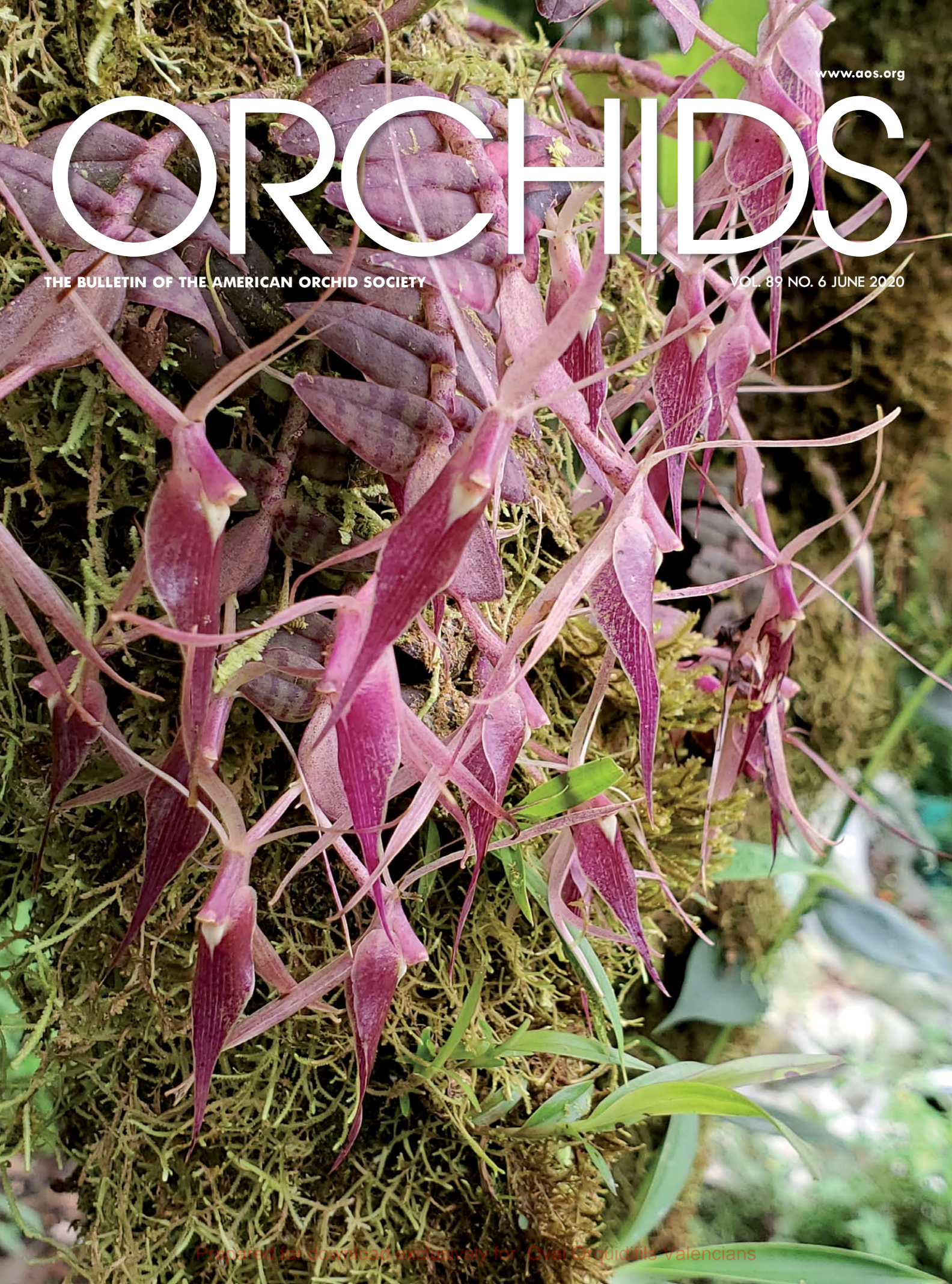


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ORCHIDS

THE BULLETIN OF THE AMERICAN ORCHID SOCIETY

VOL. 89 NO. 6 JUNE 2020



Join us July 30th through August 1st, 2020 for an event featuring two days
of presentations on history, hybridizing, culture, and other
activities including AOS judging

10th Annual Odom's Orchids **CATTLEYA** **SYMPOSIUM**

Scheduled Speakers:

Jeff Bradley

John Finer

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Fred Clarke

Bill Rogerson

Jim Roberts

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and more!

Thursday Evening

Get to know your
fellow Cattleya
enthusiasts and enjoy
complimentary pizza!

Bic.
Albert Turner
'Odom's Orchids'

Friends and Cattleya Enthusiasts,

For everybody's safety during the Covid-19 epidemic, we have canceled our 2020 Cattleya Symposium. We are determined to assemble the same outstanding slate of speakers for next year and we look forward to seeing you in 2021 at Odom's Orchids Cattleya Symposium.

**Please take care,
Odom's Orchids**

ORCHIDS

The Bulletin of the American Orchid Society

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CONTENTS

June 2020 Volume 89 Number 6



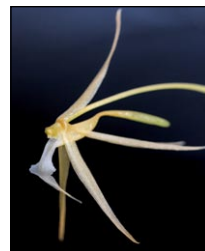
426



448



458



484

FEATURES

448 COLOMBIAN ORCHIDS

A Few Jewels of Colombia's Warm, Intermediate and Cool Habitats
Judith Rapacz-Hasler

452 REQUIEM CANCELED

Winner of the 2019 Dillon-Peterson Essay Contest
Daniel Duda

456 ORCHIDS IN WATERCOLOR

Dendrobium Snow Bells
Marcia Whitmore

458 SMALL-FLOWERED PHALAENOPSIS

Part 3. The Crossover Hybrids
Andrew Coghill-Behrends

DEPARTMENTS

Tom's Monthly Checklist 424

June: The Month of the Gift
Thomas Mirenda

Collector's Item 426

The Many Faces of Coelogyne
Charles Wilson

GREATideas 430

A Simple Method for Reducing Seed Loss After Capsule Dehiscence
Alfonso Doucette

New Rufugium Botanicum 432

Vanda tricolor var. suavis
Gustavo Rojas-Alvarado and Franco Pupulin
Watercolor by Sylvia Strigari

Conservation Committee 436

The Rest of the Story! Part 2
Thomas Mirenda

Orchids Illustrated 440

Japanese Orchids
Peggy Alrich and Wesley Higgins

Awards Gallery 468

Lindleyana 484

Rare and Threatened Orchids of Central Africa. Part 1
Murielle Simo-Droissart, Tariq Stévant, Bonaventure
Sonké and Vincent Driossart

In This Issue

AOS MEMBERSHIP INFORMATION 418

AOS DIRECTORY OF SERVICES 418

PRONUNCIATION GUIDE 419

WEBINARS 419

AOS NATIONAL VOLUNTEERS 420

GIFTS OF NOTE 421

PRESIDENT'S MESSAGE 422

SELECTED BOTANICAL TERMS 435

USEFUL TIPS 435, 492, 494

CALENDAR 491

ORCHID MARKETPLACE 493

ORCHIDS CLASSIFIEDS 493

AD INDEX 495

DILLON-PETERSON ESSAY ANNOUNCEMENT 455

PARTING SHOT 496

How to Grow Healthy, Happy Scale and Mealybugs
Deborah Dillon-Townes

SITF **Inside Back Cover**
How the SITF Does its Work
Ron McHatton

FRONT COVER

Endemic to Colombia and only described in 1967 by Leslie Garay, this spectacular miniature orchid grows in damp montane and premontane forests between 2,000 and 5,600 feet (600–1,700 m). The purple-marked foliage is beautiful even without flowers; much like the foliage of *maudiae*-type *paphiopedilums*. Photograph by Judith Rapacz-Hasler.

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A 501(c)(3) Nonprofit Organization Founded in 1921

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

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The American Orchid Society provides leadership in orchids

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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>.

amabilis (a-MAH-bee-liss)
amboinensis (am-boy-NEN-sis)
anamense (an-a-MEN-see)
Ancistrorhynchus (an-sis-tro-RIN-kus)
andreettae (an-dre-ETT-tee)
Angraecopsis (an-gray-KOP-sis)
Angraecum (an-GRAY-kum)
angustum (an-GUS-tum)
aphrodite (ah-froh-DYE-tee)
appendiculata (ap-en-dik-yew-LAY-ta)
asperata (as-per-AY-ta)
astroarche (as-tro-ARE-kay)
aurantiacum (aw-ran-tee-AY-kum)
barbata (bar-BAY-ta)
Bletilla (bleh-TILL-la)
boxallii (boks-AL-ee-eye)
Bulbophyllum (bul-bo-FILL-lum)
Calyptrochilum (kal-ip-tro-KYE-lum)
chioneum (kye-OH-nee-um)
Cremastra (kree-MASS-tra)
cristata (kris-STAY-ta)
crystalensis (kris-tal-EN-sis)
cumingii (come-ING-ee-eye)
cundinamarca (kun-dee-na-MAR-ka)
Cymbidium (sim-BID-ee-um)
Cyrtorchilum (sir-toe-KYE-lum)
Dendrobium (den-DROH-bee-um)
Dendrophyllax (den-droh-FYE-laks)
Diaphanathe (dye-aff-an-AN-thee)
dolabriformis (doe-lab-rih-FOR-miss)
Dracula (DRAK-yew-la)
Dystylodon (dih-stih-LOH-don)
Epidendrum (ep-ih-DEN-drum)
escobarianum (es-koh-bar-ee-AY-num)
falcata (fal-KAY-ta)
Fernandezia (fer-nan-DEZ-ee-a)
fimbriatum (fim-bree-AY-tum)
finleyi (FIN-lee-eye)
fischeri (FISH-er-eye)
flaccida (FLAS-sih-da)
flexuosa (fleks-yew-OH-sa)
fuliginosa (ful-ij-in-OH-sa)
fuscoroseum (foos-koh-ROSE-ee-um)
fuscoviride (foos-koh-VEER-ih-dee)
garayana (ga-ray-AY-na)
gigantea (jye-GAN-tee-a)
goeringii (gur-RING-ee-eye)
Gomphicis (gom-FIK-iss)
Goodyera (good-YEAR-ah)
Habenaria (hab-ih-NARE-ee-a)
holochila (hoh-loh-KYE-la)
incrassata (in-kras-SAY-ta)
japonica (ja-PON-ih-ka)
kanran (KAN-ran)
laichanum (lye-CHOW-num)
Lepanthes (leh-PAN-theez)
leucophaea (loo-koh-FAY-ah)

lindenii (lin-DEN-ee-eye)
lisowskii (lis-OW-skee-eye)
lizae (LEE-za-ee)
lobbii (LOB-ee-eye)
lueddemanniana (loo-dee-mann-ee-AY-na)
Masdevallia (mas-deh-VAIL-ee-a)
microglossus (mye-kroh-GLOSS-us)
moniliforme (mon-il-ih-FOR-me)
nitida (NIT-id-a)
Oncidium (on-SID-ee-um)
ovalis (oh-VAY-liss)
oxypetalum (oks-ee-PET-a-lum)
pandurata (pan-dur-AY-ta)
Paphiopedilum (paff-ee-oh-PED-ih-lum)
parishii (pair-ISH-ee-eye)
Peristylus (pair-ih-STY-luss)
Phaius (FYE-us)
Phalaenopsis (fail-en-OP-sis)
Phragmipedium (frag-mih-PEED-ee-um)
Pinalia (pye-NAL-ee-a)
Platanthera (plat-AN-ther-a)
Pleurothallis (plur-oh-THAL-liss)
prolifera (pro-LIH-fer-a)
radicans (RAD-ih-kanz)
rimestadiana (ryme-shtad-ee-AY-na)

rochussenii (row-chew-SEN-ee-eye)
sagittifera (saj-ih-TIF-er-a)
sanderæ (SAN-der-eye)
sanguineum (san-GWIN-ee-um)
schilleriana (shill-er-ee-AY-na)
schlechtendaliana (shlek-ten-dal-ee-AY-na)
schlimii (SHLIM-ee-eye)
schuetzei (SHEW-tseye)
sinensis (sin-EN-sis)
sonkeanus (sawn-kay-AY-nus)
Spiranthes (spy-RAN-theez)
Stelis (STEE-liss)
striata (stree-AY-ta)
suavis (SWAH-viss)
swaniana (swan-ee-AY-na)
tankervilleae (tank-er-VILL-ee)
taronensis (tair-on-EN-sis)
Telipogon (tell-ih-POH-gon)
tetracopis (tet-ra-KOP-sis)
tricolor (TRY-kuhl-er)
vampira (vam-PEER-ah)
Vanda (VAN-da)
venosa (vee-NOE-sah)
villosum (vill-OH-sum)
violacea (vye-oh-LAY-see-a)

Webinars-Coming Attractions!






When	June 11, 2020 8:30pm EST Thursday	June 16, 2020 8:30pm EST Tuesday	June 23, 2020 8:30pm EST Tuesday	RECORDED WEBINARS at your convenience
Topic	Best Practices Series Culture Secrets of Growing Award-Worthy Slipper Orchids	Greenhouse Chat (Orchid Q&A) <i>Send in your Questions!</i>	How to Successfully Grow Coelogyne	Culture, Judging, Pests and Diseases, Greenhouse Chats indexed by topic
Presenter	Graham Wood AOS Judge, Founder Lehua Orchids, Slipper Orchid Hybridizer	Ron McHatton Chief Education and Science Officer	Charles Wilson AOS Judge, Committee Member Education and Conservation	AOS Members, Judges, Concerned Conservationists, Scientists & More

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

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Webinar announcements are posted to Facebook, Instagram and in the AOS Corner of your Affiliated Society's newsletter.
 We digitize the webinars and they are available to view at your leisure.
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PRESIDENT'S MESSAGE

AS MANY OF you already heard, the Spring 2020 AOS members meeting was postponed due to COVID-19 (coronavirus). I must tell you this was not an easy decision. The California Sierra-Nevada Judging Center (our hosts for this event) wanted attendees to feel comfortable about attending and not worry. As I write this message, California is under stricter guidelines for group gatherings that seem to change daily. The judging center, with the help of Naya Marcano at Headquarters, is working with the hotel on new dates for a meeting. Once it has been decided, we will disseminate information. Right now, I can tell you we are **not** looking at June, July or August. I hope all of you stay healthy.

One group of AOS volunteers that is always working, and they have to or we would not have our wonderful *Orchids* magazine to read each month, is our Editorial Board. Jean Allen-Ikeson is the chair of this board and this is what she wanted you to know about them.

“Ever consider how our award-winning *Orchids* magazine arrives at your door or on your laptop each month? Probably not! The filling between the slices of columns and the awards pages needs engaging and varied content. The primary job of the Editorial Board is to provide as much of this content as is needed. We are the worker bees buzzing around behind the scenes.

We are the group that supports *Orchids* magazine and its annual *Supplement*. This includes sourcing articles or pitching ideas to authors and assisting them, writing articles for the magazine, sourcing photographs or providing photographs, editing or proofreading articles and assisting the Editor, Ron McHatton, who makes the magazine glorious with a mix of artistry and science.

Members have been selected for their skills in any or all of these jobs. Equally essential, they are often someone that has contacts in the orchid world, travels or explores possibilities for articles at their own expense, perhaps is an orchid judge, exhibits regularly in shows, or is an expert on orchid culture, conservation, taxonomy, etc. Such skills and contacts help generate articles. Additional professional experience in publishing, writing or photography

is an asset. Procrastination is not in our vocabulary! The magazine cannot be sent back to committee for further consideration next month!! The show must always go on!

Orchids magazine is an award-winning professional publication and requires far more work and time discipline than a society newsletter. The Chair of the Editorial Board is the funnel through which many of the articles flow to the Editor. The Chair works with the Editor when there is a question on an article's suitability, and provides support and assistance to the Editor when needed. As far as is practical, the Chair tries to assure that editing is in line with the Style Guide for AOS Publications, as published on aos.org, before articles reach the Editor so that he can get on with the job of delighting you each month with a beautiful and informative magazine.

Jean Allen-Ikeson, born in Houston but transplanted to Ontario, Canada, is Chair and writes many articles, requests articles and works with authors, and sources and pre-edits most of the *Supplement* besides coordinating with the Editorial Board members and the Editor. Greg Allikas, the previous Chair who set an example for professionalism in photography for *Orchids* and who now lives in North Carolina, is generous with professional photographs or making others publication-ready. Sue Bottom is our ever-popular writer in northern Florida that adds original insight and innovation to culture articles. She is a legend. Nile Dusdieker from Iowa has been a star in sourcing articles from around the world and writing some wonderful pieces including the summary of the Annual Awards to the best of judged orchids, culture and exhibits. Wes Higgins, another Floridian, lends a bit of science and orchid history. Carol Klonowski keeps the pulse of orchids in California and writes about the FCCs for the April issue. Larry Sexton, an Illinois orchid enthusiast, does proofreading, writing and keeps reminding the



WES NEWTON

Jean Allen-Ikeson addresses the meeting of members in Apopka, Florida.

editor about the importance of culture. Judith Hasler-Rapacz is our newest member who spent most of her life in genetic research with her late husband in Wisconsin. You may know her as the past Editor of the Slipper Orchid Alliance Newsletter. She speaks, reads and writes German fluently so has been tapping the European orchid 'scene' and providing wonderful translations. Laura Newton, the Awards Registrar, is a liaison to the Editorial Board and, besides writing insightful and in-depth articles (wait until you see the 2020 *Supplement*!), keeps an eye out for plants or growers that might be the inspiration for an article.”

We thank this wonderful group for all of their hard work making our magazine one of the best orchid magazines in the world. During this time when we are all staying home a lot more than we want, it is a good time to get caught up reading back issues and looking at the AOS webinars on www.aos.org, along with getting a head start on repotting all of those orchids you have!

— Susan Wedegaertner, AOS President
(email: susan@aos.org).



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June: The Month of the Gift

Text and photograph by Thomas Mirenda

AFTER MONTHS OF sequestering in place and social, if not virtual, isolation, most of us are ready to return to our old reality. But will that ever really be possible again? There has been a seismic shift in humanity's awareness and I believe it is leading us to the next evolutionary step for our species. No matter how you may feel about what has happened these last few months, there is no question that it has changed us. We are now conscious of every time we touch our face, every item we weigh in a grocery store or handle in a hardware store, and we all have new sensibilities towards our friends and neighbors, let alone strangers! Will we feel safe doing something as simple as shaking hands with a new acquaintance ever again?



Thomas Mirenda

I genuinely hope we will not be living in a hypersanitary world where the importance of human contact is forgotten or it is deemed too dangerous to engage with others. Indeed, such a hermetically sealed world will have its own set of dangers socially, psychologically and epidemiologically! I for one, would not want to live in a world where I could never go to another orchid show! A fate worse than death, in my opinion.

I choose to look at this strange time as a "gift." When before in our lifetimes have we been able to simply stop and take stock of our lives? Take time to assess who we are and what we want out of our existence? This time, used thoughtfully, might be truly transformative for many of us, and quite possibly for humanity itself. Orchids have proven to be an important part of maintaining my spirit and survival mechanisms. As you repot this month, show your gratefulness to Mother Earth by giving (virus free) divisions of orchids to your interested friends, and donations to organizations that seek to protect Her, such as the Orchid Conservation Alliance, NAOCC and the Conservation Committee of the American Orchid Society.

BOTANICAL DISTANCING Now, as the growing season is getting underway, and most of your orchids have lovely new



An exceptionally dark form of what appears to be *Cyripedium calicola*.

growths developing, it is a good time to space your plants so that they are not overcrowded and partially shaded by other more aggressively growing plants. We are entering a time when there will be fewer flowers to enjoy, but it may be the most crucial time toward the development and strengthening of your plants, which when taken seriously, will increase both the quantity and quality of your blooms in season. Make sure plants have all the space they need to flourish into beautiful specimens.

AVOIDING CONTAGION In addition to allowing adequate space for optimal growing, keeping plants too close together increases risk of passing on viruses, insect infestations, fungal rots and bacterial pathogens. In addition to spacing, intimate examinations while repotting can reveal many hidden threats to your collection's health. Often these problems, which may not have revealed themselves while plants were in semidormancy over the winter, will explode as growing conditions improve this month. Do not allow pathogens to get a hold of your precious new growths. Work hard at

eliminating any hitchhikers with a spray, if outside, or a systemic insecticide, if inside out of the reach of natural pollinators.

BRING OUT YOUR DEAD This has always been a personal foible of mine, and many others, I think. I will often hold on to a plant that is pretty clearly dead or dying for a few months (or to my shame, more) in the hope that it will somehow miraculously resprout and flourish again. No matter how precious it was to you, it is best to get it over with and get it out of your growing area. Although I have heard tales of astonishing recoveries, I believe these to be literally one-in-a-million occurrences. Do yourself a favor and release these poor tortured plants to the abyss, and who knows, you may see them again someday in orchid heaven.

NATIVE ORCHIDS Most everyone I know who loves plants has turned to their gardens now for fun and entertainment. I suspect many of us will have better gardens this year than ever before because of all the attention they are getting. This is a time of year when many garden orchids are happily growing in your backyard. Many forms of *Bletilla striata*


and its relatives and hybrids are blooming now in purple, white, yellow, and even blue shades. Certain cypripediums and calanthes are also fabulous in the garden this time of year. And if you are intrepid enough to make a bog garden, you can have a fabulous display of calopogons, platantheras and rose pogonias for as long as social distancing lasts. Cherish and enjoy these amazing orchids Mom Nature has gifted us.

— Thomas Miranda 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 (email: biophiliak@gmail.com).

HOME REMEDIES

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

— Aspirin (just ¼ of one 325 mg tablet per gallon of water) helps protect plants from fungal and viral pathogens when used as a spray. More is NOT better. Do not exceed this amount.



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COLLECTORS' ITEM

The Many Faces of *Coelogyne*

Text and photographs by Charles Wilson





2

WE SO OFTEN read orchid articles that start with the old saw “There is so much variability in this genus that generalities cannot be made. . .” that we get a bit numbed by the words and tend to look for (and sometimes even think we find) generalities that may not really exist. For what it is worth, the genus *Coelogyne* really does fulfill the old saw. Generalities with *Coelogyne* can lead to fatalities. The genus is distinguished by its arched column, creating a hollow between it and the lip with its upright side lobes, and the saccate or subsaccate base of the lip.

Consider that the 188 or so species in this broadly Southeast Asian genus develop and grow inflorescences in five different manners. Inflorescences can be

1. heteranthous, or from the base of mature pseudobulbs. When the flowers fade and the inflorescence turns brown, it can be removed.
2. hysteranthous, or from the apex of mature pseudobulbs. When the flowers fade and the inflorescence turns brown, it can be removed.
3. persistent or multiyear, a type of hysteranthous inflorescence that blooms apically from mature pseudobulbs and that continue blooming multiple times over several years. Do not remove the inflorescence until it turns brown as it can bloom for multiple years.

