchid Society “Fall Orchid Festival,”** Community Church of the Monterey Peninsula, 4590 Carmel Valley Road, Carmel, CA; Contact: Carol Easton, 831-625-1565; eastonce@aol.com

**8–10—Massachusetts Orchid Society Show “World of Orchids – Asia,”** Sons of Italy, 117 Swanton Road, Winchester, MA; Contact: Brigitte Fortin, 617-838-8682; bfortin425@msn.com

**8–10—Triangle Orchid Society Show “Fall for Orchids,”** Doris Duke Center at Sarah P Duke Gardens, 420 Anderson Street, Durham, NC; Contact: Phil Brindle, 919-884-8750; brindlep@frontier.com

**9–10—Ft. Pierce Orchid Society Show “Kaleidoscope of Orchids,”** River Walk Center, 600 N Indian River Drive, Ft. Pierce, FL; Contact: Rita Zeblin, 772-418-7426 (text only); rita2zfpos@gmail.com

**9–10—Niagara Frontier Orchid Society “Orchids Under the Dome,”** Buffalo and Erie County Botanical Gardens, 2655 South Park Avenue, Buffalo, NY; Contact: Donna Lipowicz, 716-479-7698; ladysliper@roadrunner.com

**15–17—Asociacion Vallecaucana de Orquideologia “Caliorquideas 2019,”** Orquideorama, Av 2 N #48-10, Cali, Valle, Colombia; Contact: Maria Del Rosario Malveny, +57-312-843-0462; madelmalveny@gmail.com

**16–17—Deerfield Beach Orchid Society Show “Orchid Obsession,”** Safe Schools Institute, 1790 Spanish River Boulevard, Boca Raton, FL; Contact: Cheryl Babcock, 954-464-8996; crbabcock1@netzero.net

**16–17—Essex County Orchid Society Show & Sale**, Visitation Parish Hall, 5407 Comber Side Road, Comber, Ontario, Canada; Contact: Juliette St. Pierre, 519-727-6343; canadel48@gmail.com

**21–24—Asociacion Altaverapacense de Orquideologia “XXXVI Exposición Internacional de Orquideas, Cobán,”** Convent of Santo Domingo, Anexed to Catedral Church, 1th Avenue 1-31, Zona 1, Central Park, Coban, Alta Verapaz, Guatemala; Contact: Hemuth Ibañez, (502)5204-1846; yiel\_1957@hotmail.com

**30 – December 1, 2019—Saginaw Valley Orchid Society Show & Sale**, Kochville Veterans Hall, 3265 Kochville Rd., Saginaw, MI; Contact: Roland Wilson, 989-600-3437;

rolros67@gmail.com

DECEMBER

**7—\*Mid-Lakes Orchid Society Auction**, Rogers Park, 610 South 9th Street, Leesburg, FL; Contact: Ann Parrish, 407-443-1899; sofbal8888@aol.com

JANUARY

**4–5—Sarasota Orchid Society Show “Orchids in Paradise,”** Sarasota Municipal Auditorium, 801 N. Tamiami Trail, Sarasota, FL; Contact: Marta Hudson, 941-376-7630; martadiazhudson@gmail.com

michaelschaberl@comcast.net

**10–12—Fort Lauderdale Orchid Society Show “The 20/20 Orchid Vision,”** The Greater Fort Lauderdale Broward County Convention Center, 1950 Eisenhower Boulevard, Fort Lauderdale, FL; Contact: Michael Schaberl, 954-683-9615; michaelschaberl@comcast.net

**11–12—Florida West Coast Orchid Society Show**, Seminole Recreation Center, 9100 113th Street, Seminole, FL; Contacts: Bill Nunez, 727-239-2700; biddison22@aol.com

**17–19—Miami Orchid Society’s “Tamiami International Orchid Festival,”** Dade County Fairgrounds Expo Center, Fuchs Pavilion, 10901 Coral Way (SW 24 St.), Miami, FL; Contact: Martin Motes, 305-282-7520; martinmotes@gmail.com

**17–19—North Jersey Orchid Society Show and Sale**, Rutgers University, Douglass Cook Student Center, 100 George St., New Brunswick, NJ; Contact: Carrie Buchman, 201-410-3089; cbuchman@tncb.net

**25—National Capital Orchid Society “40th Annual Paphiopedilum Forum,”** U.S. National Arboretum, 3501 New York Avenue NE, Washington, DC; Contact: Roddy Gabel and Jay Tullos, 301-646-3657; former\_zygote@hotmail.com

**25–26—Cape and Islands Orchid Society Annual Show**, The Resort and Conference Center, 35 Scudder Ave., Hyannis, MA; Contact: Tina Balog, 508-540-5006; tina@plaid.whoj.edu

