

# ORCHIDS

THE BULLETIN OF THE AMERICAN ORCHID SOCIETY

VOL. 91 NO. 6 JUNE 2022



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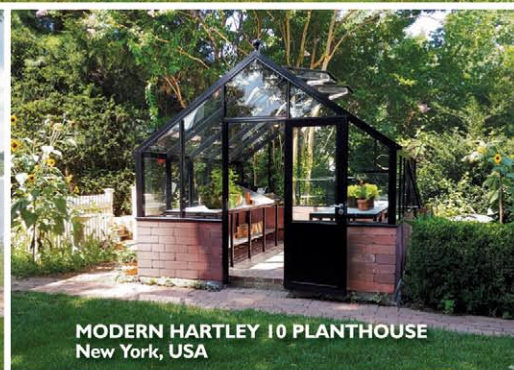
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A 501(c)(3) Nonprofit Organization Founded in 1921

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The American Orchid Society provides leadership in orchids

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## FRONT COVER

*Barkeria* Friederike Kuhl 'Black and White' (Marsh Melton × Oaxacan Showers) is a striking unanticipated cultivar with five species from the *Scandens* and *Obovata* sections of the genus *Barkeria* in its background. Photograph by Robert Marsh.

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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>.

*acmodontum* (ak-moe-DON-tum)  
*Acronia* (ay-KRONE-ee-a)  
*album* (AL-bum)  
*Andinia* (an-DEEN-ee-a)  
*Angraecoid* (an-GRAY-koyd)  
*anosmum* (a-NOSS-mum)  
*aphyllum* (ay-FILL-um)  
*appletonianum* (ap-pul-tone-ee-AY-num)  
*archilarum* (are-KILL-air-um)  
*arcuata* (are-kew-AY-ta)  
*argus* (ARE-gus)  
*aurea* (AW-ree-a)  
*austinae* (aw-STIN-ee-eye)  
*barbatum* (bar-BAY-tum)  
*Barbosella* (bar-boe-SELL-la)  
*Barkeria* (bar-KARE-ee-a)  
*bellatulum* (bell-LA-tew-lum)  
*boxallii* (boks-ALL-ee-eye)  
*Brachypetalum* (brak-ee-PET-a-lum)  
*bullenianum* (bull-en-ee-AY-num)  
*burkei* (BURK-ee)  
*Calanthe* (kal-AN-thee)  
*callosum* (kal-OH-sum)  
*carnea* (KAR-nee-a)  
*Catasetum* (kat-a-SEET-um)  
*Cattleya* (KAT-lee-a)  
*Caularthron* (kawl-ARTH-ron)  
*Cephalanthera* (sef-al-AN-ther-a)  
*chamberlainianum* (chaim-ber-lain-ee-AY-num)  
*charlesworthii* (charles-WORTH-ee-eye)  
*ciliolare* (sil-ee-oh-LARE-ee)  
*compressum* (kom-PRESS-sum)  
*concolor* (KON-kuhl-ur)  
*crinifera* (kry-NIF-er-a)  
*cruenta* (krew-EN-ta)  
*cucullata* (kew-kew-LAY-ta)  
*Cymbidium* (sim-BID-ee-um)  
*Cyrtorchis* (sir-TORE-kis)  
*dayanum* (day-AY-num)  
*dearei* (DEER-eye)  
*delpinalii* (del-peen-AL-ee-eye)  
*Dendrobium* (den-DROH-bee-um)  
*Dendrocoryne* (den-droh-kore-EYE-nee)  
*Epidendrum* (ep-ih-DEN-drum)  
*exul* (EKS-ool)  
*fairrieianum* (fair-ee-AY-num)  
*falcostrum* (fal-koe-ROSS-trum)  
*fimbriatum* (fim-bree-AY-tum)  
*fowliei* (FOWL-ee-eye)  
*fritz-halbingeriana* (fritz-hal-bin-ger-ee-AY-na)

*garayana* (ga-ray-AY-na)  
*Gastrorchis* (gas-TROR-kis)  
*glaucophyllum* (glaw-koe-FILL-lum)  
*godefroyae* (god-FROY-eye)  
*Gongorinae* (gon-gore-EE-nee)  
*gracillicaula* (grass-ill-lee-KAW-lee)  
*gratrixianum* (gray-triks-ee-AY-num)  
*Habenaria* (hab-ee-NARE-ee-a)  
*hawkesiana* (hawks-ee-AY-na)  
*haynaldianum* (hay-nald-ee-AY-num)  
*hirsutissimum* (hir-soo-TISS-ih-mum)  
*hookeri* (HOOK-er-ee)  
*huttonii* (hut-TONE-ee-eye)  
*insigne* (in-SIG-nee)  
*janellehayneana* (jan-ell-hayn-AY-na)  
*javanicum* (ja-VAN-ih-kum)  
*kerandrenae* (ker-AWD-ren-ee)  
*kingianum* (king-ee-AY-num)  
*lasioglossa* (las-ee-oh-GLOSS-sa)  
*lawrenceanum* (law-rens-AY-num)  
*Lepanthes* (leh-PAN-theez)  
*liemianum* (leem-ee-AY-num)  
*lindleyana* (lind-lee-AY-na)  
*lowii* (LOW-ee-eye)  
*Lycaste* (lye-KAS-tee)  
*macrophylla* (mak-roe-FILL-la)  
*mastersianum* (mas-ters-ee-AY-num)  
*medioflexa* (mee-dee-oh-FLEKS-a)  
*medusa* (meh-DOO-sa)  
*melanocaulon* (mel-an-oh-KAWL-lon)  
*moorei* (MORE-ee)  
*Mycoheterotroph* (mye-koe-HET-er-oh-trof)  
*naevosa* (nee-VOE-sa)  
*Neobathia* (nee-oh-BATH-ee-a)  
*niveum* (NEE-vee-um)  
*nivosa* (nee-VOE-sa)  
*obovata* (oh-boh-VAY-ta)  
*Oncidium* (on-SID-ee-um)  
*Paphiopedilum* (paff-ee-oh-PED-ih-lum)  
*parishii* (pair-ISH-ee-eye)  
*Pecteilis* (pek-TYE-liss)  
*Phalaenopsis* (fail-en-OP-sis)  
*philippinense* (fill-ip-pin-EN-see)  
*Pinalia* (pye-NAL-ee-a)  
*Pinus* (PYE-nus)  
*Pleurothallidinae* (plur-oh-thal-lid-EE-nee)  
*Pleurothallis* (plur-oh-THALL-liss)  
*Ponthieva* (pon-THEE-va)  
*primulinum* (prim-yew-LEEN-um)  
*purpuratum* (pur-pur-AY-tum)

*Quercus* (KWAIR-kus)  
*rhodocheila* (rho-doe-KYE-la)  
*robusta* (rho-BUS-ta)  
*roebbelenii* (robe-bell-EN-ee-eye)  
*rothschildianum* (roths-child-ee-AY-num)  
*sangii* (SANG-ee-eye)  
*Scandens* (SKAN-denz)  
*schlechteri* (SHLEK-ter-eye)  
*skinneri* (SKIN-er-eye)  
*Sobennikoffia* (soe-ben-ih-KOF-fee-a)  
*spectabilis* (spek-TAB-ih-liss)  
*spicerianum* (spy-ser-ee-AY-num)  
*Stelis* (STEE-liss)  
*stonei* (STONE-ee)  
*sukhakulii* (soo-kah-KOO-lee-eye)  
*sunchubambensis* (sun-cho-bam-BEN-sis)  
*superbiens* (soo-PER-bee-enz)  
*Telipogon* (tel-lee-POE-gon)  
*tetragonum* (teh-tra-GOH-num)  
*tonsum* (TON-sum)  
*uniflora* (yew-nee-FLORE-a)  
*urbanianum* (ur-ban-ee-AY-num)  
*Vanda* (VAN-da)  
*vanneriana* (van-ner-ee-AY-na)  
*vargasii* (var-GASS-ee-eye)  
*velutinum* (vel-yew-TEE-num)  
*venustum* (veh-NOOS-tum)  
*villosa* (vill-OH-sa)  
*villosum* (vill-OH-sum)  
*violascens* (vye-oh-LAS-senz)  
*virens* (VYE-renz)  
*virginalis* (vir-gin-AY-liss)  
*wardii* (WARD-ee-eye)  
*wayquechensis* (way-ketch-EN-sis)  
*whartoniana* (war-tone-ee-AY-na)  
*whytei* (WHITE-ee)  
*wolterianum* (wol-ter-ee-AY-num)  
*xanthocheila* (zan-tho-KYE-la)  
*Zygopetalinae* (zye-goh-pet-a-LEE-nee)

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## PRESIDENT'S MESSAGE

### "Everyone Deserves A Thrill" Journey

IN MY LOCAL orchid society in Houston, we have a wonderful newsletter editor and webmaster, Donna Diggons. In a bid to keep us connected as a group when the pandemic started, when we were not allowed to meet in person, one of the things that Donna did was to send out a short list of questions to long-time members of the society that we could answer at our own pace. She would then publish them in the monthly newsletter as she received our replies. The questions included questions such as "How and when did you become interested in growing orchids?" and "Is there an orchid destination on your bucket list?" You might try this in your society. It is a great way to learn a few fun facts about your fellow members that you may not have known before.

One of the other questions on Donna's list is "Tell us about your most exciting orchid moment," and I would like to share my reply with you. Let me start by saying that I have never earned a First Class Certificate on any plant of mine. I have also never earned an Award of Merit on any of my plants! No Awards of Quality, no Certificates of Cultural Excellence, no gold show trophies, etc. So, you can guess that my most exciting moment has nothing to do with receiving an award. No, mine is one of those early moments that got me really hooked on this hobby and growing these plants.

My first orchids came from The Home Depot. My local store back then had a very nice selection of plants. It turns out those were mostly standard cymbidiums, which will not last through a Houston summer, but I did not know that at the time! As I was wandering through the garden section one day probably six months after I had collected my first few plants, I came across this beat up display of sad little orchid seedlings trapped in mesh bags (of course you need to wander through the garden section even if you are there for lumber). You do not see these displays much anymore, but they used to be fairly common.

The display had been pretty well picked over, but there were two bags still hanging there with the plants inside just begging to go home with me, for surely the whole thing would have been thrown out the next day. So, I bought these two seedlings and took them home. These displays sold an assortment of orchids, but I remember the two that I got were a phalaenopsis and a cattleya. They were both in very rough



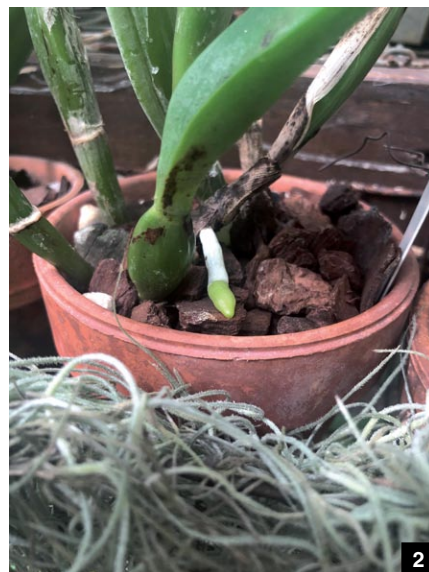
JAY BALCHAN 1

shape with lots of bruised leaves and very few roots. But I potted them both up. The phalaenopsis went to orchid heaven within a couple of days. I had just started attending our local society meetings and was not yet a member of the AOS, so my knowledge level was very basic and, had I known better, I probably would not have gotten the phalaenopsis. But, the cattleya hung in there. It had almost no roots, so I misted it regularly and had it in a nice east-facing window.

And then one day about three weeks on, magic happened! I accidentally bumped the pot and moved a piece of bark on top and under there was a brand new sexy green root shooting out of the front lead of this plant! I was over the moon! I know that I let out a yell! How could a plant that had been sitting in a mesh bag for who knows how long without water or care in a store display actually want to grow? What kind of amazing plants are these? Well, that was it for me, hook, line and sinker, for this crazy hobby. I later bloomed that plant and although the flower was nothing special, the plant always has a prime place to grow.

So that, with a bit of embellishment, is how I answered the question of my most exciting orchid moment. What has been your most exciting orchid moment? Was it a great award one of your plants received? How about an exhibit in your local show that got recognized? How about when your in-laws came over just as your best orchid was in full bloom! Maybe you can share this with your local newsletter editor for your society to read about.

In a nod to Donna, my sincere thanks and appreciation goes out to all the newsletter editors and webmasters in



JAY BALCHAN 2

- [1] Called by some "bag-baby" — a small orchid seedling packaged in a mesh bag.  
[2] Magic does indeed happen; here a healthy new root tip!

all the local societies around the world! You are the unsung heroes of your local society, toiling in the background to ensure your group has the information it needs to conduct your regular meetings and shows, all the while trying to make it interesting and entertaining. And remember, if you are an affiliated society of the AOS, you receive the AOS Corner, a monthly newsletter full of interesting content and ideas to include in your local newsletter.

Take care and be sure to share your thrilling orchid moment with some friends the next time you see them!

— Jay Balchan, AOS President (email: [jay@aos.org](mailto:jay@aos.org)).

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## IX International Conference on Orchid Conservation “Soroa 2022”

**NEW DATES**

THE SOROA BOTANICAL and Orchid Garden and the University of Artemisa IX International Conference on Orchid Conservation “Soroa –2022,” has been postponed from February 2022 to **NOVEMBER 2022** with exact dates to be determined soon.

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

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# June: The Leafy Month

By Thomas Mirenda

FOLIAGE IS THOUGHT to be the very essence of being a plant. But what if a plant has no leaves at all, such as a ghost orchid (*Dendrophylax* sp)? Well, it is argued that many orchid roots have chlorophyll within them and engage in photosynthesis, which compensates for that lack of foliage. But what about those plants that have no chlorophyll, such as the phantom orchid (*Cephalanthera austini*) and other mycoheterotrophs? They seem to have found alternate means to feed themselves. It seems there are exceptions to every rule and that life on our planet has diversified to take advantage of every situation, every means of gaining energy, food and life itself.



Thomas Mirenda

This in turn, reminds us that there is no one right way to grow orchids. In fact, all of us have different conditions and techniques that work for us and our individual

circumstances, all of them unique and specific to our own culture and human diversity. This complexity has been the greatest challenge in writing this column for almost 20 years now. How does a person, in one page, simultaneously give good advice to growers on the East or West Coast, tropical or temperate climes, mountain or coastal habitat and Northern or Southern Hemispheres? Orchid culture is often wildly different depending on where you are, who you are and what you collect. The challenges that our extremely biodiverse planet throws at us are extrapolated in every aspect of our lives whether we know it or not, but it is especially true with orchid culture.

The overwhelming majority of our orchids (and plants in general) do have foliage, so it is often better to focus on the generalities rather than the exceptions, which is what I try to do in this column. If you, like me, gravitate towards those strange plants that break all the rules, your best option is to *leaf* through your books, (and I suppose, the Internet) to get the most specific information you can find for your oddities.

**VERDANT SUMMERS** June can be exceptionally beautiful and an exciting time in the orchid world. Even though phalaenopsis, cattleyas and cymbidiums



MING TALI

*Stenoglottis maccloughlinii* 'Timothy Henry' CBR/AOS; exhibitor: Carrie Buchman.

may be taking a break from blooming, they are more "active" now than they are the rest of the year. In the Northern Hemisphere, the majority of orchids are in active growth and require your attention more frequently. Just like the foliage on your trees, new leaves and roots in orchids are triggered by the longer photoperiod and warmer temperatures. Always remember that the leaves and roots are organs that either create or take up nutrients into your orchids. The healthier and more robust those leaves and roots are, the more likely they will reward you with the flowers we are all anticipating.

**PICNICS** Imagine you are out in a beautiful park with your family. Kids are running around having fun, laughing, playing, and thriving. Lunchtime comes, and you realize you forgot to pack the cooler with drinks and food! It would most assuredly not be a pleasant afternoon. The same is true for your plants. Although environmental conditions might be perfect (as they often are in June) plants can exhaust themselves if they do not have adequate provisions. Think of the month of June as lunchtime for your plants. Good nutritious meals this month

are crucial to producing nice, plump pseudobulbs on cattleyas, catasetums and oncidiums, as well as strong canes on epidendrums and dendrobiums and strong succulent leaves on phalaenopsis, vandas and angraecoids. Take the time to feed your plants adequately this month for stronger growth and vigor.

**FLUIDITY** Water is truly the key to all life on Earth. If you want your plants to thrive and experience exceptional growth and optimum potential, the best possible water is not just helpful, but some will even say essential. For the sake of public health, most of us in North America have water infused with chlorine to kill bacteria and other pathogens, and fluoride ostensibly for our teeth! These chemicals can be quite poisonous for our orchids and at the very least, interfere with their progress. Here on the Big Island, we generally collect rainwater for our orchids in a catchment system. The results are often glorious, especially for orchids planted in gardens. While many growers do just fine with their municipal water, I encourage you to try collecting rainwater and see if you get a significant difference. I suspect you will see a great

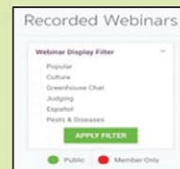
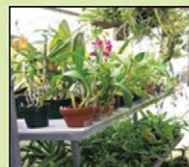


improvement in plant growth.

**GREAT OUTDOORS** Even though most of the spring ephemeral orchids in our woodlands, mountains and wetlands are mere memories by June, there are still many to see and enjoy in various parts of our country and, of course, in other parts of the world. Although we have been restricted for so long, and the world rebounds and renews itself, there is literally no safer and more inspiring place to be than out in nature, among the verdant, leafy, oxygenating trees, relishing the joy, exhilaration and reassurance that the earth's incredible biodiversity brings us. One exceptional chance to experience this renewal with likeminded friends is the Native Orchid Conference taking place this month on the Olympic Peninsula in Washington State, June 24–27, 2022, hosted by the Northwest Orchid Society (nwos.org). Do not miss it.

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

## Webinars-Coming Attractions!



When	June 07, 2022 8:30pm EDT Tuesday	June 28, 2022 8:30pm EDT Tuesday	July 19, 2022 8:30pm EDT Tuesday	August Summer Break
Topic	<b>Bulbophyllums of the Philippines</b> A Survey of Endemic Species	<b>Greenhouse Focus</b> Mounting Orchids Made Easy	<b>Greenhouse Chat</b> Orchid Q & A <i>Send in your Questions!</i>	<b>Choose Your Topic From RECORDED WEBINARS</b>
Presenter	<b>Jim Cootes</b> Australia-based Botanist, Author, Lecturer and Orchidologist	<b>Ron McHatton</b> Chief Education and Science Officer	<b>Ron McHatton</b> Chief Education and Science Officer	Hobbyists, Expert Growers, AOS Judges, Conservationists and more

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## QUESTIONS AND ANSWERS

### MOSS OR BARK MEDIA?



Top: Long fiber premium sphagnum moss.  
Bottom: Medium-grade fir bark potting medium. Photographs by Greg Allikas

### QUESTION

I have two phalaenopsis plants that I have taken care of successfully for a year. I think it is time to repot them. They are in sphagnum moss. Do I have to keep them in moss or can I move them to bark? Bark is much less expensive than moss, and I only have two plants. Do I have to worry about what kind of fertilizer I buy?

### ANSWER

First the fertilizer question. If you continue to grow in moss you need very little fertilizer. It is not necessary to buy high end fertilizers if you only have a couple of plants. Any good fertilizer not high in nitrogen will work. When growing in moss use very little fertilizer (less than ¼-strength) as moss holds on to the fertilizer salts like a sponge holds water. You can also cut back the frequency of fertilization for the same reason — half as often is not a bad target. To prevent fertilizer salt build-up in moss, it is important to regularly (and frequently) flush the pot with plain water. You might also consider using a fertilizer designed for foliar feeding which helps avoid build-up of salts in the moss.

Regarding the question of moving a plant from moss to bark, this can be a bit tricky as moss holds much more water

than bark so you need to pay careful attention to the plants to avoid having them desiccate during the adaptation process. Also, plants grown in moss tend to have less extensive roots systems than those grown in bark because of the more regular water supply, and the roots that are present are also somewhat different than those grown in bark.

To move from moss to a bark mix, I would start with moist bark — soak the bark at least overnight and I like to start with hot or boiling water to help get the bark moist. It is far easier to start with moist bark and monitor it as it dries out than it is to start with dry bark and try to get enough water to the plant until the bark starts to hold some water. Pot the plant, and make sure to water before the bark completely dries out. This is important, because your plants have been growing in a sponge like medium which holds lots of water. Even when moss is just damp you can still wring some water out of it if you squeeze it like a sponge. Bark is not like that, so before the establishment of new roots adapted to this dryer environment, it is quite easy to dehydrate your plant. The stress caused by dehydration can take quite a while for your plant to recover from. It is much easier to go from bark to moss unless one tends to over water their plants.