4. proteranthous or before-the-pseudobulb, in which the new basal growth produces an inflorescence that blooms before leaves are apparent and continues growing after blooming to become a new pseudobulb. Remove when inflorescence turns brown.
5. synanthous, or with-the-leaves, in which the new basal growth blooms at the same time that it grows leaves and continues growing along with development of the new pseudobulbs. Remove the inflorescence when it turns brown.

Most coelogyne have a lovely fragrance and although there are some that are quite colorful, most species are beautifully white or light green with distinctive and colorful lip features.

Flower sizes can vary from ¼ inch to 5 ½ inches (1–14 cm) in diameter. This variability is a reflection of the diverse range — from the frosty slopes of the Himalayas in northern India extending east through the muggy tropics of New Guinea and beyond to the islands of Fiji.

That being said, are there any shortcuts to simplify their cultural requirements? From my limited but continuing-to-learn experience, there are basically two types of growing patterns that should be closely considered in the cultivation of

[1] *Coelogyne flaccida* sends out fragrant, arched inflorescences from the base of mature pseudobulbs. The inflorescences do not grow further after blooming (they are heteranthous) and may be removed when brown.

[2] *Coelogyne cumingii* at the Tenom Orchid Center in Borneo, a large plant with very fragrant flowers, it grows best in dappled light under warm conditions and watered all year.

coelogyne.

COOL GROWERS Most often occurring at higher elevations, these species need a cooler nighttime temperature throughout the year in addition to preferring drier conditions in the winter. If kept too warm at night, these species may grow very well vegetatively but seldom bloom, if at all. The cooler-growing species include *Coelogyne barbata*, *Coelogyne fimbriata*, *Coelogyne flaccida*, *Coelogyne flexuosa*, *Coelogyne ovalis*, *Coelogyne fuliginosa*, *Coelogyne nitida*, *Coelogyne prolifera*, *Coelogyne cristata* and *Coelogyne swaniana*.

WARM GROWERS Most often found at lower elevations, closer to the equator or under more tropical conditions, these species need warmth and water throughout the year. If kept



[3] *Coelogyne flexuosa* 'Jolah's Chasus' CHM/AOS is an excellent example of a hysteranthis species in that it blooms from the apex of a mature pseudobulb (before the next growth). After flowering, the inflorescence does not continue to grow, turning brown, and may be removed. The species has flowers that are similar in flower to *Coelogyne flaccida*, except that species produces heteranthis inflorescences.

[4] *Coelogyne pandurata*, one of the largest species, with very fragrant flowers 5 ¼ inches (13.2 cm) wide, sends out its magnificent inflorescences from the apex of new growth before the appearance of any leaves (proteranthis, or before the leaves) and the developing growth continues growing after flowering to become a mature pseudobulb.

[5] *Coelogyne schilleriana*, an oft-overlooked species with abruptly backswept lateral sepals, has single flowers up to 3 inches (7.5 cm) tall on a plant that is itself not much bigger. The inflorescences of this species are synanthis (opening at the same time that the leaves start to grow with the growth continuing after flowering to eventually become a mature pseudobulb). When dead and brown, the inflorescences may be removed.

[6] *Coelogyne incrassata*, a warm-growing Indonesian species with incredible purple-suffused foliage, not only blooms from atop mature pseudobulbs (hysteranthis), but the inflorescence is persistent, blooming regularly for several years on the same continuously growing inflorescence. Do not remove these inflorescences until they are brown and you are sure they are dead.



too cool, these species may grow very well vegetatively but seldom bloom, if at all. The warm-growing species include *Coelogyne asperata*, *Coelogyne incrassata*, *Coelogyne pandurata* and *Coelogyne rochusenii*.

Sadly, it seems that unless one can provide two such distinct growing zones, it is most likely that the grower will not be able to reliably flower representatives of both groups.

Those species found at high altitudes (e.g., *Coelogyne taronensis* thrives at 11,500 ft [3,500 m] in southern Yunnan, China) have an even more restricted temperature range and if conditions are too warm they may not even survive.

So, how are we to know the requirements for our latest acquisition? There have only been two treatises written on this genus in this century (Dudley Clayton's *The Genus Coelogyne*, 2002, in English, and George's 2011 *Les Coelogyne* in French, both available by searching online).

Today there are also many internet resources available (e.g., www.orchidspecies.com). It just takes the time to search for the needed information.

CULTURAL NOTES Coelogyne are finely rooted and quite often very slow



6

growing. A fine bark mix with ample drainage works well, allowing for more frequent watering. Species with long rhizome sections between pseudobulbs appear to do better when grown in large baskets or rafted (mounted horizontally rather than vertically) on a totem to accommodate their naturally elongate and often pendent growth habit.

— Charles Wilson, retired Director of the Memphis Zoo, is an accredited AOS judge in the Pacific Northwest Judging Center and has been growing

orchids for over 40 years. He and his wife Susan, also an AOS judge, are members of both Conservation and Education Committees and he serves on the SITF. They have led many safaris worldwide to support conservation.



Charles Wilson

His orchid interests vary, *Bulbophyllum* to *Paphiopedilum*, and about everything in between (email: zoomeritus@gmail.com).

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A Simple Method for Reducing Seed Loss after Capsule Dehiscence

WHEN A FIRE ravaged my home in October 2019, I was fortunate enough to have the surviving portion of my collection maintained by a local greenhouse while the house was rebuilt. One of the challenges I encountered during this time was finding a way to gather the seed from the fruits that were maturing on my orchids.

At home, I had the luxury of being able to check on the capsules daily in the wine coolers upstairs and the growth chambers in my basement. I tried to replicate this practice for the first few months my collection was off-site. I would visit my collection three or four times a week to try and catch the capsules before they split with mixed success. I knew I needed to think of something special when the capsule on my *Dracula vampira* approached three-months' maturity because I did not want to lose the seed.

The challenge the *Drac. vampira* capsule posed was the difficulty in determining when the immature capsule would be ready to harvest if I decided to harvest it green. If you harvest a capsule too early it will not have viable embryos. I prefer to harvest dry seed because of the difficulty in determining maturity of green capsules and because of anxieties I have about them splitting, spoiling or smashing in the mail on their way to be flaked. It feels much simpler to mail dry seed in an envelope. However, harvesting dry seed poses its own problem due to the impossibility of predicting the exact date a capsule will dehisce. There are some subtle tells like a change in color, texture or both of the capsule that indicate it is close to splitting, but these can be difficult to read; it may be days or weeks before the capsule actually splits, and the changes are not obvious for every species.

My practice until recently was to wait for the moment the lines of dehiscence started to part. Once that happened, I would cut the fruit and leave it on a sheet of white paper that was folded over lengthwise to protect the capsule from disturbance and the seed from blowing away while it dried. In about 24 hours, the capsules for most of the Pleurothallidinae I work with are sufficiently dried and have released their seed. The bright thought I had about how to gather seed from my *Drac. vampira* was to wrap the capsule up in polyester thread! I suspected that this



would allow the time I needed to get to the capsule before it dehisced completely.

I had no idea if this would work or if the thread might cause the capsule to rot under the humid greenhouse conditions. Fortunately, the capsule did not rot, and it was bound tightly enough to keep the capsule from splitting open completely. This has resulted in my current practice of wrapping capsules in polyester thread (Singer thread, 150 yards, white or black)

[1] Blossoms of *Dracula vampira* ('Walter' × ['HH' × 'Tyler']) that I won at a raffle table in San Francisco at a meeting of the Pleurothallid Alliance. The plant is a seedling from the breeding of John Leathers and has well-defined stripes in addition to the great size of the blooms.

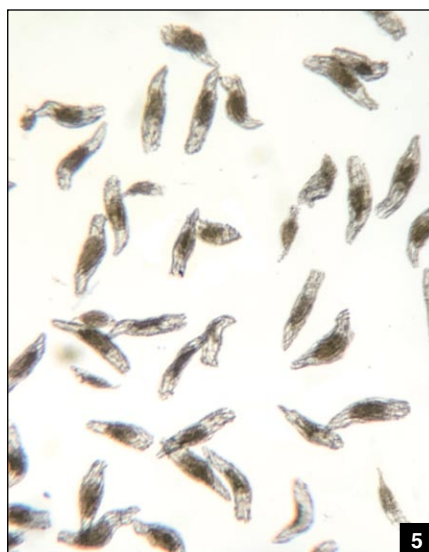
to hold the capsules shut long enough for me to get to them.

For capsules under an inch long, I start by running a few loops around the point of connection of the pedicel to the ovary and then loop tightly enough so that little of the actual capsule is visible. For larger capsules, I do not make the loop around the base. I wrap all the way up leaving a small portion free near the apex. I finish the wrap with a few tight loops and a few overhand knots around the dried perianth parts or tied back to the other end if knots around the perianth are difficult. I wrap polyester thread around the capsule at the earliest expected date of dehiscence — after three months for *Pleurothallidinae*.

The space I like to leave around the base of the capsule is helpful because it allows you to observe when the capsule has split. I have found that the capsule can be left wrapped for at least a month as in the case of the *Drac. vampira* capsule included in the photographs. I check these wrapped capsules weekly and they appear to have a high yield of viable embryos even if they remain wrapped up for, presumably, a few days after splitting. I expect for this technique to be useful for a wide range of orchid species and hybrids.

Other materials in addition to polyester thread, like cotton thread or fishing line, might be used, but I have not tried these. My preference for polyester thread comes from years of using that material to tie my plants to their mounts. I found that it worked just as well as fishing line and it is cheap, readily available — I purchase mine from a nearby drugstore — and does not break down as quickly as cotton thread. I also considered using tea bags because they breathe, but these are too large for some of the small species I work with, and improperly shaped for some of the larger species I work with. Tea bags also seem like they would have the added risk of losing more seed than is necessary upon removing the split capsule from the sack.

— Alfonso Doucette, PhD, speaks internationally for orchid societies and conferences on a range of subjects including systematics and cultivation of pleurothallids and growing orchids in wine coolers. He received a doctorate in botany from the University of Wisconsin–Madison and completed a bachelor of science at Cornell University in plant sciences. Alfonso is also a member of the AOS species identification task force (email: adoucette@wisc.edu).



- [2] The *Dracula vampira* ('Walter' × ['HH' × 'Tyler']) capsule produced from a selfing about 24 hours after harvest. A large quantity of seed was produced and protected by wrapping the capsule with polyester thread. The capsule traveled home with me in my coat pocket wrapped in printer paper from the greenhouse hosting my collection to my temporary residence and little if any seed appears to have been lost during transport.
- [3] An additional example of a capsule wrapped in thread, *Masdevallia naranjapatae* Luer, three months and two weeks after pollination. The thread has been on this capsule for two weeks.
- [4] *Dracula vampira* ('Walter' × ['HH' × 'Tyler']), the lower surface of the capsule showing the sutures beginning to dehisce. The base of the capsule is wound with a greater distance between the threads to allow for easier visibility of the capsule sutures.
- [5] Light microscopy photos with transmitted light showing the seeds of *Dracula vampira* ('Walter' × ['HH' × 'Tyler']) × self with an estimated count of 91 percent viable embryos. Image courtesy of Meyers Conservatory.



Sylvia Strigari

Vanda tricolor subsp. *suavis*

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

Tribe VANDEAE
Subtribe AERIDINAE
Genus VANDA Jones ex. R. Br.

Vanda tricolor* subsp. *suavis (Lindl.) Pupulin and Salguero, *stat. nov.* Basionym: *Vanda suavis* Lindl., *The Gardeners' Chronicle and Agricultural Gazette* 351. 1848. Synonyms: *Vanda tricolor* var. *suavis* (Lindl.) Rchb.f., *W.G. Walpers, Ann. Bot. Syst.* 6:866. 1864. Type: Java (Indonesia).

A climbing monopodial epiphytic herb, without pseudobulbs, up to 1 m tall. *Roots* terete, produced from the lower portion of the stem, perpendicular to the leaves, branching extensively, very thick, to 16–18 mm diameter. *Leaves* sessile, distichous, linear, conduplicate-canalicate, strongly curved, acute or irregularly bilobed, bright green, 30–40 long × 3–5 cm wide, the old basal leaves deciduous. *Inflorescence* a stout raceme produced from the axil of the leaf sheaths, with 6–12 sweetly-scented flowers; the peduncle terete, suberect, 25–40 cm long, surpassing the leaves. *Ovary* clavate, striated, purplish. *Flower* resupinate, large, about 5–7 cm, the sepals and petals white or whitish cream, with numerous red-brown spots, light or dark, the lip purple with radiating white stripes at the base of the midlobe, the column white suffused with purple at the base. *Sepals* subsimilar, obovate, cuneate at the base, spreading, the distal part widened with crisped edges, about 3.5 × 2.5 cm; the lateral sepals slightly asymmetrical. *Petals* similar in general shape and color to the sepals, but rather narrower, to 3.5 × 2.3 cm. *Lip* trilobed, as long as or longer than the other parts of the perianth, thick and fleshy, oblong-cordiform, or lyrate, the two lateral lobes parallel, rounded, not incurved, the midlobe oblong, a little dilated at the apex, and there imperfectly bilobed, with a short spur without ornaments inside, less than 1 cm; entire lip to 3.8 × 2 cm. *Column* short, almost 1 cm long and with an expanded base that surrounds the lip base of about 1.5 cm, without foot, the rostellum short, broad and simple, bidentate after the removal of the viscidium. *Anther cap*, white, cucullate, bilocular. *Pollinia*, two, yellow, spherical, grooved, attached to a broad, flat caudicle with a rounded almost transparent foot.

The genus *Vanda* includes approximately

74 species distributed from India, Nepal, Bhutan, Burma, Thailand, Indochina, southern China, Taiwan, Japan, Korea, the Philippines and Indonesia, to New Guinea, northern Australia and the Solomon Islands. The highest diversity of *Vanda* has been recorded in the Southeast Asian archipelagos and the Himalayan-Indochinese region (Pridgeon et al. 2014). Nearly all the species have large flowers, of varied and attractive color, so they are well known garden plants in tropical climates and are highly prized in horticulture (Motes 1997).

Although species of this genus have been recorded in Asia since the mid-seventeenth century (Rumphius, 1741), the name “Vandá” was not transcribed until 1799, when Sir William Jones’ observations on selected plants from India were published in the fourth volume of the proceedings devoted to the studies carried out by members of the Asiatic Society (Jones 1799), of which Jones was the president until his death in 1794. Here he provided a detailed description of the plant, but referred the use of the Sanskrit name Vandá “to all parasitic plants” (see also Pridgeon et al. 2014). Although taxonomic literature invariably refers Jones’ description of *Vanda* as published on page 302 of *Asiatic Researches*, his description begins instead on page 311 and extends to page 313. It was not until 1820, when the Scottish botanist Robert Brown validly described *Vanda* using Jones’ concept, basing it on *Vanda roxburghii* (a name now accepted as a synonym of *Vanda tessellata*) (Brown 1820).

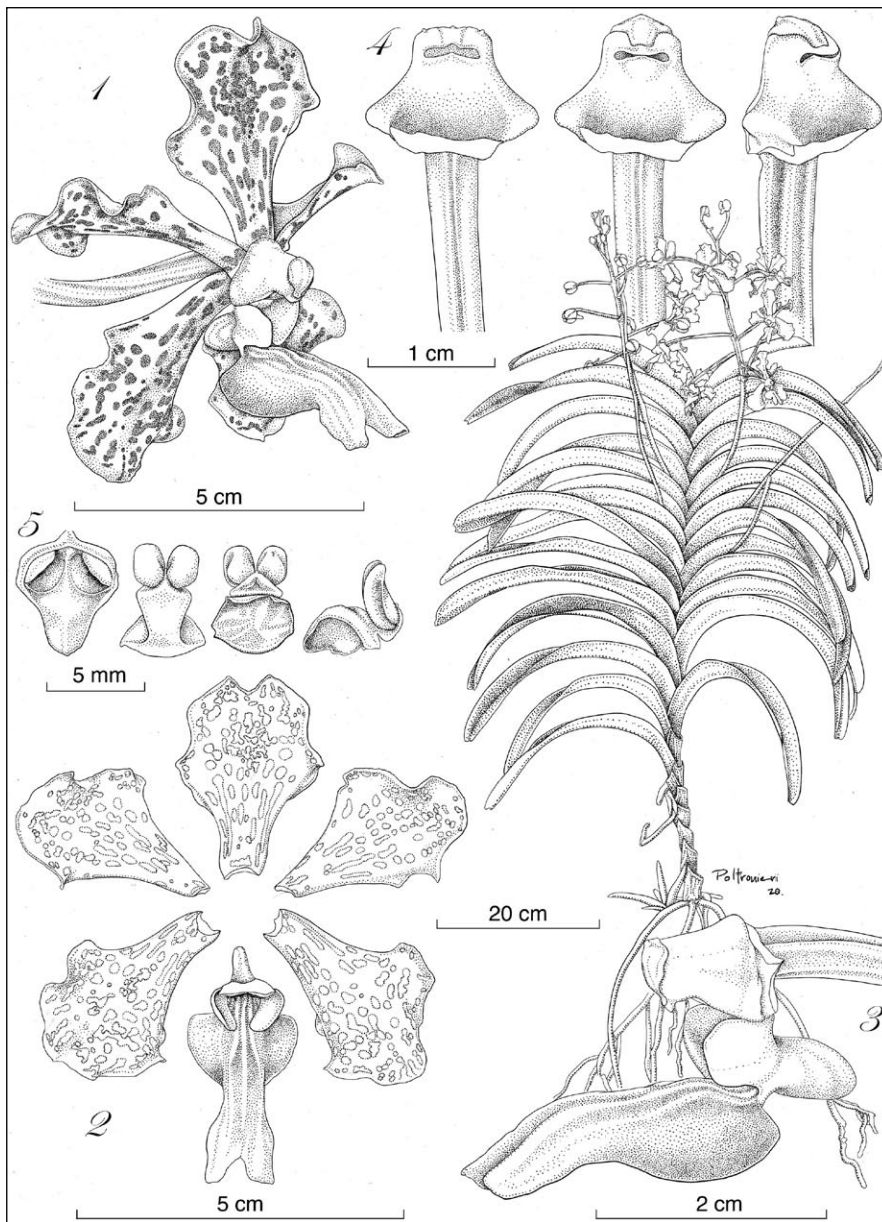
In the late 1830s, John Lindley began his work on the genus, describing several species, including *Vanda tricolor* in 1847 (Lindley 1847a). With the exceptions of sections *Fieldia* (whose species were transferred to *Vandopsis* and *Dimorphorchis*) and *Anota* (now included in *Rhynchostylis*), Lindley’s (1853) sectional classification of the genus has withstood the test of time, and all the species generally accepted by contemporary botanists as belonging to *Vanda* fit Lindley’s definition and could be placed in one of its sections (Motes 1997). Only recently the circumscription of *Vanda* has been considerably broadened as a result of phylogenetic analyses based on molecular data (Gardiner et al. 2013), to

include a number of genera previously kept apart on the basis of their different vegetative or floral morphology, such as *Ascocentrum*, *Ascocentropsis*, *Christensonia*, *Eparmatostigma*, *Neofinetia* and *Trudelia*. These generic rearrangements are moot for the case of *Vanda tricolor*, a species that genetic analyses firmly place within the group *Deltoglossa* (*sensu* Gardiner et al. 2013), restricted to the Indonesian and Philippine archipelagos and that includes species traditionally treated as *Vanda* in the strict sense.

Vanda tricolor had been brought to the attention of Lindley by Messrs. Veitch, the largest group of family-run plant nurseries in Europe during the 19th century. Lindley (1847a) published the protologue of *Vanda tricolor* published without any illustration, *in calce* to his description and plate of *Iris aurea* (Lindley 1847b), but a specimen received from the same source, well illustrating the salient features of the species, was portrayed two years later by William J. Hooker (1849). The specific epithet comes from the Latin *tricolor*, in allusion to the three colors of the flower.

Vanda tricolor itself is a quite variable species, occurring in two distinct morphs. The typical morph has a broad lip and the sepals and petals are yellow, heavily mottled with red-brown. The second form which has traditionally been known as the variety *suavis*, has a narrower lip but, as in the typical *V. tricolor*, this is pinched in the middle to result in an elongated, pandurate shape. The flowers are nearly pure white, with spots of vivid purple-red (Motes 1997). This morph was first described by Lindley in 1848 as a good species, *Vanda suavis*, but following the opinion of Reichenbach f., who recombined it at the varietal rank (Reichenbach 1864), it has mostly been treated as a variety of *V. tricolor*.

Molecular markers are unable, at this stage, to discriminate between the samples of *Vanda tricolor* and those of the variety *suavis* included in the phylogenetic analyses, and comparing sequences of three plastid DNA regions the two entities are genetically indistinguishable, clustering on the same terminal branch of the phylogenetic tree (Gardiner et al. 2013). On that basis we have to favor the hypothesis that treats the two taxa as conspecific.



that the range of *V. tricolor* var. *suavis* is entirely outside that of typical *V. tricolor*. According to the treatise by Martin Motes (1997), this interpretation seems much more likely.

Specimens of *Vanda tricolor* with pure white flowers spotted with vivid purple and with a narrower lip are morphologically quite uniform, and they seem to present some degree of genetic integrity, even when it cannot be molecularly characterized today. They mostly occupy a different geographic range and a distinct ecological niche, as populations of this morph are found at elevations to over 2000 meters, and plants of *Vanda tricolor* var. *suavis* are more tolerant of cooler temperatures than other species of *Vanda*.

Populations of a species that are geographically separate and exhibit recognizable phenotypic differences are good candidates to be taxonomically recognized at the level of subspecies, which implies morphological diagnosability and ranks higher than variety (*varietas*), to recognize greater differences between populations. For this reason, we have proposed a name at new rank (*status novus*) for this taxon.

The beauty of the flowers of *Vanda tricolor* subsp. *suavis*, coupled with its strong tendency to bloom in the spring, make this subspecies particularly desirable to horticulturists. The name *suavis* means "sweet-smelling" referring to its powerful and sweet fragrance (Motes 1997). Although this species is widespread in cultivation, in its native regions of Java and Bali, wild populations are small and highly fragmented due to massive overcollection and habitat destruction (Gardiner 2007).