**25–26—Grand Valley Orchid Society Show**, Frederick Meijer Gardens & Sculpture Park, 1000 East Beltline NE, Grand Rapids, MI; Contact: Mei Ling Clemens, 231-557-2647; meilingclemens@gmail.com

**25–26—Orchid Society of Minnesota “St. Paul Winter Carnival Orchid Show,”** Marjorie McNeely Conservatory, 1225 Estabrook Drive, St. Paul, MN; Contact: Michael Dyda, 612-223-4059; michael1027us@yahoo.com

**25–26—Peninsula Orchid Society Show and Sale**, Community Activities Building, 1400 Roosevelt Ave., Redwood City, CA; Contact: Mike Drilling, 650-692-8998; mike.drilling@

gmail.com

**31—February 2—Susquehanna Orchid Society Show “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

FEBRUARY

**1–2—Madison Orchid Growers Guild “Orchid Quest,”** Olbrich Botanical Gardens, 3330 Atwood Ave., Madison, WI; Contact: Terri Jozwiak, 608-592-7906; lodijoz@charter.net

**1–2—Venice Area Orchid Society Annual Show & Sale**, Venice Community Center, 326 S. Nokomis Ave., Venice, FL; Contact: Carol Wood, 941-497-4995; cwood12@msn.com

**6–9—Deep Cut Orchid Society Show & Sale**, Dearborn Market, 2170 Route 35 South, Holmdel, NJ; Contact: Brenda Pauwels, 732-687-7805; bjpauwels@outlook.com

**8–9—Boca Raton Orchid Society Show “In Love With... Orchids,”** Safe Schools Institute, 1790 NW Spanish River Blvd., Boca Raton, FL; Contact: Carla Lacher, 561-843-6134; cmlacher@hotmail.com

**8–9—Southern Ontario Orchid Society Orchid Show & Sale**, Toronto Botanical Garden, 777 Lawrence Avenue East, Toronto, Ontario, Canada; Contact: Cathy Dunn, 416-697-8747; show@soos.ca

**14–16—Asociación Orquideologica de Escazú “Festival de Orquideas Escazú 2020,”** Avenida Escazú, Escazú, San Jose, Costa Rica; Contact: Gabriel Antich Artavia, (506) 8874-5558; di.rbzam@gmail.com

**14–16—Batavia Orchid Society Show**, DuPage County Fairgrounds, 2015 Manchester Rd., Wheaton, IL; Contact: Larry Sexton, 630-406-8460; orkidoc@aol.com

**15–16—Miami Valley Orchid Society Show**, Cox Arboretum MetroPark, 6733 Springboro Pike, Dayton, OH; Contact: Kristen Mason, 513-502-5408; orchidbiochem@aol.com

**15–16—Orchid Society of Highlands County “Orchids From the Heart,”** Agri-Civic Center, 4509 George Boulevard, Sebring, FL; Contact: Susie Whitehead, Lori Coon, Marlen Martinez, 863-446-0189; cmghmartinez@gmail.com

**15–16—Port Saint Lucie Orchid Show “Orchid Jungle Book,”** Port Saint Lucie Botanical Gardens, 2410 SE Westmoreland Blvd., Port Saint Lucie, FL; Contact: Claudia Young, 757-879-2142; oma.young@ymail.com

**20–23—San Francisco Orchid Society “Pacific Orchid Exposition,”** Hall of Flowers at Golden Gate Park, 1199 9th Avenue, San Francisco, CA; Contact: James Carmichael, 415-307-1442; dexdah@yahoo.com

**21–23—St. Croix Orchid Society Show “20/20 A Vision of Orchids,”** St. George’s Botanical



Gardens, 127 Estate St. George, Frederiksted, USVI; Contact: Michelle Thurland-Martinez, 340-690-1330; mmthurland@gmail.com

**21-23—Virginia Orchid Society Show “PICTURE THIS,”** Strange’s Florists, Greenhouses and Garden Center, 12111 West Broad Street, Richmond, VA; Contact: Gary Marshall, 412-521-2877; g.marshall@chatham.edu

**22-23—Amherst Orchid Society Show,** Smith Vocational and Agricultural High School, 80 Locust St. (Rt. 9), Northampton, MA; Contact: Marc D. Gray, 802-348-7926; bulbophyllum@myfairpoint.net

**22-23—Greater Lansing Orchid Society Orchid Show,** Michigan State University, Plant & Soil Sciences Bldg., 1066 Bogue St., East Lansing, MI; Contact: Peter Ostlund, 517-449-5248; p.ostlund@yahoo.com