With only a few plants, if you cannot find a local source of small quantities of premium moss, the mass marketers such as Home Depot and Lowes often sell 4-inch by 8-inch (10-cm × 20-cm) packages of moss appropriate for orchids. These small packages have enough moss to pot a couple of plants, depending on the pot size. Read the labels and make sure the moss is appropriate for orchids. The loose material sold in bags is of lower quality and is intended more for topdressing regular houseplants and will not hold up very well as a potting medium.

In summary, be careful moving from moss to bark, paying attention to the plant's water needs to avoid dehydration in the new potting medium.

### SNOW MOLD QUESTION

What is snow mold? What causes it? How do I get rid of it? Two of my recently repotted (in tree fern substrate) plants developed it within four to five months.



Early stages of snow mold (arrow) beginning to grow on the potting mix of this phalaenopsis plant. The longer this is left untreated, the bigger these sheets of fungus will become. Photograph by Terry Bottom.

### ANSWER

Snow mold is caused by one or more *Ptyogaster* mold species. It grows on dead or decaying material and the visible manifestation is the formation of white spots, sheets or hairlike growths throughout the potting medium. The fungus does not directly attack the plants as it is feeding on decaying material in the potting medium but the growth of the fungus is hydrophobic so eventually the mold prevents water from reaching the roots of the plant. In this respect, snow molds are not *Rhizoctonia* that infects the plant's roots directly, rotting the roots and eventually causing the death of the plant.

The spores of snow mold are very common in the environment and simply waiting for the right conditions to germinate — wet and dead organic matter. This is the reason that some growers drench recently repotted plants with fungicide or even heat the potting medium to sterilize it before use.

If snow mold has taken hold in fresh potting material, the questions to answer are how old is the mix and has it been overwatered? I have actually seen snow mold growing in some potting mix when the bag was first opened because the bag was actually quite old.

What leads to the death of the plant

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



## QUESTIONS AND ANSWERS

is that the fungal hyphae literally shed water. As the mold grows through the potting mix and onto the plant's roots, the growth prevents water uptake. Your potting medium cannot physically hold more water and what is there cannot reach the roots. In effect, the plant dies of dehydration. Because the outward symptoms are that of dehydration, the grower waters more often, in actual effect overwatering, speeding up the decomposition of the medium which in turn just feeds the fungus, creating a vicious cycle!

Once started, this is a hard fungus to eradicate. Unlike pathogenic fungi that attack the plant directly, fungicides taken up by the plant do not effectively reach the fungus. Few fungicides work very well at treating active snow mold, but Physan drenches do appear to be somewhat helpful. First, remove the plant and thoroughly clean the roots, removing as much of the medium *and* fungal growth from the plant as possible. Next, treat the roots with Physan, repot in new potting mix, and drench the new mix with Physan biweekly until the plant seems to be re-established in the new mix.

## Fertilizer Baskets



These little baskets were first introduced to me by Desert Valley Orchid Society (Phoenix) member Karla Velasco who was using them with a timed-release fertilizer. Because I was using a liquid fertilizer at the time, I put it aside for future use. Then I read about a fertilizer called Purely Organic manufactured in South Carolina ([purelyorganicfertilizer.com/about/how-to-order](http://purelyorganicfertilizer.com/about/how-to-order)). Sue Bottom's article (2017) showed excellent results on struggling orchids. The instructions were to put it into a tea bag and place the tea bag on top of the medium. The fertilizer will slowly release its nutrients as you water. I used the tea bag approach, which

worked but looked really ugly sitting in the orchid pot. So, I ordered these little fertilizer baskets (the small size is 0.8 inches [2 cm]) from Amazon, 100 for around \$16.50. They were designed for pelletized fertilizers for plants such as bonsai and orchids. So far, they work beautifully. They blend in well with the plant and even fit into my small 2-inch (5.1-cm) pots. For my larger pots, I use two. You would think that the powdered fertilizer would fall through the small holes but if you press it down firmly, it does not leak out. — *Cindy Jepsen (email: [cindyjepsen@cox.net](mailto:cindyjepsen@cox.net))*.

### References

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

### International Palm Society Biennial in Hawaii

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Experience the lush, tropical Hawaiian Islands with the International Palm Society (IPS).

The IPS will host its 32<sup>nd</sup> Biennial meeting on Oahu and the Big Island with an optional pre-Biennial tour to Maui. We shall tour the most important private and public palm collections and gardens, enjoy knowledgeable and entertaining evening speakers, visit a world-renowned nursery, and reconnect with palm and tropical horticulture enthusiasts from all over the world. It will be a week-long immersion in tropical horticulture at its best!

Registration opens March 1<sup>st</sup>, 2022 and is limited to the first 150 participants. For more information and the full itinerary, please visit the IPS website, [www.palms.org](http://www.palms.org).

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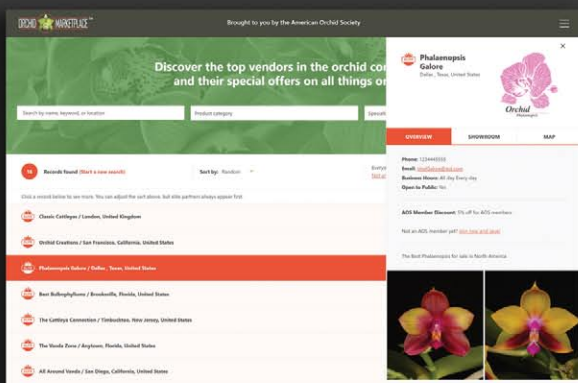
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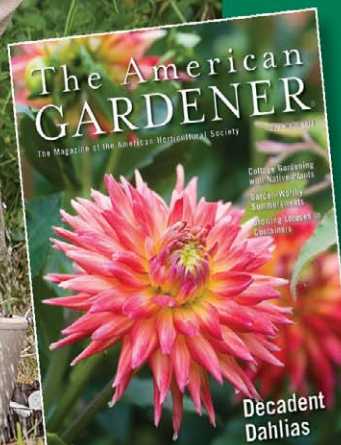
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A close-up photograph of several white Dendrobium anosmum flowers. The flowers are shown in various stages of bloom, with some fully open and others as buds. The petals are broad and have a slightly ruffled or fringed edge. The background is a dark, textured surface, possibly a leaf or a backdrop, which makes the white flowers stand out. The lighting is soft, highlighting the delicate structure of the flowers.

RAPACZ-HASLER

# *Dendrobium anosmum*

The “Odorless” Dendrobium

By Judith Rapacz-Hasler



THE GENUS *DENDROBIUM* was first officially described by Olof Swartz in 1799. The name comes from the ancient Greek “dendros” (“tree”) and “bio” (“life”) and refers to the epiphytic habit of most of its species. *Dendrobium anosmum* is widespread from Sri Lanka, India, Myanmar, Thailand, Vietnam, Laos, Peninsular Malaysia, Indonesia, Maluku, Borneo, New Guinea and the Philippines at elevations from 1,600 to 4,200 feet (500–1,300 m).

Plants can grow into relatively large specimens with terete, arched to pendulous canes up to 6 feet (2 m) long, producing a gorgeous display at flowering time. Plants from the Philippines are reported to be some of the largest with one recorded example reaching 10 feet (3 m). The species is deciduous or semideciduous, producing new growths while older growths drop their leaves, usually prior to blooming in spring.

The plants have many-noded stems, each node enveloped by the loose-fitting leaf base and oblong elliptic, acute leaves. The species is warm- to cool-growing and needs a distinct dry rest, beginning as the leaves begin to fall and lasting until the new leads appear in the spring, to flower well. The flowers, carried one or two, rarely three, per inflorescence arise from the nodes along the distal halves of the leafless canes. The 2–4-inch (5–10-cm) flowers are raspberry-scented, often powerfully so, which is ironic in that the species name means “without fragrance.”

Several color forms exist varying from purple (var. *anosmum*) to semialba (var. *huttonii* — albescent forms of the semialba are called var. *burkei*) to pure white (var. *dearei* — often erroneously called var. *album*). In addition to these color forms, examples exist of forms with variously fuzzy lips and are called var. *velutinum*.

Ideally, plants should be mounted on tree fern or a plaque of cork to accommodate the long, pendent canes. Alternatively, they can be grown in a basket tilted on its side. Dormancy begins in October or November and lasts into February, a period when temperatures in its native habitat cool slightly, but more importantly, rainfall drops dramatically from 15–18 inches/month (38–46 cm) in the summer to less than 1 inch/month (<2.5 cm). Emulating this slightly cooler and much drier condition when growing this plant indoors or outdoors is key to good flowering and plants may simply be misted occasionally during



JASON R. MILLS

the winter. New growths appear in the late spring, while still in bloom, signaling the time to start watering again. While not actively growing, plants do not need fertilizer and must be allowed to dry between waterings. Once active growth begins, watering and fertilizing should be increased and maintained throughout the growing season. The goal is to produce the longest canes possible because this summer's canes carry next spring's flower. Leafless canes that have flowered are capable of reflowering the following year so do not cut them off.

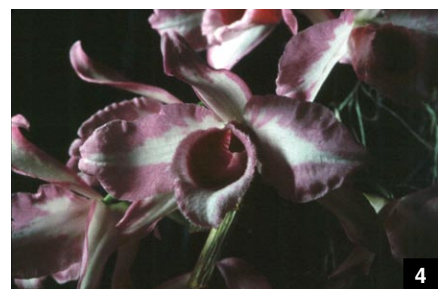
Although the species can be grown under warm or cool conditions, plants are not tolerant of frequent and extreme changes in temperature and will immediately exhibit signs of stress including spotting of the foliage and unseasonal leaf drop. Arrangement of the flowers along the canes is influenced by light, so do not change position of the plant once buds begin to form or you run the risk of poor flower arrangement.

Three years ago, I acquired small plants of *Dendrobium anosmum*, *Dendrobium aphyllum*, *Dendrobium fimbriatum*, *Dendrobium anosmum* var. *dearei* and a hybrid, *Dendrobium* Little Sweet Scent (*anosmum* × *parishii*). *Dendrobium* Little Sweet Scent bloomed last year and again this year with a gorgeous display of flowers that lasted several weeks. As I write this, *Dendrobium fimbriatum* has buds, and I am looking forward to seeing its yellow flowers. *Dendrobium anosmum* var. *dearei* bloomed at the end of March for the first time. The plant carried 10 pure white, gorgeous flowers on a 29-inch (75-cm) pendulous cane. The petals of my plant are very lightly suffused with lime green and the combination of color, slightly undulate petal margins, finely serrated lip and flowers that can last 6–7 weeks make for a beautiful show.

*Dendrobium anosmum* is a gorgeous



GREG ALLIKAS



ALYN NISHIOKA

- [1] The white albinistic form of the species, often seen in cultivation called var. *alba* is correctly var. *dearei*. Photograph by the author.
- [2] MBF' AM/AOS is a deep purple form of the species grown by Marble Branch Farms.
- [3] A rather variable species, forms exist from deep purple to white and virtually every combination in between. 'Riverlane' JC/AOS grown by Jean Wilson.
- [4] 'Touch of Class' JC/AOS is a peloric example where the petals resemble lips. Grown by Ted and Dot Sakamoto, this clone is available commercially.

and an elegant-looking plant to enjoy or display at a show.

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

# Judging Floriferousness Part

By Andrew Goghill-Behrends

## TYPES OF FLORIFEROUSNESS

The AOS Judging Scales offer little guidance on how to point "Floriferousness." There is a usual disclaimer in the guidance that says: "The number of flowers will vary according to the species, or breeding" (this quote is taken from the Phalaenopsis scale, but there is similar verbiage with most scales). That leaves us to decide whether we judge floriferousness based on past awards or based on what the component species in a hybrid have to offer. Unfortunately, we often tend to focus on the former and not do our research into the latter.

Allen-Ikeson (2019) suggests six aspects of floriferousness:

- Total number of flowers
- Flowers per inflorescence
- Number of inflorescences
- Number of inflorescences in relation to the number of growths or pseudobulbs (important in cultural awards as a byproduct of "how fully flowered" [sic] the plant is)
- Number of inflorescences per growth
- Branching

Allen-Ikeson (2019) also looks at some of these in detail. If we are presented a plant with 38 flowers, how those flowers are arranged are of significance: on one inflorescence (possibly branched), on three inflorescences on one growth or on three inflorescences on three growths. These can all be indications of good culture, poor culture or genetic potential of the cultivar.

Based on my research and drawing from Allen-Ikeson's work, I would propose the following attributes as components of floriferousness. Each of these will carry different weight, depending on the genera and lines of breeding involved.

- Total number of flowers: sometimes this is the only information that is of importance, where each new growth produces exactly one inflorescence with exactly one flower.
- Number of inflorescences: when noting the number of inflorescences, it is important

to count the number of inflorescences actively in bud or bloom and the number of immature inflorescences.

- Flowers per inflorescence: this average can be easily calculated with the first two pieces of information (using only the inflorescences in active bud or bloom), though this could vary considerably from inflorescence to inflorescence.
- Number of growths or bulbs in bloom: well-flowered plants will have multiple leads and may have blooming back bulbs as well (discussed later).
- Inflorescences per growth or bulb in bloom: this can be a simple calculation, but like flowers per inflorescence, may vary considerably from bulb to bulb.
- Growths or bulbs in bloom as a fraction of "flower-eligible" growths or bulbs: some dendrobiums and masdevallias and pleurothallids can rebloom on older growths, as compared to paphiopedilums, cattleyas and catasetums, which will not.
- Branching: freely branching inflorescences will likely possess higher flower counts than unbranched inflorescences and add to the score for floriferousness.
- Hybrids that bloom multiple times per year: we cannot really assess this at the judging table, but using genera (or related genera) that bloom at different times of the year can result in hybrids that are quite free-flowering, blooming multiple times per year or almost continuously.
- Extra-large blooms: does having exceptionally large flowers make a plant more floriferous? Or does it just get more points for size?

## COMPETING FACTORS

Several of the "Other Characteristics" involved in scoring a plant for flower quality can have significant impacts on each other.

Notably, Size and Floriferousness can

have a direct impact on each other. Plants expending energy to produce large flowers may likely produce fewer of them (as in the lycaste examples awarded with only one bloom). Conversely, plants producing smaller flowers can produce many more of them. Ideally, as a hypothetical standard of perfection, we would have a plant with many large flowers. Plants with few, relatively small flowers should not score well.

An indirect impact is how size and floriferousness impact presentation and arrangement. Plants with many large flowers on an inflorescence are likely to produce a more crowded arrangement; conversely, too few small flowers will produce a "sparse" inflorescence. It is important that the three characteristics are balanced to produce a presentation where flowers are able to be seen individually without too much windowing.

## THE LYCASTES

Lycastes — and many other genera — do not have a specialized judging scale and are judged with the General Scale, which apportions 30 points for Color (generally), 30 points for Form (generally) and then 40 points for Other Qualities (10 of which are specifically assigned for floriferousness).

Many of the awards to hybrids, however, have been given with 1–2 flowers, which is definitely not representative of the genus. Both Slaughter (1992) and Bechtel (1998) observe that for a proper judging of Lycastes, a scale needs to be developed that addresses their qualities. Slaughter notes that:

"In reviewing the point scales for AOS awards for flower quality, none of them fit the flower characteristics of the genus Lycaste. The flower shape most closely resembles a Cymbidium; however, Lycaste is a single-flowered genus and the points allotted here and in the general scale for habit and arrangement of inflorescence should be distributed elsewhere. **The scale for paphiopedilums allows for lycaste flowering habit but not for the floriferous nature of the species and the hybrids.** Currently there is no acceptable scale that allows judges to evaluate the special nature of the flowers of this very



# 1: Lycastes

beautiful genus." (p. 198) [emphasis added]

The authors, however, differ as to whether floriferousness should be emphasized or de-emphasized. Slaughter (1992) proposes maintaining or de-emphasizing floriferousness for the genus and Bechtel (1998) would prefer to emphasize floriferousness and increase the points for this attribute to 15.

Most of the awarded modern hybrids have a significant percentage of *Lycaste virginalis* in their background, in many cases upwards of 80 or 90 percent. That said, while a large number of *virginalis* clones have been awarded with a single flower, if we look to the cultural awards (and flower quality awards with more than one flower) we can hope to see what a well-flowered clone can do. Unfortunately, most of the descriptions do not indicate from how many leads the inflorescences emerge, so our sample is rather small; of the 143 awards granted by the AOS, only eight specify the number of flowering leads.

In 1960 (*OrchidWiz*), *Lycaste virginalis* 'Christie' CCM/AOS (81) was given the first cultural award to the species with "[t]wenty pink flowers on four flowering pseudobulbs."

In 1971, the clone 'David' CCM/AOS (82) was awarded with "[f]ifteen large, cameo-pink flowers and two buds emanating from a single clean-leaved growth; three leafless back bulbs." We can debate whether a cultural award is warranted for a plant with a single bulb producing blooms, but this plant shows the potential for the genus, with 17 flowers and buds from that single bulb.

In 1974 'Elise' CCM/AOS (80) had "[t]wentyflowerstypicalofthespecieswith nine buds on 29 spikes; two pseudobulbs with leaves, 12 leafless pseudobulbs and three flowering pseudobulbs." This results in an average of 7–8 flowers and buds per flowering bulb.

In 1988 'Northern Fairy' CCM/AOS (91) was awarded with "[t]wenty-three flowers and one bud on 24 inflorescences from three growths plus seven backbulbs." Again, this demonstrates an average of eight flowers per flowering bulb.



- [1] *Lycaste virginalis* 'Christie' CCM/AOS.
- [2] *Lycaste virginalis* 'David' CCM/AOS; exhibitor: Michael Roccaforte.
- [3] *Lycaste virginalis* 'Elise' CCM/AOS; exhibitor: William E. White.
- [4] *Lycaste virginalis* 'Northern Fairy' CCM/AOS; exhibitor: Enrique Ruiz-Medina.
- [5] *Lycaste virginalis* 'Marsh Hollow' HCC/AOS; exhibitor: Mario and Conni Ferrusi.
- [6] *Lycaste virginalis* (Alba) 'Frau Elise' CCM/AOS; exhibitor: Manfred Hay.
- [7] *Lycaste virginalis* 'Mario Palmieri' AM/AOS; exhibitor: Mario Palmieri.

In 1996, the clone 'Marsh Hollow' HCC/AOS (79) had "[t]wo majestic flowers on two inflorescences coming from one robust pseudobulb."

In 2008, 'Frau Elise' CCM/AOS (87) held "[t]wenty-seven stately, slightly cupped flowers and two buds on 29 inflorescences on a two-lead plant." This indicates an impressive 14–15 inflorescences per lead.

In 2009, the clone 'Mario Palmieri'

AM/AOS (85) was presented with "[t]wo outstanding, flat flowers and two buds on one lead of a four-pseudobulb plant."

Finally, in 2014, 'Oldfield' HCC/AOS (76) had "[e]leven flowers on 11 inflorescences, six from one and five from the other flowering pseudobulb."

Based on these descriptions, it is evident that *Lycaste virginialis* is capable of holding 2, 4, 8, 15 or even 17 flowers per lead. If we are judging floriferousness based on the "hypothetical standard of perfection," a single-flowered plant should therefore receive a very low score for floriferousness. Other species prominent in the background of many modern hybrids carry multiple inflorescences per lead as well:

*Lycaste macrophylla*: there are only 19 AOS awards to this species, and the best description is for the clone 'Orkiddoc' CHM-AM/AOS (82), CHM/AOS, awarded in 2017 as *Lyc. xanthochiela*. At the time of judging, it held "[o]ne flower and one bud on two basal inflorescences to 7 cm, emerging from a three-growth plant, a fourth growth emerging." With only one new growth emerging, it is not a large logical leap to infer that both inflorescences are emerging from a single lead.

*Lycaste lasioglossa*: of the 11 AOS awards to the species, two clearly indicate the potential of this species. 'Eddy Girl' AM/AOS (80) was awarded in 2006. There is no photo available, but the description states "[f]our flowers and 12 buds emanating from two lead pseudobulbs." More recently, in 2010, 'June Simpson' CCM/AOS (82) was described as having "[t]wenty-four flowers and 23 buds on 46 inflorescences on a . . . 11-pseudobulb plant." The former description clearly describes an average of eight inflorescences per lead. The latter description is rather vague (as it describes the number of bulbs and not the number of leads), but at least four inflorescences per lead is definitive and if I am doing my math correctly, there was one multiflowered inflorescence.

*Lycaste cruenta*: due to the ambiguousness of the descriptions, there is little to go on, but the clone 'Mitzi' CCM/AOS (87), awarded in 1969, allows us to use our math skills to get a general idea of the possibilities. "Eighty-four typical flowers on 84 spikes; plant consists of 13 leafless bulbs." That is 6–7 flowers per bulb — and I am sure fewer than half of those bulbs were in bloom.