Few pollination studies of *Vanda* species have been carried out. Because the diversity in floral morphology seen across the spectrum of the genus is extremely high, with a wide range of sizes, shapes and labellum structures, it is likely that this floral diversity is a result of different pollination syndromes (Pridgeon et al. 2014). Many species with large, colorful and fragrant flowers, with an open and spreading perianth (such as those of *Vanda tricolor* subsp. *suavis*), are visited by large bees of many types wherever they are grown throughout the tropics. In the wild in Java, a carpenter bee, *Xylocopa latipes*, has been recorded as a pollinator of *Vanda* (Chase et al. 2017).

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Vanda tricolor subsp. *suavis*. The plant.

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

All drawn from JBL-35736 by Sara Poltronieri.

Different opinions can be found in the literature concerning the natural distribution range of *Vanda tricolor* and its variant with white flowers. According to Teoh (2005), *Vanda tricolor* extends eastwards from Java to Bali and the Northern Territory of Australia. Comber (1990) reported that the typical form, as well as darker forms, is mostly found in West Java, while the variety *suavis* mostly occurs in Central and East Java. He also excluded Australia from the geographic distribution of *Vanda tricolor*, considering that Australian plants probably resulted from human introductions. Some writers, however, indicate that the two varieties can be found together. Although Cribb and collaborators (1981) stated that both forms occur simultaneously in Java, in their treatment of *Vanda* for the *Flora of Java*, Backer and Bakhuizen (1968) reported

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Too hot in the summer greenhouse?

Stick one side of Velcro disks a foot apart onto the outside of the west side of the greenhouse to fit the shape of the foil-covered, bubble-wrap-type batts like the material used as jackets for hot water heaters. It can be purchased in rolls. The foil will reflect the hot west sun and the bubble wrap will help insulate against the heat. It may also be used to insulate the north side of the greenhouse on the inside to keep heat in and reflect the light back into the greenhouse. — *Jean Allen-Ikeson (email: jean.ikeson@gmail.com).*

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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
 basionym – first name ever given to a taxon
 bidentate – having two toothlike projections
 bilobed – two lobed
 bilocular – two chambered
 caniculate – grooved
 caudicle – slender, stalklike appendage
 clavate – club-shaped
 foot – basal extension; i.e., column-foot
 concave- curved inward like the interior of a bowl
 conduplicate – folded lengthwise
 cordiform – heart-shaped
 cucullate – hooded
 cuneate – wedge-shaped
 dehisce – gape or burst open
 dehiscence – splitting of a capsule
 distichous – arranged alternatively in two opposite rows
 ellipsoid – shaped like an ellipse
 elliptic – oval
 epiphyte - growing on another plant for support and not as a parasite

glumaceous – chaffy
 heteranthous – flowering from the base of the completed pseudobulb
 hyaline – clear, transparent
 hysteranthous – flowering from the apex of the completed pseudobulb
 lanceolate – narrow oval tapering to a point at each end
 ligulate – tongue-shaped
 lyrate – shaped like a lyre
 monopodial – growing upward from a single main stem
 montane – habitat on the slopes of mountains at moderate elevations
 oblanceolate - narrow at attachment, rounded apically
 oblong – longer than wide, ends rounded
 obovate – egg-shaped with the wide end up
 obtuse – blunt or rounded
 ovate – egg-shaped with the narrow end up
 ovoid – egg-shaped, narrow end up
 pedicel – a stem carrying a single flower
 peduncle – the lower part of the inflorescence below the first bud
 perianth – sepals and petals
 petiole – stalk connecting leaf to stem
 phylogenetic – evolutionary history

pollinarium – structure that is attached to the insect during pollination
 premontane – habitat found on the lower slopes of mountains
 proteranthous – flowering from the new growth *before* leaves are apparent
 raceme – having flowers attached by short stalks at equal distances along a main stem
 resupinate – rotated to bring the lip lowermost
 rostellum – part of the column separating anthers from stigma
 sessile – unstalked
 sub - prefix meaning nearly or almost as in subpyriform - almost pear-shaped
 synanthous – flowering from the new growth as the leaves develop
 terete - cylindrical or pencil-shaped
 trilobed – having three lobes
 truncate - abruptly terminated as if cut off
 viscidium – the sticky pad on the caudicle or stipe of the pollinarium that attaches the pollinarium to a pollinator

CONSERVATION COMMITTEE

The Rest of the Story!

Part 2

TEXT BY THOMAS MIRENDA/PHOTOGRAPHS BY DR. LAWRENCE W. ZETTLER



AS THE YEAR advanced from 2019 to 2020 last winter and the great news about Jim Fowler's Native American orchid species stamp series was starting to disseminate, some other creative minds were at work on how to use the national exposure of native orchids to best advantage for their conservation. Around this time, I got a phone call from fellow Big Island resident, friend and owner of Lehua Orchids, Graham Wood. He was excited about the possibility of generating some excellent publicity for the AOS by capitalizing on this opportunity for national news. His thinking was that if there were some endangered species depicted among the new orchid stamps, perhaps we could find a way to do something positive for species conservation by drawing attention to them at the launching ceremony for the new stamps. He thought that I, as AOS Conservation Chair, might have some insight and information that could help. Several of the species are quite rare, but one stood out due to its federally threatened status: the spectacular *Platanthera leucophaea*, the eastern prairie fringed orchid. But how would we go about highlighting this gorgeous species' fight for survival?

Also serving as the current AOS Treasurer, Wood had become aware of some legacy funds held by the AOS from the Dorothy Nieter Trust. The only stipulation for use of these funds was that it should be somehow related to "our charitable activities in the state of Illinois." As it turns out, the eastern prairie fringed orchid is an Illinois native species and has been the subject of research by Dr. Lawrence Zettler who leads the Orchid Recovery Program at Illinois College (<https://sites.google.com/ic.edu/orchid-recovery-program/home>). Happily, it seemed we had a match! I contacted Dr. Zettler and let him know of the opportunity, and could he please describe his early projects and collaborations with this species, and what work could be supported by funds from Dorothy Nieter's bequest to aid in its recovery. He supplied excellent information that Wood and I were able to present at the next AOS Board of Trustees meeting. The Board agreed that Dr. Zettler and his Orchid Recovery Program were worthy recipients of support, and a gift of \$50,000 was expedited so it could be announced at the stamp launching in February; a win-win-win situation!

An early North American Orchid Conservation Center collaborator, Dr. Zettler, having been raised in Florida, had



- [1] *Platanthera leucophaea* photographed by Ronald Coleman.
- [2] Illinois prairie orchid group; left to right: Kayla Alexander, Dr. Elizabeth Esselman, Paulina Quijia-Lamiña, Adam Herdman, Connor Melton, Rach Helmich, Estelle Courtot, Dr. Lawrence W. Zettler and Hana Thixton.
- [3] Dr. Lawrence W. Zettler and Erin Wood planting out *Peristylus holochila* seedlings in Hawaii.
- [4] *Peristylus holochila* on Molokai.
- [5] Erin Wood shown caring for seedlings of the Hawaiian endemic orchid, *Peristylus holochila*, grown in the Orchid Recovery Program. Photograph courtesy of Chris Young.

a unique awareness of how biodiversity was being lost alarmingly quickly in his home state and around the world. His Orchid Recovery Program was, for him, a means to combat the degradation of the Earth and empower his students to join the ranks of the next generation of orchid conservationists. His undergraduates have done truly significant work with endangered orchids around the globe, solving the mysteries of their propagation and symbioses with mycorrhizal fungi. I wish I had a professor like him when I was an undergraduate. His students have unparalleled opportunities to engage with the conservation world with well-established programs in Ecuador, Madagascar, Hawaii, Palau and of course, Florida. His work with the ghost orchids, *Dendrophylax lindenii*, in the Florida Panther National Wildlife Refuge has been quite successful. Relationships he has built with Cuban botanists (notably Dr. Ernesto Mujica) at Soroa Orchid Garden, University of Artemisa and University of Pinar Del Rio have added substantial expertise towards the advancement of knowledge about this mysterious and beloved species that our two nations share.

But it is Dr. Zettler's projects in the prairies of Illinois, where the exquisite *Platanthera leucophaea* is struggling for survival, that we want to spotlight. Understanding its special needs has been challenging for him, his team and collaborators across the state. It turns out the germination of seed has been particularly difficult due to a greatly extended cold stratification needed to break their dormancy. That, and the experimentation with myriad fungi extracted and banked from wild specimens means that there is tremendous work to be done if we are to be able to unlock their secrets and eventually, reintroduce this flagship species to its former range. I, for one, would love to see thousands of them interspersed in the prairie one day, and revel in their beauty and fragrance as they wave in the breezes as they did a century ago. It is through the work of terrestrial orchid pioneers such as Dr. Zettler that this dream may someday be realized. We hope the conservation funding the AOS was able to provide through Dorothy Nieter's bequest will make this dream a reality in our lifetime. Godspeed, Larry!

— Thomas Mirenda has worked professionally with orchids for over 30 years. He is an AOS accredited judge and chairman of the AOS Conservation Committee (email: biophiliak@gmail.com).



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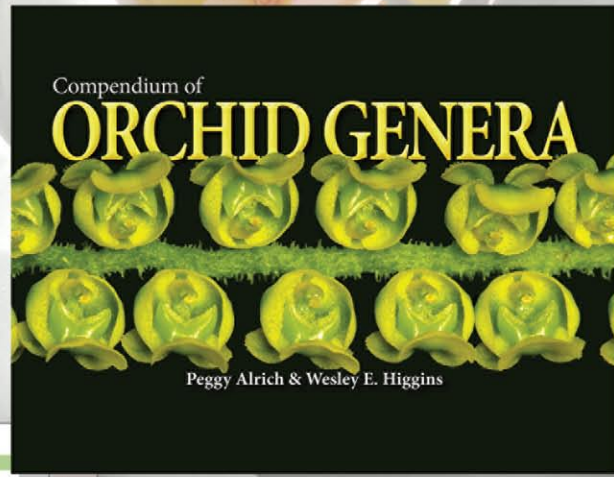
[6] Dr. Lawrence W. Zettler (left), Connor Melton (middle) and Dr. Lynnaun Johnson in Cuba.

[7] *Angraecum sororium* photographed in the central highlands of Madagascar where it grows on fully exposed rock outcroppings.

[8] Orchid research can be hazardous to your health. Evidence this massive pothole that nearly consumed the road in Madagascar. The pothole was the result of a cyclone the group experienced in 2015 — a rough trip.

[9] High in the Andes near Cuenca, Ecuador. Although the plants in the foreground are not orchids, the shot gives you a good idea of the terrain in Ecuador's páramo.

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獨頭蘭



Japanese Orchids

by Peggy Alrich and Wesley Higgins



WOODBLOCK PRINTING IN Japan traces back to Empress Kōken (713–770), who commissioned one million small wooden pagodas, each containing a small woodblock scroll printed with a Buddhist text. Such printing was reserved for Buddhist seals and images until the 17th century, when Hishikawa Moronobu (1618–1694) produced the first *ukiyo-e* woodblock prints. The term *ukiyo-e* translates as “pictures of the floating or sorrowful world,” depicting subjects as female beauties, kabuki actors and sumo wrestlers, scenes from history and folk tales, travel scenes and landscapes, flora and fauna, and erotica. The art of *ukiyo-e* developed in the city of Edo during the Tokugawa Period (1615–1868). *Ukiyo-e* was initially considered “low” art, by and for the nonelite classes by the shogun rulers, but its artistic and technical caliber is consistently remarkable.

Kōno Bairei (1844–1895), the son of a moneylender, was born as Yasuda Bairei and lived in Kyoto. He started his art education at the age of eight, when he began studying under Nakajima Raishō, a Maruyama school artist. At age 27, with the permission of his teacher, he began studying under Shiokawa Bunrin of the Shijō School, and came to know a number of other painters, poets, and amateur scholars active in the literati circles at the time. Unlike the majority of *ukiyo-e* artists, he was trained as a classical Japanese painter.

Kōno Bairei was a literati painter of the Meiji period, and is generally considered among the most influential literati painters of that period. A literati painting is the



ideal form of the scholar–painter who is more interested in personal erudition and expression than in literal representation or an immediately attractive surface beauty. In 1873, Kōno was invited to show his work at the second Kyoto Exposition and was established as an independent painter, although at that time he was not successfully making a living selling his works; actually, he was quite poor. Bairei was a master of “kacho-e” painting (depictions of birds and flowers) and went on to win many awards for his art later in his career.

Although at first woodblock prints were only an afterthought, Bairei ultimately designed woodblocks for illustrated books and produced a number of series of prints, such as *Bairei Hyakuchō Gafu* (Bairei’s Album of 100 Birds) and *Bairei Kachō Gafu* (Bairei’s Album of Flowers and Birds), which depicted birds and flowers in the four seasons, and *Bairei Gakan* (Mirror of Bairei Paintings) which depicts animals, birds, insects, flowers,

landscapes, Mount Fuji and more.

Kōno Bairei served as head of the Shijō School, when his teacher Shiokawa Bunrin died. He cofounded (with a few others) the Kyoto Prefectural Painting School that shaped the foundation of what is today known as the Kyoto City University of Arts. Kōno was named an Imperial Household Artist in 1893, and completed several commissions to paint murals for the Higashi-Honganji Temple before his death.

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

— Wesley Higgins is an AOS accredited judge (wesley.higgins@comcast.net).

ADDITIONAL READING

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Antique Plates — Kōno Bairei

- [1] *Cymbidium goeringii* (Rchb.f.) Rchb.f.
- [2] *Habenaria sagittifera* Rchb.f.
- [3] *Phalaenopsis japonica* (Rchb.f.) Kocyan and Schuit.
- [4] *Dendrobium moniliforme* (L.) Sw.
- [5] *Phaius tankervilleae* (Banks) Blume
- [6] *Bletilla striata* Rchb.f.
- [7] *Cremastra appendiculata* (D. Don) Makino
- [8] *Spiranthes sinensis* (Pers.) Ames
- [9] *Goodyera schlechtendaliana* Rchb.f.
- [10] *Cymbidium kanran* Makino
- [11] *Vanda falcata* Beer
- [12] *Dendrobium moniliforme* (L.) Sw.
- [13] *Pinalia japonica* (Maxim.) Ormerod



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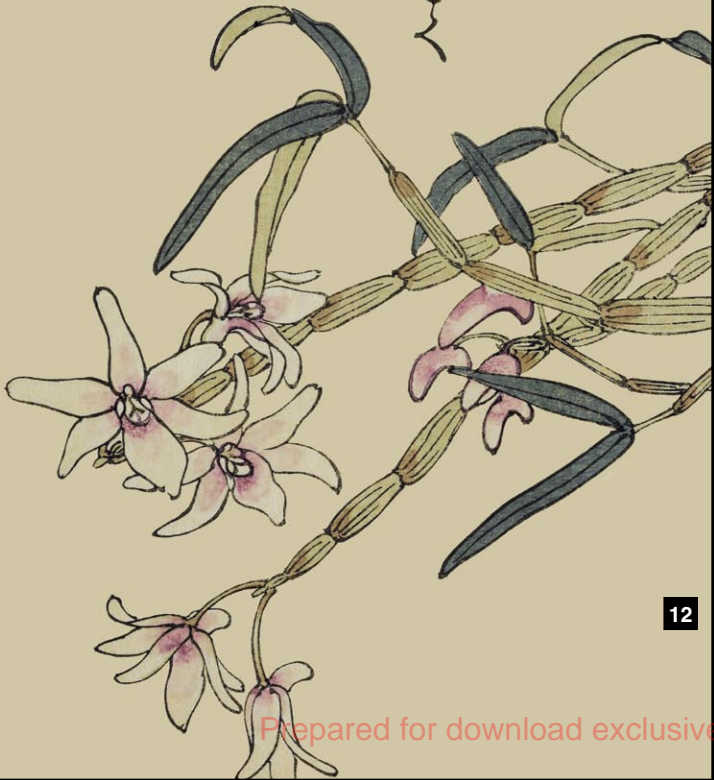
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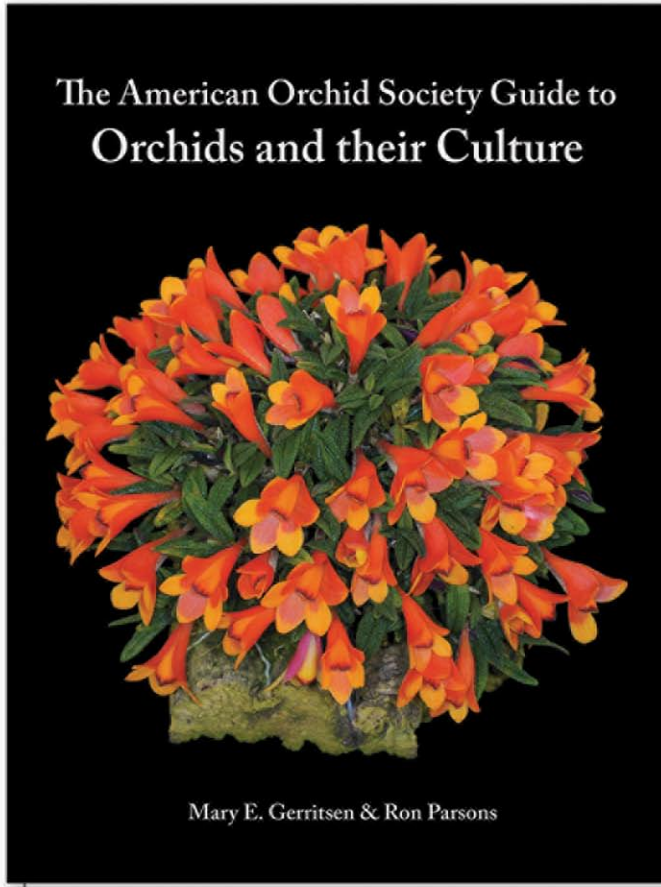
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Colombian Orchids

A Few Jewels of Colombia's Warm, Intermediate and Cool Habitats

TEXT AND PHOTOGRAPHS BY JUDITH RAPACZ-HASLER



A TRIP TO Colombia has long been on my to-do list, having visited tropical orchid habitats in Costa Rica, Ecuador, Peru, Brazil and Malaysia. Finally, last November, I attended the International Orchid Exposition Caliorquideas 2019, organized by the Vallecaucana Association, and the trip became reality. There were a couple of obstacles. Having grown many *Cattleya* species, I always wanted to visit their habitat, but this was not their blooming time. In addition, it was questionable whether I would be able to hike into the habitats at this point in my life. However, some of Colombia's orchid species were still in bloom, despite it being the end of the blooming season and beginning of the dry period.

Cali is the capital of the Valle de Cauca and considered the warm climate zone, around 3,000–5,500 feet (914–1,676 m) with temperatures that do not exceed 85 F (29 C) and seldom fall below 55 F (13 C). By word of mouth, I learned about InSitu Expeditions as well as a guide in Cali, who on short notice could take me for a short guided tour. A friend from California joined me for part of the journey, and we had the entire day before departing on a late-night flight from Cali to Medellín. The guide, David, met us in front of Andrea Niessen's home after we had visited her nursery.

With approaching unrest and a blockade during the week, the question was where to go. I was particularly interested to visit *Phragmipedium* habitats, but that turned out to be too far out, and in the opposite direction from the airport. So we opted for an easy roadside walk a couple of hours from Cali. We did not get far up the hill from Cali before there was a blockade. The guide decided to turn around and take a different road that turned out to be a country road under construction. The taxi driver, Orlando, must have wondered what these crazy orchid folks were up to.

Leaving the main road and driving along a hillside and a river below, we got out of the car and walked along the roadside and encountered many orchid species, mainly *Epidendrum*, *Pleurothallis*, *Stelis*, *Oncidium*, etc., although only a few of them were in flower. The great surprise was finding a seldom-seen species, *Epidendrum escobarianum*, overlaying a moss-covered tree branch with its lovely flowers, as well as many seedlings all around the branch. Farther down the road, we saw a couple of *Masdevallia* species covered by shrubs next to a creek and thus in high-moisture surroundings.



We drove for a few miles and encountered many more epidendrums, and then David pointed to a *Phragmipedium* in flower far off the roadside among shrubs. Farther down the road (I could not believe my eyes) was another *Phragmipedium* in bloom, just staring in my face! Next to it was a plant with a seed capsule with several seedlings growing in the vicinity. We moved on as we did not want folks wondering what we were doing. A couple of miles down the road was another surprise. Up on a slope were lovely flowering plants of *Phragmipedium andreettae*, and so the question arose: What was the *Phragmipedium* we had seen before? It was speculated that it might be a hybrid of *Phragmipedium schlimii* with *Phrag. andreettae*, but nobody had ever seen *Phrag. schlimii* in the area. Was it a hybrid with *Phragmipedium fischeri* as Jerry Fischer suggested? A photo

- [1] *Phragmipedium andreettae*. The inset photograph is the first *Phragmipedium* speculated to be a hybrid.
- [2] Close-up of *Phragmipedium andreettae* in situ.
- [3] A close-up photograph of the potentially hybrid *Phragmipedium* observed earlier.

of *Phragmipedium* Mont Coutanche (*andreettae* × *fischeri*) by Chris Purver, Eric Young Orchid Foundation, shows this cross. The staminode seems to be different, but who knows what Mother Nature created?

Medellín, capital of Antioquia, is situated in a valley totally surrounded by mountains. It is considered the intermediate climate zone, around 5,500–7,500 feet (1,676–2,286 m) with temperatures 50–75 F (10–24 C).

After arriving at the International Airport at Medellín, we took a taxi to



- [4] *Epidendrum radicans*
- [5] *Epidendrum fimbriatum*
- [6] *Telipogon vollesii* complete with seed capsules.
- [7] *Telipogon microglossum*. For perspective, the inset background is a fingertip and the ridges are fingerprint ridges.
- [8] *Gomphichis cundinamara*
- [9] *Masdevallia amanda*
- [10] *Epidendrum chioneum*
- [11] *Epidendrum oxypetalum*
- [12] The Department of Cundinamarca in central Colombia, despite its population of nearly three million people, is spectacularly beautiful. It is also home to Colombia's capital, Bogotá.
- [13] *Cyrtorchilum tetracopis*
- [14] Cloud forest near the town of Baldia.

the hotel downtown, about 10 miles (16 km) away. The next morning we were met by Luis from InSitu Expeditions, who took us in a four-wheel drive vehicle on a fairly rough road up to the cloud forest of Baldia in the páramo region, passing small towns and cattle pastures along the way. This resembled much the alpine regions of Switzerland that I am so familiar with! Again wandering about the hillside, we found *Epidendrum radicans*, *Epidendrum fimbriatum*, *Telipogon* seed pods, *Lepanthes*, *Oncidium*, many fernandezias and a rather rare orchid, *Gompichis cundinamarca*. Luis brought along a lovely lunch that we enjoyed looking over the fog-covered mountains.