**22-23—Naples Orchid Society Show,** Naples Botanical Garden, 4820 Bayshore Drive, Naples, FL; Contact: Richard Pippen, 239-775-5220; rpippen@comcast.net

**29-March 1—Orchid Society of the Royal Botanical Gardens “39th Annual Orchid Show,”** Royal Botanical Gardens, 680 Plains Road West, Burlington, ON, Canada; Contact: Ben Boers, 905-979-4886; bmboers@hotmail.com

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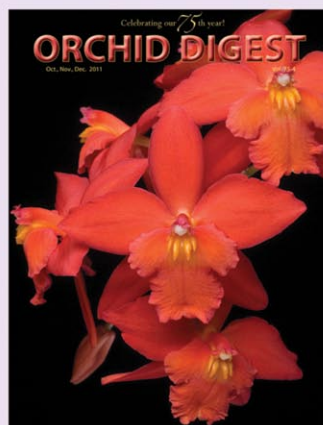
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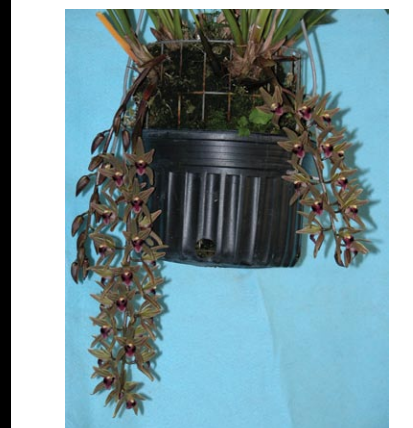
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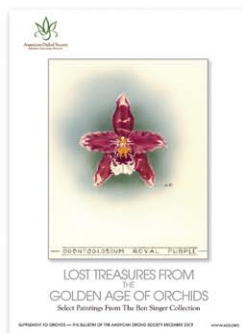
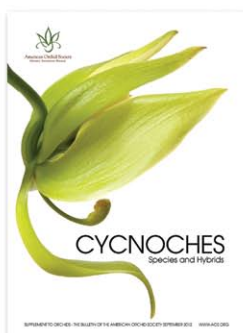
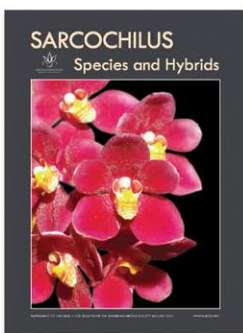
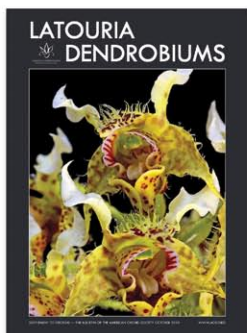
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The AOS welcomes the submission of manuscripts for publication in *Orchids* magazine from members and non-members alike. Articles should be about orchids or related topics and cultural articles are always especially welcome. These can run the gamut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

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# Orchid Modern: Living and Designing with the World's Most Elegant Houseplants

Marc Hachadourian. 2019. Timber Press, Inc., Portland, Oregon. Softcover. 248 pages. \$24.95.

MARTHA STEWART SAID it best: “Marc’s engrossing and beautiful book is useful for all of us, novice and experienced orchid lovers alike.” The “Marc” Ms. Stewart is referring to is Marc Hachadourian, Curator of the Orchid Collection at the New York Botanical Garden (NYBG) and author of the new book, *Orchid Modern: Living and Designing with the World’s Most Elegant Houseplants*.

This sophisticated book is well-organized into essentially three sections. It opens with a brief, reader-friendly history of cultivation, orchid anatomy and taxonomy. A chapter on how to keep orchids happy and healthy follows. Hachadourian encourages readers to imagine themselves orchids growing on a branch in the tropics — it is a charming visual — to introduce their basic cultural needs. He then dives deeper into light, air, water, humidity and nutrient requirements. He is especially generous with his coverage of media selection, repotting and dividing orchids, devoting some 20 pages, including spot-on pictorial tutorials. Following a brief section on identifying plant problems, Hachadourian includes a seasonal task-based care calendar.