Some lycaste aficionados have suggested that floriferousness should be



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JUDITH HIGHAM



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KATIE PAYEUR



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GREG ALLIKAS

de-emphasized by indicating they should be judged on the Paphiopedilum scale, since you only expect a single flower per inflorescence. *But there are even some clones of Lycaste virginialis that have multiple flowers per inflorescence!* About every 10 years one shows up.

On November 17, 1982, two multifloral alba clones were awarded: 'La Princesa' AM/AOS (81) possessed two flowers on a single inflorescence and 'Cutie' AM/AOS (81) possessed six flowers on five

inflorescences. No photos are included in the record for these two awards, but the language in the descriptions is quite clear.

More recently, in 1992, the clone 'Kate' AM/AOS (89) was awarded with two flowers and three buds on four inflorescences. The only photo in the record simply records a single flower. The description notes "slight mechanical damage precluded a higher score."

In 2001, another alba clone 'Walter



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AOS AWARD ARCHIVES



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de Pinal' was awarded with a JC/AOS with eight flowers on seven inflorescences. "Commended for multiple flowering on a single inflorescence." Given that commendation, one would hope for a better picture of the multiple flowering.

In 2012, the clone 'Juan Francisco Velasquez' CCE/AOS (91) was awarded with 56 flowers and 26 buds on 80 inflorescences, implying that a couple of the inflorescences carried multiple flowers, but with so many flowers counting errors are a possibility?

Most recently, in 2017, 'Claudia de Ruiz' AM/AOS (81) was awarded with three flowers and two buds on four inflorescences. The photographic evidence of this one is fairly clear, and it is equally clear that multiple flowers per inflorescence results in crowding.

The occurrence of multiple flowers per inflorescence in lycastes is, admittedly, very rare and a single flower *should* be expected. In cases such as these for any single-flowered inflorescence genus, perhaps the identification of the species should be confirmed by SITF before using the new award to set a new standard for floriferousness.

Multiple inflorescences per lead, however, should also be expected. In the end, I can agree with none of the proposed changes to the judging of lycastes, but I do believe that proper allocation of the 10 points available — by taking into account the possibilities of the genus — would result in more uniform scoring for flower quality awards.

— Andrew Coghill-Behrends (email [mrccoghill@hotmail.com](mailto:mrccoghill@hotmail.com)).

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SALLIE DELAHOUSSE



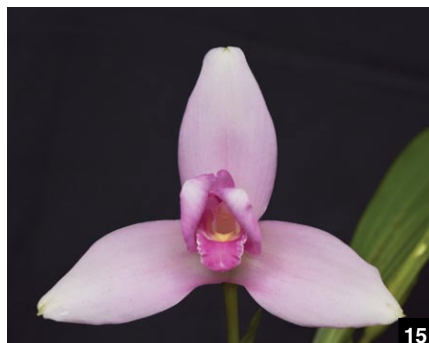
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JORGE CARLOS



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JORGE CARLOS



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- [8] *Lycaste virginalis* 'Oldfield' HCC/AOS; exhibitor: Jonathan Littau.  
 [9] *Lycaste macrophylla* var. *alba* 'Orkiddoc' AM/AOS; exhibitor: Larry Sexton.  
 [10] *Lycaste lasioglossa* 'June Simpson' CCM/AOS; exhibitor: June's Orchid Estate.  
 [11] *Lycaste cruenta* 'Mitzi' CCM/AOS; exhibitor: Rodney K. Meredith.  
 [12] *Lycaste virginalis* 'Kate' AM/AOS; exhibitor: Wilfred B. Neptune, MD.  
 [13] *Lycaste virginalis* 'Walter Del Pinal' JC/AOS; exhibitor: Dalton Watson.  
 [14] *Lycaste virginalis* 'Juan Francisco Velasquez' CCE/AOS; exhibitor: Juan Francisco Velasquez.  
 [15] *Lycaste virginalis* 'Claudia de Ruiz' AM/AOS; exhibitor: Enrique Ruiz.

## 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.

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

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

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

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# Wayquecha Cloud Forest Research Station

Text by Thomas Mirenda/Photographs by Daxs Herson Coayla

AS THE WORLD tentatively reopens to travel these last few months, and adjusts to our global “new normal,” I think that ecotourism trips are the way to go. Generally speaking, they avoid big, crowded cities and indoor places where pestilence may spread, tend to have vast expanses of trails laden with fresh air and greenery and offer a type of psychic renewal we all could use at this moment in history. I took my chances this past winter, by going on an extensive trip through Central and South America as well as the Caribbean in search of that psychic renewal so greatly needed after two years of relative solitude and inactivity. Granted, I live in a most lovely place with daily botanical stimulation many are envious of. But, the world is wild and wonderful and there is so much to experience. If the world were a encyclopedia, would you read only one page?

After the mind-blowing trip to Viracochasi, Peru I wrote about in April, my friend and fellow orchid explorer, Daxs Herson Coayla took me to one of his favorite places. Wayquecha (meaning “brother” in the Quechua language) Cloud Forest Research Station is a remarkable, one-of-a-kind resource in the Peruvian Andes built and operated by the Amazon Conservation Association ([www.amazonconservation.org](http://www.amazonconservation.org)). As the only such field station in a cloud forest in Peru, some groundbreaking ecological research is happening within its 1,450 acres (586.8 ha) of virgin primary forest, most notably with the conservation of the threatened Andean Bear, crucial for its importance in maintaining forest biodiversity due to its capacity for seed dispersal, and an innovative technique to study climate shifts by placing a huge curtain over a section of the cloud forest that mimics the reduction of moisture as would happen as a habitat warms. Daxs did a project tracing the courses of waterfalls through the landscape to better understand how changes in these systems might affect life further down the mountain. This is all incredibly interesting and important stuff for our planet.

The diversity of life in the cloud forest



- [1] A relatively clear moment on the trails at Wayquecha, gives some context for the vast, and lovely wilderness that surrounds the reserve.
- [2] A section of the canopy walk at Wayquecha that leads to the research areas where climate data of the cloud forest is being recorded daily.
- [3] The author taking photos of a rare and unknown *Lepanthes* on the trail with new friends: volunteers and staff of the reserve.
- [4] Fantastic clumps of *Barbosella cucullata* were blooming in profusion along this trail within the Wayquecha Orchid Garden.
- [5] *Epidendrum fimbriatum* is a pretty, well-known, cool growing species that thrives under cloud forest conditions, but is adaptable and vigorous in cultivation.



can be really remarkable, and Daxs knew I would be delighted to see the orchid garden that had been established there. It is absolutely packed with incredible orchid species, and I walked through it two or three times a day despite the cold and rain. With outstanding, awe-inspiring views at every turn, I kept finding additional orchids each time I passed through, many of which were unknown to me. Luckily, they had produced a terrific book with many of the species expertly photographed and mostly correctly identified. Many new species have been discovered there since the book was produced in 2014.

On my daily treks through the trails, I came across many maxillarias, odontoglossum-type oncidiums, cyrtorchilums, many telipogons, a wild diversity of epidendrums, pleurothallids including *Barbosella*, *Lepanthes*, *Acronia*, *Stelis*, *Pleurothallis*, and a most exceptional and plentiful *Andinia* species, *Andinia suchubambensis* (*Andinia wayquechensis*) literally cascading from the shady dripping branches of the cloud forest trees. Many orchids grew terrestrially as well, including additional epidendrums, spiranthoid types and a particularly beautiful *Ponthieva* species. I cannot stress enough the value of such gardens as places not just for orchid conservation, but also for access to the studies of graduate students and citizen scientists working on ecological pursuits including discovering natural pollination systems and interactions with other organisms including mycorrhizal associations. This circa situm strategy for orchid conservation allows us so many avenues to work for orchid conservation, observation and ultimately, appreciation — the first step towards stewardship.

I hope that many of you will go on such ecotours to destinations such as Wayquecha, Viracochasi and, of course, Inkaterra in the coming years as the hunger for adventure travel comes back with force and purpose. If you want to go with me one day, drop me an email.

— Tom Mirenda has been working professionally with orchids for over three decades. He is currently an AOS trustee and is a past chair of the AOS Conservation Committee. He is an AOS accredited judge in the Hawaii Center (email: [biophiliak@gmail.com](mailto:biophiliak@gmail.com)).



[6] What a treat it was to find these enormous flowers of *Telipogon vargasii* along the trail. Telipogons are truly challenging to grow, but flourish in a circa situm orchid garden. These had seed capsules so natural pollinators are clearly present.

[7] *Andinia suchubambensis* (syn *wayquechensis*); though miniatures, these stunning, trailing plants with enchantingly beautiful, delicately fringed flowers festooned the trees near the canopy walk. They are endemic to the Wayquecha area.

[8] *Ponthieva garayana*. Ponthievas are terrestrial orchids well known in North America with the evocative common name hairy shadow witch. It was lovely to see this South American member of the genus frequently along the trail. Photograph by Monika Gomikiewicz.





S. Holden, del. & Lith.

*Dendrobium Kingianum.*

Prepared for download exclusively for Oval Orquidifils Valencians



# *Dendrobium* section *Dendrocoryne* by Wesley Higgins and Peggy Alrich

Eastern Australia to New Caledonia



# Dendrocoryne

WHEN LINDLEY DESCRIBED *Dendrobium compressum* in 1842, he subtitled the species as *Dendrocoryne*. Subsequently, in 1851 Lindley described *Dendrobium* section *Dendrocoryne*. Although *Dendrobium compressum* was included in Lindley's section *Dendrocoryne*, currently the species is placed in section *Platycaulon*, which may create a nomenclatural issue. Section *Dendrocoryne* Lindley has 14 species and two natural hybrids that are typically lithophytes occurring in New South Wales, Queensland, Lord Howe Island and New Caledonia.

**ETYMOLOGY** From Greek word-forming elements, *dendron* = tree and *koruna* = club.

The section is characterized by the club-shaped pseudobulbs contracted at the base carrying two to six leaves at or near the apex and pseudobulbs of several nodes without leaf sheathing bases. The inflorescences are subapical to terminal, racemose and have a distinct peduncle with many flowers and rarely only one or two fleshy flowers. The trilobed lip is not strongly hinged, and the erect side lobes

are attached to the column foot apex. The callus has one to three low keels.

Phylogenetic investigation by Adams et al. (2006) based on parsimony analysis of 31 morphological characters found that the analyses did not support proposals to recognize new genera. In 2008, Burke et al. conducted a phylogenetic analysis based on DNA (ITS) sequences that was used to identify functional outgroups for analysis of all taxa in *Dendrobium* section *Dendrocoryne*. The analysis confirmed the results of other workers that *Dendrobium* sensu lato includes a major Australasian clade and that the splitting of the Australasian dendrobiums into various genera by other authors is excessive and unnecessary.

## CULTURE

**Light:** Being mostly lithophytes, many of these plants get an incredible amount of sunlight at some point during the day. Many can be acclimated to full sun very easily. Plants grown in six hours of direct sun grow and bloom just as well as plants grown in all-day full sun.

**Water:** Most dendrobiums, need a

good amount of water during their active growth season. The amount of water is directly dependent upon the amount of light they get and what they are potted in, as well as the amount of air circulation. When active growth pauses, a dry rest is recommended until the buds start showing.

**Fertilizer:** Any balanced orchid fertilizer for most of the year, stopping when not actively growing.

**Potting:** In nature, many of these species grow in the cracks of boulders where leaf litter collects, so using a comparable mix tends to work well. These are frequently grown in azalea-type pots, with a bark mix consisting of fine fir bark with charcoal, coarse perlite, chunky peat and medium tree fern. Some of the smaller members of this section can be mounted, but most grow so big that mounting is not the best option.

## References

Adams, P.B., J.M. Burke, and S.D. Lawson. 2006. Systematic Analysis of *Dendrobium* Swartz Section *Dendrocoryne* in the Australian Region. *Plant Systematics and Evolution* 260:65–80.



*Mist. Drusko del.*

*Publ. J. Krieger 150 Piccadilly Nov 1845*

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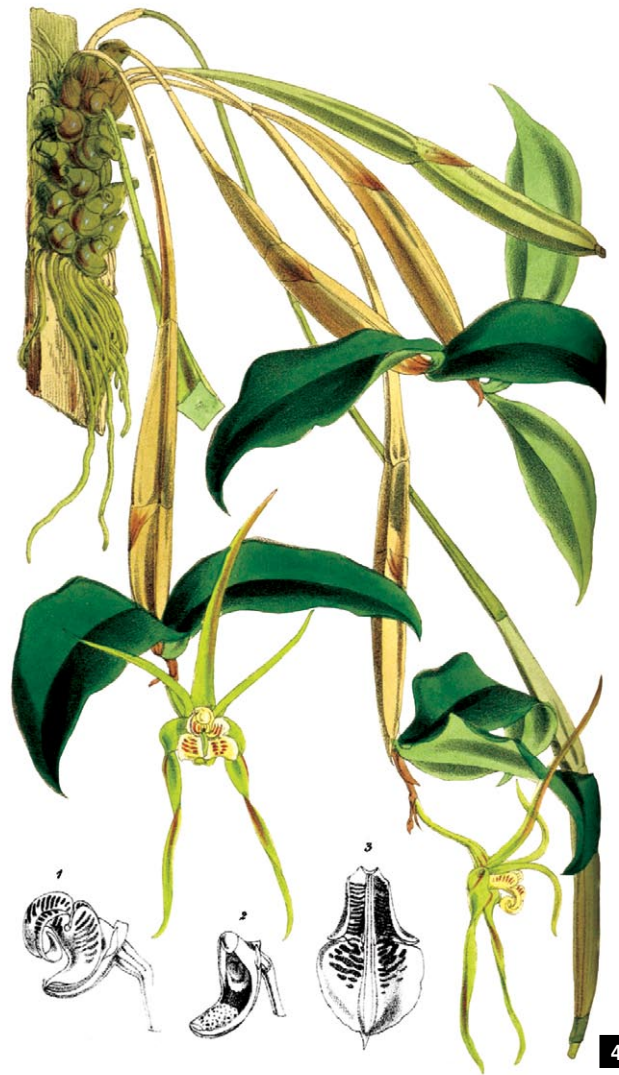




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# Dendrobium

## ANTIQUE PLATES

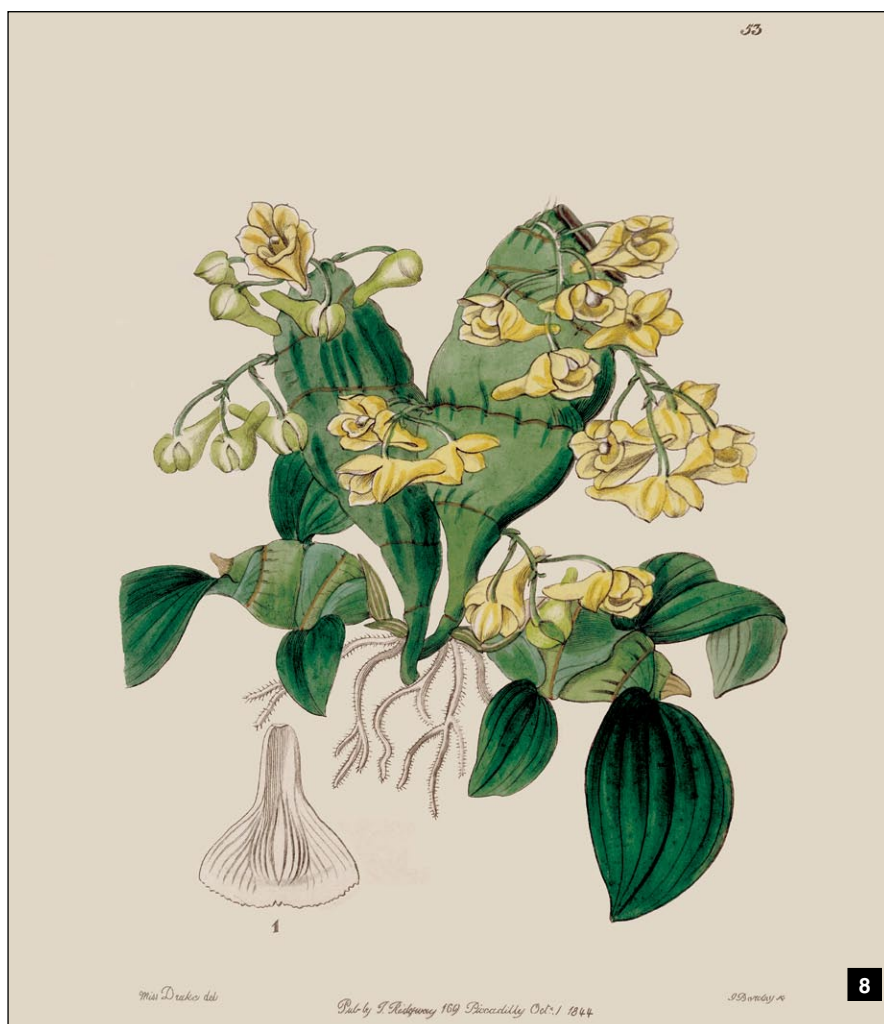
- [1] *Dendrobium kingianum*, *Paxton's Magazine of Botany*, 12: 1845 p. 97 (1845).
- [2] *Dendrobium kingianum*, *Botanical Register*, 31: t.61 (1845).
- [3] *Dendrobium gracilicaule*, *Botanical Magazine*, 115: t.7042 (1889).
- [4] *Dendrobium tetragonum*, *Botanical Magazine*, 98: t.5956 (1872).
- [5] *Dendrobium falcorostrum*, *Australian Orchids*, 1(5): t.40 (1870).
- [6] *Dendrobium kingianum*, *Dictionnaire Iconographique Orchidées*, t.38 (1905).
- [7] *Dendrobium moorei*, *Australian Orchids*, 1(6): t.65 (1870).
- [8] *Dendrobium compressum*, *Botanical Register*, 30: t.53 (1844).



5

DENDROBIUM Falcorostris

Printed at the Botanical Magazine, London, England, 1870.



## 76. DENDROBIUM compressum.

**D. (Dendrocoryne) compressum**; caule obovato compresso 2 6-phylo, foliis ovalibus acutis striatis basi dilatatis membranaceis amplexicaulibus, racemis subquadrifloris cernuis, sepalis petalisque ovatis erectis, cornu elongato obtuso, labello cuneato laevi per axin sulcato.

A curious species with yellow flowers of middle size, and singular compressed stems not more than three or four inches long. The lip is singularly truncated. Mr. Nightingale sent it from Ceylon to His Grace the Duke of Northumberland at Syon. We shall publish a figure of it as soon as we can find room.

### § 8. DENDROCORYNE.

From this point the development of the genus diminishes. The stem is contracted at the base, and club-shaped, with leaves at only the extreme end, as in the § *Spathium* among Epidendrums; the flowers are as in *Eudendrobium* and *Stachyobium*. The inflorescence may be made to constitute sectional differences.

#### A. Inflorescence terminal. (Chiefly Australian.)

118. *D. speciosum* Smith. 119. *D. canaliculatum* R. Br. 120. *D. semulum* R. Br. 121. *D. kingianum* Bidwill. 122. *D. Veitchianum* Lindley. 123. *D. tetragonum* Cunningham. 124. *D. Macraei* Lindley. 125. *D. longicollis* Lindley.

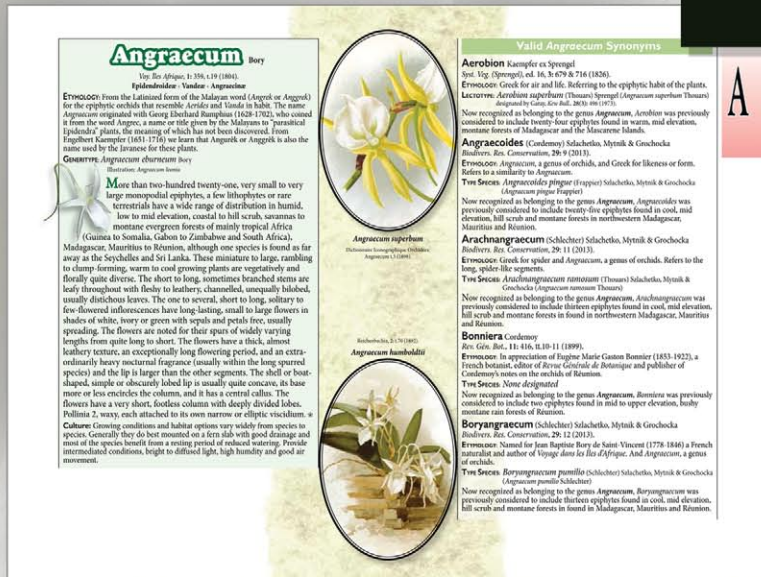
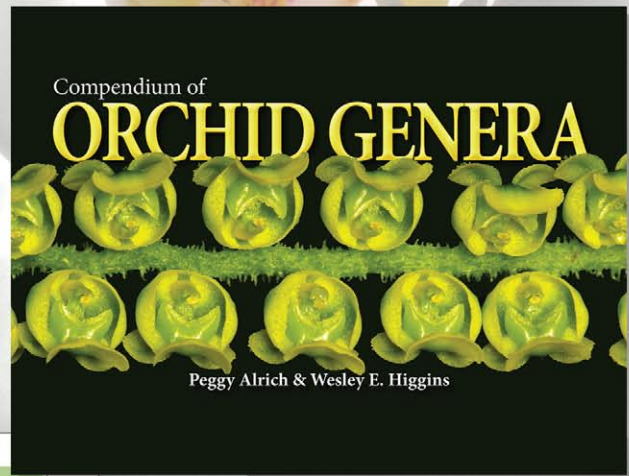
#### B. Inflorescence lateral.