The next day we visited the Arvi National Park, a hillside nature reserve with several hiking paths that most local folks access from the city by Metrocable. It connects directly from the Metro and is an efficient infrastructure with several stops up the mountain, where people reside. We joined a tour of the orchid trail and orchid house where many species of rescued orchids were planted.

With the upcoming blockade the next day, we opted to move to the airport hotel, from where I took a flight to Bogota the following day, checking in near the airport hotel. Bogota is the capital of Colombia and is located in the cool climate zone at 7,500 feet (2,286 m) and above with temperatures between 45 and 65 F (7–18 C). I was picked up from the hotel by the driver from InSitu Expeditions and taken to Guasca-Cundinamarca, about an hour's drive from the city. It was a lovely trip over mountainous roads where hundreds of bikers enjoy their weekend hobby, and they own the road! There at a small country inn, El Recreo, the guide Fredy waited for the day's excursion. Not far up the road, he pointed to a few *Telipogon* still in bloom. We made several stops along the road looking for orchids and encountered many species, especially epidendrums, which already had seed capsules. We had a few more surprises, especially a lovely specimen of *Cyrtochilum tetracopis* that I noted out the corner of my eye, just as we drove past it. Still in bloom were *Fernandezia sanguinea*, *Epidendrum chioneum*, *Epidendrum oxypetalum* and one of my favorite genera, *Telipogon*. I had seen *Telipogon* in Ecuador about 20 years earlier and was aware that this is a species that is difficult to grow, since they grow best at 7,500 feet (2,286 m) and above with temperatures between 45 and 65 F (7–18 C). The five species I saw grow mostly higher up the trees and thus



were difficult to photograph. *Telipogon microglossus* is a tiny flower, as the name indicates. I'm not sure how many times Fredy has walked the roadside to know just on which tree they grow, but his brain global positioning system served us well.

We returned to town just before a rain shower that was lurking over us for most of the day, but it fortunately held off until the end of the tour. We had dinner at a local restaurant and then Fredy showed me his exclusive collection of orchids.

I stayed at the inn and returned the following morning for the flight to Miami.

The topography of the country is incredibly mountainous and this means that distances are not as they appear on a flat map. These types of elevation changes are the norm when traveling in Colombia as most all the cities are on the sides of the two cordilleras of the Andes. Within these elevation changes are a myriad of the Earth's climate zones, thus allowing for such a rich flora and fauna.

ACKNOWLEDGMENTS

My thanks to David Haelterman (freelance) and Luis Pérez, Sebastian Vieira and Fredy Alexander Acosta of InSitu expeditions.

— *Judith Rapacz-Hasler* *Judith Rapacz-Hasler is a retired research scientist, past Editor of the SOA Slipper Orchid Alliance Journal and current member of the AOS Editorial Board. She is a longtime member of AOS, the SWFL Southwest Florida, San-Cap and Swiss Orchid Societies. She translates articles on orchids from German to English and vice-versa for several orchid journals. She and her late husband had grown orchids for 15 years, and now she manages to grow a few Cattleya species and hybrids in Florida despite spending summers in Europe. Among her most rewarding experiences are frequent travels to observe orchids in their native habitats. (email: jorapacz@wisc.edu).*

Requiem Canceled

Winner of the 2019 Dillon-Peterson Essay Contest

TEXT AND PHOTOGRAPHS BY DANIEL DUDA

WITH HURRICANE MICHAEL in the Gulf of Mexico bearing down on northwest Florida during the first week of October 2018, my home near Panama City was threatened and I started preparing for the damage that the storm could inflict. In addition to all the tasks associated with “buttoning up” and clearing patio furniture and plants, I moved my collection of orchids from their outside, summer location to covered, dry storage in and on my trailer-borne skiff, stowed securely in my separate, “man-cave” garage. Having performed the same exercise for previous storms with little or no damage to the plants, I thought this was the prudent way to prepare.

Having little training or background in meteorology save that received during training as a student naval aviator (long before weather satellites existed), as I watched the storm progress north and intensify, my intuition told me it was going to be severe. The morning of October 9, my survival sense took charge and my wife, Judy, Jake the “wonder dog” and I evacuated to a pet-friendly hotel in Tallahassee. On October 10, the storm made landfall as a strong hurricane, eventually analyzed and rated by NOAA as a Category 5, which totally destroyed the City of Mexico Beach and Tyndall Air Force Base, then passed directly over my neighborhood in Bay County, Florida, wreaking catastrophic wind and storm-surge damage. The storm tracked north-northeast, passing through Tallahassee and causing massive power outages there and along its path through neighboring counties. With no power at the hotel on October 11, we departed Tallahassee and drove to Tampa, where we stayed until electric power was restored to our neighborhood, returning on October 29.

We were fortunate to find that our home was not totally destroyed, but did suffer substantial roof, truss, and ceiling damage caused by two massive pines, with major damage to one end of the house. The opposite side of the house was livable and is where we “camped” until completion of all the repairs to our home. My man cave (detached garage/



shop) with an attached greenhouse did not fare as well. A huge pine and big oak crashed through the roof, missed my skiff and orchids, but knocked off the cupola, and rolled onto my greenhouse, totally smashing it. Almost *all* trees and shrubs (county-wide) were destroyed in the wind, and our own, once beautifully landscaped home site now stands as barren as a war zone.

But the target theme of this story is about orchids — more specifically, the effect that the threatened loss of an amateur (but almost 40-yr-old) collection has had on me, ideas and efforts to salvage a lifetime hobby, and whether things will ever get back to normal with regard to growing a collection of “restored” and new plants.

- Upon returning, and after first checking the operation of our deep-well water source, electrical power and “flushables” in our home, retrieval of roughly 120 orchid plants from their “hide hole” on the skiff in my man cave followed. I discovered that, even without water and very little light during our absence, they looked stressed, but were all alive and three were even blooming. Approaching November and wintry weather without a greenhouse, I began thinking about what was next.

- The first thought on a course of action was relatively simple: send some to my daughters in Tampa, where they grow outdoors year-round. This took about 20 plants to good homes, leaving me with 100+ to worry about. I gave another 20 plants to local friends who, over the years, have admired orchids and indicated that they would someday like to try growing them. I offered some recommendations for windowsill culture and suggested that they access the AOS website for more complete advice.

- My next thought was to find a greenhouse, commercial or privately owned, that was within a reasonable driving distance and would be willing to lease bench space. I had some very kind help in this effort, including some great recommendations from the Tallahassee Nursery, but was not successful in securing any greenhouse space for my remaining collection.

- Although growing orchids *outdoors* in coastal areas of northwest Florida is relatively carefree from approximately late March through early November, *winter* temperatures, while relatively mild, still see nighttime averages in the low 50s F to the mid-40s F (7–11 C), with occasional plunges into the 30s F (–1.1 to 3.9 C) and



below. Being without a greenhouse, my *remaining* collection of mostly Cattleya Alliance plants then graced two, mobile, A-frame structures that occupied one bay of our attached, unheated garage. Without heating and ventilation, about 65 of the plants survived without severe cold damage, but with light limited to clear, burning sun and below-ideal ambient temperatures, they certainly did not thrive and, in fact, were debilitated and prone to pests and diseases. Desiccation, sun burn, scale and some form of wilting coupled with an unidentified rot took their toll.

- Less-than-ideal temperatures and some prolonged, cloudy days dealt another practical lesson. Rolling the mobile plant stands with the orchids out

- [1] The calm before the storm. Our lean-to greenhouse prior to Hurricane Michael.
- [2] The crushed greenhouse greeting us on our return. The white area in the lower third of the photograph is the crushed roof and kneewall side of the structure.
- [3] After clearing away the debris. Note the complete absence of viable trees to the right of the greenhouse.
- [4] Surviving plants, somewhat worse for wear, waiting for a new greenhouse.

to take advantage of a sunny day resulted in severe burn from the bright sunlight untempered by the now-missing trees that had offered such great "filtered sunlight" before.

- Almost abandoning the rescue effort, my third thought was the charm. Years ago, while active in the Bay County/IFAS Master Gardener Program, I met a lady who, likewise, was an avid orchid enthusiast. Remembering that she and her husband had a greenhouse, I re-established contact with her, hoping that she still grew orchids, still had a greenhouse that had not been destroyed in the storm and would be willing to accept plants on a lease or gift basis. She very kindly and enthusiastically offered her help! I am most grateful to her and, after cleaning up and debugging, delivered the surviving rescued plants into her care.

- Hoping to remain an orchid enthusiast able to rescue and grow at least a part of my collection, I placed an order to a major greenhouse company for a replacement with nearly the same model specifications and began the demolition of the destroyed greenhouse, salvaging operative ventilation fans, shutters, heaters and thermostats.

Fortunately, this company has been in business for a long time and still had the specifications and records relating to the greenhouse that they built for me over 20 years ago! The estimated completion and installation date of late April–May 2019 turned out to take place in late June, but considering our time that was taken up with all the other restoration work to our damaged home, the completion timing turned out fine.

At 78 years old, the last thing anyone my age needs is enduring a major disaster with catastrophic damage that threatens enjoyment of their remaining years. Throughout this ordeal, I have vacillated between persisting with my most enjoyable hobby or abandoning it and moving on to something with quicker need gratification. Reflecting on the enjoyment (and challenges) of growing orchids and all the satisfaction of experimenting with different culture practices, media, containers, and fertilizer regimens, I have decided to remain in the business and look forward to the next challenge: picking a site in my yard for erecting a pergola or summer shade house, because the few remaining trees are somewhat defoliated, and there will be no filtered sunlight in which my plants can thrive.

— Daniel Duda is a retired U.S. Naval



Officer and Aviator who, following 30 years of naval service, now resides in northwest Florida. An AOS member for nearly 50 years, he has grown orchids as a hobby since stationed in Hawaii in the early 1960s. He is presently working to restore his collection of mostly Cattleya Alliance species and hybrids (email: danduda@comcast.net).

- [5] Post-demolition of the old greenhouse. We were lucky in that the supporting kneewall survived the collapse of the trees.
- [6] Slowly plants are recovering and survivors are starting to flower. This is *Rhyncholaeliocattleya* Lester McDonald. Note the desiccated older grows and the new growth with sheath.
- [7] The new greenhouse completed. Replacing the physical structure is the easy part. Replacing the natural shade destroyed in the storm will take decades.



2020 Dillon/Peterson Essay Prize

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

Membership in the American Orchid Society is not necessary to enter the contest. **The deadline is September 30, 2020.** The winning entry, if any, will be published in the June issue of the following year. For complete contest rules see <http://www.aos.org/about-us/article-submissions/essay-contest-winners.aspx>

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

Orchids in Watercolor

Dendrobium Snow Bells (Thomas Warne × *schuetzei*)

MARCIA WHITMORE

DENDROBIUM SNOW BELLS (Thomas Warne × *schuetzei*) is a large-flowered hybrid that is easy to grow. *Dendrobium* Thomas Warne is an orchid hybrid originated by R.E. Warne in 1948. It is a cross of *Dendrobium sanderae* × *Dendrobium schuetzei*. This hybrid typically blooms for me in the spring with long-lasting flowers. The buds began forming in late February and the flowers were still in full bloom in mid-April. The plant loves bright light, good quality water and fertilizer applied at quarter-strength with a flush of pure water on the third watering. The plant easily carries up to six flowers on each spike and often sends up new flowering spikes on older growths. This watercolor was completed on Arches 300 lb. cold pressed paper. I love the challenge of working with white flowers on white paper: I am forced to work with the shadow and subtle color changes, which improves my observational skills, making me a better painter. — *Marcia Whitmore (email: whitbrits@gmail.com)*.

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).



Dendrobium
thomas warne
Dendrobium schuetzei

M. Whitmore '20



Small-Flowered Phalaenopsis

Part 3: The Crossover Hybrids

ANDREW COGHILL-BEHREND

AS HAS BEEN noted previously, the two paths of breeding have their distinct advantages and drawbacks. Traditional multiflora miniature phalaenopsis take advantage of floriferousness and color at the expense of form and substance. Novelty phalaenopsis present great form, substance, and color at the expense of floriferousness. There is some obvious potential in attempting to merge the best qualities of both groups. In fact, the first artificial phalaenopsis hybrid was *Phalaenopsis* Harriettae (*amabilis* × *violacea*); "John Seden of James Veitch & Sons made the cross and succeeded in raising only a single seedling" which received an FCC/RHS in 1887 (Greisbach 1998).

Phalaenopsis Golden Sands (*lueddemanniana* × *Fenton Davis Avant*)

This impressive grex has received its share of awards. *Phalaenopsis* Fenton Davis Avant is a fairly complex hybrid consisting of only three (four, if you count *rimestadiana*) of the species from Section *Phalaenopsis*: *amabilis*, *aphrodite*, and *schilleriana*. One particular clone of Golden Sands, however, proved to be a standout: *Phal.* Golden Sands 'Canary' FCC/AOS was described as having "... heavy substance and nearly perfect form..." in addition to having a sparkling texture. But as impressive as it was in its own right at the time in the 1960s, this clone became important in later hybridizing efforts. *Phalaenopsis* Golden Sands 'Canary' is a non-splitting triploid (rather than try to sort an odd number of chromosomes into an even number, it just gave up and sent them all), meaning that, when used as a parent, and crossed with a diploid, all the resulting offspring were tetraploid. It has been used extensively in hybridizing and has over 7,000 registered progeny, including familiar names such as Solar Flare (× *Golden Pride*), Golden Amboin (× *amboinensis*), Goldiana (× *lueddemanniana*), Liu Tuen-Shen (× *gigantea*) and Golden Bells (× *venosa*).

In 1985, John Ewing Orchids registered *Phalaenopsis* Sara Lee (Princess Lorraine × *amboinensis*), which served as a building block for small-flowered phalaenopsis originated by Brother Orchid Nursery during the late 1990s. There were several notable hybrids to develop out of this line of breeding, including first-generation offspring Brother Supersonic (× Brother Purple), Brother Sara Gold (× Taipei Gold) and Brother Peptide (× Brother Passat). Other notable progeny include Tying Shin Forever Love, Tying Shin Cupid and Sogo



AOS AWARDS ARCHIVES



AOS AWARDS ARCHIVES



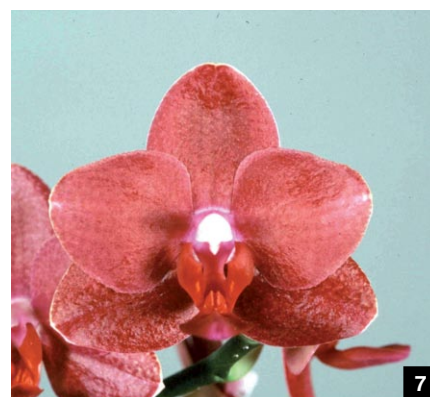
AOS AWARDS ARCHIVES



AOS AWARDS ARCHIVES



GREG ALLIKAS



LOUIS-PHILIPPE COITEUX

Lawrence.

Brother Orchid Nursery took this foundation and focused a great part of their breeding on an effort to generate small-flowered harlequin phalaenopsis. More recent breeding efforts have been undertaken by Big Leaf Orchids, Krull-Smith Orchids and Tying Shin Orchids to use these foundation hybrids to develop a line of small-flowered red phalaenopsis.

In 1995, H.P. Norton registered *Phalaenopsis* Katie Morris (Harford's Jewel × Donald Rigg), which quickly became another important building block in the development of the crossover hybrids. Of the four grandparents of this hybrid, three are either novelty species or hybrids and the remaining is a large-flowered, pink standard phalaenopsis. It is in the

- [1] *Phal.* Krull's Vixen 'Jordon Winter' AM/AOS; exhibitor: Krull-Smith; photographer: Julie McMillan.
- [2] *Phal.* Solar Flare 'Ana Teresa' AM/AOS; exhibitor: A.R. Izquierdo.
- [3] *Phal.* Liu Tuen-Shen 'Charming' HCC/AOS; exhibitor: J. Frank Hughes.
- [4] *Phal.* Goldiana 'Eureka' AM/AOS; exhibitor: J. Frank Hughes.
- [5] *Phal.* Golden Amboin 'Mom' AM/AOS; exhibitor: Jose R. Selles.
- [6] *Phal.* Golden Bells 'Ponkan' HCC/AOS; exhibitor: Krull-Smith.
- [7] *Phal.* Brother Supersonic 'Alexandre' HCC/AOS; exhibitor: Le Paradis des Orchidées.

ancestry of many successful hybrids and as a direct parent of one hybrid.

***Phalaenopsis* Pylo's Sweet Orange (Katie Morris × Yungho Gelb Canary)**

The parentage of the grex means it is composed of mainly novelty phalaenopsis and only a small percentage of large-flowered whites. With such a high percentage of novelty in the background, this grex has not been able to overcome the pointed floral segments, but it has been an impressive start in this direction of breeding.

The first two awarded clones, 'Ronnie Brandenburg' HCC/AOS and 'Jerry Brandenburg' AM/AOS, were awarded in early March 2013. Two weeks later, the Brandenburgs had five additional clones awarded at the Shreveport Judging Center's monthly judging session. Then, finally, in April 2013, the Brandenburgs presented 14 clones of the grex (including the seven previously awarded clones) and received two more flower quality awards and an Award of Quality for the grex, which was commended for "...superior quality in the bronze art-shade novelty breeding line; flowers consistently full and flat, ranging in color from light golden brown through bronze to magenta; three AM's and six HCC's exemplified the high standards present when granting this award; hybridizer Peter Lin."

The clone, *Phal.* Pylo's Sweet Orange 'Jerry Brandenburg' AM/AOS, had "sepals and petals pale burnt orange, centrally brushed fuchsia; lip magenta; column and anther cap white; substance very heavy; texture satiny."

Phalaenopsis Pylo's Sweet Orange 'Becki' AM/AOS had "sepals and petals cream-colored heavily overlaid orange-red, magenta basally..." *Phalaenopsis* Pylo's Sweet Orange 'Stacey' AM/AOS was perhaps the most impressive of the grex in terms of color suffusion and had "two very flat, full flowers and one bud on one upright inflorescence; sepals and petals cream heavily overlaid magenta, centrally light fuchsia, barred darker fuchsia...."

Phalaenopsis Pylo's Sweet Orange 'Peter's Rainbow' AM/AOS was awarded late, and, in contrast, presents a pleasing pastel form of the grex. It had "sepals and petals yellow-orange, suffused light fuchsia, white proximally; lip golden yellow, midlobe and side lobes overlaid fuchsia on distal half...substance hard; texture diamond dust".

***Phalaenopsis* Citrus Candy (Tying Shin Forever Love × Tying Shin Golden City)**



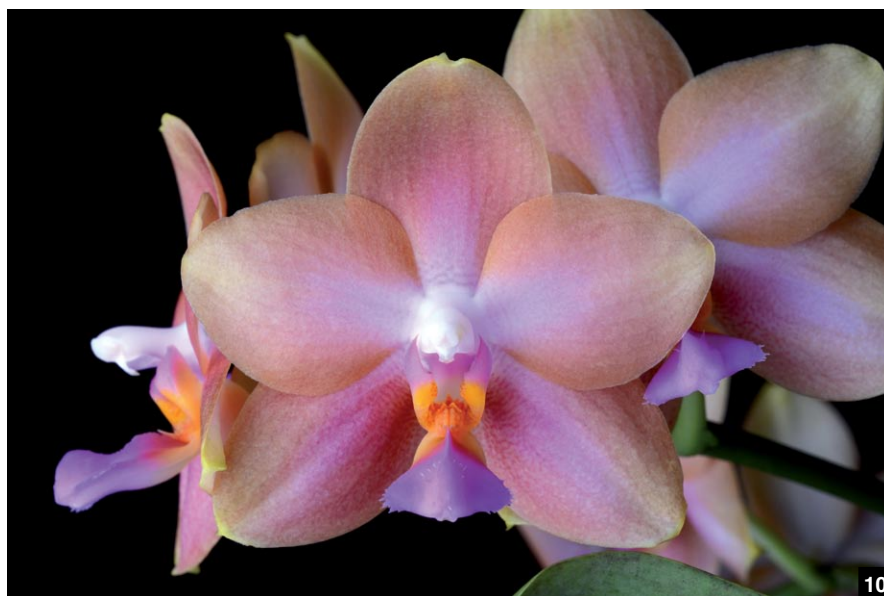
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DAVID GOULD



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DAVID GOULD

Phalaenopsis Citrus Candy is a complex grex with *Phal.* Sogo Lawrence being a grandparent on both sides (and a great grandparent in another strain). It includes in its heritage some large-flowered whites (e.g., *Phalaenopsis* Doris), multiflora miniatures (e.g., *Phal.* Timothy Christopher) and novelty hybrids (e.g., *Phal.* Princess Kaiulani). The grex is highly awarded, with all but one of the awards going to clones presented by Krull-Smith Orchids. This grex was able to accomplish the goals of having small flowers on occasionally branched inflorescences, good full form, firm substance, good presentation and intense color. There are a range of color forms, but all have an intense yellow base color with some degree of markings and overlay.

The first awarded clone of the grex was *Phal.* Citrus Candy ‘James Krull’ AM/AOS awarded in 2013. This clone shows that possibilities for branching in the grex.

Another color form can be seen in *Phal.* Citrus Candy ‘Asheville’ AM/AOS, which shows little overlay or markings resulting in a bright, clear-yellow flower. It held “twenty-four flowers and nine buds on two inflorescences.”

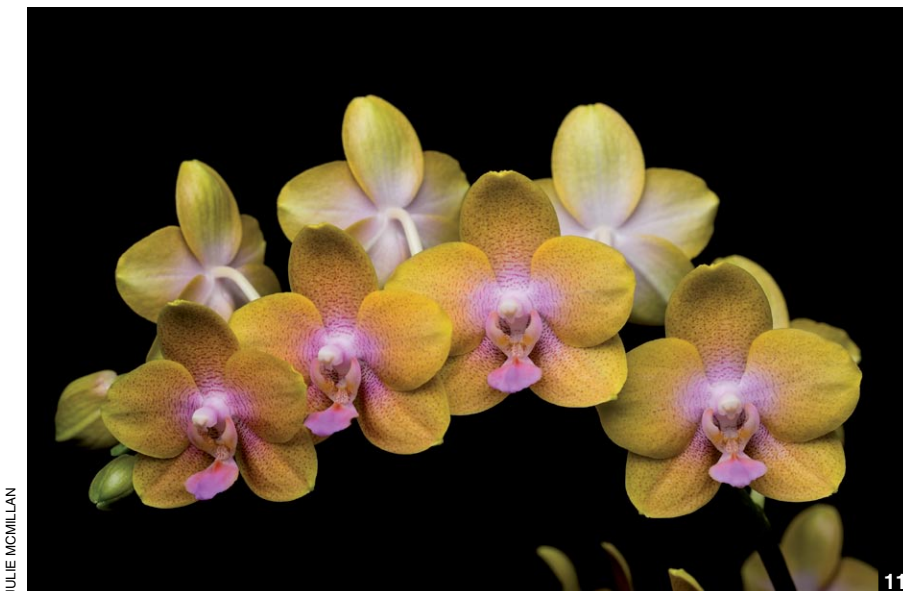
At the other end of the spectrum, we can consider *Phal.* Citrus Candy ‘Drey Winter’ AM/AOS, which has a heavy overlay and markings. It held “thirty-two flat flowers on three arched inflorescences; sepals and petals golden yellow overlaid bronze-red, fuchsia halo...”