What distinguishes this book from others found in orchid libraries is the content found in its middle. The man who has amazed thousands of visitors at the annual orchid extravaganzas at the NYBG with inspiring orchid super trees, orchid chandeliers and orchid promenades masterfully showcases how to present orchids in the home. Hachadourian shares step-by-step instructions to create 10 dramatic orchid displays — terrariums, wreaths, mobiles, centerpieces, bonsai trees. He also demonstrates the arts of kokedama, a traditional Japanese way of displaying plants, and penjing, the Chinese way of using decorative or sculptural rock, to create striking minimalist designs. These how-to tutorials (including materials lists) are captured each step of the way in right-sized photographs. I expect this section will inspire readers’ creativity and style, not only in their own homes, but the next time they put in an individual or society

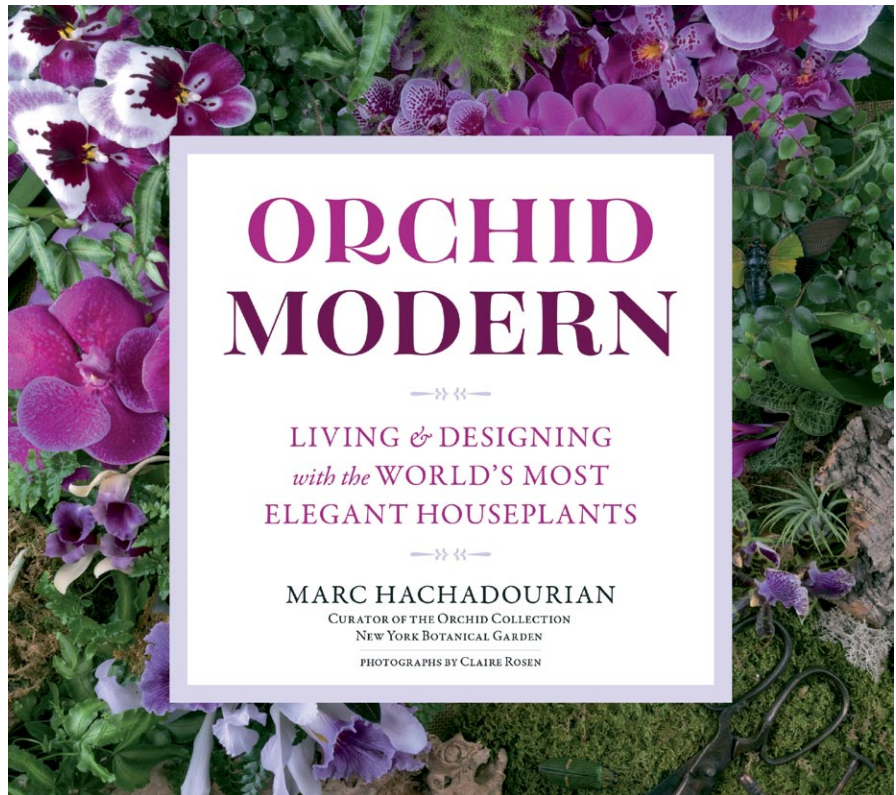
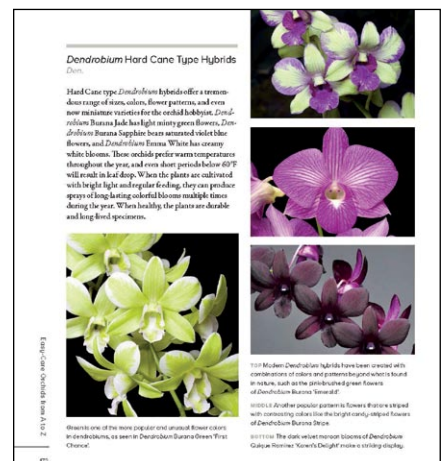


exhibit at their local orchid show.

The book’s final section is a helpful and interesting easy-care reference of 120 orchids from A to Z. This photographic survey includes growth habit and culture information about many species and hybrids spanning the most popular genera. In addition to the typical orchid descriptions, Hachadourian also imparts which plants are appropriate for individual growing conditions and skill levels. The book concludes with useful lists of plant vendors, public gardens with orchid displays and orchid organizations and online forums.

*Orchid Modern* is both sophisticated and instructive, thanks to the author’s proven experience in orchid cultivation and horticulture display. The layout and production are pleasing and easily accessible. It is generously illustrated with beautiful photography, primarily contributed by well-known photographer Greg Allikas (orchidworks.com). The frequent use of sidebars effectively catches the eye of the reader to



- [1] Dust jacket cover courtesy of Timber Press.
- [2] Hard cane dendrobiums are popular subjects for orchid growers for their free-flowering habit and colorful bloom. Hachadourian provides culture notes and growing tips for this and other genera in *Orchids Modern*. Photographs by Greg Allikas.





deliver complementary enlightening information.

I agree with Ms. Stewart. *Orchid Modern* will appeal to orchid lovers of all types, whether seekers of easily understood how-when-and-where cultural information or unforgettable visual

and horticultural design statements.

— *Jeanne Buchanan, 201 2nd Street, Boerne, Texas 78006 (email: jeanne@folioco.com)*

[3] Instead of having to miniaturize a tree, Hachadourian shows you how to create a miniature tree of orchids. Photograph by Claire Rosen, courtesy of Timber Press.