126. *D. chrysotoxum* Lindley. 127. *D. Griffithianum* Id. 128. *D. aggregatum* Roxburgh. 129. *D. compressum* Lindley. 130. *D. densiflorum* Wallich. 131. *D. Palpebrae* Lindley.

- [9] *Dendrobium compressum* Lindley, *Edwards's Botanical Register*, 28(Misc.): 63 (1842)  
— top; *Dendrobium* section *Dendrocoryne* Lindley, *Paxton's Flower Garden*, 1: 136 (1851)  
— bottom.



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# *Barkeria* Hybrids

## Part 3: *Scandens* Section

ROBERT MARSH AND DENNIS SZESZKO/PHOTOGRAPHS BY ROBERT MARSH UNLESS OTHERWISE CREDITED





IN THIS THIRD article of our series on *Barkeria* hybrids we turn our attention to the last clade in the genus: the *Scandens* section. This section has eight species distributed throughout Mexico and Central America: *fritz-halbingeriana*, *lindleyana*, *melanocaulon*, *scandens*, *skinneri*, *spectabilis*, *vanneriana* and *whartoniana*. Guatemalan researchers proposed two additional species a decade ago with the names *Barkeria archilarum* and *Barkeria delpinalii* (Archila-Morales and Chiron 2011), but after careful review and without DNA evidence to support these species, we believe that the proposed taxa are aberrant forms of *spectabilis* and *skinneri*, respectively. We have excluded them from our circumscription of this clade of the genus.

The eight species in the *Scandens* section prefer intermediate temperatures, for the most part, so we speculate that this clade of *Barkeria* arose from an ancestor that also grew at intermediate temperatures. The Mexican state of Oaxaca harbors the greatest number of *Barkeria* species (MAS Orchids 2021) as well as its oldest species, *whartoniana* (Angulo et al. 2012), indicating that it is likely the center of diversification of the genus. When Oaxaca became hotter and drier 7.5 million years ago (mya; Becerra 2005), it seems that the *Scandens* section lineage found refuge in higher-elevation temperate forests where it continues to evolve. In addition to having the oldest extant species, the *Scandens* section also includes some of the newer species (*skinneri* and *lindleyana*) that diverged just 1–1.5 mya (Angulo et al. 2012). *Scandens* section species managed to disperse south out of Mexico and into Central America (*skinneri*, *spectabilis* and *lindleyana*) while evolving adaptations not seen in the *Uniflora* and *Obovata* sections; for example, ornithophilous pollination (*skinneri*), spring flowering (*melanocaulon* and *spectabilis*) and acrotonic growth habit (*vanneriana*).

At the same time that there was extensive habitat transformation in Southwestern Mexico to hotter and drier tropical deciduous forest (Becerra 2005), there was a concomitant explosion in the number of species of wild beans (Delgado-Salinas et al. 2006). We theorize that *Barkeria* flowers rode this trend, which saw their flowers evolve to mimic the purple, pink and white *Phaseoleae* flowers to attract the same insect pollinators.

The need to produce a flower that mimics another species, we think, explains why several *Barkeria* species have flowers



so similar that even botanists can have a hard time distinguishing them. Three of the most obvious examples of distinct species (confirmed by DNA analysis) but with flowers that are practically identical are *vanneriana*, *scandens* and *lindleyana*. The mimicry is so cunning that botanists were totally fooled for decades and erroneously thought that these three species were subspecies of each other. Here is a quick primer on how to tell them apart from vegetative and floral characteristics:

*Barkeria vanneriana* and *scandens* grow sympatrically at some stations in their distribution range in Mexico, but their growth habits easily set them apart, since *vanneriana* is a climbing, rupicolous species in which new leads develop two to three internodes above the base of the previous growth while *Barkeria scandens*, growing with equal alacrity on rocks or trees, has a subcaespitose habit and will break a new lead usually only one internode higher on the previous year's growth. *Barkeria lindleyana* is strictly epiphytic, clump-forming (caespitose) and will develop new growths only from the base. With regard to the flowers, an easy way to identify *scandens* is to examine the column for the absence of spots. The lack of spotting on the column is diagnostic for this species, as this feature easily differentiates it from *vanneriana* and *lindleyana*, which almost always have spots on the column. In turn, *vanneriana* and *lindleyana* can be distinguished by their petals. In *vanneriana* a careful examination reveals that the sepals and petals are subequal meaning that the petals are nearly the same as the sepals, whereas in *lindleyana* the petals are



- [1] *Barkeria* Leo 'MAS Orchids I' (*spectabilis* × *melanocaulon* f. *alba*) is a spectacular cultivar from a remake of this aptly named primary hybrid. The progeny have cane-like 6-inch (15 cm) pseudobulbs topped by an 18–24 inch (45–60 cm) erect inflorescence carrying 16–26 flowers that are 2.5–3.5 inches (6.4–8.9 cm) wide.
- [2] *Barkeria scandens* 'Villa Guerrero', a select cultivar from an outcross made by Roberto Frías Solís.
- [3] *Barkeria lindleyana* wild-type.
- [4] Esteban Padilla with an albescent cultivar of *Barkeria lindleyana* that received Honorable Mention at an orchid show in San Jose, Costa Rica. Grown by Esteban Padilla, photographed by Brandon Padilla Castro.

almost twice the width of the sepals and rhombic in shape.

With so many species in this section it can be difficult to generalize about their growing habits and characteristics, but some trends do appear. First, all the species in this section have moderately to very thick, terete roots. These roots grow best when they are fully exposed, so it should not be surprising that the majority of the species in this section are rupicolous with growth habits that see them climbing or creeping across rock surfaces. Second, they can be considered highland species that are rarely observed below 3,000 feet (1,000 m) and that generally establish at around 4,500 feet (1,500 m). In Mexico at this altitude there is usually an ecotone where the xeric *Quercus-Pinus* temperate forest changes to tropical deciduous forest, and it is here in this transitional biome that these plants grow best. The low atmospheric humidity in these dry habitats means that there is little water vapor in the air to buffer air temperatures, causing pronounced swings between diurnal and nocturnal temperatures. Third, all the *Scandens* section plants have cane-like, foliaceous pseudobulbs with large leaves. These leaves (and to a large extent also the exposed roots) require ventilation provided by omnipresent cooling winds. Fourth, the inflorescences in this section are racemes (rarely branched) sporting large, colorful flowers with prominent keels on the lip.

*Barkeria fritz-halbingeriana* — The rarest *Barkeria*, and that is really saying something when one considers the rarity and endemism of several of the species in the genus. It is known from two different localities in Oaxaca, but we do not mean to give the impression that we are talking about two populations of plants; instead, we mean two **individual** plants of this species are all that have ever been found in the wild. This species is a thin, rupicolous plant that grows on exposed granite outcroppings in semideciduous tropical forest. In contrast to all the other species in the genus, it frequently produces inflorescences with adventitious keiki plantlets.

*Barkeria lindleyana* — The only *Barkeria* species that is not native to Mexico, but instead grows exclusively in Costa Rica as an epiphyte at an elevation between 3,100–4,450 feet (950–1,350 m) in wet, temperate montane forests along the Pacific drainage slope where it is uncommon under natural conditions. However, in marked contrast to most



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[5] *Barkeria vanneriana*.

[6] *Barkeria fritz-halbingeriana*, M.A. Soto-Arena's type specimen for the species.

[7] *Barkeria melanocaulon* 'Summer Breeze'.

[8] *Barkeria skinneri*.

[9–10] Two *Barkeria spectabilis* wild-type cultivars that illustrate the range in color and spotting that typifies the species.

[11] *Barkeria whartoniana* 'John Ignacio', an especially dark lavender cultivar.

[12] *Barkeria* Mary Marsh 'With Love' (Marsh Mela × *naevosa* f. *aurea*).

[13] *Barkeria* Brandenburg Gold 'MAS Orchids' (Mary Marsh × Chiapas Spring).

[14] *Barkeria* Mary Marsh 'Sunrise', a cultivar from an F2 cross.



orchid species, this is a plant that absolutely thrives on anthropocentric (human-induced) disturbance. At present, *lindleyana* is a weedy, twig-epiphyte in the suburban neighborhood gardens and coffee plantations that ring the capital city of San José, where the plants can almost be classed as invasive because they take over groves and “fincas” with their overwhelming vigor and fecundity. It is an ideal species for use in hybrids owing to its floriferous nature, large flowers 2.5–3 inches (6.4–7.6 cm) in diameter, and the pulchritudinous (beautiful) conformation of the flower segments that are so elegantly presented above the lip. The plants are caespitose (clumping) without a lanky, awkward climbing habit and generally compact (although some giant-sized clones are known).

*Barkeria melanocaulon* — Endemic to Oaxaca, Mexico, but with a restricted range in just a few discontinuous localities near the state capital. The plants rarely form colonies, are mostly rupicolous, and grow widely interspersed on limestone outcroppings along with *Hechtia*, *Tillandsia* and arborescent cacti. They may also colonize shrubby brush and grow on north-facing tree trunks or on the leaf tips of large bromeliads with their roots meandering into the “wells” between the leaf axils to find retained rainwater and organic detritus. It is highly prized by collectors because of its ease of culture and beautiful, long-lasting flowers. The species is easily distinguished by its spring-blooming habit and its concolorous apple-blossom pink flowers, sometimes with a darker blotch on the lip.

*Barkeria scandens* — Endemic to Mexico in the Transverse Volcanic Belt (Michoacán, Mexico State and possibly Colima) and the Sierra Madre del Sur Mountains (Guerrero and Oaxaca). Relatively rare in the wild with scattered, discontinuous populations, it grows in xeric oak forests or subtropical scrub. It is commonly seen growing on trees hanging over cliffs or directly on rocky escarpments at the top of hills where there is a constant breeze. It seems that this species requires high light levels including up to full sun, but the temperatures must be attenuated with cooling winds for the best growing conditions.

*Barkeria skinneri* — The only one whose flowers are adapted to pollination by hummingbirds (Trochilidae). The inodorous flowers arranged on a raceme, with a striking magenta coloration and pale yellowish-white pollinarium, are evidence of hummingbird pollination



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syndrome. Additionally, the column is fused to the lip along most of its length to form a tube and the bright yellow keels on the lip probably serve as visual nectary guides for the visiting birds. The most obvious evidence for hummingbird pollination is the shape of the flowers. The lateral sepals are reflexed and held back behind the lip to allow easier access for a hovering bird to probe into the center without its wings coming into contact with the flower. However, the conformational

adaptation of the flower shape to allow for bird pollination eliminates the beautiful arrangement of the sepals and petals observed in all other *Barkeria* species in the *Scandens* and *Uniflora* sections. This is the Achilles' heel of using *skinneri* in crosses since the trait is dominant in the progeny.

*Barkeria spectabilis* — The most widely distributed species of the *Scandens* section

with a range that begins in Southern Mexico and continues southward through most Central American countries. These are common branch or twig epiphytes in middle elevation *Quercus–Pinus–Juniperus* forests throughout their range, but they have a marked preference for sunny, exposed, well-ventilated sites. This habitat is usually dry, and even during the monsoon rainy season the plants will completely dry out during the course of the day. The plants are compact with only a few leaves at the apex of their stubby, stout pseudobulbs. This species is capable of incredible growth as it can break a node and produce a fully developed, foliated pseudobulb and inflorescence with impressively large flowers in only two months. The fact that it undertakes such meteoric growth during the dry season in its natural habitat when the back bulbs are leafless and there is limited moisture is mind-boggling.

*Barkeria vanneriana* — It prefers to grow on rocky outcrops and steep, crumbling rocky slopes where owing to its ability to survive extreme, xeric (dry) conditions and its acrotonic, climbing habit it will thrive and outcompete other plants. There is a conspicuous tendency at the limits of its range to seek out increasingly arid habitats with the most northerly part of its distribution being the Tehuacán-Cuicatlán Valley that straddles Oaxaca and Puebla — a dry, desert-like area forested with a profusion of arborescent cactaceous species. It is a tough, adaptable species that can be found in a wide altitudinal interval between 3,100–6,500 feet (950–2,000 m) and is one of the first fall-blooming *Barkeria* species to flower, right as the rainy season is ending in Mexico.

*Barkeria whartonianiana* — As the oldest extant *Barkeria* species possibly dating back 7 mya, this species exhibits a floral morphology that is completely different from that of the other members of the genus. Its flowers superficially resemble those of *Caularthron*, a closely related genus, in having a lip divergent from the column, and this characteristic can consistently be used as a diagnostic feature with 100 percent reliability. This species has an extremely small population and locality near sea level on the Isthmus of Tehuantepec in Oaxaca where it grows on north-facing rocks, columnar cacti and trees. It is a working hypothesis of the authors that *whartonianiana* is not particularly well-adapted to its current locality but is instead a “living fossil” or ancient relic of the *Scandens* section that



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became stranded on top of rocky hillocks during the desertification of Mesoamerica as the area became hotter and drier and the vegetation transitioned into tropical deciduous forest. *Barkeria whartonianiana* grows where it does, not because it requires tropical heat, but because the extremely windy conditions present at the locality moderate the searing heat and allow it to cling to life. The species

- [15] Racemes from two cultivars of *Barkeria* Brigitte Foellmer (Marsh Mela × Oaxacan Showers).
- [16] *Barkeria* Marsh Mystery ‘Surprise’ (Brandenburg Gold × Brigitte Foellmer).
- [17] *Barkeria* Double Zinger ‘Impassioned’ (*scandens* × Zinger).
- [18] *Barkeria scandens* ‘Guerrero Royal’.
- [19] *Barkeria* Lilium Bryan ‘With Love’ (*lindleyana* × Marsh Melton).
- [20] *Barkeria* Friederike Kühl ‘With Love’ AM/AOS (Marsh Melton × Oaxacan Showers).



is effectively ship-wrecked with less than 1,000 individuals in the wild and no chance of dispersal to adjacent suitable habitats. Ex situ culture is a different matter entirely as the plant is easy for a grower to cultivate if they do not misguidedly replicate its blistering natural habitat, but rather grow them under intermediate conditions, which they very much prefer.

With eight species in this section, each with their distinct characteristics, there is an abundance of raw genetic material available for a hybridizer. Not surprisingly, the *Scandens* section boasts the parents of the first hybrid within the genus *Barkeria*. In 1969, the orchid adventurer and author Lance Birk registered *Barkeria Erika*, a cross between *lindleyana* and *skinneri*. At the time, these were the most frequently seen *Barkeria* species in orchid enthusiasts' collections. Almost two decades elapsed before the next hybrid appeared, followed by a succession of new combinations, boosted by the commercial availability of Mexican *Barkeria* species and Federico Halbinger's (1973, 1977) series of articles in English and Spanish that updated the taxonomic key for the genus and introduced the species to orchid hobbyists.

The total number of registered intrageneric *Barkeria* hybrids now stands at 91 with *Scandens* section species present in 84 percent of them. *Barkeria lindleyana*, *skinneri* and *scandens* are found in the pedigrees of about half of these hybrids; genes from *melanocaulon*, *spectabilis* and *whartoniana* are present in about a quarter of them. What features have hybridizers noticed that have motivated them to incorporate these species in their breeding? The most obvious and exceptional characteristics would be large flower size, appealing floral conformation and color intensity. To that list one could also add: (1) multifloral inflorescences, (2) pollen and capsule fertility of intrasectional hybrids and often intersectional hybrids and (3) the late spring or early summer flowering habit of *spectabilis* and *melanocaulon*, which extends the bloom season beyond the fall and winter flowering of all other *Barkeria* species.

Unlike the *Uniflora* section, where *uniflora* is the star of the show, no single species in the *Scandens* section commands top honors. But, a show of hands within their home countries of Mexico and Costa Rica would probably see *scandens* and *lindleyana* f. *alba*, respectively, win as overwhelmingly popular favorites. The best cultivars of these species produce



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erect, rarely-branched inflorescences of 1–2.5 feet (30–76 cm) carrying 20–35 well-spaced flowers that are 2–3 inches (5–8 cm) in width, with *scandens* falling at the lower end of these ranges and *lindleyana* at the top. One additional reason for their popularity is that the bloom time of *scandens* coincides with Mexico's commemoration of Day of the Dead at the beginning of November, while in Costa Rica the flowering of *lindleyana* is so intimately associated with their Independence Day that the orchid is colloquially known as "quince de septiembre." Costa Rican orchid growers prize the crystalline, white flowers of *lindleyana* f. *alba* over the common lavender flowers of the wild-type species.

Unfortunately, neither *scandens* nor *lindleyana* are easy *Barkeria* species to grow in many areas due to their need for warm days from 80–85 F (27–29 C) and cool nights from 55–60 F (13–16 C) during their summer growing season. High temperatures late in the growing season as the bloom spikes are maturing are extremely detrimental to the aesthetics of the flowers in these species. To circumvent the need for cool nights for optimal flowering, *lindleyana* was crossed with the more temperature-tolerant, warmer-growing *whartoniana*. The resultant *Barkeria* Marsh Mela is a vigorous *Scandens* section grex that grows happily with nights from 70–80 F (21–27 C) and days from 80–90 F (27–32

C) and occasionally higher. As noted in the first article of this series, *Barkeria* Marsh Mela is a “close contender for being the perfect parent” with its excellent conformation, wide petals, pale yellow lip keels and ability to impart fertility to varied hybrid progeny. Heat-tolerance is a critical addition to this list of favorable progenitor characteristics.

**HYBRIDS WITH YELLOW LIPS** Crossing Marsh Mela with the yellow-lip *Obovata* section species *Barkeria naevosa* f. *aurea* produced *Barkeria* Mary Marsh, another vigorous, attractive, heat-tolerant grex with good form and high flower count. Its flowers vary from light pink to medium magenta. Although the cross was made with the hope of producing yellow hybrids, only about one in 100 progeny had pale yellow lips. In an attempt to fully recover the recessive yellow trait, a sib cross of two Mary Marsh clones was made. This yielded well-formed darker flowers with a strong yellow center to the lip, but no fully yellow lips.

A second approach for a *Barkeria* hybrid with a solid yellow lip was attempted by crossing *spectabilis* with *naevosa* f. *aurea*. Unfortunately, even backcrosses with *naevosa* f. *aurea* were unable to produce lips with dark yellow coloration. Since two different pathways to yellow lips had resulted in unsatisfactory results, the two breeding lines were combined with the hope that the full yellow character from the *naevosa* f. *aurea* parent would finally reemerge in a larger, well-formed flower. When the best Mary Marsh and *spectabilis*-*naevosa* f. *aurea* cultivars were crossed, a good medium-sized flower with a solid yellow lip resulted. This grex was registered as *Barkeria* Brandenburg Gold in appreciation of Ronnie and Jerry Brandenburg, long-time AOS judges who had given Robert Marsh the extremely rare *naevosa* ‘Brandenburg’ HCC/AOS with the intense yellow lip that was the progenitor of the resulting hybrid.

A third approach to achieving a yellow-lip hybrid with classic *lindleyana* form entailed crossing Marsh Mela with *Barkeria* Oaxacan Showers: a hybrid illustrated in the first article in this series and containing genes for a yellow lip from both *naevosa* f. *aurea* and *Barkeria obovata*. The cross yielded *Barkeria* Brigitte Foellmer, with many of the progeny displaying dark yellow keels on peachy-yellow lips. A subsequent cross of one of these with Brandenburg Gold ‘MAS Orchids’ bred *Barkeria* Marsh Mystery ‘Surprise’, which is particularly noteworthy for its yellow lip with well-defined fuchsia veining. The



- [21] *Barkeria* Friederike Kühl ‘Fire & Ice’.
- [22] *Barkeria* Palenque ‘MAS Orchids’ (Flying Dreams × *lindleyana*).
- [23] *Barkeria* Butterflies (*whartonia* × *spectabilis*).
- [24] *Barkeria* Leo (*spectabilis* × *melanocaulon* f. *alba*), sibling of the ‘MAS Orchids I’ cultivar. Placed at the foot of grower Margarita Herrera, Laboratorio VitroAlma, Villa Guerrero, Mexico, to show its size. Photograph by Dennis Szeszko.
- [25] *Barkeria* Princess Margo (*skinneri* × Lulubelle). Grown and photographed by Marilyn LeDoux.
- [26] *Barkeria* Brian’s Barkers ‘Windy Hill’ AQ-HCC/AOS (*whartonia* × *skinneri*). Grown by Marilyn LeDoux, photographed by Matthew Nutt.

fact that Brigitte Foellmer in general and the ‘Surprise’ cultivar of Marsh Mystery are fertile bodes well for unusual yellow novelty hybrids in the future.