The most highly awarded clone of the grex is *Phal.* Citrus Candy ‘Crystelle’ FCC/AOS. The description notes the branching of the grex, the presentation and the appearance of bright colors on the flowers: “flower base color mustard yellow, overlaid with fine red spots to give the appearance of copper color, picotee yellow, proximally bright fuchsia.”

The most recent of the awards — and my personal favorite — was to *Phal.* Citrus Candy ‘Sweet Mama’ AM/AOS. I find both the form and the color of this clone to be exceptional. When presented for judging, it was described as “sepals and petals full, gold, heavily overlaid and stippled brick red, except at margins, bright fuchsia basally; lip dark fuchsia, yellow on base of side lobes...substance rigid; texture faintly crystalline.”

***Phalaenopsis* Krull’s Red Bird (H.P. Norton × Hot Embers)**

The parent, Hot Embers, is half *Phal.* *amboinensis*, half Krull’s Red Hot (which is another highly awarded deep-red



JULIE McMILLAN

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JULIE McMILLAN

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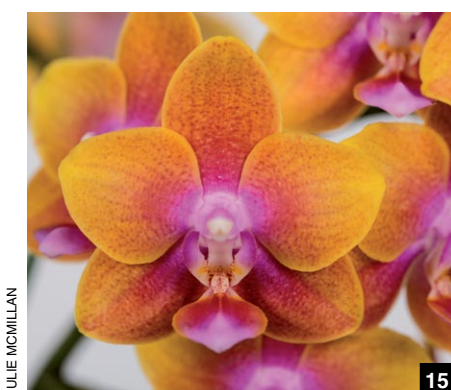
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JULIE McMILLAN

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- [8] *Phal.* Pylo’s Sweet Orange ‘Jerry Brandenburg’ AM/AOS; exhibitor: Ronnie and Jerry Brandenburg.
- [9] *Phal.* Pylo’s Sweet Orange ‘Stacey’ AM/AOS; exhibitor: Ronnie and Jerry Brandenburg.
- [10] *Phal.* Pylo’s Sweet Orange ‘Peter’s Rainbow’ AM/AOS; exhibitor: Big Leaf Orchids.
- [11] *Phal.* Citrus Candy ‘Asheville’ AM/AOS; exhibitor: Krull-Smith.
- [12] *Phal.* Citrus Candy ‘Drey Winter’ AM/AOS; exhibitor: Krull-Smith.
- [13] *Phal.* Citrus Candy ‘Crystelle’ FCC/AOS; exhibitor: Krull-Smith.
- [14] *Phal.* Citrus Candy ‘Sweet Mama’ AM/AOS; exhibitor: Krull-Smith.
- [15] *Phal.* Citrus Candy ‘James Krull’ AM/AOS; exhibitor: Krull-Smith.

COGHILL-BEHREND'S

hybrid). H.P. Norton is half Krull's Red Hot, half Brother Pirate King (which is a highly complex hybrid with Golden Peoker, George Vasquez and a fair amount of Golden Sands in its heritage). This grex represents a step forward in the hybridizing for red phalaenopsis, resulting in intense color, exceptional substance and fine presentation.

The first awarded clone is also the most highly awarded clone to date. *Phalaenopsis* Krull's Red Bird 'Crystelle' AM/AOS was impressive for its exceptional substance and color. The "sepals and petals (were) olive green gold overlaid burnt red-orange, fuchsia halo basally; lip dark red violet...substance hard; texture glossy."

In 2011, the grex received an AQ/AOS for a grouping of plants that garnered four AM/AOS awards during the judging session. Those four clones — 'Laurie Nissen' AM/AOS, 'Jim Krull' AM/AOS, 'Tom Simpson' AM/AOS and 'June Simpson' AM/AOS — were remarkably similar in size, color, presentation and substance. The clone 'Laurie Nissen' was described as "twenty very dark red flowers and one bud on two branched inflorescences; dorsal sepal broad and blunt...lip very dark solid red...substance extra firm; texture waxy."

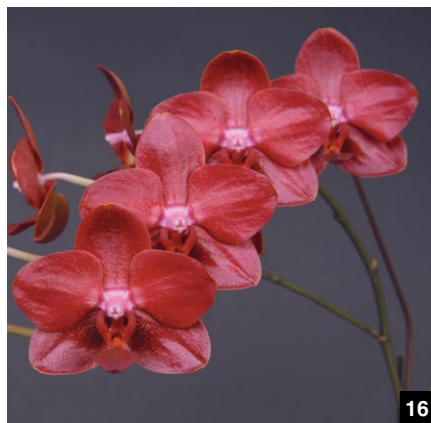
Phalaenopsis Pingtung Glory (Sogo Lawrence × Venimp)

This grex received two Awards of Merit and an Award of Quality at the Taiwan International Orchid Show in 2015. The AQ/AOS description recognizes the grex for "thirteen high quality plants... dramatic range of colors present from yellow with oxblood red spots through orange to solid oxblood red, all clear and well-defined; epitome of improvement in achievement of standards for which the Award of Quality is intended."

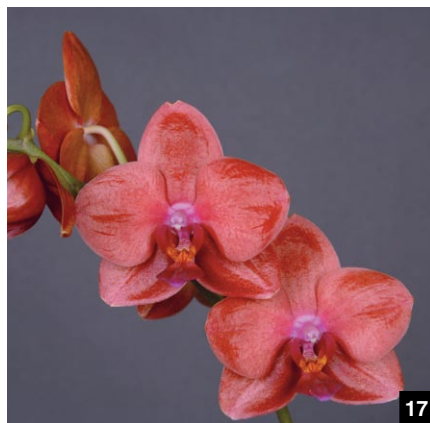
Phalaenopsis Krull's Vixen (H.P. Norton × Sogo Lawrence)

Phalaenopsis Krull's Vixen raised the bar for hybridizing of red phalaenopsis. *Phalaenopsis* Krull's Vixen 'Krull-Smith' HCC/AOS is not a typical color form for the grex. While most clones have a heavy overlay of magenta, 'Krull-Smith' was only lightly brushed with magenta.

In 2015, Krull-Smith presented 13 plants of the grex, which received an Award of Quality, at the Tampa Bay Orchid Society Show. Four plants from that group received an Award of Merit. The AQ/AOS contained "thirteen cultivars of superior quality; full, flat, round flowers ranging



BRIAN KELLY



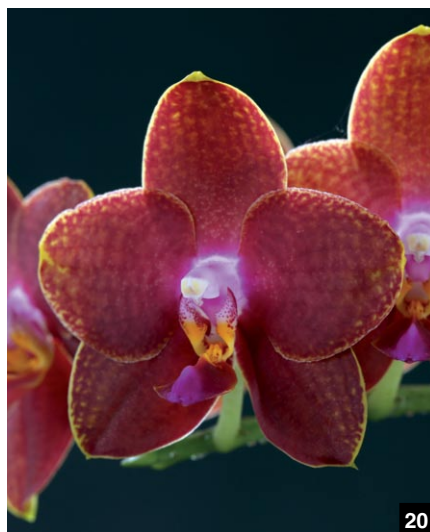
BRIAN KELLY



BRIAN KELLY



JEA SHANG PHOTOGRAPHY



JEA SHANG PHOTOGRAPHY

[16] *Phal.* Krull's Red Bird 'Laurie Nissen' AM/AOS; exhibitor: Krull-Smith.

[17] *Phal.* Krull's Red Bird 'Tom Simpson' AM/AOS; exhibitor: Krull-Smith.

[18] *Phal.* Krull's Red Bird 'June Simpson' AM/AOS; exhibitor: Krull-Smith.

[19] *Phal.* Pingtung Glory 'NPU 2675' AM/AOS; exhibitor: National Pingtung Univ. of Science.

[20] *Phal.* Pingtung Glory 'NPU 2680' AM/AOS; exhibitor: National Pingtung Univ. of Science.

PHALAENOPSIS KRULL'S VIXEN



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[21] 'James Krull' AM/AOS; exhibitor: Krull-Smith. Photograph by Jim Tear.

[22] 'Hayden Jensen' AM/AOS; exhibitor: Krull-Smith. Photograph by Julie McMillan.

[23] 'Crystelle' AM/AOS; exhibitor: Krull-Smith. Photograph by Jim Tear.

[24] 'Krull's Red Hots' AM/AOS; exhibitor: Krull-Smith. Photograph by Tom Kuligowski.

[25] 'Dear John' AM/AOS; exhibitor: Krull-Smith. Photograph by Julie McMillan.

[26] 'Jordan Winter' AM/AOS; exhibitor: Krull-Smith. Photograph by Julie McMillan.

[27] 'Krull-Smith' HCC/AOS; exhibitor: Krull-Smith. Photograph by Tom Kuligowski.



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PHALAENOPSIS CRYSTAL SURPRISE



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[28] *Phal.* Crystal Surprise (Lioulin Venus 'LM 81 × LD's Bear Queen 'Mituo 2') AQ; exhibitor: Crystal Star Orchids, Ellen and Eric Lee. Photograph by Ed Cott.

[29] 'Crystal Star' HCC/AOS; exhibitor: Crystal Star Orchids, Ellen and Eric Lee. Photograph by Ed Cott.

[30] 'Sunray' AM/AOS; exhibitor: Crystal Star Orchids, Ellen and Eric Lee. Photograph by Ed Cott.

[31] 'Cordovan' HCC/AOS; exhibitor: Crystal Star Orchids, Ellen and Eric Lee. Photograph by Ed Cott.

[32] 'Bing Cherry' HCC/AOS; exhibitor: Crystal Star Orchids, Ellen and Eric Lee. Photograph by Ed Cott.

[33] 'Watercolor' AM/AOS; exhibitor: Crystal Star Orchids, Ellen and Eric Lee. Photograph by Ed Cott.



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in color from yellow, heavily spotted red to yellow-orange, overlaid red, with faint yellow-orange spots showing through; all flowers have consistent heavy substance and waxy texture; flowers pleasingly arranged for this type of breeding...."

Phalaenopsis Krull's Vixen 'James Krull' AM/AOS, also part of the AQ, showed much fuller suffusion of color and — despite some minor form issues — was a well-balanced flower.

Phalaenopsis Krull's Vixen 'Crystelle' AM/AOS had the highest award of the four awarded clones in the AQ with exceptional substance and color. It had flowers with "base color yellow-orange, overlaid light red, faint yellow-orange spots showing through."

Almost three weeks after receiving the Award of Quality, Krull-Smith presented additional clones at the 2015 Western North Carolina Orchid Society Show and received three more Awards of Merit for 'Dear John' AM/AOS, 'Jordon Winter' AM/AOS and 'Hayden Jensen' AM/AOS. All three clones were strikingly similar in color, form and presentation. 'Dear John' was described as having flowers with "...sepals and petals old gold, heavily overlaid dark cordovan; lip midlobe deep violet-purple, side lobes yellow, blotched red-violet...."

There have only been a few clones of this grex awarded since 2015; the most recent, in my opinion, is one of the most spectacular, despite some obvious issues. *Phalaenopsis* Krull's Vixen 'Krull's Red Hots' AM/AOS (82) was awarded in 2018 and had "flowers red-copper; dorsal sepal and petals lightly spotted deep red centrally; lateral sepals heavily spotted red centrally; lip red with yellow striations on side lobes and base of midlobe; column pink with a magenta halo around column..."

***Phalaenopsis* Crystal Surprise (Lioulin Venus × LD's Bear Queen)**

Phalaenopsis Crystal Surprise was bred by Eric Lee in 2017. The parent, *Phalaenopsis* Lioulin Venus, has yellow harlequins in its ancestry and provided some surprises in the resultant offspring.

The grex received three HCC/AOS, two AM/AOS and the Award of Quality in one session. The AQ/AOS was bestowed upon 13 plants from the cross which, according to the judges present "show exceptional novelty harlequin breeding; flowers full and relatively flat, ranging in color from yellow with red burgundy blotches to solid red burgundy, creating a palette of red burgundy, yellow and art-shade harlequin flowers; plants also noted for



Phalaenopsis Jordon Winter 'Nala' HCC/AOS; exhibitor: Krull-Smith. Photograph by Julie McMillan.

taller upright inflorescences and pleasant sweet citrus fragrance...."

Phalaenopsis Crystal Surprise 'Crystal Star' HCC/AOS) is a rather unusual flower. When I began raising orchids, a yellow phalaenopsis with harlequin markings was not common. This clone had, according to the judges, "two harlequin flowers on one upright, 23.5-cm inflorescence; dorsal sepal yellow, overlaid dark burgundy on the front and reverse, picotee yellow; lateral sepals blotched dark burgundy proximally, random splotches coalesced to solid distally; petals yellow, blotched red burgundy proximally, bordered lighter yellow, dusted wine red on upper and lower margins on inner half...."

Phalaenopsis Crystal Surprise 'Watercolor' AM/AOS is another harlequin presentation but has a much more pleasing patterning with the blotching well-defined and confined to the central portion of the flower.

Phalaenopsis Crystal Surprise 'Sunray' AM/AOS provides a clear contrast to the harlequin clones previously described, with a clear, bright yellow color and distinct markings. The plant at the time of judging had "sepals and petals butter yellow, spotted magenta; lip white, overlaid magenta at base of side lobes and midlobe, throat golden yellow...." I would opine that the description "spotted magenta" does not describe the complexity of the patterning evident in the award photograph.

The two remaining awarded clones are quite similar and are more analogous to the breeding previously covered in this

section. *Phalaenopsis* Crystal Surprise 'Cordovan' HCC/AOS and *Phal.* Crystal Surprise 'Bing Cherry' HCC/AOS both have heavily overlaid segments. The description for the clone 'Bing Cherry' correctly assesses the flowers' color as "...flower reverse chartreuse, heavily suffused brown-burgundy; sepals and petals chartreuse, harlequin spotting very heavily overlaid brown-burgundy, tips chartreuse...."

***Phalaenopsis* Jordon Winter (Citrus Candy × Krull's Red Bird)**

Phalaenopsis Jordon Winter came from Krull-Smith Orchids in 2018. It is the result of hybridizing two highly successful hybrids: Citrus Candy and Krull's Red Bird. The grex received an Award of Quality in 2018 for "[a] group of twelve plants demonstrating consistent flower quality with a broad range of pleasing red shades and consistent carriage and presentation...." The grex has received two flower quality awards: one prior to the AQ/AOS and one concurrent.

Phalaenopsis Jordon Winter 'Nala' HCC/AOS held "six deep cordovan red flowers and six buds on one gently arched inflorescence...substance firm; texture waxy." What is not noted in the description, but is evident in the photographic evidence, is that the inflorescence is distinctly branched.

Phalaenopsis Jordon Winter 'Anthony's Choice' AM/AOS was awarded at the time of the Award of Quality. The suffusion of color in the flowers was so complete that the base color was not

notable, even on the obverse surface. It was described as having "sepals and petals rich ruby red, ovate; lip fuchsia, suffused ruby red, yellow centrally; column fuchsia, anther cap white; substance heavy; texture lacquered."

NOTES ABOUT BREEDING FOR RED PHALAEOPSIS AND NEW DIRECTIONS I have discussed some of the recent results of crossover breeding and the quest for red-flowered phalaenopsis. To date, however, the truly reds would still be considered miniatures by most standards. One direction in breeding is for large, red flowers, nearly approximating a standard phalaenopsis. These flowers are not actually red but have heavy magenta overlays on a yellow base color, which looks red to us. Unfortunately, most of the novelties are diploid and most of the large-flowered phalaenopsis are tetraploid or triploid genetically, so the breeding line comes to a quick end.

There are some possibilities for creating large-flowered, red phalaenopsis, which could overcome these hybridizing obstacles. One is the use of nonsplitting triploids (such as was noted with *Phal. Golden Sands 'Canary'*) to create tetraploid reds, which could then be crossed with standard yellow hybrids. Perhaps a more practical approach, however, would be to develop tetraploid strains of the novelty and crossover hybrids to breed tetraploid × tetraploid. This effort could take considerable time to develop the complexities of the red crossover hybrids that we have just seen. Finally, in the absence of tetraploid, small-flowered, red hybrids, the only other option would seem to be colchicine-treated, large-flowered triploids, resulting in 4n plants through hexaploid × diploid hybridizing. Hexaploid breeding tends to be rather unstable, however, and often results in aneuploidy offspring.

These options are currently being considered, however, in the pursuit of large-flowered red phalaenopsis and I would wager that such results will be seen in my lifetime. *Phalaenopsis* Jordan Winter already seems to be a reasonable step toward this goal.

Although there has been some extensive breeding done with the species covered in this article, there are some exciting and potentially remarkable avenues currently being followed in the pursuit of miniature phalaenopsis hybrids. The National Pingtung University of Sciences and Technology, Hwa-Tung Liu Orchids and Karine Hervé (among others) have been using other miniature



34

JULIE MCMILLAN

species in their breeding efforts with some modest success. Included species are *Phalaenopsis lobbii*, *Phalaenopsis parishii*, *Phalaenopsis appendiculata*, *Phalaenopsis lindenii* and *Phalaenopsis finleyi*. Some of these efforts are seeing second- and third-generation hybrids flower and the results are interesting. With further refinement, we should be seeing surprising new hybrids hitting the judging tables soon.

CONCLUSIONS Despite there being only about 30 to 35 years of intense interest in the small-flowered phalaenopsis, there has been a considerable amount of progress made by hybridizers in producing some high-quality hybrids for the orchid-growing community. The multifloral miniature hybrids never fail to produce a breathtaking display of diminutive blooms on highly branched inflorescences. These hybrids, unfortunately, often have qualities that preclude flower quality awards through the judging system. Novelty phalaenopsis, on the other hand, produce only several moderately sized blooms per inflorescence and — despite their positive qualities — may not be as attractive to the average grower. Their flowers however have wonderful form, color and substance and are readily awarded due to these positive qualities. More recent breeding efforts have managed to combine the best qualities of both of these breeding lines and create some truly stunning results. Fortunately, there are still many lines yet to be pursued to their conclusion and we can expect some interesting clones to find their way to our vendors' tables in the near future.

—Andrew began growing orchids about 13 years ago in Iowa City, Iowa



35

WES NEWTON

[34] *Phal.* Jordan Winter 'Anthony's Choice' AM/AOS; exhibitor: Krull-Smith.

[35] *Phal.* Jordan Winter 'Electric' AM/AOS; exhibitor: Krull-Smith.

[36] *Phal.* Yaphon Oh Mygod 'Susan's Valentine' AM/AOS (KS Happy Eagle × *tetraspis* f. *speciosa*); exhibitor: Susan Tompkins. Photograph by Bryon Rinke.

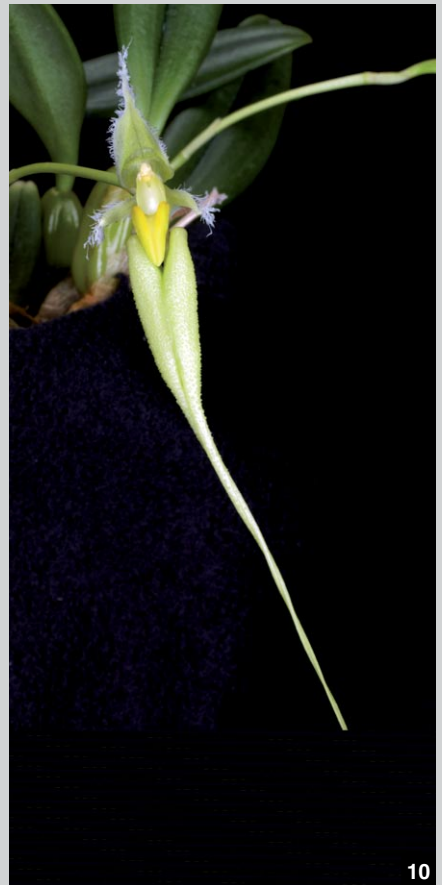
when he inherited a lightstand from extended family. He and his son, Quincy, are now active members of the Eastern Iowa Orchid Society and Andrew was promoted in March of 2019, to an associate judge in the Chicago judging center (email: mistercoghill@hotmail.com).

ADDITIONAL READING

Coghill-Behrends, A. Small-Flowered Phalaenopsis. Part 1: The Miniature Multiflorals. *Orchids* 89(3):204–213.

Coghill-Behrends, A. Small-Flowered Phalaenopsis. Part 2: Novelty Hybrids. *Orchids* 89(5):370–381.







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- [1] *Paphiopedilum* President's Lady 'Slipper Zone Leilani' AM/AOS (President Fred x Fred's Lady) 82 pts. Exhibitor: Lehua Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [2] *Paphiopedilum* Macabre Illusion 'Slipper Zone Ethers' AM/AOS (Hawaiian Illusion x Macabre Contrasts) 82 pts. Exhibitor: Lehua Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [3] *Paphiopedilum* Voodoo Jewel 'Champagne' HCC/AOS (Voodoo Crazy x Jewel Green) 76 pts. Exhibitor: Dave Sorokowsky; photographer: Arthur Pinkers. Pacific South Judging
- [4] *Paphiopedilum* Macabre Hawaiian 'Slipper Zone Yet Another' HCC/AOS (Hawaiian Illusion x Macabre Pops) 79 pts. Exhibitor: Lehua Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [5] *Paphiopedilum* Memoria Raymond Burr 'Xico's' AM/AOS (Spotglen x Menthule) 80 pts. Exhibitor: Francisco Baptista; photographer: Arthur Pinkers. Pacific South Judging
- [6] *Paphiopedilum venustum* f. *measuresianum* (album) 'No Red' HCC/AOS 75 pts. Exhibitor: Donald Goss; photographer: Arthur Pinkers. Pacific South Judging
- [7] *Paphiopedilum* Berenice 'Sunset Valley Orchids' AM/AOS (*lowii* x *philippinense*) 83 pts. Exhibitor: Fred Clarke; photographer: Arthur Pinkers. Pacific South Judging
- [8] *Paphiopedilum* Adding Booth 'Sunset Valley Orchids Too' AM/AOS (Genevieve Booth x *adductum*) 86 pts. Exhibitor: Fred Clarke; photographer: Arthur Pinkers. Pacific South Judging
- [9] *Lycaste* Sagano 'Thornton Purity' AM/AOS (Abou Sunset x Shoalhaven) 83 pts. Exhibitor: Thornton Conservatory; photographer: Arthur Pinkers. Pacific South Judging
- [10] *Bulbophyllum fascinator* (Aureum) 'Green Dragon' CHM/AOS 83 pts. Exhibitor: Peter T. Lin; photographer: Arthur Pinkers. Pacific South Judging
- [11] *Catamodes* Dragons Glade 'Sunset Valley Orchids' AM/AOS (Dragons Tail x *Catasetum* Orchidglade) 85 pts. Exhibitor: Fred Clarke; photographer: Arthur Pinkers. Pacific South Judging
- [12] *Cymbidium tortisepalum* var. *longibracteatum* 'Vineland's Pink' HCC/AOS 76 pts. Exhibitor: Carol Beule; photographer: Arthur Pinkers. Pacific South Judging
- [13] *Mormodes* Aftermath 'Sunset Valley Orchids' HCC/AOS (Midnight Hooker x Mark Mills) 79 pts. Exhibitor: Fred Clarke; photographer: Arthur Pinkers. Pacific South Judging
- [14] *Paphiopedilum* Ruby Voodoo 'Fuerte' AM/AOS (Voodoo Magic x Ruby Pulsar) 82 pts. Exhibitor: Outhay Viengkhou; photographer: Arthur Pinkers. Pacific South Judging
- [15] *Cattleya* Petittfleur 'Diamond Orchids' HCC/AOS (*jongheana* x *praestans*) 77 pts. Exhibitor: Peter T. Lin; photographer: Arthur Pinkers. Pacific South Judging
- [16] *Holcostylis* M S Sunlight 'Diamond Orchids II' AM/AOS (*Holcoglossum flavesceus* x *Rhynchostylis gigantea*) 80 pts. Exhibitor: Peter T. Lin; photographer: Arthur Pinkers. Pacific South Judging





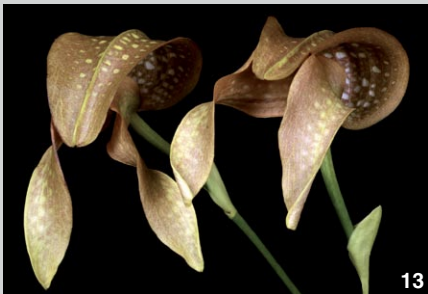
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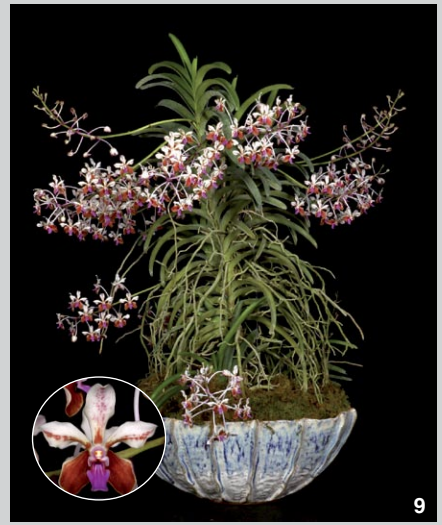


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- [1] *Rhyncholaeliocattleya* Memoria Alida Laboy 'Sunset Valley Orchids' AM/AOS (*Cattleya* Virginia Dickey x *Rubescence*) 83 pts. Exhibitor: Fred Clarke; photographer: Arthur Pinkers. Pacific South Judging
- [2] *Phalaenopsis* Krull's Sunrise 'Krull-Smith' AM/AOS (Krull's Golden Champion x *Citrus Candy*) 81 pts. Exhibitor: Krull-Smith; photographer: Tom Kuligowski. West Palm Beach Judging
- [3] *Rhyncholaeliocattleya* Memoria Anna Balmores 'Five Stars' AM/AOS (*Cattleya* Memoria Robert Strait x *Good News*) 82 pts. Exhibitor: Jeff Tucker; photographer: Tom Kuligowski. West Palm Beach Judging
- [4] *Brassocattleya* Morning Song 'Canaima's Exotic Lip' CCM/AOS (Morning Glory x *Cattleya* Melody Fair) 85 pts. Exhibitor: Bredren Orchids and Phillip Hamilton; photographer: Tom Kuligowski. West Palm Beach Judging
- [5] *Paphiopedilum* Fajen's Fair Wench 'Kidege' HCC/AOS (*fairrie anum* x *wenshanense*) 76 pts. Exhibitor: Jose A. Izquierdo and Irma Saldana; photographer: Irma Saldaña. Puerto Rico Judging
- [6] *Epidendrum* Wedding Valley 'Susan's Pink Starburst' CCE/AOS (Princess Valley x *Pearl Valley*) 91 pts. Exhibitor: Susan Kolinsky; photographer: Tom Kuligowski. West Palm Beach Judging
- [7] *Encyleyvola* Clarissa Cagauan 'Kiilani' CCM/AOS (Sammie Evans x *Brassavola nodosa*) 84 pts. Exhibitor: José Alberto Rodríguez; photographer: Irma Saldaña. Puerto Rico Judging
- [8] *Clowesetum* Afterglow 'B-C II' AM/AOS (*Clowesia* Rebecca Northen x *Catasetum spitzii*) 85 pts. Exhibitor: B. Butts- C. Lefaive; photographer: Robin McLaughlin. Toronto Judging
- [9] *Catasetum osakadianum* 'B-C' CHM/AOS 82 pts. Exhibitor: B. Butts- C. Lefaive; photographer: Robin McLaughlin. Toronto Judging
- [10] *Coelogyne flaccida* 'Jardin botanique de Montréal' AM/AOS 81 pts. Exhibitor: Jardin botanique de Montréal; photographer: Thang Dam. Toronto Judging
- [11] *Pleurothallis andreae* 'Hill Island' CBR/AOS. Exhibitor: Joyce Medcalf; photographer: Robin McLaughlin. Toronto Judging
- [12] *Cymbidium madidum* 'Jardin botanique de Montréal' CCE/AOS 90 pts. Exhibitor: Jardin botanique de Montréal; photographer: Thang Dam. Toronto Judging
- [13] *Bulbophyllum grandiflorum* 'Apopka' AM/AOS 84 pts. Exhibitor: Krull-Smith; photographer: Tom Kuligowski. West Palm Beach Judging
- [14] *Paphiopedilum* Dark Matter 'Night Howl' HCC/AOS (Enzan Rose Crown x *Yi-Ying Fire Fox*) 78 pts. Exhibitor: Stanley Luk; photographer: Robin McLaughlin. Toronto Judging
- [15] *Phragmipedium* Priscilla's Pirouette 'Heaven James' HCC/AOS (*Acker's* *Ballerina* x *dalessandroi*) 75 pts. Exhibitor: ThienNgo N. Le; photographer: Mark Van der Woerd. Rocky Mountain Judging
- [16] *Cattleya intermedia* (Orlata) 'Jaime Salgado' AM/AOS 80 pts. Exhibitor: Carlos Bianchi; photographer: Jorge Carlos. West Palm Beach Judging





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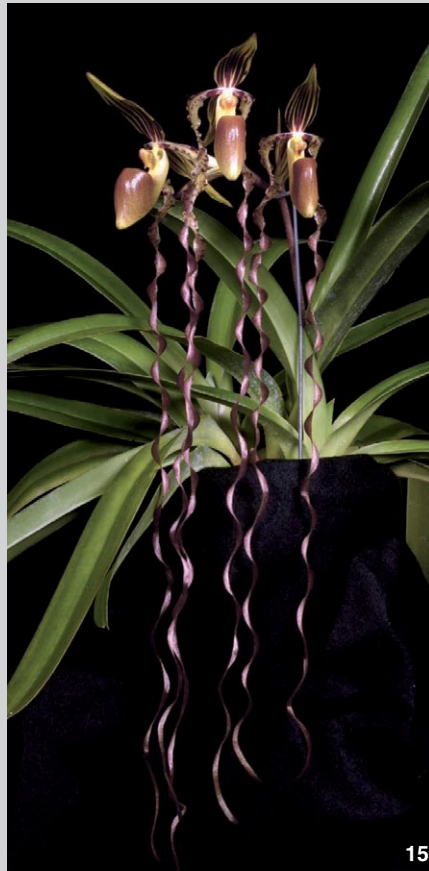
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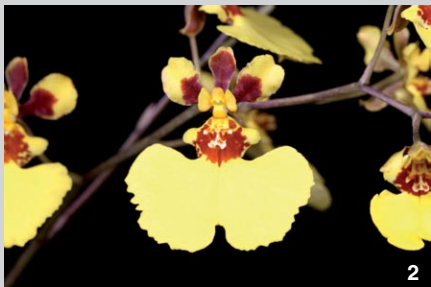
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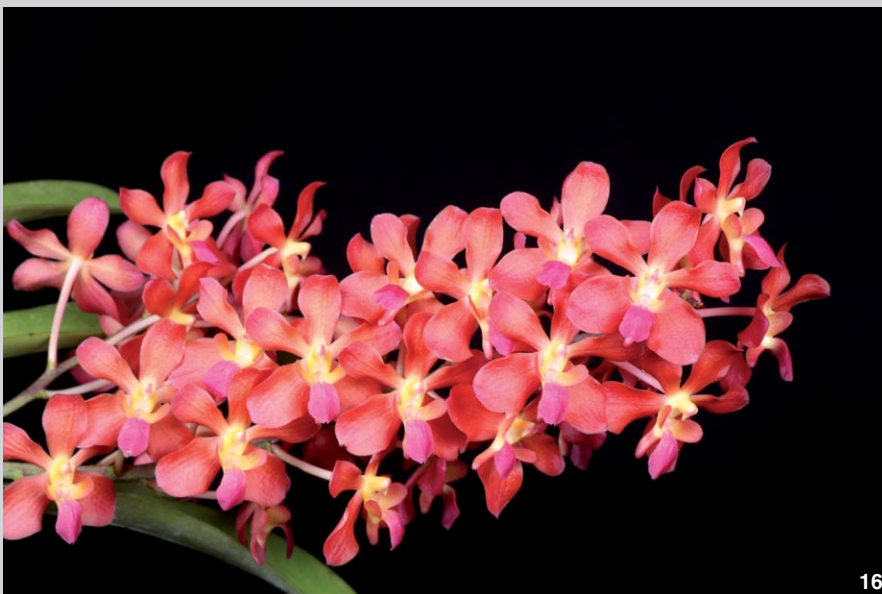
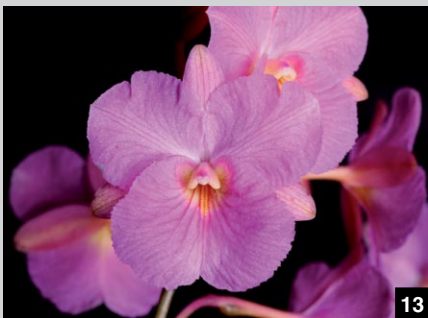
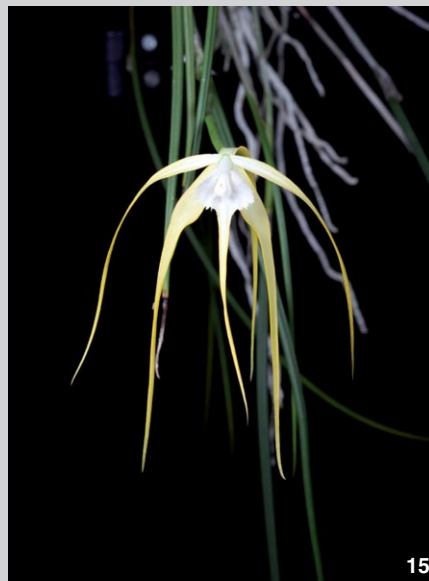
- [1] *Dendrobium mirbelianum* 'Obsequio' AM/AOS 86 pts. Exhibitor: Gladys Roudel; photographer: Tom Kuligowski. West Palm Beach Judging
- [2] *Rhyncattleanthe* Nina de Primavera 'Crownfox Sunrise' CCE-FCC/AOS (Orange Nuggett x *Cattleya* Horace) 90-90 pts. Exhibitor: Sandi Block-Brezner; photographer: Tom Kuligowski. West Palm Beach Judging
- [3] *Paphiopedilum* Satchel Paige 'Felipe Mejicano Palmieri' HCC/AOS (*wardii* x *Vintner's Treasure*) 78 pts. Exhibitor: Mario and Silvia Palmieri; photographer: Jorge Carlos. West Palm Beach Judging
- [4] *Lycaste* Shoalhaven 'Cali Bianchi 901' AM/AOS (*virginialis* x *Koolena*) 86 pts. Exhibitor: Carlos Bianchi; photographer: Jorge Carlos. West Palm Beach Judging
- [5] *Lycaste* Reina Del Cisne 'Mario Palmieri' HCC/AOS (*angelae* x *Kiama*) 78 pts. and Mario and Silvia Palmieri; photographer: Jorge Carlos. West Palm Beach Judging
- [6] *Restrepia fritillina* 'Enrique y Emma' CBR/AOS. Exhibitor: Enrique Novales; photographer: Jorge Carlos. West Palm Beach Judging
- [7] *Lycaste virginialis* 'Eddy Ballinas' HCC/AOS 78 pts. Exhibitor: Carlos Bianchi; photographer: Jorge Carlos. West Palm Beach Judging
- [8] *Cattlianthe* Ana Raquel 'Palmieri's Love' AM/AOS (*Cattleya lueddemanniana* x *Guarianthe guatemalensis*) 80 pts. Exhibitor: Mario and Silvia Palmieri; photographer: Jorge Carlos. West Palm Beach Judging
- [9] *Vanda lamellata* var. *boxallii* 'Crownfox' CCE-FCC/AOS 95-94 pts. Exhibitor: R.F. Orchids, Inc.; photographer: Tom Kuligowski. West Palm Beach Judging
- [10] *Encyclia patens* 'Benttree' CCM/AOS 86 pts. Exhibitor: Bonnie and Will Riley; photographer: Tom Kuligowski. West Palm Beach Judging
- [11] *Guarianthe aurantiaca* 'Palmieri's Tangerine' AM/AOS 80 pts. Exhibitor: Mario and Silvia Palmieri; photographer: Jorge Carlos. West Palm Beach Judging
- [12] *Cattlianthe* Ana Raquel AQ/AOS (*Cattleya lueddemanniana* 'Mario Palmieri' x *Guarianthe guatemalensis* 'Rosa de enero'). Exhibitor: Mario and Silvia Palmieri; photographer: Jorge Carlos. West Palm Beach Judging
- [13] *Rhynchostylis gigantea* f. *alba* 'Memoria Martha Di Paola Merlo' AM/AOS 82 pts. Exhibitor: Jorge Merlo; photographer: Tom Kuligowski. West Palm Beach Judging
- [14] *Paphiopedilum* Wössner Sander's Love 'Nike' AM/AOS (*Mercatellii* x *sanderianum*) 86 pts. Exhibitor: Ernie Barham; photographer: Tom Kuligowski. West Palm Beach Judging
- [15] *Pterostylis erecta* 'Cherokee Spirit' CCM/AOS 83 pts. Exhibitor: David Mellard; photographer: Jason R. Mills. Atlanta Judging
- [16] *Rhynchosteles stellata* 'Arquelon' CCM-AM/AOS 85-82 pts. Exhibitor: Carlos Bianchi; photographer: Jorge Carlos. West Palm Beach Judging



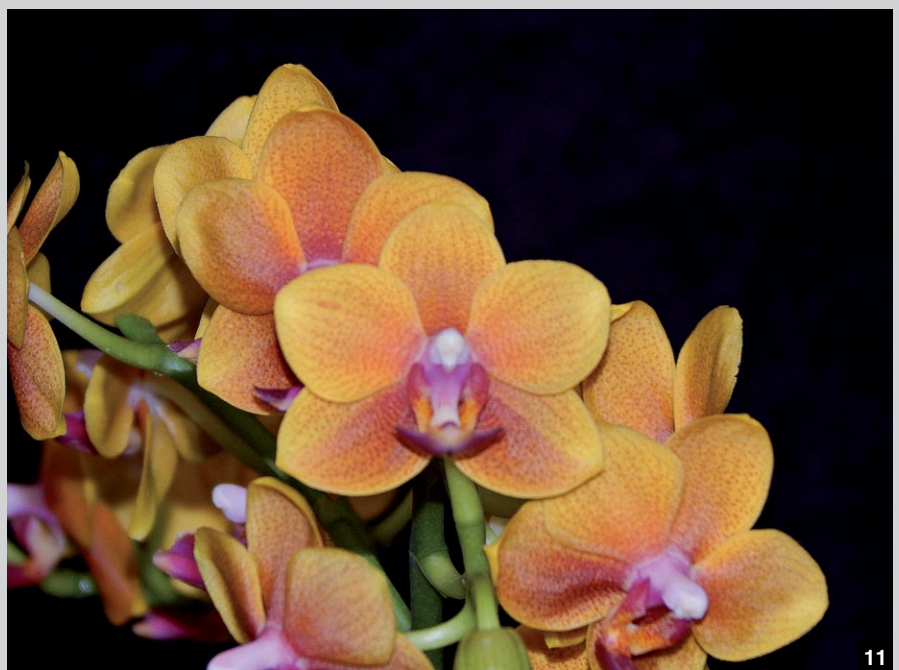


- [1] *Cattleya alariorum* 'Cedarwood Denali' AM/AOS 82 pts. Exhibitor: Cecily Maciejewski; photographer: Charlotte Randolph. Alamo Judging
- [2] *Trichocentrum splendidum* 'Sunshine' AM/AOS 84 pts. Exhibitor: Merlin and Kelly Verret; photographer: Charlotte Randolph. Alamo Judging
- [3] *Paphiopedilum* Spring Sunset 'Madison's Smile' HCC/AOS (Spring Moonbeam x *mastersianum*) 76 pts. Exhibitor: Laurie and Sheila Skov; photographer: Robert Bermea. Alamo Judging
- [4] *Dendrobium* Mini Snowflake 'Louise' CCM/AOS (*aberrans* x *johnsoniae*) 81 pts. Exhibitor: Pat Calvey; photographer: Scott Weber. Chicago Judging
- [5] *Cattleya* David Prehleser 'Big Fred' HCC/AOS (Angel's Dream x Memoria Trudi Marsh) 77 pts. Exhibitor: Chen-Hao Hsu; photographer: Ramon de los Santos. California Sierra Nevada Judging
- [6] *Paphiopedilum* Fanaticum 'Box of Rain' CCM/AOS (*malipoense* x *micranthum*) 86 pts. Exhibitor: Nicholas Spaulding; photographer: Ramon de los Santos. California Sierra Nevada Judging
- [7] *Rhyncholaeliocattleya* Memoria Dorothy Bertsch 'Betty' HCC-CCM/AOS (Iliad x Midas Charm) 79-82 pts. Exhibitor: Merlin and Kelly Verret; photographer: Charlotte Randolph. Alamo Judging
- [8] *Paphiopedilum* Happylyght 'Shireland' HCC/AOS (Happy Hill x Nulight) 77 pts. Exhibitor: Arnold J. Klehm, Grower; photographer: Mike Rollinger. Chicago Judging
- [9] *Cymbidium* Spark Sprite 'Sparky' HCC/AOS (Sarah Jean x *canaliculatum*) 78 pts. Exhibitor: Mike and Liz Fitzgerald; photographer: Mike Rollinger. Chicago Judging
- [10] *Cymbidium* Gateway to Gold 'Floracultura' HCC/AOS (Coratea x Sporting Life) 76 pts. Exhibitor: Ed and Jaybee Dumaguin; photographer: Ramon de los Santos. California Sierra Nevada Judging
- [11] *Cymbidium wenshanense* 'Mello Spirit' AM/AOS 80 pts. Exhibitor: David Mellard; photographer: Jason R. Mills. Atlanta Judging
- [12] *Paphiopedilum* Hsinying Delight 'Meg's Shock' HCC/AOS (*spicerianum* x Stone Lovely) 76 pts. Exhibitor: Meg McLaughlin; photographer: Scott Weber. Chicago Judging
- [13] *Paphiopedilum* Giant Wunder 'Memoria Patricia June' AM/AOS (Giantstone x Lippewunder) 85 pts. Exhibitor: Stephen Helbling; photographer: Richard Noel. Cincinnati Judging
- [14] *Holcoglossum kimbalianum* 'Silas' CCM/AOS 83 pts. Exhibitor: Walter E. Crawford; photographer: Scott Weber. Chicago Judging
- [15] *Paphiopedilum* Sander's Park 'Elektra' AM/AOS (Paul Parks x *sanderianum*) 81 pts. Exhibitor: Larry Cox; photographer: Tom Kuligowski. West Palm Beach Judging
- [16] *Restrepia cymbula* 'Raegan' CCM/AOS 83 pts. Exhibitor: Claire Rojohn; photographer: Mike Rollinger. Chicago Judging