**BRILLIANT MAGENTA HYBRIDS** Another goal in breeding with the *Scandens* section was to try to rectify the major flaw of *scandens* having poor temperature tolerance while simultaneously amping up its show-stopping neon-magenta to fuchsia color. Melding *scandens* with the warmer growing species *naevosa* and *whartonia* produced *Barkeria* Double Zinger; when *scandens* was combined with *lindleyana*, *melanocaulon*, and *whartonia*, *Barkeria* Bold Venture was



the result. Both of these hybrids produce excellent flowers of good form and intense color, but more importantly they can grow and flower well in intermediate greenhouse temperatures without the need for cool nights. Nonetheless, the very best cultivars with the largest flowers and most intense coloration have resulted from selective breeding of *scandens* itself. To overcome poor temperature tolerance, a warmer-growing, lower-altitude form of *scandens* from the Mexican state of Guerrero was crossed with a line-bred plant from Roberto Frías Solís that was selected for form and color intensity but has genes from the cooler-growing form of *scandens* from the mountains of Michoacán. The resultant *scandens* 'Guerrero Royal' is the best example from this breeding, with erect racemes bearing flowers 2.5 inches (6.3 cm) in width and shocking red-magenta in color.

**WHITE HYBRIDS WITH PATTERNED LIPS** Because of the success of Marsh Mela as a parent, an analogous primary hybrid was made by crossing *whartonianiana* with *melanocaulon* in place of *lindleyana*. It was registered as *Barkeria* Marsh Melton. Initially, this grex seemed disappointing as the flowers were relatively small at about 1 inch (2.5 cm) in width; and while the columns were pleasingly marked with spots of dark red-magenta, the flowers were otherwise a bland pale pink. Furthermore, the plants bloomed in the fall rather than in the hoped-for late spring or summer like the *melanocaulon* parent, and they seemed infertile at first. But happily, after a couple of years of strengthening growth, they set capsules easily. Attractive cultivars that bloomed in late summer resulted from a cross of *lindleyana* 'SanBar White Cloud' AM/AOS by Marsh Melton. This hybrid, *Barkeria* Lilium Bryan, has arched racemes that are up to 2 ft (65 cm) long with up to 20 flowers 1.75–2 inches (4.4–5 cm) wide in various shades of lavender with broad columns spotted dark magenta. Another Marsh Melton hybrid that was a real surprise in terms of the superior quality of its flowers was *Barkeria* Friederike Kühl. This time Marsh Melton was used as the capsule parent and a white Oaxacan Showers cultivar with a pale-yellow lip contributed pollen. The progeny have inflorescences carrying one or two dozen flowers that are immaculate white to blush with a few having yellow lips. Setting off these flower colors is the chiaroscuro contrast of darkly pigmented lip markings or nearly black columns. Having the flowers presented on gracefully arched

racemes or laxly branched inflorescences that rebloom after the initial flowers fade makes for a long-lasting, stunning spectacle. The flowers are 1.5–2 inches (3.8–5 cm) in diameter, the inflorescences are 1.5–3 feet (50–100 cm) in length, and the vigorous, warm-growing plants grow compactly with pseudobulbs 8–12 inches (20–30 cm) in height. As an important plus, many cultivars of this grex are both pollen and capsule fertile.

*Barkeria spectabilis*, with flowers that can be more than 3 inches (7.5 cm) wide and the ability of some clones to grow into spectacular specimen plants, may rightfully claim to share top honors in the *Scandens* section with *scandens* and *lindleyana*. Its use in hybrids has the principal effects of increasing the flower size and shortening the inflorescence. For example, crossing the primary hybrid *Barkeria* Flying Dreams (*spectabilis* × *scandens*) with *lindleyana* yields *Barkeria* Palenque which has 1–1.5 feet (30–46 cm) long inflorescences carrying good-sized flowers with broad segments that are a rich magenta and that flaunt an even darker lip apex. In another example, crossing *spectabilis* with the small-flowered *whartonianiana* to make *Barkeria* Butterflies creates exotic shooting-star flowers that resemble an enlarged *whartonianiana* with its tell-tale crown of reflexed sepals and petals. Finally, crossing *spectabilis* with a midsize *melanocaulon* f. *alba* to make *Barkeria* Leo produces beautifully presented, absolutely amazing pink-and-white flowers that are up to 3 inches (8 cm) or more in width, the largest of any *Barkeria* hybrid.

In the years after Lance Birk used the intense rose-magenta *skinneri* to make the first registered *Barkeria* hybrid, *skinneri* continued to be used sporadically as a parent until 2003. Now, after a long hiatus, Marilyn LeDoux at Windy Hill Gardens has renewed its use in intrageneric *Barkeria* hybridization. In 2021 LeDoux registered *Barkeria* Princess Margo (*skinneri* × Lulubelle), but it was her outstanding *Barkeria* Brian's Barkers (*whartonianiana* × *skinneri*) 'Windy Hill' that received an HCC-AQ/AOS in January of this year.

No hybrids have been registered involving the climbing *vanneriana* or slender *fritz-halbingeriana*, whose flowers resemble a diminutive *vanneriana*. Unregistered crosses of *fritz-halbingeriana* with *scandens* and Mary Marsh, the latter made by Roland Schafflützel, produced small, unremarkable flowers, suggesting that *fritz-halbingeriana* may have little to



offer hybridizers.

The expected stars of the *Scandens* section — *lindleyana*, *scandens*, *skinneri* and *spectabilis* — have definitely proven their worth when it comes to the production of outstanding hybrids. The surprise is that the small, light-lavender *whartonianiana* and mid-sized, pink *melanocaulon* have also shown themselves to be stars with both imparting excellent conformation plus intersectional fertility in the case of *whartonianiana* and size in the case of *melanocaulon*. Wild-type and color-variants of these six species, plus the stars of the *Obovata* and *Uniflora* sections, beckon hybridizers to create an ever-expanding array of exciting new *Barkeria* hybrids. We believe the surface has only been scratched.

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# Paphiopedilum venustum: Part 2

## The Hybrids

BY LESLIE EE, ND

THE FIRST HYBRID of *Paphiopedilum venustum* to appear was registered in 1873 by Lady Ashburton, soon followed by three registered by Veitch. Currently there are more than 400 progeny. This is a surprisingly low number compared to other species such as *Paphiopedilum callosum*, with more than 10 times that number. There must be some mysterious reason why this species was not utilized as often. Perhaps the answers may rest in its hybrids.

*Paphiopedilum venustum* can reach blooming size within two years from flask. The plants stay compact, have beautifully mottled leaves and rebloom easily (Wood, pers. comm.). Furthermore, plants grow easily under home conditions into specimens, producing a nice display of many long-lasting, bright and cheerful flowers in winter. Historically, many breeders have been reluctant to use *Paph. venustum* in their breeding lines because of their small size, poor flower form and poor transmission of traits (S. Tsui, pers. comm.).

### INTERSECTIONAL HYBRIDS

Few intersectional crosses were successful enough to have been continued. Most of these primary crosses were made experimentally and the majority of the breeding lines stopped as soon as each began. This is because the hybrids were not beautiful to behold, were poor growers or proved to be sterile. Table 1 lists some examples of these intersectional hybrids with the year registered and their number of successful offspring (some were named twice or more before modern standards of nomenclature).

As one can see from these numbers, many primary crosses led nowhere, particularly with the multiflorals. The ones that were utilized also seemed to have been taken no further than the third generation. The reason may be sterility issues in intersectional breeding. Or simply the flowers did not attract any commercial value. The most successful group to cross to was within its own section — *Barbata*.



*Paphiopedilum* Double Deception 'Dots Incredible' HCC/AOS (*venustum* × *sukhakulii*); exhibitor: Paphanatics, unLtd.

### PAPHIOPEDILUM VENUSTUM CONTRIBUTION TO ITS HYBRIDS

*Paphiopedilum venustum* plants discovered earlier in the 19th century did not have the dazzling deep-red pouch or flat red petals of today. Except for their distinctive veiny, "brain-like" pouch, most of them were rather drab, brownish flowers with a small dorsal sepal and thin, deeply reflexed petals. These qualities were not highly desirable for early hybridization, particularly considering that there were other species that could produce larger, flatter, rounder, and brighter colored flowers such as *Paphiopedilum bellatulum*, *niveum*, *charlesworthii*, *spicerianum*, *gratrixianum*, *insigne*, *lawrenceanum* and *callosum*. For these reasons, it is not surprising that there are only about 440 progeny from *venustum*.

The early hybrids with *Paph. venustum* and other species did not show the promise of the species' marbled pouch, increased size or more rounded flower shape. Hybrids such as *Crossianum* (× *insigne*) 1873, *Chloroneurum* (× *Harrisianum*) 1880 and *Pavoninum* (×

*boxallii*) 1888 showed open flowers with mild to no influence of the *venustum* pouch. The other flower dominated the color while *venustum* decreased the floral size of each part, an undesirable effect. According to observations, it appears that when bred to *Brachypetalum* species (such as *concolor*), the traits of *venustum* were almost wiped out while decreasing the size, such as in *Paph. Marshallianum* (× *concolor*) 1875. Regardless of this poor transmission of these undesirable traits, it was still used in the Victorian era from 1893 to 1903, possibly to study its inheritance. During that time, it produced only 10 Royal Horticultural Society awards in four hybrids (out of 47). With these poor rewards and small-sized offspring, its use waned until after World War II. With newer jungle imports of better form and color in the 1950s, it made a resurgence and was used to make approximately one cross per year from 1943 until 1987.

What happened in the 1980s? The discovery of a new Thai species *Paphiopedilum sukhakulii* in the 1960s radically changed the destiny of *venustum*.

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The hybrid of these two species, *Paph.* Double Deception, rocked the judging world by garnering almost 30 worldwide awards with its large flowers (almost 6 in. [15 cm]) that had wide, flat and horizontally held petals. Some flowers even showed the deep-green marbled veins on the pouch with a dark-reddish-brown overlay, such as 'Dots Incredible' HCC/AOS grown by Paphanatics. Unfortunately, the marbled green veins did not pass through easily to its offspring as the *sukhakulii* traits dominated subsequent generations. However, it was remotely possible for the red pouch to sneak through if a certain combination was attempted (to be discussed later).

From this point forward with the success of Double Deception, from 1989 to 2019, *venustum* was used more often (coinciding fortuitously as more albino venustums became more widely available) by hybridizers particularly in the USA and Japan, producing over 62 first-generation crosses and garnering over 50 awards internationally. It seemed from this point that the only true success of *venustum* was with *sukhakulii*.

As better cultivars of *venustum* were developed through selective line breeding, with dark-red pouches (and deep-green veining) and red petals, more hybridizers started to use them in their breeding program. According to Koopowitz (2008), *venustum* is the only species that has the ability to pass on "true spectrum red on petals because there are surface epithelial red anthocyanins that overlay a deep layer of bright yellow carotenoids." This is particularly interesting because the albino versions of *venustum* have these yellow petal bases that other so-called almost red-petaled species such as *Paph. argus*, *Paph. wardii* and *Paph. sukhakulii* do not. This yellow is from the concentration of chromoplasts at the petal tips (Koopowitz, pers. comm.). In this case, *venustum* can be used to breed true-red offspring, rather than the lavender or maroon from the vinicolor *callosum* line.

This in fact can be seen in some of the hybrids that have flowered over the last two decades. A deeper analysis will reveal the extent of such genetic inheritance of the red color and pouch reticulations.

#### POUCH COLOR INHERITANCE

Color inheritance is a complicated hierarchical process. It involves multiple structural genes, which encode enzymes and the respective regulatory genes that control the expression of such structural genes. Both types of genes can be expressed as dominant or recessive.

**Table 1. Intersectional hybrids of *Paphiopedilum venustum*.**

Section	Hybrid
<i>Brachypetalum</i>	× <i>bellatulum</i> = Venubel (1895, 0 offspring), Bella-venustum (1895, 0)
	× <i>concolor</i> = Marshallianum (1875, 2)
	× <i>godefroyae</i> = Lloydiae (1896, 0), Sade Lloyd (1890, 0)
	× <i>niveum</i> = Saron (1897, 0)
<i>Parvisepalum</i>	None
<i>Coryopedilum</i>	× <i>philippinense</i> = Euterpe (1900, 0), Arthur (1890, 0)
	× <i>rothschildianum</i> = Bruellense (1901, 0)
	× <i>stonei</i> = Doris (1890, 0)
<i>Pardolopetalum</i>	× <i>haynaldianum</i> = Tatiana Ivanova (1982, 0)
	× <i>lowii</i> = Pycnopterum (1879, 0), Porphyropsilum (1879, 0)
<i>Cochlopetalum</i>	× <i>chamberlainianum</i> = Venus Chamber (1980, 0)
	× <i>glaucophyllum</i> = Shem (1970, 0)
	× <i>liemianum</i> = Chiada Zoe (2018, 0)
	× <i>primulinum</i> = Arnold J. Klehm (2014, 0)
<i>Paphiopedilum</i>	× <i>charlesworthii</i> = Hung Sheng Venus (2012, 0)
	× <i>exul</i> = Exultum (1959, 0)
	× <i>fairrianum</i> = Pandion (1972, 0)
	× <i>gratrixianum</i> = Venus Trick (1995, 0)
	× <i>hirsutissimum</i> = Deception (1893, 0)
	× <i>insigne</i> = Crossianum (1873, 12), Francis Heygate (1902, 1)
	× <i>spicerianum</i> = Polystigmaticum (1888, 0)
	× <i>villosum</i> = Measuresianum (1887, 4), Rowallianum (1891, 0), Madame Gibez (1893, 0), Amesianum (1887, 0), Julien Coffigniez (1894, 0), Thetis (1894, 0)
	× <i>acmodontum</i> = Albetine (1982, 0)
	× <i>appletonianum</i> = Memoria Heine Christ (1973, 0)
<i>Barbata</i>	× <i>argus</i> = Christmas Cheer (1975, 0)
	× <i>barbatum</i> = Venusto-Crossii (1880, 0), Thetis (1880, 0), Calophyllum (1881, 18)
	× <i>bullenianum</i> = Fitchianum (1889, 7); a possible line not discussed with potential for veined red pouch
	× <i>callosum</i> = Orpheus (1891, 6)
	× <i>ciliolare</i> = Marie Hey (1966, 0)
	× <i>dayanum</i> = Caligare (1888, 0)
	× <i>fowliei</i> = Hubertus Hoffman (2004, 0)
	× <i>hookerae</i> = Cassiope (1889, 0), Atys (1888, 1)
	× <i>javanicum</i> = Schrat (1961, 0)
	× <i>lawrenceanum</i> = Aureureum (1887, 23); could be useful for the albino lines
	× <i>mastersianum</i> = John Sadler (2000, 0)
	× <i>purpuratum</i> = Symondsiae (1896, 0), Meirax (1880, 0)
	× <i>sangii</i> = Mustafa's Mucho Gusto (2019, 0)
	× <i>sukhakulii</i> = Double Deception (1987, 21)
	× <i>superbiens</i> = Carrierei (1887, 0)
	× <i>tonsum</i> = Polyphemus (1894, 0), Tonso-venustum (1887, 0)
	× <i>urbanianum</i> = Tom Sawyer (1997, 0)
	× <i>violascens</i> = Solomon Venus (1994, 0)
	× <i>virens</i> = Venus Legend (1996, 0)
	× <i>wardii</i> = Varuna (1976, 4)
	× <i>wolterianum</i> = Shanti Gardens (1985, 0); this hybrid shows some pouch veining as well

Cofactor regulators along the gene code can also modify the intensity of the color, just like blue eye color. Each parent contributes half the genes (haploid) and they combine to express the (diploid) color. Some flowers have up to 50 genes to code their color (Griesbach and Koopowitz 2005).

Anthocyanins (or flavonoids) are pigments that cause the black, blue and purple-to-red coloration in flowers. They are usually in the outer epidermal layers in cell vacuoles. Carotenoids (or tetraterpenoids) are pigments that create yellow to orange colors. They are stored in plastids in chromoplasts in dermis and deeper layers. They both combine, along with transparent flavone copigments, to moderate each other for the final color, like layers of colored glass on top of each other (Griesbach and Koopowitz 2005). The synthesis and accumulation of these pigments are not only genetically coded, but affected by the environment such as light level, temperature, nutrition, petal pH and stress.

In the case of the red pouch color of *venustum*, the red comes from anthocyanins, likely cyanidin. Anthocyanin genes are inherited from both parents. If both have dominant red genes, as in most of *Barbata* section, they will show up as a red pouch. This is similar to red petal gene inheritance. The brightness of the red on the pouch and petals is determined by the background yellow carotenoid genes and the amount of yellow chromoplasts; the brighter the yellow on the bottom layer, the brighter the red on the top layer. Usually, red color exists in vacuoles in the top single layer of the epidermis. It may be possible to have a mutation with more layers, or even a mutation with increased anthocyanin production with the nuclear allele coding in the cell cytoplasm to fill additional red in the vacuoles. All this means is that in hybrids, if the *venustum* (or its similarly colored offspring) is used as a parent with its red genes and the yellow base genes, the resulting offspring will appear more red.

Another twist to this is that the red color phenotypic expression does not always mean the genotypic code is always the same. Red color can come from a single red anthocyanin gene (in the vacuole) or an admixture of purple anthocyanin over a yellow carotenoid (Griesbach, pers. comm.). In addition, as in some phalaenopsis flowers, three regulatory genes might be needed before red genes can be expressed.

Scientifically, the green color coding



1 ALAN PORTER



2 AOS AWARD ARCHIVES



3 AOS AWARD ARCHIVES

is determined by chloroplasts, which contain the green pigment chlorophyll, and which are in the capsule (mother) parent. Only the capsule parent can pass this chloroplast structure to the offspring (Griesbach and Koopowitz 2005). These chloroplasts remain in the region close to the *venustum* veins and stay green, whereas the chloroplasts between the veins lose their chlorophyll and turn to yellow chromoplasts (Koopowitz, pers. comm.). This green chloroplast concentration along the pouch veins makes the distinct green marbling of the species. In addition, Koopowitz (pers. comm.) indicated that if the chromoplasts between the veins do not lose most of the green chlorophyll (as in some normal forms), it may make the pouch muddy (when red overlays the greenish base color). These important facts must be noted when transmitting deep-green color to the petals and pouch of the offspring. It is fascinating to observe that in *Paph. venustum* var. *measuresianum* (the albinistic form) breeding the green veins on the petals are inherited along with the pouch reticulations. After all, the pouch is really a modified third petal and may share similar color inheritance genes parallel to the two "normal" petals. Furthermore, regulatory genes are responsible for the

marbled-green veined pouch (Griesbach, pers. comm.). Veins in the flower are formed from a different tissue than the rest of the floral parts, much like the veins from the leaves (Lee 2007). That is why they contain the green chloroplasts in the pouch veins and the petal veins.

All these genes can be shut down or moderated by albinistic genes from other album or white species and their hybrids (Liu 2000). For example, normally colored *venustum* breeding with white *Brachypetalum* species such as *Paph. niveum* and *Paph. godefroyae* will produce yellow-to-white flowers with linear brown speckling and usually a cream pouch, as seen in *Paph. Marshallianum* (× *concolor*). No green or red anthocyanins seem to pass through easily. This can be due to missing genes for the red anthocyanin enzyme pathway or the absence of regulatory genes (Griesbach, pers. comm.).

Interestingly, the warts and hairs on the petals of albinos and aureum (yellow) forms are determined by another set of anthocyanin red genes that do not theoretically code petal or pouch colors (Koopowitz and Hasegawa 1989). Because most of the petal anthocyanins are blocked over most of the flower, except at these warts, logically the location of this wart anthocyanin gene is different from



the petal anthocyanin (Koopowitz, pers. comm.) This is seen in the breeding of albescent forms in *venustum* where the minute red hairs and black or gray warts on petal base can be bred out without affecting petal or pouch color. Perhaps these are controlled by nonfunctional, defective, mutant or enzyme-deactivated regulatory genes like other albescent orchid flowers (Griesbach and Klein 1993).