- [1] *Clowesia* Rebecca Northen 'Beepaw' AM/AOS (Grace Dunn x *rosea*) 82 pts. Exhibitor: Dana and Edward White Jr.; photographer: Richard Noel. Cincinnati Judging
- [2] *Rodrumnia* Memoria Pat Tomlinson 'Hamlyn' AM/AOS (Orchidom Alameda Beth x *Tolumnia urophylla*) 82 pts. Exhibitor: Claude W. Hamilton; photographer: Claude W. Hamilton. Florida-Caribbean Judging
- [3] *Cattleya* Bedford Sunrise 'Peggy' HCC/AOS (Circle of Life x Jeweler's Art) 78 pts. Exhibitor: Michael Hinshaw; photographer: Richard Noel. Cincinnati Judging
- [4] *Phragmipedium* Allison Strohm 'Whooping Crane' AM/AOS (*kovachii* x Living Fire) 85 pts. Exhibitor: Kwen Hsu; photographer: Richard Noel. Cincinnati Judging
- [5] *Phragmipedium* Suzanne Decker 'Little Marco' AM/AOS (*kovachii* x Cape Sunset) 84 pts. Exhibitor: Michele Little; photographer: Richard Noel. Cincinnati Judging
- [6] *Dendrochilum uncatum* 'Elder' AM/AOS 81 pts. Exhibitor: Ian Wilhite; photographer: Richard Noel. Cincinnati Judging
- [7] *Paphiopedilum* Fairre Helen 'Ramerhouse' CCM-HCC/AOS (*fairreanum* x Pacific Shamrock) 81-77 pts. Exhibitor: Elaine Ramer; photographer: Richard Noel. Cincinnati Judging
- [8] *Paphiopedilum* Apple-Master 'On The Shelf' AM/AOS (*appletonianum* x *mastersianum*) 81 pts. Exhibitor: Eric Sauer; photographer: Richard Noel. Cincinnati Judging
- [9] *Laelia undulata* 'Daisy Wortel' CCM/AOS 87 pts. Exhibitor: Daisy Wortel; photographer: Carmen Johnston. Florida-Caribbean Judging
- [10] *Rhynchodenia* Magic Wand 'Anri Grant' AM/AOS (*Rhynchostylis coelestis* x *Seidenfadenia mitrata*) 84 pts. Exhibitor: Richard Grant; photographer: Claude W. Hamilton. Florida-Caribbean Judging
- [11] *Paphiopedilum* Kilkieran 'Nike' AM/AOS (*gigantifolium* x *glanduliferum*) 84 pts. Exhibitor: Ernie Barham; photographer: Carmen Johnston. Florida-Caribbean Judging
- [12] *Paphiopedilum* In-Charm Pride 'Nike' AM/AOS (Prince Edward of York x Saint Swithin) 86 pts. Exhibitor: Ernie Barham; photographer: Carmen Johnston. Florida-Caribbean Judging
- [13] *Broughtonia sanguinea* 'Elizabeth Hamilton' AM/AOS 85 pts. Exhibitor: Claude W. Hamilton; photographer: Claude W. Hamilton. Florida-Caribbean Judging
- [14] *Paphiopedilum* Angel Hair 'Nike' AM/AOS (Saint Swithin x *sanderianum*) 84 pts. Exhibitor: Ernie Barham; photographer: Carmen Johnston. Florida-Caribbean Judging
- [15] *Brassavola cucullata* 'Hamlyn's Yellow Star' HCC/AOS 78 pts. Exhibitor: Claude W. Hamilton; photographer: Claude W. Hamilton. Florida-Caribbean Judging
- [16] *Waironara* Tango Fire 'Kirk' AM/AOS (*Perreiraara* Bangkok Sunset x *Renanthera storiei*) 84 pts. Exhibitor: Kirk Hoo; photographer: Claude W. Hamilton. Florida-Caribbean Judging





- [1] *Renanstylis* Manoa Queen 'MV Andromeda' AM/AOS (Maui Queen x *Rhynchostylis gigantea*) 81 pts. Exhibitor: Stuart Henderson; photographer: Wes Newton. Florida North-Central Judging
- [2] *Paphiopedilum* Ron Sims 'Rocking K Ranch' HCC/AOS (Hsiying Web x *concolor*) 76 pts. Exhibitor: Karen Wilson; photographer: Wes Newton. Florida North-Central Judging
- [3] *Clowesetum* Melana's Daughter 'Smart Delight' AM/AOS (*Catasetum* Melana Davison x *Clowesia* Rebecca Northen) 82 pts. Exhibitor: Donn Smart; photographer: Jay Loeffler. Florida North-Central Judging
- [4] *Paphiopedilum* Booth's Sand Lady 'Crystelle' FCC/AOS (Lady Isobel x *sanderianum*) 91 pts. Exhibitor: Krull-Smith; photographer: Jay Loeffler. Florida North-Central Judging
- [5] *Paphiopedilum* Wössner Mini Goldi 'Springwater' CCM/AOS (*primulinum* var. *primulinum* x *helenae*) 82 pts. Exhibitor: Springwater Orchids and Thanh Nguyen; photographer: Wes Newton. Florida North-Central Judging
- [6] *Vanda lamellata* var. *boxallii* 'Birthday' AM/AOS 85 pts. Exhibitor: Sharon Kahnoski; photographer: Jay Loeffler. Florida North-Central Judging
- [7] *Rhyncattleanthe* Krull's Mini-Sunburst 'Gavin Henderson' AM/AOS (Jack Crawford x *Cattleya* Seagulls Mini-Cat Heaven) 84 pts. Exhibitor: Krull-Smith; photographer: Jay Loeffler. Florida North-Central Judging
- [8] *Paphiopedilum* Shun-Fa Golden 'Krull-Smith' AM/AOS (*hangianum* x *mali-poense*) 87 pts. Exhibitor: Krull-Smith; photographer: Jay Loeffler. Florida North-Central Judging
- [9] *Cattleya* Loddiglossa 'Darlene' AM/AOS (*amethystoglossa* x *loddigesii*) 82 pts. Exhibitor: Joanna Shaw; photographer: Jay Loeffler. Florida North-Central Judging
- [10] *Ophrys ferrum-equinum* 'Iron-Horse' AM/AOS 81 pts. Exhibitor: Doug and Beth Martin; photographer: Lynn O'Shaughnessy. Great Lakes Judging
- [11] *Phalaenopsis* Tying Shin Golden Eagle 'James Krull' AM/AOS (Tying Shin Champion x Tying Shin Miracle) 83 pts. Exhibitor: Krull-Smith; photographer: Jay Loeffler. Florida North-Central Judging
- [12] *Lepanthes telipogoniiflora* 'Duck Creek' HCC/AOS 76 pts. Exhibitor: Dave Miller; photographer: Eileen Findak. Great Lakes Judging
- [13] *Cattleya loddigesii* 'Bill Thoms' AM/AOS 84 pts. Exhibitor: Krull-Smith; photographer: Jay Loeffler. Florida North-Central Judging
- [14] *Coelogyne* Cosmo-Crista 'Winter Haven' HCC/AOS (*intermedia* x *cristata*) 76 pts. Exhibitor: Keith and Dina Emig - Winter Haven Orchid Nursery; photographer: Kay Clark. Florida North-Central Judging
- [15] *Paphiopedilum* Rolfei 'Windswept's Prince' AM/AOS (*bellatulum* x *rothschildianum*) 83 pts. Exhibitor: Windswept in Time Orchids; photographer: Eileen Findak. Great Lakes Judging
- [16] *Bulbophyllum polliculosum* 'Whisper Fuzzy Chaps' AM/AOS 80 pts. Exhibitor: Laura and Wes Newton; photographer: Kay Clark. Florida North-Central Judging





- [1] *Cattleya* Nora's Melody 'Sylvia' AM/AOS (Love Knot x Little Dipper) 83 pts. Exhibitor: Larry Galdes; photographer: Lynn O'Shaughnessey. Great Lakes Judging
- [2] *Oncostele* Tiger Barb 'Micki' AM/AOS (*Rhynchostele maculata* x *Oncidium* Tiger Hambühren) 85 pts. Exhibitor: Luba Durisin; photographer: Lynn O'Shaughnessey. Great Lakes Judging
- [3] *Phalaenopsis* Walnut Valley Itty Bitty 'Max & Bryon' AM/AOS (Anna-Larati Soekardi x *honghenensis*) 80 pts. Exhibitor: Max Thompson and Bryon Rinke; photographer: Bryon Rinke. Great Plains Judging
- [4] *Cattleya lueddemanniana* 'Shogun's Classic' HCC/AOS 77 pts. Exhibitor: Shogun Hawaii- Matthias Seelis; photographer: Glen Barfield. Hawaii Judging
- [5] *Lycaste* Fire Bird 'Lehua Okika' AM/AOS (Island of Vulcorn x Macama) 80 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging
- [6] *Phragmipedium* Inca Embers 'Surprise' AM/AOS (Andean Fire x *longifolium*) 85 pts. Exhibitor: Linda Sule; photographer: Lynn O'Shaughnessey. Great Lakes Judging
- [7] *Paphiopedilum* Luna Hijinks 'Bryon' AM/AOS (Luna Magic x Luna Shadow) 83 pts. Exhibitor: Bryon K. Rinke; photographer: Bryon Rinke. Great Plains Judging
- [8] *Cattleya amethystoglossa* (Coerulea) 'Orchid Eros' AM/AOS 82 pts. Exhibitor: Ben Oliveros and Orchid Eros; photographer: Glen Barfield. Hawaii Judging
- [9] *Cattleya* Gravesiana 'Shogun's Giant' AM/AOS (*lueddemanniana* x *mossiae*) 83 pts. Exhibitor: Shogun Hawaii-Matthias Seelis; photographer: Glen Barfield. Hawaii Judging
- [10] *Cattleya loddigesii* 'Izzy' HCC/AOS 78 pts. Exhibitor: Ben Oliveros and Orchid Eros; photographer: Glen Barfield. Hawaii Judging
- [11] *Cymbidium* Daiquiri Ice 'Timbucktoo' HCC/AOS (Sleeping Nymph x Olymilum) 76 pts. Exhibitor: Sarah Pratt; photographer: Bryon Rinke. Great Plains Judging
- [12] *Paphiopedilum* Petula's Sensation 'Slipper Zone Fifth Time' AM/AOS (Macabre Contrasts x Petula's Flame) 80 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging
- [13] *Paphiopedilum* Ghostly Contrasts 'Slipper Zone Super Stuff' AM/AOS (Magical Contrasts x Macabre Contrasts) 84 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging
- [14] *Stelis morganii* 'Natural World' JC/AOS. Exhibitor: Tropical Orchid Farm, Inc.; photographer: Michael Blietz. Hawaii Judging
- [15] *Himantoglossum robertianum* 'Winter Green' CBR/AOS. Exhibitor: Doug and Beth Martin; photographer: Melissa Garner. Mid-America Judging
- [16] *Vanda* Manuvadee 'Marguerite De Priest' HCC/AOS (Ponpimol x *coerulea*) 76 pts. Exhibitor: Dennis Wollard; photographer: Malcolm McCorquodale. Houston Judging





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16

- [1] *Cattleya* Pole-Star 'Orchid Eros Flare' AM/AOS (*coccinea* x *briegeri*) 80 pts. Exhibitor: Ben Oliveros and Orchard Eros; photographer: Glen Barfield. Hawaii Judging
- [2] *Phragmipedium* Alfredo Manrique 'Pacific Heights' AM/AOS (*kovachii* x Walter Schomburg) 81 pts. Exhibitor: Katherine Leonard; photographer: Roy Andrade. Hawaii Judging
- [3] *Paphiopedilum* Lunar Dawn 'Windy Hill' AM/AOS (Honey Dew x Skip Bartlett) 81 pts. Exhibitor: Marilyn M. LeDoux; photographer: Melissa Garner. Mid-America Judging
- [4] *Dendrobium* Cheeky 'Doreen' CCM/AOS (Rutherford Blushing Bride x Candice) 86 pts. Exhibitor: Dick and Carol Doran; photographer: Cheryl Langseth. Mid-Atlantic Judging
- [5] *Paphiopedilum* Memoria Jacob Jake Piloto 'Ruth Luethans' AM/AOS (Duguesclin x Double Deception) 80 pts. Exhibitor: Tod Luethans; photographer: Nathan Bell. Mid-America Judging
- [6] *Oncidium* Flora Maxey 'Hot Chili' HCC/AOS (Actrix x Robert Dugger) 78 pts. New Vision Orchids; photographer: Melissa Garner. Mid-America Judging
- [7] *Dendrobium* SnuggleBear 'Frosty' AM/AOS (Blushart x Rutherford Sunspot) 82 pts. Exhibitor: Waldor Orchids, Inc.; photographer: Cheryl Langseth. Mid-Atlantic Judging
- [8] *Paphiopedilum* Petula's Sensation 'Sriramulu' HCC/AOS (Macabre Contrasts x Petula's Flame) 78 pts. Exhibitor: Madhu Chintala; photographer: Cheryl Langseth. Mid-Atlantic Judging
- [9] *Phragmipedium* *schlimii* var. *manzurii* 'Penns Creek' AM/AOS 83 pts. Exhibitor: Woodstream Orchids; photographer: Bryan Ramsay. National Capital Judging
- [10] *Dendrobium* *darjeelingense* 'Memoria Lina' CHM/AOS 84 pts. Exhibitor: Gertraude Bliesath; photographer: Cheryl Langseth. Mid-Atlantic Judging
- [11] *Paphiopedilum* Prince Edward of York 'Lady Harriet' AM/AOS (*rothschildianum* x *sanderianum*) 84 pts. Exhibitor: Steven Schneider; photographer: Bryan Ramsay. National Capital Judging
- [12] *Laelianthe* Abigail Sunset 'Tangerine Dream' HCC/AOS (Memoria Earl Blanford x *Laelia anceps*) 78 pts. Exhibitor: Matt and Michelle Jaenke; photographer: Melissa Garner. Mid-America Judging
- [13] *Ophrys* *sphegodes* subsp. *helenae* 'Troy' CHM/AOS 80 pts. Exhibitor: Doug and Beth Martin; photographer: Melissa Garner. Mid-America Judging
- [14] *Oncidium* *maculatum* 'Thanks, Rolf' AM/AOS 84 pts. Exhibitor: John Dunkelberger; photographer: Bryan Ramsay. National Capital Judging
- [15] *Paphiopedilum* Lunar Dawn 'Windy Hill' AM/AOS (Honey Dew x Skip Bartlett) 81 pts. Exhibitor: Marilyn M. LeDoux; photographer: Melissa Garner. Mid-America Judging
- [16] *Dendrobium* Butter Star 'Joe's Habit' CCM-HCC/AOS (Star of Riverdene x *gracillimum*) 84-79 pts. Exhibitor: Waldor Orchids, Inc.; photographer: Cheryl Langseth. Mid-Atlantic Judging

LINDLEYANA

Rare and Threatened Orchids of Central Africa

Part 1

By Murielle Simo-Droissart, Tariq Stévant, Bonaventure Sonké and Vincent Droissart



ORCHIDS REPRESENT AN emblematic plant family for biodiversity conservation worldwide. The greatest threat to their huge diversity is the human-induced habitat loss that reaches dramatic levels in the tropics. In western Central Africa, rapid population growth and need for natural products is leading to concurrent destruction of forest and woodland for plantations of cash crops, subsistence agriculture, wood for fuel, development of livestock and cities. Also, logging and mining by local or multinational companies represent a large part of the current and future threats to the natural habitats. These threats affect the orchid diversity since two-thirds of Central Africa's orchids are epiphytic plants.

Reducing habitat loss for orchids can be mainly accomplished by (a) the inventory, report and risk of extinction assessment of the most threatened species; (b) the identification of critical habitats and areas that host extraordinarily high diversity and endemism; and (c) the simultaneous development of integrated in situ and ex situ conservation approaches to ensure maintaining of the threatened species. In a series of two papers, we would like to present how we are gradually implementing these important conservation approaches in Central Africa, thanks to support from the American Orchid Society. In this first part, we will briefly explain how to assess the extinction risk for plant species, and more specifically for orchids. In a second paper, we will present how we can better identify or target priority areas for conservation and how to deal with in and ex situ conservation of the most threatened orchid species in Central Africa.

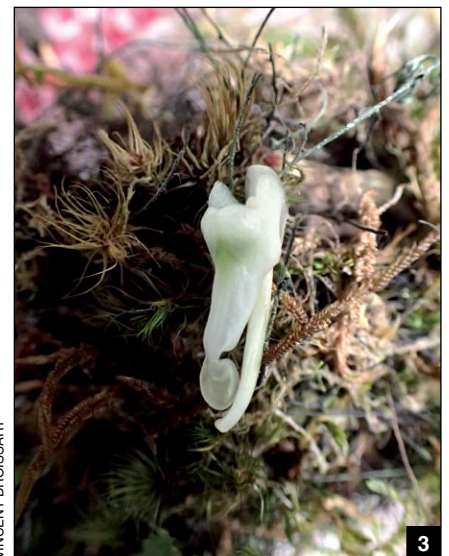
We firstly identified 177 orchid taxa (belonging to 38 genera) that are endemic to Atlantic Central Africa (ACA). This region roughly covers the southern part of Nigeria, Cameroon, Gabon, Equatorial Guinea, Republic of the Congo, and four small islands of the Gulf of Guinea. Then, thanks to funding from the AOS granted in 2016, Murielle Simo-Droissart assessed, in the frame of postdoctoral research, the conservation status of these 177 taxa by applying the methodology recommended by the authoritative International Union for Conservation of Nature (IUCN, <http://www.iucnredlist.org>).

The IUCN Red List categories define the extinction risk of species' wild populations inside their natural range, and the following nine categories are defined: Not Evaluated (NE), Data Deficient (DD), Least Concern (LC), Near Threatened



(NT), Vulnerable (VU), Endangered (EN), Critically Endangered (CR), Extinct in the Wild (EW) and Extinct (EX). There are five quantitative criteria (from A to E) of which only one criterion has to be met to assign the threatened category. Due to the orchids' life forms (around 70 percent of the species are epiphytes and therefore difficult to study) and their mode of dispersal (they have tiny wind-dispersed seeds), it is not obvious to quantify the population evolution (criteria A, C and D) or to perform a quantitative analysis showing the probability of extinction in the wild (criterion E). Criterion B, which principally uses georeferenced distribution data, is the most widely used to assess conservation status of orchid taxa.

HOW DO WE ASSESS THE IUCN CONSERVATION STATUS OF ORCHID SPECIES? First, we used a computer-based methodology (i.e., the *ConR* package, see Dauby et al. 2017, <https://cran.r-project.org/web/packages/ConR/>) to perform, in a batch process, calculations of the two main parameters used to assess criterion B: (1) the extent of occurrence (EOO; i.e., the surface of largest polygon encompassing all the known records of a given species) and (2) the area of occupancy (AOO; i.e., the surface among the EOO that is actually being occupied by the species). By using a geographic information system (GIS) and data from the World Database on Protected Areas (<https://www.protectedplanet.net/>), we generated a map to identify the occurrences within protected areas and the number of occupied protected areas for each of those 177 endemics. Then, and with the collaboration and



- [1] *Ancistrorhynchus crystalensis* general habitat and closeup of an inflorescence in full flower.
- [2] *Ancistrorhynchus crystalensis* flowering habit.
- [3] Flower close-up. Note the unusual globose nectary.

exchange of information between Central Africa's orchid specialists (especially during workshops and meetings), we used projection and inference based on information on habitat to provide high-quality assessment rationale for each species. We should stress that an IUCN category assigned to a species is not static, as species can be moved from one category to another depending on the current main threat affecting their population and habitat.

A "full" IUCN assessment provides detailed information about range,

population size, habitat and ecology, use and trade, threats, and conservation actions that will help inform necessary conservation decisions. These assessments are made publicly and freely available via the IUCN Red List portal (for example see <https://www.iucnredlist.org/species/87582588/87582628>). Globally, results obtained with the assessment of the 177 species endemic to ACA are truly breathtaking and quite alarming: two species, both endemic to São Tomé Island, might be in the Extinct category (*Angraecopsis dolabriformis* and *Angraecum astroarche*), 131 (74 percent) are threatened with extinction (with 25 classified as being Critically Endangered, 76 Endangered and 30 Vulnerable), 13 are Near Threatened and only 26 are classified as Least Concern. We also lack information for five species that have consequently been assessed as Data Deficient. Statistics about these full conservation assessments allow us to identify the most important threats affecting orchid diversity in Central Africa; namely, shifting agriculture (for 95 percent of the species assessed as Critically Endangered, Endangered, Vulnerable or Near Threatened according to the IUCN categories), followed by selective logging (91 percent) and urbanization (27 percent).

Among the 131 species threatened with extinction, we will present below and in a forthcoming paper the characteristics and main threats for 15 highly threatened species that we have recently collected and pictured in Central Africa. Six of the following species have been assessed as EN, and the last one as CR.

A N C I S T R O R H Y N C H U S
CRYSTALENSIS *Ancistrorhynchus crystalensis* was first discovered in the Crystal Mountains, in the northwestern part of Gabon, during an expedition led by the University of Wageningen (the Netherlands). Based on two specimens that flowered in cultivation at Wageningen greenhouses in August 1984 and August 1988, Philip J. Cribb and Frank M. van der Laan described this remarkable species in 1989 (see Cribb et al. 1989) and considered it as endemic to that area. Thanks to several field trips we carried out, the species was reported from Rio Muni (the Continental Region of Equatorial Guinea) in 1999 and from Príncipe Island in 2004, although it was collected in the latter place six years before (see Stévant and de Oliveira 2000). During inventories carried out in the vicinity of the Campo Ma'an National Park, southern part of Cameroon, in 2004, we harvested a living



VINCENT DROISSART



VINCENT DROISSART



VINCENT DROISSART

- [4] *Angraecopsis lisowskii* general habitat.
[5] Plants of *Angraecopsis lisowskii* resemble small *Phalaenopsis* species.
[6] Inflorescence of *Angraecopsis lisowskii* in full bloom.
[7] *Angraecum angustum* in situ and close-up of the flower.
[8] *Bulbophyllum lizae* plant and flower close-up.
[9] A pure green form of the species.

plant that we assigned to that species. We have brought into cultivation that living plant in our ex situ collection at Yaoundé, Cameroon, and, despite our tremendous efforts to keep it alive, the plant died before flowering, which prevented us at that time from confirming its occurrence in Cameroon. Fortunately, we collected flowering specimens of the species within the same protected area in 2015.

Of the 17 tropical African species recognized in the genus, *Ancistrorhynchus crystalensis* possesses the most beautiful and largest flowers. It is an epiphytic herb usually found in very humid vegetation, such as submontane forest or deep valley with rushing streams. It has also been found growing as a lithophyte (i.e., on rocks) near waterfalls in the northwestern part of Gabon. The species occurs at an elevation of 328–3,051 feet (100–930 m). *Ancistrorhynchus crystalensis* is currently known from five distinct collecting sites in Central Africa of which four occur within protected areas. Outside the protected area network, its habitat is fairly accessible to people living in the vicinity. Human pressure to meet domestic needs (in particular from shifting agriculture and selective logging for firewood) is possible but should be quite limited. However, the future construction of a hydroelectric dam will probably lead to the loss of this subpopulation in the northwestern part of Gabon, a situation that, combined with its small distribution range, justifies the IUCN conservation status of EN (Simo et al. 2018a, <http://dx.doi.org/10.2305/IUCN.UK.2018-1.RLTS.T87583266A87739837.en>). Nevertheless, *Ancistrorhynchus crystalensis* is easily being grown in the most humid shadehouses of our network (Bom Successo in São Tomé, and Jardi-Gab and the Sibang Arboretum in Libreville, Gabon).

ANGRAECOPSIS LISOWSKII *Angraecopsis lisowskii* was described in 2001 by Dariusz L. Szlachetko and Tomasz S. Olszewski in the third volume of the *Flore du Cameroun* (see Szlachetko and Olszewski 2001), from a specimen collected in 1975 in the Northwest Region of Cameroon. This highly distinctive species has coriaceous leaves up to 2 inches (5 cm) wide (the largest in the genus) that are very similar to those of *Phalaenopsis* or *Aeranthes*, and possesses a spur up to 1.2 inches (3 cm) long (one of the longest in the genus). Ten years after the description of the species, we collected it twice on the lower slope and inhabited part of Mount Oku, also situated in the Northwest Region of Cameroon.