It may also be worthwhile to realize that other known species with veined pouches such as *sangii*, *ayubianum* and *qingyongii* have not been proven to pass the strong reticulations onto their progeny (no offspring currently or more data needed). An example is the primary  $F_1$  hybrid of (*sangii*  $\times$  *micranthum*) where only light reticulations are seen on the pouch. Furthermore, these species are also not as easily accessible as *venustum* and its hybrids.

#### FIRST-GENERATION HYBRIDS

Of the 64 primary crosses, 16 were repetitions, making it only 48 true primary hybrids. Of these, only 12 continued to make offspring and the rest were dead ends, including those with *charlesworthii*, *godefroyae*, *niveum*, *philippinense*, *lowii* and even *rothschildianum*. This poor continuation of the *venustum* line reflects much cross-sectional difficulties or poor results that influenced hybridizers to not continue. Most never made it past  $F_2$ . Of the 12, four received award recognition, with most having only one award each except *Paph.* Double Deception (29 awards), *Paph.* Aureureum (6), *Paph.* Shanti Gardens (4) and *Paph.* John Sadler (3). These statistics were not favorable odds for hybridizers to continue using *venustum* as a parent.

Yet several hybridizers chose to take a chance and produced some of the most fascinating *venustum* hybrids never seen before. Graham Wood from Lehua Orchids in Hawaii was one of these innovative hybridizers who used the *venustum* lines to create some captivating *venustum* hybrids. Inspired by the beauty of *Paph.* Varuna (an  $F_1$  *venustum* primary with *wardii*), Wood continued and expanded the work of Terry Root from Orchid Zone (Wood, pers. comm.). Many of this group of successful *venustum* hybrids came from Wood's inspiring "no preconceptions" and "no prejudgment" attitude, because in his own foreshadowing words "yes, it can" (Wood, pers. comm.).

Some of the most beautiful *venustum* hybrids are from the first generation, particularly with members of the *Barbata*



CHARLIE RINER

4



AMY RADER

5

section. They can inherit the dazzling colors of the pouch with its intense green marbling and reddish suffusion. Most will also carry on the red in the petals. The other parent also increased the size of floral parts while eliminating petal reflexing. They also inherited the glossy and waxy textures of *venustum*.

Notable hybrids in the first generation include the following:

***Paphiopedilum* Christmas Cheer** ( $\times$  *argus*) 1975. This cross is interesting because both species contain red pigments on the petal tips and marbling in the pouch. The hybrid does in fact come out with both traits with strong red petals and a beautifully veined pouch. Unfortunately, it has not produced

- [1] *Paph.* John Sadler 'Brian's Pride' AM/AOS; exhibitor: Katherine Weitz.
- [2] *Paph.* Aureureum 'Crooked Creek' HCC/AOS; exhibitor: Richard E. Hepler.
- [3] *Paph.* Shanti Gardens 'Chardon' AM/AOS; exhibitor: Ruth Morlocke.
- [4] *Paph.* Venus Knight 'Louisiana' HCC/AOS; exhibitor: Al Taylor.
- [5] *Paph.* Venus Knight 'Orion' AM/AOS; exhibitor: Tina Balog.

any offspring, indicating that some intrasectional breeding may prove to be infertile. More experimentation with this hybrid might be needed.

***Paphiopedilum Varuna* (× *wardii*)** 1976. Made and registered by Stewart Orchids, this is one of the hybrids whose beauty inspired Wood to start using the *venustum* line in his breeding program (Wood, pers. comm.). Most have the deep-green veining of *venustum* in the pouch as well as red petal tips. In some cultivars such as ‘Kaiena III’, the red hue dominates over the pouch and ⅔ of the petals! Fortunately, this trait can be passed on to its hybrids, which will be discussed later.

***Paphiopedilum Double Deception* (× *sukhakulii*)** 1987. By adding *sukhakulii* genes into this hybrid, the petals enlarged and elongated close to horizontal, intensifying the spotting throughout the face of the flower. The *venustum* intensified the marbling of the reddish pouch as well as adding some red to the distal half of the petals in some cultivars. Although it has not proven to be a strong red parent, it has produced progeny with red pouches (*Paphiopedilum Memoria Cha Cha Sprintz*, 2011) as well as a green-veined pouch when bred back to *venustum* (*Paphiopedilum Deceptively Venus*, 2012). It may hold more surprises in the future, particularly with orange pouch cultivars such as ‘Royale’ HCC/AOS.

***Paphiopedilum John Sadler* (× *mastersianum*)** 2000. It took more than 150 years for someone to combine *venustum* with the glossy *mastersianum*. The hybrid can inherit the red-brown pouch and petal tips of the *venustum*, as shown in the cultivars ‘Paphgal’ HCC/AOS and ‘Brian’s Pride’ AM/AOS. The *mastersianum* imparted the glossy texture and wider dorsal sepal. The combination produced a stunning, long-lasting, larger flower on a tall stem. So far, it has not produced any progeny.

When *venustum* was used with *Barbata* hybrids, some progeny showed this marbled pouch inheritance as in *Paphiopedilum Mauven* (× *Maudiae*). Most have continued to produce similar progeny. Some of the best examples are as follows:

***Paphiopedilum Venus Knight* (× *Ninja*)** 2010. This cross was produced by using a complex *Maudiae* with dark genes from *sukhakulii* and *wardii* in *Ninja* with *venustum*. The resultant hybrid showed the green veined pouch and in some good cultivars, very red pouch suffusion and red petals. Shape was improved by *Ninja*



JAMES HARRIS



JAMES OSEN



ALBERTO RODRIGUEZ



MICHAEL PEARSON

for a bigger and proportionate flower. The cultivar ‘Louisiana’ HCC/AOS showed a cranberry red pouch while the cultivar ‘Orion’ AM/AOS had a pouch veined dark green with mahogany red overlay.

***Paphiopedilum Magical Venus* (× *Macabre Magic*)** 2010. *Macabre Magic* is from a *Maudiae* (*callosum* and *sukhakulii*) lineage. When crossed with *venustum*, it produced stunning deep-red pouches and red petals, resembling a larger *venustum* such as the cultivars ‘Pink Flare’ and ‘Hampstead’ AM/AOS. This grex produced the F<sub>2</sub> *Paphiopedilum Wonderfully Wood* (× *Wood Wonder*) 2016 that looked like a giant *venustum* with a “dark burgundy” pouch, as seen in the cultivar ‘Slipper Zone at Last’ HCC/AOS. This occurred even though *Wood Wonder* had no *venustum* genes and came from *Macabre* lineage.

***Paphiopedilum Venus Aglow* (× *Saiun*)** 2012. *Saiun* is *Paphiopedilum* (*sukhakulii*

- [6] *Paph.* Double Deception ‘Falls Impression’ AM/AOS; exhibitor: John Martin.
- [7] *Paph.* Magical Venus ‘Hampstead’ AM/AOS; exhibitor: Sarah Hurdell.
- [8] *Paph.* Wonderfully Wood ‘Slipper Zone at Last’ AM/AOS; exhibitor: Lehua Orchids.
- [9] *Paph.* Venus Aglow ‘Happy Humbug’ AM/AOS; exhibitor: Emerald City Orchids.
- [10] *Paph.* Hawaiian Illusion ‘Wowee Lehua’ HCC/AOS; exhibitor: Lehua Orchids.
- [11] *Paph.* Hawaiian Illusion ‘Memoria Ferenc M. Nagy’ HCC/AOS; exhibitor: Gyorgy Nagy.
- [12] *Paph.* Hawaiian Illusion ‘Saturatingly Lehua’ AM/AOS; exhibitor: Lehua Orchids.
- [13] *Paph.* Hawaiian Contrasts ‘Golden Eagle’ AM/AOS; exhibitor: Stones River Orchids.
- [14] *Paph.* Hawaiian Magic ‘Slipper Zone Venus Rising’ HCC/AOS; exhibitor: Lehua Orchids.
- [15] *Paph.* Delightfully Venus ‘Tawny’ HCC/AOS; exhibitor: Dave Sorokowsky.



× *wardii*). This cross could produce red pouches with dark-green lines and red-pink petals. The cultivar 'Happy Humbug' AM/AOS is described as having petals "apical half dusty rose" and "pouch green, veined darker green, overlaid maroon." No further progeny noted.

#### SECOND-GENERATION HYBRIDS

In the second generation of *venustum* hybrids, some interesting things started to happen producing unexpected coloring with good *venustum* traits.

***Paphiopedilum* Hawaiian Illusion** (Varuna × Grand Illusions) 2010. Grand Illusions is a vinicolor line of *Maudiae*, and when crossed with Varuna, produced incredibly red, glossy petals and a deep brown-red pouch. These colors were not present in *vinis*, whose color was more deep lavender black-purple. The *venustum* introduced the red petal tones even though it contributed only around 25 percent of the genes, shown clearly in the cultivars 'Wowee Lehua' HCC/AOS and 'Memoria Ferenc M. Nagy' HCC/AOS. The outstanding cultivar 'Saturatingly Lehua' AM/AOS with the red tone on burgundy can clearly be discerned from the *vinis*-type coloring. A contrasting bright-green dorsal sepal made the flower stand above its class. This fantastic grex has continued to produce red-tone progeny such as *Paphiopedilum* Petula's Illusion, *Paphiopedilum* Hawaiian Volcano, *Paphiopedilum* Hawaiian Treasure and *Paphiopedilum* Hawaiian Charm.

***Paphiopedilum* Hawaiian Contrasts** (Varuna × Jewel Green) 2011. Jewel Green is a super highly colored and glossy *mastersianum-sukhakulii* hybrid (with around 5 percent *venustum* back to the fifth generation). When crossed with an  $F_1$  *venustum* hybrid, it produced a steroid-looking *venustum*, with some good cultivars having pink-red pouches or reddish petals. Some even showed the green veining on the pouches, even though the *venustum* accounted for little more, theoretically, than 25 percent of the genes.

***Paphiopedilum* Hawaiian Magic** (Magical Venus × Varuna) 2018. With almost half of *venustum* genes from both parents, this hybrid inherited strong traits of the species. In the cultivar 'Slipper Zone Venus Rising' HCC/AOS, the pouch was "rose-pink, strikingly veined olive green" while the petals were "overlaid pink distally." This shows clearly that pouch and petal traits are inherited if both  $F_1$  parents had *venustum* genes.

***Paphiopedilum* Delightfully Venus** (Venus Knight × Magical Venus) 2016. Both



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MARCUS VALENTINE



RAMON DE LOS SANTOS

parents have *venustum* as a grandparent, and the first to be recognized with an award was 'Tawny' HCC/AOS. This cultivar, exhibited by Paph Paradise, had a dark-mahogany pouch with darker webbing and dark-rose petals. The shape looked like a large full-formed *venustum*, showing that the *venustum* genes (about 50 percent) overtook other species in the mix, including that of *sukhakulii* and *wardii*. The few others to bloom showed similar dark red-pink pouches and red-rose petals. David is currently using his cultivar 'Dolcetto' in several crosses to test its genetic potential (Sorokowsky, pers. comm.).

***Paphiopedilum* Jeweled Venus** (Jewel Green × Parisienne Venus) 2017. Parisienne Venus is an  $F_1$  *venustum* hybrid with *mastersianum* and *sukhakulii* in its background. Jewel Green, as mentioned previously, is also from *mastersianum*, *sukhakulii* and *callosum* lines from an  $F_5$  *venustum* background. With only 25 percent *venustum* and almost 50 percent of *mastersianum* and *sukhakulii*, this hybrid produced flowers with the beautiful large, waxy, lime-green-dorsal (from *mastersianum*), long broad petals (from *sukhakulii*) and the spots and minimal reddish tones on the pouch and petal tips (from *venustum*). This grex was

so lovely for shape, form and color that it received an Award of Quality from the AOS for Wood in 2018. The description reads "flowers with rich, glowing green coloration." Its further contribution to the green-veined pouch and red petals may not be useful in later generations as most *venustum* traits were minimally expressed.

***Paphiopedilum* Stella Scope** (Supersuk × Double Deception) 2000. Supersuk is an  $F_1$  *sukhakulii* hybrid with *lawrenceanum* and *mastersianum*, looking like a massive *sukhakulii*. When bred with Double Deception, it produced large, glossy and stocky *sukhakulii*-type flowers with some cultivars inheriting the green *venustum* pouch reticulations such as in 'Blazing Yellow Lehua' AM/AOS. It should be pointed out that *venustum* genes came through as the pollen parent, which will make a difference in the reduction of red-and-green gene inheritance. It also inherited the extra glossy sheen of *mastersianum* from two generations back. The grex was granted an AQ/AOS for its "consistency and uniformity."

***Paphiopedilum* Macabre Deception** (Double Deception × Macabre Love) 2020. This exciting hybrid produced some



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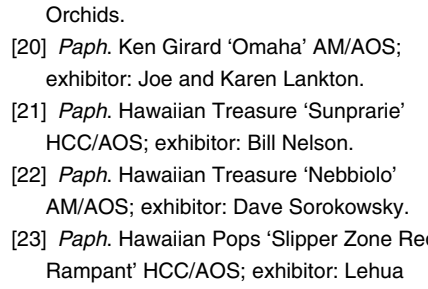
of the darkest-red petals and pouch seen so far. The cultivar 'Slipper Zone Fissure Eight' AM/AOS reflected red tones in the petals and pouch that vinicolors do not have, possibly due to the yellow carotenoid base layer (inherited from the *venustum* parent) that is evident from the posterior view of the flower. Even though the vinicolor Macabre Love parent did not have any *venustum* in its background, it allowed the burgundy to combine with the *venustum* red. It should be noted that Double Deception was used as the capsule parent, which enabled the "electric green" chloroplasts and yellow petal genes to come through. Progeny of this cultivar are currently in the lab (Wood, pers. comm.). There are other  $F_2$  hybrids that showed potential but were not used, such as *Paphiopedilum* Fair Venus (Venus Ward  $\times$  Fair Fred) with a solid-red pouch from the *Paphiopedilum fairrieianum* lineage. These may need more work done to see where they may lead.

#### THIRD-GENERATION HYBRIDS

In the third generation, *venustum* genes start to become further diluted as more other species' genes take over. Although the theoretical percentage of *venustum* genes drops from 50 percent to 10 percent, we see some surprising inheritance in red traits.

***Paphiopedilum* Ken Girard** (Calgary Ken  $\times$  Misty Eyes) 2008. Calgary Ken is an  $F_3$  *venustum* hybrid with *sukhakulii* and *callosum* in the background, while Misty Eyes is a *sukhakulii*-Maudiae mix. With both sides heavy in *sukhakulii*, this grex showed heavy petal spotting, while some showed reddish pouch coloration from the 13 percent *venustum* influence. The cultivar 'Omaha' AM/AOS showed the heavy *sukhakulii* petal spotting but with the red-burgundy pouch from *venustum*. The cultivar 'Lauritzen Gardens' HCC/AOS was described with an "oxblood" pouch. Unfortunately, no progeny has been produced, suggesting fertility issues.

***Paphiopedilum* Hawaiian Treasure** (Hawaiian Illusion  $\times$  Petula's Flame) 2016. Crossing  $F_2$  Hawaiian Illusion with Petula's Flame (a dark vini line with *wardii* and *sukhakulii* accounting for over 50 percent of the genes), this grex showed dark-red petals and pouch, such as the cultivar 'Nebbiolo' AM/AOS described with "dark wine"-red pouch and petals. Some cultivars such as 'Sunprairie' HCC/AOS had raspberry-red petals covered with dense overlapping black warts. Even with a 13 percent *venustum* contribution, it seems that red tones could pass through. Indeed, this does happen even when



- [16] *Paph.* Jeweled Venus AQ/AOS; exhibitor: Lehua Orchids.
- [17] *Paph.* Stella Scope AQ/AOS; exhibitor: Lehua Orchids.
- [18] *Paph.* Stella Scope 'Blazing Yellow Lehua' AM/AOS; exhibitor: Lehua Orchids.
- [19] *Paph.* Macabre Deception 'Slipper Zone Fissure Eight' AM/AOS; exhibitor: Lehua Orchids.
- [20] *Paph.* Ken Girard 'Omaha' AM/AOS; exhibitor: Joe and Karen Lankton.
- [21] *Paph.* Hawaiian Treasure 'Sunprarie' HCC/AOS; exhibitor: Bill Nelson.
- [22] *Paph.* Hawaiian Treasure 'Nebbiolo' AM/AOS; exhibitor: Dave Sorokowsky.
- [23] *Paph.* Hawaiian Pops 'Slipper Zone Red Rampant' HCC/AOS; exhibitor: Lehua Orchids.
- [24] *Paph.* Hawaiian Volcano 'Slipper Zone Red at Last' AM/AOS; exhibitor: Lehua Orchids.
- [25] *Paph.* Petula's Illusion 'Whisper Lehua' HCC/AOS; exhibitor: Laura and Wes Newton.
- [26] *Paph.* Hawaiian Charm 'Slipper Zone Lustrous Glow' AM/AOS; exhibitor: Lehua Orchids.

mated to non-*venustum* vinicolor lines. Its progeny *Paphiopedilum* Hawaiian Pops (×Macabre Pops) 2019 produced “pink-red” petals and an “oxblood”-red pouch in the beautiful cultivar ‘Slipper Zone Red Rampant’ HCC/AOS.

***Paphiopedilum* Hawaiian Volcano** (Hawaiian Illusion × Memoria Jacob Jake Piloto) 2016. This grex is one of the few  $F_3$  hybrids with *venustum* genes from both  $F_2$  parents. Though the *venustum* contribution was approximately 25 percent, most of the grex showed bright greens and browns, thanks to the *mastersianum-sukhakulii* background. However, a few dramatic cultivars such as ‘Slipper Zone Red at Last’ AM/AOS had scarlet overtones in the petals. One cultivar even displayed a dark-red, waxy pouch and petals in *OrchidWiz*.

***Paphiopedilum* Petula’s Illusion** (Hawaiian Illusion × Petula’s Song) 2016. Petula’s Song is a semi-vinicolor from the *Barbata* line with strong *sukhakulii*, *wardii* and *acmodontum* genes (combined total 75 percent). When bred with the  $F_2$  Hawaiian Illusion, the *venustum* influence helped produce deep-red petals and a dark red-brown pouch. Two cultivars that showed these red tones (versus the purple of *vinis*) are ‘OK’ HCC/AOS with “raspberry-red” petals and ‘Whisper Lehua’ HCC/AOS with “deep-rose” petals.

It appears that if *venustum* genes are present in both  $F_2$  or  $F_3$  parents, the chances of getting the red traits increase. In some cases, the vinicolor line can absorb the *venustum* red genes and produce a red-tone burgundy. This may indicate that the red gene may either be dominant or act as a modifier to the usually dominating vinicolor burgundy gene. This behavior can be observed in the following hybrid:

***Paphiopedilum* Hawaiian Charm** (Hawaiian Illusion × Kiwi Charm) 2017. This hybrid produced the cultivar, ‘Slipper Zone Lustrous Glow’ AM/AOS that was described as having petals “flushed deep red” with a “dark-red” pouch. Even the dorsal sepal was “veined dark red.” This was the first time an entire flower was described with true red spectrum, making it a breeding milestone for *venustum* to influence red genes (even though *venustum* theoretically contributed less than 13 percent). This occurred despite the fact that the Kiwi Charm parent had no *venustum* in the background, coming rather from the *Barbata* lineage with *sukhakulii*, *mastersianum*, *acmodontum*, and *hennisianum*. Perhaps true-red *paphiopedilums* have arrived! It will be



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CHARLENE ASATO

exciting to see where this lineage goes and what it can produce in their offspring.

#### LATER GENERATIONS

It seems that beyond the exciting  $F_3$  generation, *venustum* genes become progressively weaker, with the rare appearance of either a red pouch or red-toned petals. This can be seen in a few examples in  $F_5$  *Paphiopedilum* Jewel Green hybrids such as  $F_6$  *Paphiopedilum* French Jewel (Jewel Green × Duguesclin) 2011,  $F_6$  *Paphiopedilum* Petula’s Jewel (Jewel Green × Petula’s Flame) 2015 and  $F_6$  *Paphiopedilum* Memoria Jeffrey Ma (Jewel Green × Petula’s Ghost) 2010. The



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F<sub>7</sub> *Paphiopedilum* Jewel Memories (Jewel Green × Memoria Jeffrey Ma) 2015 barely kept the rose-red petals and the reddish-burgundy pouch, as seen in 'Slipper Zone Pink Gracefully' HCC/AOS. All had less than a theoretical 5 percent *venustum* genetic contribution.

#### THE FUTURE OF THE RED SPECTRUM

From this analysis, it is apparent that the influence of *venustum* on the red pouch (and green veins) as well as red petals are strongest in the F<sub>1</sub> and F<sub>2</sub> hybrids. In F<sub>3</sub>, some of the red colors were enhanced with the vinicolor line. By F<sub>4</sub> and beyond (with rare exceptions where a few red traits appeared), most of the dark red traits (and green veins) were reduced to pink or eliminated. This was more obvious when the parents used contained low amounts of yellow carotenoids in their base color. As a result, the genetic coding for these desirable traits has to be concentrated with breeding between these F<sub>1</sub> and F<sub>2</sub> plants, especially if *venustum* genes are on both sides. Some of the newer F<sub>3</sub> reds from the vinicolor line with *venustum* lineage are showing some potential for the future, most likely if bred back to contributors of yellow genes. Occasionally returning to the species will anchor the desired traits, particularly in using the newer and darker-red *venustums* from selected line breeding or a primary *venustum* F<sub>1</sub> hybrid. It is also a good reminder to note that the petal recurving of *venustum* is recessive and easily eliminated when bred to a flat-petaled species. In all cases, the petal width increased.

#### ALBUM HYBRIDS

The appearance in the late 19th century of the golden-yellow-and-green album form of *Paphiopedilum venustum* f. *measuresianum* must have been exciting with its alien-looking pouch that looked like a yellow brain in a net of deep emerald-green veins. Even today, more than 100 years later, its mysterious look still draws crowds at shows, a timeless enigma of sorts.

There are two forms of this albinistic form in existence today: one that is pure yellow and green with no brown markings or warts (true albino by definition), and one that has minute brown or grey spots caused by anthocyanins (not truly albino by definition, but rather called albescent). The brown in the second type is usually in the form of red, brown, black or gray warts or hairs at the base of the petals, which can be random or linear. It can be as little as a tiny dot or as much as multiple spots forming a large wart or line. The



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SUSAN WEST



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TOM KULIGOWSKI



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RICHARD NOEL



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TECK HIA

dark marks can extend to the middle of the petal in some cases. Curiously, these albescent forms breed as if they are pure albino forms, producing some pure albino offspring. These brown warts and hairs are genetically coded differently from the anthocyanins of the rest of the flower color and inherited separately.

There are basically two forms of "album" hybrid lines. First is the *Barbata* album line. The second breeding line is with the big, round flowers of the so-called "bulldog" lines. Please note the term "album" used in this section is for easy reference only. Album is, by definition, a flower completely devoid of colored pigments while white flowers variously marked with yellow or green are technically called "albinum" forms. Yellow forms are "flavum" or "xanthic" forms. The designation "albino form" is taken to

- [27] *Paph.* Hawaiian Illusion 'Memoria Ferenc M. Nagy' HCC/AOS; exhibitor: Gyorgy Nagy.
- [28] *Paph.* French Jewel 'Lehua's Green Finery' AM/AOS; exhibitor: Lehua Orchids.
- [29] *Paph.* Petula's Jewel 'Lehua's Boldness' HCC/AOS; exhibitor: Lehua Orchids.
- [30] *Paph.* Jewel Memories 'Slipper Zone Pink Gracefully' HCC/AOS; exhibitor: Lehua Orchids.
- [31] *Paph.* Oriental Venus 'Green Jewel' HCC/AOS; exhibitor: Paphanatics, unLtd.
- [32] *Paph.* Tsui's Oriental 'Jeanie' AM/AOS; exhibitor: Sam Tsui.
- [33] *Paph.* Jacob's Dream 'Slipper Zone Venus on High' HCC/AOS; exhibitor: Lehua Orchids.
- [34] *Paph.* Vintage Venus 'Springwater Emerald' AM/AOS; exhibitor: Springwater Orchids and Thanh Nguyen.
- [35] *Paph.* Starring Venus 'Omaha' HCC/AOS; exhibitor: Joe and Karen Lankton.
- [36] *Paph.* Maurice J. Coté 'Phil Ryan' AM/AOS; exhibitor: Steve Ryan.
- [37] *Paph.* Orpheus 'Penny' AM/AOS; exhibitor: A&P Orchids.

encompass the colors yellow, white and green.

The *Barbata* album line is formed by crossing an album form of *venustum* with album *Barbata* hybrids. Two good examples are *Paphiopedilum* Oriental Venus (× Oriental Frieze) 1989 and *Paphiopedilum* Jacob's Dream (× Memoria Jacob Jake Piloto) 2019. These flowers inherited the green-veined pouch of *venustum* and better form of the other parent, eliminating the petal reflexing of *venustum*. Though not big, around 4.3 inches (11 cm), many of these flowers were highly prized and awarded. A particularly nicely veined pouch from *Paph. venustum* f. *measuresianum* was expressed attractively in *Paph.* Oriental Venus 'Green Jewel' HCC/AOS grown by Paphanatics. It was described as "pouch light green, intricately veined medium green in *Paphiopedilum venustum* style." Unfortunately, this veining was greatly reduced by F<sub>2</sub> with *Paphiopedilum* Tsui's Oriental (× *Paphiopedilum* Oriental Mystique) 1997. Oriental Mystique is a grex without *venustum* in its background, therefore *venustum*'s genetic contribution is reduced to a theoretical 25 percent. It appears from this that to maintain pouch reticulation, both sides of the cross must contain *venustum* in their background (as seen in the first example, where the parent Oriental Frieze is a combination of *callosum*, *lawrenceanum*, *sukhakulii* and *curtsii*, without *venustum*). This, in fact turned out to be true as *Paphiopedilum* Jacob's Dream 'Slipper Zone Venus on High' HCC/AOS had the pouch described as "dramatically veined dark green" because both parents had *venustum* genes.

The bulldog line uses big yellow-complex hybrids (so-called "bulldog" hybrids) to create larger albino flowers. These lines produced almost round flowers with large dorsal sepals, longer and wider petals and with some inheriting the green veins on the pouch in varying intensity from mild to dark. The flower of *Paphiopedilum* Vintage Venus 'MH-3' TRO/TOGA (× Vintage Harvest) 2005 had round petals and nice, solid yellow-green colors. It also inherited the brown warts on the petal base, which did not detract from its overall beauty. There are other Vintage Venus cultivars such as 'Spartan Spirit' and 'Springwater Emerald' AM/AOS that had pouches richly veined green. Another hybrid, *Paphiopedilum* Starring Venus (× Telstar) 2012, also has light-green veins on the pouch, exemplified 'Omaha' HCC/AOS. Yet another stunning *venustum* hybrid is a cross with the yellow-green



WOOLF ORCHID CULTURE



WOOLF ORCHID CULTURE



JEANNE KAEDING



JEANNE KAEDING

*Paphiopedilum* Stone Lovely, producing the bright-yellow pouched *Paphiopedilum* Maurice J. Cote 'Phil Ryan' AM/AOS 2013 with a large dorsal sepal and 1.4-inch (3.5-cm)-wide petals. Although the pouch on that cultivar did not have green veins, it carries the genes, as shown clearly in the cultivar 'SVO'.

Both lines show much promise to continue to create golden yellow or green flowers with green-veined pouches, particularly if both sides of the parents contain *venustum* genes. This pouch-venation inheritance seems to parallel the petal striping coding as well. More work needs to be done in this area as this reticulation is unique and attractive. **YELLOW AND BRONZE HYBRIDS**

This group of hybrids is created when one parent is an albino or yellow, while the other parent is a normal color type for the species. This combination created light-brown bronzing of the petals and pouch with color sprays of greens and pinks over a light background. They are occasionally referred to as "aureum" forms but that is incorrect due to the presence of the brown coloration. Sometimes these can create wonderfully artistic combinations, but most often they do not.

Three beautiful F<sub>1</sub> hybrids stand out in this category, one as far back as the Victorian era:

***Paphiopedilum* Orpheus** (*venustum* × *callosum* album) 1891. This hybrid can reach 5.1 inches (13 cm) in width with a wide dorsal sepal and petals. Overall flower color is green with deeper-green veins all over including the pouch, with a light-brown and pink overlay on the petals



JEANNE KAEDING

[38–39] *Paph.* Steve Waters [Woolf Orchid Culture]

[40] *Paph.* Bronze Venus '9'

[41] *Paph.* Bronze Venus '10'

[42] An Albinistic example of *Paph.* Bronze Venus

and pouch. The cultivar 'Penny' AM/AOS had "pouch light green with darker green reticulations overlaid honey-brown."

***Paphiopedilum* Steve Waters** (× Impression) 1996. When crossed to a yellow "bulldog" flower, the result was surprisingly pleasant. The flowers were round and moth-shaped with green or white coloration and deeper-green venation all over including the pouch. Some had light brown overlays on both petals and pouch, but others had almost none, appearing all green. What was clearly evident was the deep-green veins on all pouches. In the cultivar 'Honey Glow' HCC/AOC, the green veining on the pouch was distinct and beautiful.

***Paphiopedilum* Bronze Venus** (× LSF Prime Peridot 'Lemon Zest') 2020. This cross used a yellow-green "bulldog"



parent with a dark-pouched *venustum*. This cross was made by Jeanne Kaeding, with the intention of creating a yellow “bulldog” flower with “red or green veining on the lip” (Kaeding, pers. comm.). The grex did show red veins on the pouch, with some light to dark brown overlay over the petals and pouch. It had a very attractive lime green dorsal. Some had flat petals and good stocky cruciform shape, intermediate between the two parents. It was not rounded as expected and Kaeding thinks it may serve as an intermediary step to her goal (Kaeding, pers. comm.). The cross was also made using an albino *venustum* and produced pure green flowers with nice green reticulation on the pouch.

All three of these examples produced veined pouches, a trait that can be bred for in the future. Except for Bronze Venus, none have been further pursued.

#### A NOTE ON ALBINO BREEDING

In the breeding of albinos, it is important to study the inheritance background of the parents used and their breeding behavior. Not all albino parents are homozygous, carrying only recessive alba. Some outwardly appearing to be albinos may actually be “diluted” heterozygous parents masquerading as albinos (Griesbach 1988). Dilute genes code for quite pale flowers such as in *Paphiopedilum insigne* f. *sanderæ* and *Paph. sukhakulii* f. *aurea*. Another dilute is *Paph. niveum* whose hybrids are usually tetraploids that randomly scatter minute spotting. In addition, the alba recessive-gene location for each alba parent may be different, such as for *Paph. fairrieianum* f. *album* and *Paph. bellatulum* f. *album*. If combined, these parents produce colored progeny. This is called genetic complementation.

Interestingly, there are also genes in some species that block chlorophyll synthesis in flowers, such as *Paph. bellatulum* f. *alba* and *Paph. niveum*. Recognizing these situations helps to explain the presence of groupings of albinistic parents that match better together to produce albino offspring (Koopowitz and Hasegawa 1989).

The vast majority of albino paphiopedilums block anthocyanin pathways in three of the 10 genes that code the enzymes to make red (Griesbach 1988). Unfortunately, these pathways may be blocked in other parts of the plant that depend on anthocyanin production to protect them from environmental stresses such as ultraviolet radiation, leading to cultural problems. In some cases, blocking

anthocyanin production may result in so-called “lethal” genes resulting in plants that cannot survive.

#### MYSTERY OF THE ORANGE POUCH

One interesting venue that has not been explored in any breeding lines is the use of the orange-pouched *venustum* forms to create deep-orange-pouched hybrids with green reticulation. The pouch in these forms has chromoplasts with reduced chlorophyll-containing orange carotenoids. Unfortunately, most orange pigments enzymatically convert automatically to yellow pigments in the normal pathway of the carotene cycle. If that enzyme is blocked by a mutated gene, it is possible to get a pure orange pouch (Koopowitz, pers. comm.). Theoretically, that is. Interestingly, petal apices are also orange in these orange phenotypes.

It is highly likely most orange pouches might involve layering of color pigments, specifically the presence of a light, dusty rose-red overlay on a green or yellow pouch. If that is the case, it might be feasible to achieve an orange pouch using the bronze breeding line as mentioned previously, which uses white or yellow “bulldog” paphiopedilums, because some hybrids do show some variation of an orange-toned pouch such as *Paph. Bronze Venus*.

Other possible ways to achieve this are to use white or light-yellow species such as *concolor*, *armeniaceum*, *leucochilum*, *emersonii* or *hangianum*. As these species are not always dominant for pouch color, their white or yellow pouches may allow the green reticulation to come through with the orange genes.

Using the albino versions of some species such as *Paph. charlesworthii*, *Paphiopedilum malipoense*, *Paph. philippinense* and *Paph. fairrieianum* may add interesting forms to orange-pouched flowers.

Yet another conceivable direction is using large, yellow-pouched hybrids such as *Paphiopedilum* Michael Tibbs, *Paphiopedilum* China Moon, *Paphiopedilum* Dollgoldii, *Paphiopedilum* Frank Smith, *Paphiopedilum* Sugar Sweet or *Paphiopedilum* Liberty Taiwan that already have some minor pouch reticulation. Some of these hybrids may allow the orange color of the *venustum* pouch to come through as they are not always dominant. Only time will tell what will happen if these lines are attempted. However, it seems like it may take up to the F<sub>2</sub> and F<sub>3</sub> hybrids to achieve success as in the other lines.

Hennessy and Hedge (1989) summed

up this concept with ardor and stated, “Cultivars of *P. venustum* whose flowers have warm orange overtones are likely to continue to yield interesting hybrid progeny and their potential should be exploited.”

#### OVERVIEW OF BREEDING USES

The contribution of *Paph. venustum* to the breeding of incredibly rich-colored red pouches with deep emerald-green veining as well as “true” spectrum red petals is an important tool in the hybridizer’s palette. The secret may lie in the use of parents with *venustum* red genes on both sides as well as to utilize capsule parents with the strongest yellow background and green chloroplasts. Whereas other species may contribute larger size, more spotting and fuller form, none can do what this small, recurved and modest “brainiac” can do.

Therefore, from this study and analysis of the species variations and the resulting hybrids’ lines, it is plausible to formulate a molecular breeding plan to use *venustum* and its hybrids judiciously to create a compact, mottled-leaf, bright, true-red Maudiae-type flower with a green marbled-veined pouch that blooms several times a year for the commercial market. Or, perhaps even a big, round, yellow or green flower with a deep-green veined pouch? And how about a flower with an orange pouch, reticulated green? One just needs an imagination and a toothpick!

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— Leslie Ee is a naturopathic physician from Borneo and an associate judge in the Toronto Judging Center. As a popular speaker, he has given talks across North America. He grows cattleyas and paphiopedilums primarily (email: drleslieee@hotmail.com)

# Who Were These Guys: Part 17

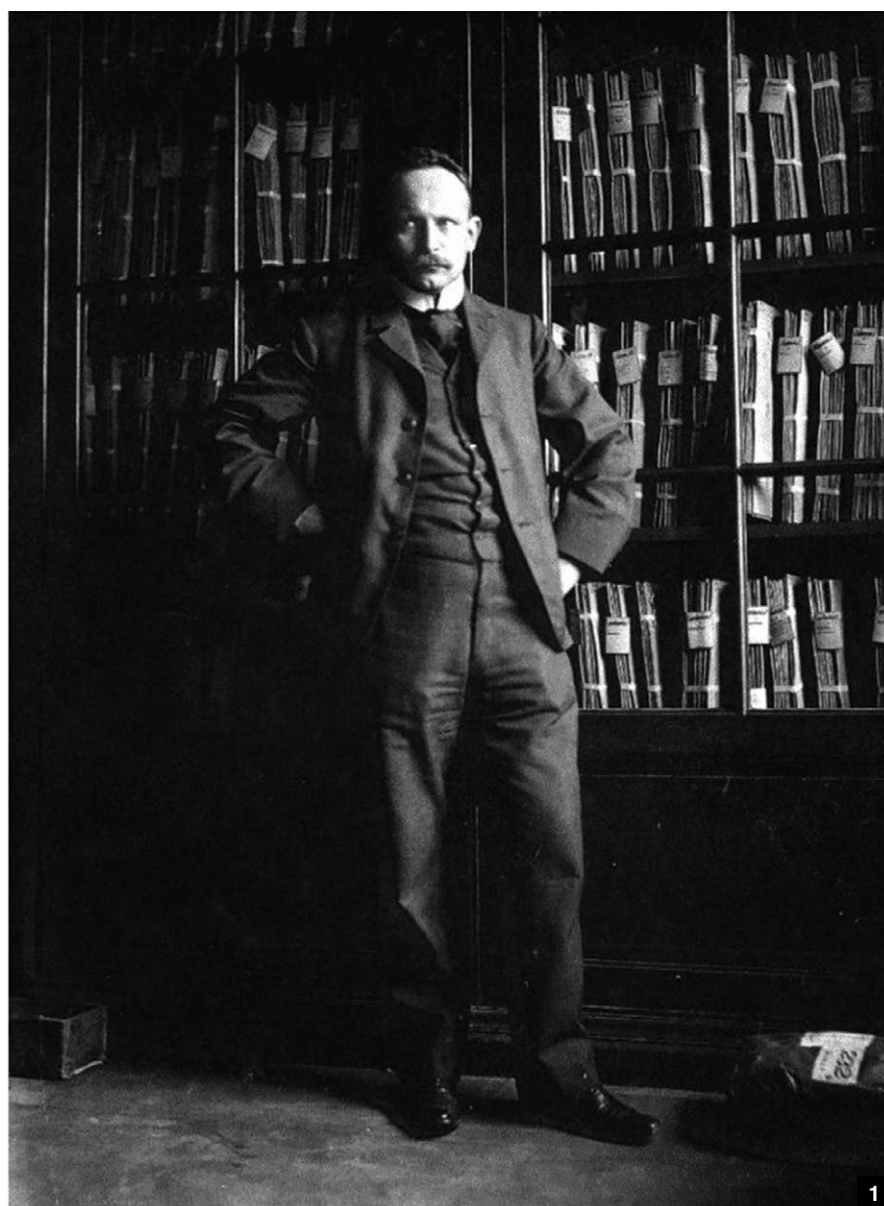
## Friedrich Richard Rudolf Schlechter (1872–1925)

BY DAVID ROSENFELD, MD

FRIEDRICH RICHARD RUDOLF Schlechter was a German botanist who followed in the footsteps of his Germanic predecessor Heinrich Gustav Reichenbach (1823–1889; Rosenfeld 2018). Schlechter was intellectually Reichenbach's equal with a prodigious capacity for work, a driving ambition and probably a photographic memory. During their lifetimes, they both identified and described thousands of new orchid species. Besides having similar stellar intellectual attributes, they also shared the characteristic of having less than engaging personalities. A fine example is the following quote attributed to Schlechter: "Without a good memory it is of no use trying to be a botanist; one had better give it up and be a merchant." During frequent visits to London and especially the herbarium at Kew Gardens, his prickly personality did not endear him to his botanical compatriots. He had little respect for the feelings and concerns of others and was strong willed and dogmatic about his convictions. Sometimes reluctantly, he was afforded great respect based on his achievements and knowledge. Who was this dynamo, and how did he acquire a premier stature in the orchid world in the early 20th century?

Schlechter was born in 1872 in Berlin. His father was a lithographer. During his teenage years he began a horticultural apprenticeship at the botanical garden of the University of Berlin. At age 19, Schlechter journeyed from Europe for the first time. Why he chose South Africa is unclear. We do know that his first employment was as an inspector of vineyards, charged with detecting the insect phylloxera, a plant louse that was devastating the vines.

He later worked as an assistant at the herbarium of Dr. Harry Bolus in Cape Town, acquiring knowledge of local flora. During his four-year residence in South Africa, he traveled widely, exploring the flora of many provinces including Natal, Transvaal, and Cape. It was during these years, he decided to devote his life to the



study of orchids.

Upon his return to Berlin in 1895, he published his first orchid article: *Beitrag zur Kenntnis Neuer Und Kritischer Orchideen Aus Sudafrika* (Contributions To The Knowledge Of New And Critical Orchids From South Africa). In 1896, Schlechter returned to South Africa and Mozambique, staying for two years. He

was described by Dr. S. Schonland, a noted local museum director, as "the most acute and most successful botanical collector who ever visited South Africa." His third visit to Africa (1899–1900) was sponsored by the German Colonial Department. He was sent as the leader of an expedition to the Cameroons and adjacent countries in hopes of discovering new latex producing



plants.

During the first decade of the 20th century, Schlechter spent many years in what is now Indonesia, especially what is currently the country of Papua New Guinea and surrounding islands. He visited all the main Indonesian islands including Borneo, Sumatra, Celebes, and Java. His charge by the German Colonial Department was to set up rubber research stations in the German colonial protectorate on the island of New Guinea.

I think a little historical interlude is in order. Germany, under Chancellor Otto Von Bismarck, started late in the European nations "Great Game" of acquiring colonies in Africa, Asia and the South Pacific. In 1880, the western half of New Guinea had already been a colony of the Netherlands for hundreds of years. In 1884, Germany claimed control of the northeast portion of the remaining half and called it Kaiser-Wilhelmsland. This also included the surrounding islands including New Caledonia and the famous WWII battleground island of Guadalcanal. Germany remained in control of this region until the end of WWI.