VINCENT DROISSART



VINCENT DROISSART

Angraecopsis lisowskii is an epiphyte growing in submontane humid forest, in plantations and on isolated trees in villages near roadsides, where it occurs at an elevation of 3,772–5,905 feet (1,150–1,800 m). The species is currently known only from two distinct collecting sites and its habitat there is easily accessible by local residents. The main threats to the species are small-scale activities such as shifting agriculture and collecting of fuel wood, which gradually led to the species decline. According to the IUCN Red List categories and criteria, we assessed this rare species as Endangered (Simo et al. 2018b, <http://dx.doi.org/10.2305/IUCN.UK.2018-1.RLTS.T87583579A87739852.en>).

ANGRAECUM ANGUSTUM *Angraec-*



VINCENT DROISSART



10

VINCENT DROISSART



11

VINCENT DROISSART

cum angustum was initially described in 1898 by an English botanist, Robert Allen Rolfe (1855–1921), the first curator of the orchid herbarium at the Royal Botanic Gardens, Kew (see Rolfe 1898). The flowers of this rare and tiny *Angraecum* species appear solitarily or in small inflorescences, and have largely golden or pale orange floral segments. For more than a century, the species was known only from the type specimen collected in 1897 from Old Calabar, southern part of Nigeria, which flowered in cultivation in the Royal Botanic Gardens, Kew. The first rediscovery of the species was made in Cameroon in 2006, during orchid surveys that we carried out. After that, many additional specimens were collected in the South and the Southwest regions of Cameroon, and the species is currently known from five distinct collecting sites. *Angraecum angustum* is an epiphyte growing on small mossy branches in submontane forest, at an elevation of 1,476–3,444 feet (450–1,050 m). In Nigeria and for some collecting sites in Cameroon,

the species occurs in unprotected areas that are easily accessible to local residents. In addition to logging activities and shifting agriculture at a small scale, some sites are under mining threats (such as the Ngovayang massif area), a situation that leads to the gradual decline in quality of the species habitat. According to the IUCN Red List categories and criteria, we assessed *Angraecum angustum* as Endangered (Simo et al. 2018c, <http://dx.doi.org/10.2305/IUCN.UK.2018-1.RLTS.T87583688A87739862.en>).

BULBOPHYLLUM LIZAE *Bulbophyllum lizae* was first collected on São Tomé Island in 1980. Described by Jaap J. Vermeulen from a plant that flowered in cultivation at Wageningen in 1984 (see Vermeulen 1984), it was also recorded in 1988 from Bioko Island (Equatorial Guinea). With its shiny light green leaves and pale yellow flowers, this beautiful species has the largest flowers among West and Central African *Bulbophyllum*. It occurs in dense primary and secondary lowland, submontane and montane forests at an elevation of 2,624–5,282 feet (800–1,610 m). *Bulbophyllum lizae* is currently recorded from four distinct collecting sites among them the Obò National Park (São Tomé) and the Pico Basile National Park in Bioko (Equatorial Guinea). Within these two well-managed protected areas, the species habitat is not under threat. The two other collecting sites outside the Obò Park, in wasteland and tree fallow, are easily accessible by local residents and consequently, the species habitat is threatened. Small-scale logging activities and shifting agriculture for subsistence represent the main threats for this spectacular *Bulbophyllum* species. The ongoing loss of the species habitat will lead to a continuous decline of its mature individuals, a reason for which we assigned to *Bulbophyllum lizae* an IUCN conservation status of Endangered (Simo, et al. 2018d, <http://dx.doi.org/10.2305/IUCN.UK.2018-1.RLTS.T44392996A87584907.en>).

CALYPTROCHILUM AURANTIACUM Better known as *Ossiculum aurantiacum*, we recently transferred this species to the genus *Calyptrochilum* (Simo-Droissart et al. 2018b). It was first collected in the Mungo River Forest Reserve, western part of Cameroon, in 1980 by the Dutch botanist Henk J. Beentje. A young seedling was then cultivated at the University of Wageningen and produced in November 1983 a flowered specimen, which was used by Cribb and van der Laan to



VINCENT DROISSART

12

describe the species in 1986 (van der Laan and Cribb 1986). Despite thousands of botanical collections made in the original locality, the species was not spotted again for nearly a quarter century. In 2004, we discovered a new locality in an officially protected area, the Banyang-Mbo Wildlife Sanctuary, Cameroon, casting away the fears that *C. aurantiacum* might already be extinct. This discovery has fostered new specific surveys and a dedicated conservation program (<https://www.speciesconservation.org/case-studies-projects/beentje-orchid/5698>). Intensive fieldwork in Cameroon between 2011 and 2017 allowed us to discover three additional collecting sites of *C. aurantiacum*. In 2018, while examining dried material deposited in the herbarium of the Université Libre de Bruxelles

[10] *Calyptrochilum aurantiacum* habitat and close-up.

[11] *Diaphananthe garayana* plant growing in the Yaoundé shadehouse and flower close-up.

[12] *Distylodon sonkeanus* flowering in cultivation in the Yaoundé shadehouse.

(Brussels), we discovered that the species had also been collected more than 20 years ago, in 1996, in the Odzala National Park, a protected area in the Republic of the Congo, but had been misclassified among the *Cyrtorchis* collections. The species is currently known from five distinct collecting sites. *Calyptrochilum aurantiacum* is an epiphyte found at an elevation of 787–1,968 feet (240–600 m). It grows naturally in lowland evergreen

rainforests that are currently experiencing a great deal of human pressure from forest clearance for timber exploitation, cocoa and oil palm plantations, and shifting agriculture. Somewhat surprisingly, our recent study also revealed that the species could adapt to this new human-transformed habitat. As a matter of fact, we found one living specimen in the canopy of a cocoa tree, in secondary lowland forest. This finding provides a glimmer of hope for the future and, with this in mind, transplantation experiments are now underway in those cocoa plantations. In spite of this new finding, the ongoing loss of the species habitat leads us to predict a continuous decline in mature individuals of *C. aurantiacum* and to assign to the species an IUCN conservation status of Endangered (Simo et al. 2018e, <http://dx.doi.org/10.2305/IUCN.UK.2018-1.RLTS.T46364A87750844.en>).

DIAPHANANTHE GARAYANA This species was first collected in southern part of Cameroon in 1918. It was described in 2001 by Szlachetko and Olszewski in the *Flore du Cameroun* based on that unique collection (see Szlachetko and Olszewski 2001). The species is dedicated to the famous American botanist Leslie Andrew Garay (1924–2016), who was director and curator of the Oakes Ames Orchid Herbarium at Harvard University for a half century. Garay also reviewed many orchid genera, and described at least 13 new genera and 75 new species. The intensive botanical surveys we have carried out since 2004 in the southern part of Cameroon have enabled us to collect this rare species. *Diaphanante garayana* is an epiphyte in lowland forest and occurs at an elevation of 164–820 feet (50–250 m). Its habitat in the two known collecting sites in Cameroon is currently impacted by human activities and settlements. The main threats to the species are shifting agriculture, small-holder farming and plantations, and selective logging for domestic uses. These activities will continue in the future and we project that they will lead to a continuous decline of the species. For these reasons, we assigned an IUCN conservation status of Endangered to *D. garayana*.

DISTYLODON SONKEANUS *Distylodon* is a mysterious angraecoid genus collected only twice, with a large disjunction of distribution. *Distylodon sonkeanus* is only known from the type specimen we collected in 2007 in the South Region of Cameroon (Droissart et al. 2014). Indeed, we brought into

cultivation in our shadehouse in Yaoundé a living plant collected on a fallen branch from the canopy. Once it flowered a few months later, we erroneously thought that it was an *Angraecopsis* due to the presence of a trilobed lip on the flower. After detailed examination and comparison with literature and closely related material preserved in several herbaria, we were amazed to find that the flowering specimen was a new species of *Distylodon*, a heretofore monotypic genus established more than 50 years ago by Victor S. Summerhayes and known only from the first species, *Distylodon comptum*, collected in Uganda. *Distylodon sonkeanus* is an epiphyte found in the lowland evergreen forest at an elevation of 328 feet (100 m). The species is currently known from a unique collection site in southern Cameroon. This site is accessible to local residents who are gradually transforming the area into secondary forest through their practices of shifting agriculture and selective logging, a situation that will lead to a continuous decline of the habitat of *D. sonkeanus*. We thus assigned to the species an IUCN conservation status of Critically Endangered.

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— Dr. Tariq Stévant is Scientist at the Africa and Madagascar Department of the Missouri Botanical Garden (USA). He is a plant taxonomist focusing his research on the orchid family since 1997 and has initiated scientific and conservation projects devoted to study orchids of tropical Africa. (email: tariq.stevart@mobot.org).

— Prof. Bonaventure Sonké is currently head of the Department of Biology at the Higher Teachers' Training College of the University of Yaoundé I. He specializes in the systematics of Rubiaceae (the coffee family) and is also interested in studying forest dynamics for a sustainable management of African forests (email: bonaventuresonke@ens.cm).

— Dr. Vincent Droissart is a researcher at the Institut de Recherche pour le Développement (IRD, France) and specializes in the taxonomy, phytogeography and conservation of African orchids. He also devotes a part of his research in assessing plant diversity patterns at local and regional scales in Africa. (email: vincent.droissart@ird.fr).

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Yellow Sticky Cards for Bush Snails

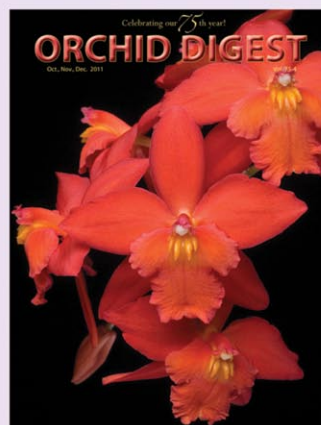
A little trick I learned a few years ago: to catch those nasty bush snails which do not seem to respond to any other method: cut a piece of yellow sticky card and insert it into the orchid pot. If you have bush snails they will be attracted to the card and get stuck. You will not get them all but you will get an amazing number of them.

I came to this solution sort of by accident; I do not like to use chemical solutions if I do not have to and bush snails are almost impossible to get rid of. I had stuck a piece of a yellow card in a pot to catch fungus gnats and was amazed to see about 20 bush snails on the card as well. Now I try to keep a card in every one of my pots.

— Sara Johnson, Concord,
California

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Where to Place Baskets



MY NEW YEAR'S resolution was to enhance my skills and become knowledgeable about my orchid collection. Lately, I have been rearranging my orchids by cultural requirements and creating growing environments that will promote better vigor and growth in my plants. I am at the point where I am not killing my plants but they are just not growing or blooming as well as I would like them to.

As a result, I have been organizing some of my orchids into wire baskets. The medium-to-high light-loving orchids hang from the ceiling of my greenhouse with a retractable plant pulley (available from Amazon for about \$10.00/2-pack) so they are easy to pull down to check on them. My shade-tolerant orchids are in baskets sitting on the floor. Plants are further segregated by potting medium: moss vs bark. I water my bark baskets more often than my moss baskets. I am learning more about the individual requirements of my collection with this system plus I can fit more orchids into a small space. Who would not love that!

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

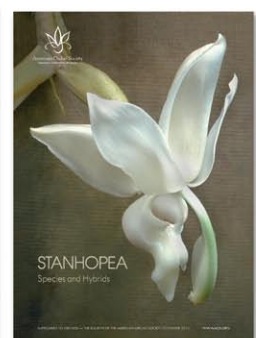
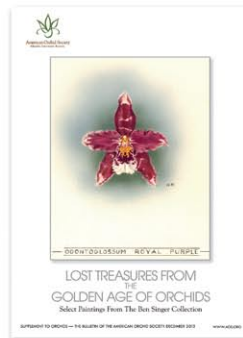
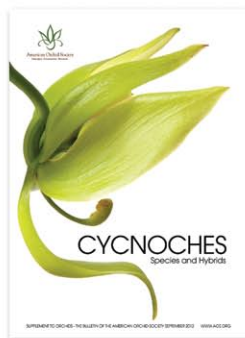
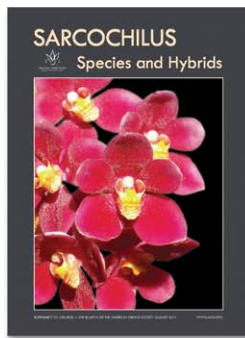
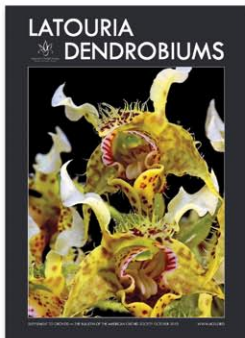
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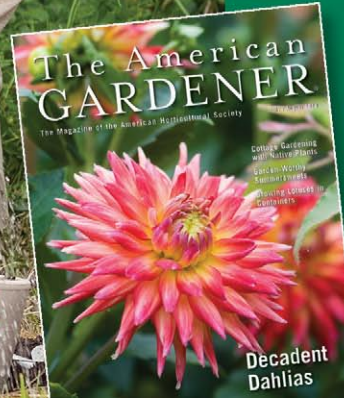




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AD INDEX

African Violet Society.....	492	10th Annual Odom's Orchids	
American Begonia Society.....	494	Cattleya Symposium.....	Inside Front Cover
American Horticultural Society	495	Orchiata.....	493
American Orchid Society		Orchid Digest	492
American Orchid Society Guide to		Orchid Review	491
Orchids and Their Culture	447	Plantío La Orquídea	429
2020 Annual Supplement		R.F. Orchids	425
Supplement	429	T. Orchids.....	493
Better Grow.....	493		
Centennial Celebration			
Save-the-Date.....	423		
Classified Ads	493		
Compendium of Orchid Genera.....	439		
Easy Money	492		
Membership	491		
Past Supplements	494		
Webinars	419		
Cymbidium Society of America.....	425		
Dyna-Gro Nutrition Solutions	425		
Gothic Arch.....	493		
Jaybird Manufacturing.....	493		
Krull-Smith	Back Cover		
Kultana Orchids	493		

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How to Grow Healthy, Happy Scale and Mealybugs

By Deborah Dillon-Townes



TERRY BOTTOM

A healthy, happy Boisduval scale colony on a cattleya

PEOPLE ARE ALWAYS asking me how I manage to grow such an impressive collection of healthy scale and mealybugs in my greenhouse. I get so many requests that I have decided to share my methods so that others can benefit from my years of experience and grow their own healthy colonies of these fascinating creatures.

1. Start with orchids as your host plants. Scale and mealybugs love these plants. Do not be particular as to where you obtain them and pay no attention as to the health of the orchid. In fact, the more dubious the source and the unhealthier the orchid, the more likely you are to bring home “seed” insects that will form the foundation of your collection.

2. Crowd all the orchids together on a greenhouse bench or windowsill so that the leaves are touching each other. This makes it easier for the insects to spread from one plant to the next.

3. Encourage ants. These delightful little helpers are the farmers of the insect world and will happily transport your scale and mealybugs from one plant to another, speeding up their spread and growing your collection much more quickly. This is

where you will find it is easier to raise your insects in the greenhouse rather than on a windowsill, presuming there are more ants inside your greenhouse than there are in your house.

4. Stress the host orchids frequently by underwatering, overwatering, giving too much light, too little light, conditions too hot and dry, too cold and wet, etc. A stressed orchid is an easier meal for scale and mealybugs and will help them establish themselves more easily. *Side Note: Occasionally an orchid may put up a flower or two. Do not be alarmed if this happens. Scale and mealybug love these tasty treats.*

5. Provide places for the insects to hide: inside brown sheaths of the host orchid, at the base of the canes and pseudobulbs, inside a curled leaf, inside the growing medium. Also, do not disturb your insects too much. They are better able to multiply quickly when you neglect the host orchids and let them sit without examining them all the time.

6. Do not clean up your growing area and pay no attention to hygiene. The more debris there is, the better the insects like

it, and you might even pick up a virus or two as a bonus.

7. Do not ever get any insecticidal soap, neem oil, rubbing alcohol, or insecticidal chemicals anywhere near your scale and mealybugs. It could kill them!

If you follow my methods, you will be able to grow an outstanding collection of fine scale and mealybugs in no time. As a matter of fact, you will eventually be so successful that you will have to replace the host orchids as they finally succumb and die while nourishing your insects. But that is half the fun of this exciting hobby. Simply throw them away, buy new orchids, and start all over again! Just remember to save a couple of the old orchids to introduce a whole new crop of insects to your new orchids. Happy Growing!

—Deborah Dillon-Townes is an aerobics instructor who has been growing orchids for over 25 years under lights, in her greenhouse and on her windowsills. She is the former long-time newsletter editor of the Peninsula Orchid Society in Hampton, Virginia, to which she still belongs; 286 Eastwood Drive, Newport News, Virginia (email: dtzoo@cox.net).

How the SITF does its Work

by Ron McHatton

Chrysoglossum ornatum?

PERHAPS YOU READ Jay Norris' (Norris 2019) article detailing the photographs the Species Identification Task Force (SITF) needs to do its work or perhaps you have had a species awarded that has been verified by the SITF or possibly you will have in the future. Beginning this month and continuing on a space-available basis, the SITF will present selected plants submitted for verification. The task force consists of a small group of dedicated volunteers and staff, under the supervision of the Judging Committee, with access to significant reference materials and taxonomic keys. Under most circumstances, a determination can be made using documented references but the SITF also relies on input from respected taxonomic authorities worldwide.

The plant presented here was awarded under the name *Chrysoglossum ornatum*, a species widespread from Nepal to the southwestern Pacific islands. The first step in any determination is an attempt to locate documentable drawings of the species. Modern photographs can be helpful but verifiable line drawings are always best because of the proliferation of mislabeled photographs. In this case, there are several drawings available and from those drawings, the species presented lacks any evidence of characteristic column wings midway along the underside of the column and, although the lip is trilobed, the relative sizes of the lobes, their shapes and the midlobe crests rule out *Chrysoglossum ornatum*; in fact, the absence of any discernible column wings or horns rules out any *Chrysoglossum* species.

What now? When the species name is incorrect it is one matter but an incorrect genus can be even more of a challenge. In this case, nomenclatural history, distinctive growth habit and knowing where the plant originated provided the clues necessary to finalize a determination.

In 1861, *Chrysoglossum ornatum*, was given the synonym *Ania maculata* by Thwaites and then transferred to *Tainia maculata* by Roland Trimen in 1885. Although we know from the line drawings that this isn't *Chrysoglossum ornatum*, could it be a *Tainia* species?

The growth habit of the plant presented is consistent with a species of *Tainia*; almost cylindrical pseudobulbs that are effectively flat-topped once the petiolate leaves are

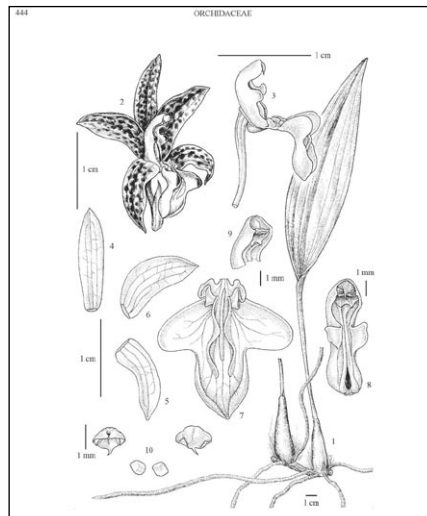


Figure 444. 1-10. *Chrysoglossum ornatum* Hance, 金唇兰 jin chi lan. —1. Habit. —2. Flower. —3. Lip, column, and ovary. —4. Dorsal sepal. —5. Lateral sepal. —6. Petal. —7. Lip. —8. Column apex. —9. Column apex. —10. Adaxial and abaxial views of anther and pollinia. (OSC 313; 1929; B. 306; 1999. —Susanna Stuart-Smith, reproduced from Nicholas R. Pearce & Phillip J. Cribb, *Orchids of Bhutan* 309, 2002).

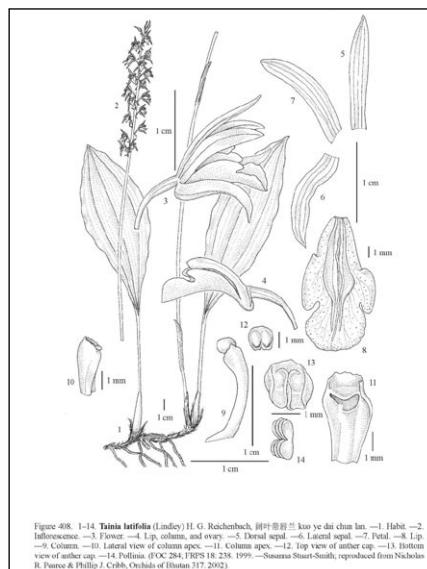


Figure 408. 1-14. *Tainia latifolia* (Indey) H. G. Reichenbach, 阔叶兜兰 kuo ye dou lan. —1. Habit. —2. Inflorescence. —3. Flower. —4. Lip, column, and ovary. —5. Dorsal sepal. —6. Lateral sepal. —7. Petal. —8. Lip. —9. Column. —10. Lateral view of column apex. —11. Column apex. —12. Top view of anther cap. —13. Bottom view of anther cap. —14. Pollinia. (OSC 284; 1929; B. 278; 1999. —Susanna Stuart-Smith, reproduced from Nicholas R. Pearce & Phillip J. Cribb, *Orchids of Bhutan* 317, 2002).

completely shed and broad, more or less plicate leaves with long, distinct petiolate bases.

Tainia is a widespread genus ranging from southern China to Australia with fully half the species represented in China. Consulting the key to the species in *Flora of China* suggested a possible identification of the plant in question as *Tainia latifolia*. Further, comparison of the measurements and description of the awarded plant indicated the plant in question fit the published description of *Tainia latifolia* very well — flower color, size and shape of the floral segments, lack of column wings and very short column foot.



- [1] Drawing of *Chrysoglossum ornatum* by Susanna Stuart-Smith; reproduced from Nicholas R. Pearce and P.J. Cribb, *Orchids of Bhutan* 309, 2002. Note the clearly visible column wings in 3.
- [2] Drawing of *Tainia latifolia* by Susanna Stuart-Smith; reproduced from Nicholas R. Pearce and P.J. Cribb, *Orchids of Bhutan* 317, 2002.
- [3] Photograph of the plant verified as *Tainia latifolia* subsp. *elongata*.

Knowing that the plant in question originated in Java completes the determination. *Tainia latifolia* occurs in two subspecies; subsp. *elongata* in Java and Sumatra and subsp. *latifolia* throughout the rest of Asia. Final determination — *Tainia latifolia* subsp. *elongata*; see the SITF blog at <http://www.aos.org/sitf-blog.aspx>.

REFERENCE

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