During Schlechter's years in Kaiser-Wilhelmsland, which encompassed much of the first decade of the 20th century (1901–1902) and (1906–1909), he collected a vast number of new orchid species for his developing herbarium. He also greatly extended the botanical knowledge of this region. Prior to 1901, only 90 species and 32 genera had been previously described. Schlechter's collection brought the number of species to an astounding 1,450 species and 116 genera. During this decade, Schlechter also spent 1902 and 1903 exploring the large adjacent island of New Caledonia, which led to his completion of his PhD thesis on the botany of the island. Upon his return to Berlin, he assumed the position as curator of the Berlin Botanical Museum and commenced his eventual 1,100-page tome *Die Orchidaceen Von Deutsch-Neu-Guinea* (*The Orchids Of German New Guinea*) completed in 1914.

Schlechter was an indefatigable and compulsive workaholic. It was said that he had the goal to describe at least one new species a day. That goal may have been achieved. He described some 170 new orchid genera and over 5,500 new orchid species. He became editor of the German orchid journal *Orchis* in 1915 and published 333 scientific papers, 233 of which were devoted to orchids. Schlechter eventually amassed one of the largest herbariums in the world.



CHARLES MARDEN FITCH



JAY NORRIS



ARTHUR PINKERS

- [1] Friedrich Wilhelm Rudolf Schlechter (1872-1925) from the archives of the late Rudolf Jenny.
- [2] *Ponthieva villosa* 'Leon' CHM/AOS grown by H. Philips Jesup. The species was described by Schlechter in 1923 as *Ponthieva brenesii*.
- [3] *Sobennikoffia robusta* 'Sparkling Elegance' AM/AOS; exhibitor Mario and Conni Ferrusi. Described by Schlechter in 1925.
- [4] *Cyrtorchis arcuata* was described by Schlechter in 1914. *Cyrtorchis arcuata* subsp. *whytei* 'Diamond Orchids' HCC/AOS; exhibitor: Peter T. Lin.



DR. WAYNE ROBERT HANSON

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His botanical career was interrupted by World War I, in which he served as an officer in the German army. After the war, he resumed his work at Berlin Botanical Museum expanding his herbarium. Unfortunately, his life was cut short in 1925 at the age of 53, probably as the result of multiple bouts of tropical diseases. It might have been just as well, at least he did not have to endure the destruction of the Berlin Botanical Museum and his precious herbarium on March 1, 1943 from World War II Allied bombing.

During the last 15 years of his life, he developed an intense interest in South American orchids despite never visiting the continent. Schlechter was fortunate to be acquainted with a cadre of German botanists living all over South America that sent him well over 1,000 species for identification and description. During these years, he published a remarkable 91 articles on the orchids of tropical South America. An additional 17 were published posthumously by his wife Alexandra and others. Most notable among his South American publications was the multivolume *Die Orchideenfloren De Sudamerikanischen Kordillernstatten* (*The Orchid Flora Of The South American Cordilleras*). The five volumes were begun in 1919 and later completed after his

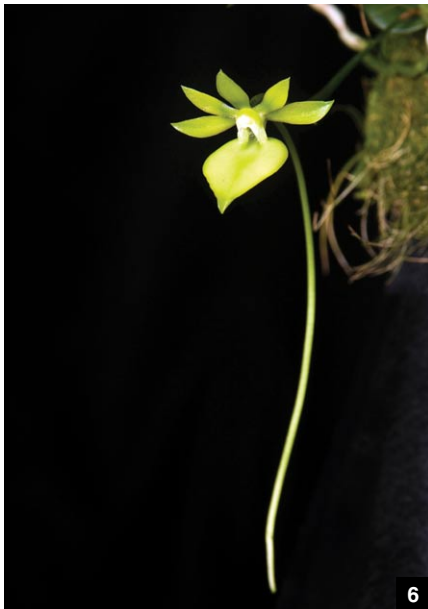
death in 1925 by his successor at the Berlin Museum, Rudolf Mansfeld, in 1929. It is truly astonishing that Schlechter could write such a monumental work without ever having visited the continent. (For those of you who are interested in an extremely detailed account of Schlechter's connections with the South American botanists of specific countries, I refer you to the five meticulously researched and detailed articles in the online journal *Lankesteriana* published by Lankester Gardens of Costa Rica between 2018 and 2021 and written by Carlos Ossensbach and the late Rudolf Jenny.)

During the same years, he initiated what became a prolific correspondence with the famous Harvard botanist Oakes Ames (1874–1950; Rosenfeld 2021). It is uncertain how this contact began but fortunately, 350 pages of letters between them had been archived in the Oakes Ames Herbarium at Harvard. The two giants of early 20th century orchids developed a long-distance and deep friendship, but only meeting once in person in Berlin in 1922. They were of very different personalities, experiences and upbringing. Schlechter was of middle-class status, a world traveler and attained his prestige only through obsessive hard work. Oakes Ames came from great wealth and a long

line of New England aristocracy, acquiring his knowledge of orchids mainly through herbarium specimens sent to him for identification. Over several decades, Ames did amass one of the world's great orchid herbaria and generously shared his abundant knowledge of tropical American orchids with his German compatriot. Fortunately, they also exchanged copious numbers of herbarium specimens. As a result, many duplicates now exist in the Harvard museum preserving some of what was destroyed in the Allied bombing of Schlechter's herbarium in 1943.

It is fascinating to read some of the correspondence between the two orchid giants. Remember no Internet or email existed 100 years ago. Ames's letters were typed and Schlechter's were handwritten. The letters, especially Schlechter's written after WW1, provide a window into the difficult and sometimes dire circumstances he had to work under. Schlechter continued work like a maniac until his untimely death in 1925, writing his five-volume tome on the orchids of the Andes. Due to enormous inflation of the German mark, he could not find the funds to publish the last three volumes. Sadly, he finally asked Ames for help. "Printing costs have however got high here on account of our bad valuta . . . this would roughly cost





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about 450 Dollars (approximately \$7,230 today). . . . Would it not be possible for you to help me." Ames replied positively, "I am very anxious to help orchidology in every way and it is a great pleasure to hasten the monographs." There were also letters by Schlechter in which he proposed to Ames that they write together a giant monograph modeled on John Lindley's *Folia Orchidaceae* written 100 years earlier. Schlechter wrote, "It is my ambition, and I hope yours too, that we should be able to finish a monograph of the Orchidaceae before our lives are finished." Ames did not express much enthusiasm and the project died with Schlechter's death in 1925 never having been started.

In conclusion, I will let Oakes Ames describe his first meeting with Schlechter during Ames's visit to Berlin in 1922.

"In the Orchid Herbarium at Harvard University there is a watercolor drawing of *Stanhopea ruckeri*...the original specimen from which it was made was instrumental in introducing Schlechter to me in a crowded railway station. At this time, I lacked knowledge of what Schlechter looked like, and he was in complete ignorance of what I might look like. . . . As I walked along the platform, I saw a man of medium height coming toward me. . . . He held a large spray of *Stanhopea ruckeri* in his outstretched hand. It was not necessary for me to say "Dr. Schlechter I presume?" The glorious spray of *Stanhopea ruckeri* was a flaunting badge of his identity."

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— David Rosenfeld, MD, has been growing orchids with his wife Joan for 40 years. David is a retired professor of pediatric radiology at the Rutgers Medical School. They have a 700-square foot (about 65-sq m) greenhouse with both warm and cool sections where they grow a mixed collection of species and hybrids. Their skill as growers is illustrated by their 110 AOS awards including 32 for cultural achievement. David has written 24 articles for *Orchids* and last wrote about Joseph Dalton Hooker in the January 2022 issue (91[1]:43–45) (email: orchiddoc@com-cast.net).

- [5] The genus *Barbosella* was described by Schlechter in 1918 when he moved several species from *Restrepia* including *Barbosella cucullata* pictured here. 'Seminario San Luis' CCM/AOS; exhibitor: Ecuagenera.
- [6] Schlechter described the genus *Neobathiea* in 1925. Pictured here is *Neobathiea keraudrenae* 'Tristan's Chameleon' HCC/AOS; exhibitor: Brenda Oviatt.
- [7] The genus *Gastrorchis* was described by Schlechter in 1924, moving several species from *Phaius*. Pictured is *Gastrorchis humblotii* var. *schlechteri* 'Memoria Suzi Porter' grown by Stephen Helbling.

# A Baker's Dozen of Habenarias...

And Then Some

TEXT AND PHOTOGRAPHS BY LEON GLICENSTEIN, PHD





IT HAS BEEN some time since I wrote anything about *habenaria* hybrids for the American Orchid Society, so I thought I would add to the previous listing of hybrids (Glicenstein, 2018) by adding a baker's dozen of newer ones (and perhaps a few more) I wonder how many people remember the expression "Baker's Dozen"? Does my using it reflect upon my age?

In a quest for brighter and brighter flower color, I have used, among other hybrids, *Habenaria* Oriole (*roebbelenii* × *xanthocheila*). Two hybrids that I have especially liked are *Habenaria* Flame Tanager (× *Mayfly*) and *Habenaria* Flame Bowerbird (× *Summer Tanager*).

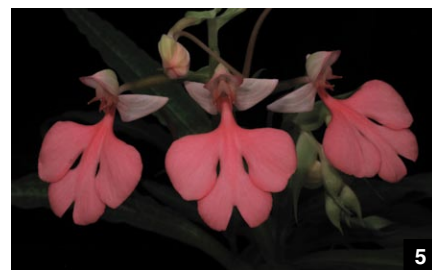
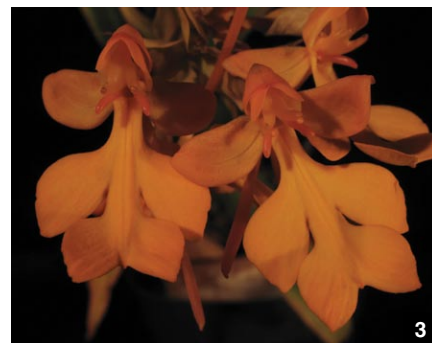
*Habenaria* Flame Tanager has flowers with a natural spread of about  $\frac{3}{4}$  inch (1.9 cm). This was the first use of *Hab.* *Mayfly* in further hybridization. The *Habenaria lindleyana* in *Hab.* *Mayfly* still affects the size of the lateral lobes of the lip, but it does make for a nicely shaped flower. The lateral sepals are held out to the sides of the flower, as in the *Hab. lindleyana* ancestor and not reflexed, giving the flower a fuller shape. The lip color of the one that has flowered is a brilliant orange-scarlet.

All of the *Hab.* Flame Bowerbird plants that have flowered have had intensely colored flowers. Their trilobed lips have been bright orange-scarlet to bright red-scarlet and the lateral sepals have been red. On most flowers the lateral sepals are not reflexed, rather held flat in the plane of the flower. The flowers appear to glow in the sunlight. When buds first open, the flowers appear small, but rapidly increase in size, some achieving 2 inches (5 cm) in length, and  $1\frac{1}{2}$  inch (3.8 cm) natural spread.

*Habenaria janellehayneana* is a relatively recently described species that has been added to the breeding pot, and there are a few new hybrids made with it. This species often adds fragrance to the flowers, although not always, and not necessarily a fragrance that everyone can perceive. Many of these hybrids like the *Hab. janellehayneana* parent are usually late breaking dormancy.

*Habenaria* Galah is a hybrid of (*carnea* × *janellehayneana*) with large, full, fairly flat and evenly pink to rose colored flowers. A number of them have already been awarded and many of the plants have nicely marked foliage. Some people have even called the flowers beautiful.

The hybrid of (*rhodocheila* × *janellehayneana*) was registered as *Habenaria* Spoonbill. The widespread lateral sepals and petals of this very floriferous hybrid are white with a slight pink or green



[1] *Habenaria* Galah (*carnea* × *janellehayneana*.)

[2] *Habenaria* Flame Tanager (Oriole × *Mayfly*)

[3–4] *Habenaria* Flame Bowerbird (Oriole × *Summer Tanager*)

[5] *Habenaria* Spoonbill (*rhodocheila* × *janellehayneana*)

[6] In this *Habenaria* Pink Cockatoo (*janellehayneana* × *medusa*), the lip fringe is fully developed and a striking presentation.

tint and the lip is pink to rose colored.

For those who like fringed flowers there is *Habenaria* Pink Cockatoo (*janellehayneana* × *medusa*). As the name suggests, the flowers are pink, varying from light to darker pink. The amount of fringing varies as well. In the best one I have seen, the fringe is very deep, although most fringes are shorter. The flowers are about 1–1 ¼ inch (2.5–3.2 cm) natural spread. Interesting, at least to me, is that the most *medusa*-like flowers also had color on the lip claw; a trait from *Hab. medusa* not usually passed on to the progeny.

Another new *Hab. janellehayneana* hybrid is *Pectabenaria* Pink Peacock (*Habenaria janellehayneana* × *Pectabenaria*) Wow's White Fairies. The full flowers of this hybrid are about 1 ¼ inch (3.2 cm) in natural spread, fairly round, flat and pink, with lip side lobes nicely fringed. I hope I can use this in further hybridization.

*Habenaria* Pink Coral (Tracy × Mayfly) produces flower of nice shape with a natural spread of approximately 1 ¼ inch (3.2 cm). The trilobed lip is a rich pink-coral color, and the sepals and petals a much lighter coral resulting in a very pleasing effect.

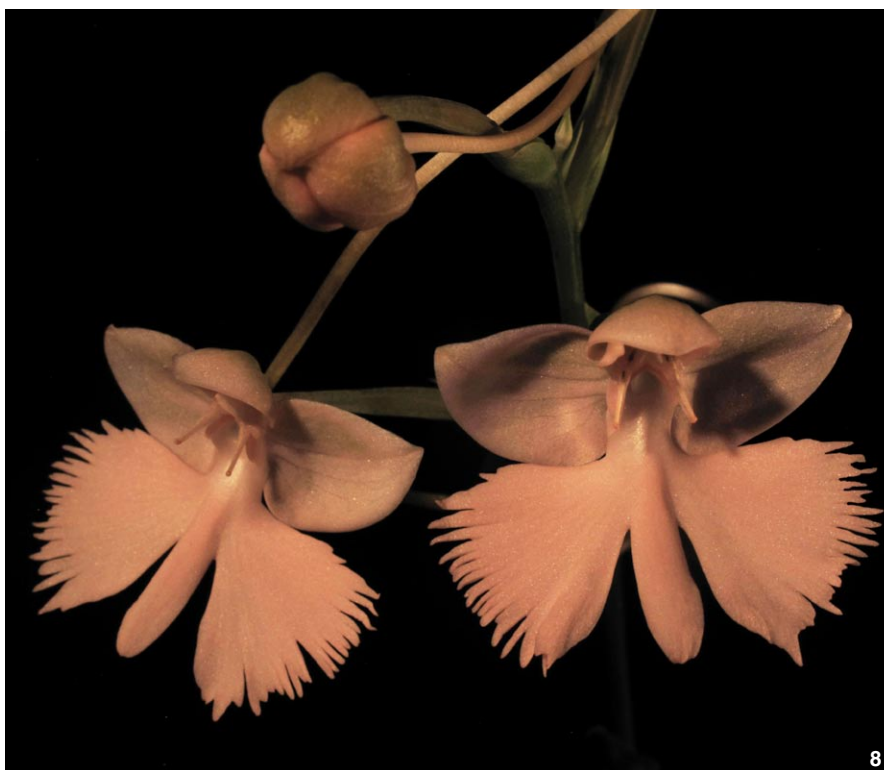
I only obtained one plant of *Habenaria* Kat Bird (Kat's Whiskers × Bird of Paradise), so I do not know what the color variation of the cross would have been. As a first bloom seedling it had about 18 flowers, each pale yellow, with a nice fringe on the lateral lobes of the lip. I will have to remake this cross to see what variation in flower color might also be possible.

Unfortunately, I had too few seedlings to see variations in the cross *Habenaria* (Kat's Whiskers × *carnea* f. *nivosa*). Because the flowers are white, I registered this as *Habenaria* Blanco. The flower was smaller than most, only about ¾ inch (1.9 cm) natural spread with fairly flat segments although there was a slight cupping of the whole corolla. The only trace of the fringe from *Hab. Kat's Whiskers* was a notch or two on the lateral lobes of the lip.

The cross *Habenaria* (Bird of Paradise × Oriole) also only produced a single seedling. Nevertheless, it was registered as *Habenaria* Topaz. There are bicolored topaz gemstones, some that matched the colors of this flower. The sepals and petals were a pale red-brown, and the lip a nice golden-orange. For a first bloom seedling it eventually had 14 long-lasting flowers.

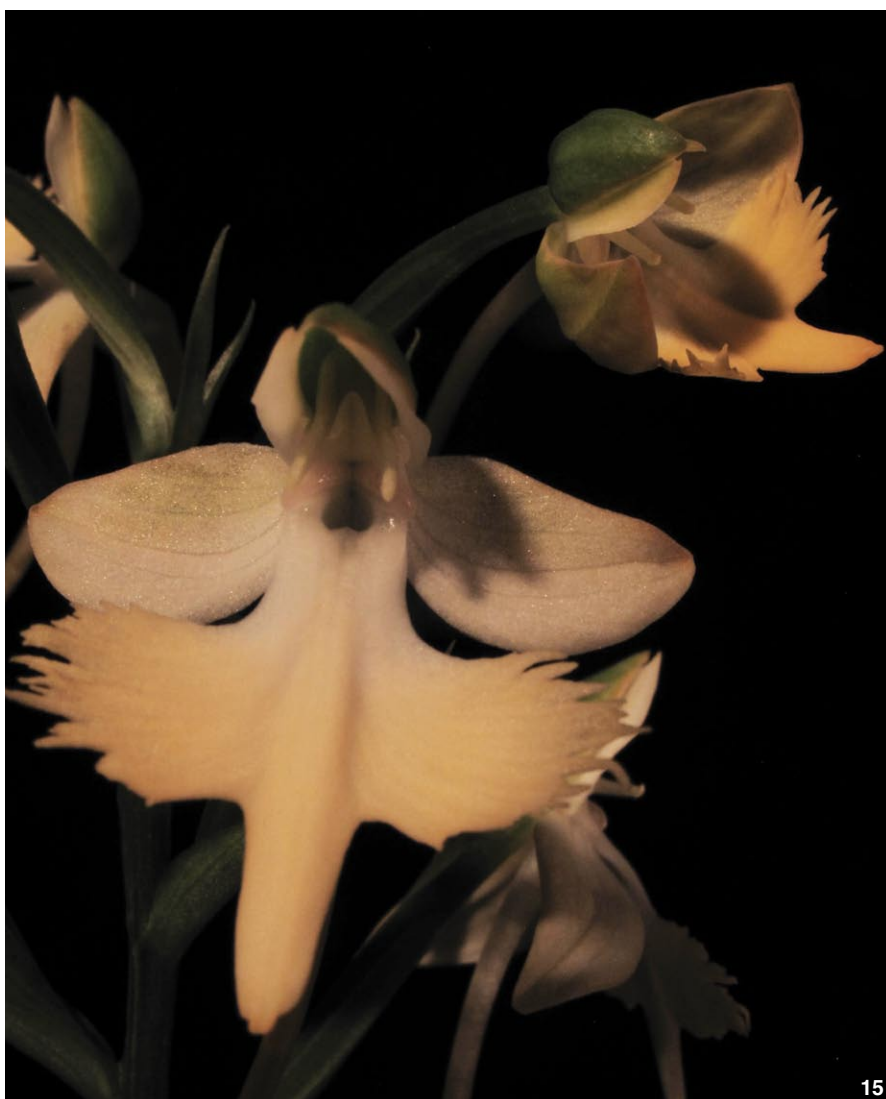
Over this time period a number of additional *Pectabenaria* hybrids were registered. These include:

*Pectabenaria* Chrysaor (Western



- [7] In this *Hab. Pink Cockatoo*, the fringe development is much less.
- [8] *Pectabenaria* Pink Peacock (*Habenaria janellehayneana* × Wow's White Fairies)
- [9] *Habenaria* Pink Coral (Tracy × Mayfly)
- [10] *Habenaria* Kat Bird (Kat's Whiskers × Bird of Paradise)
- [11] *Habenaria* Blanco (Kat's Whiskers × *Habenaria carnea* f. *nivosa*)
- [12] *Habenaria* Topaz (Bird of Paradise × Oriole)
- [13–15] *Pectabenaria* Chrysaor (Western Tanager × *Habenaria medusa*)







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[16] *Pectabenaria Chrysaor* (Western Tanager × *Habenaria medusa*)

[17] A newly opened flower of *Pectabenaria Tourmaline* (*Habenaria Tracy* × *Pecteilis hawksiana*)

[18] *Pectabenaria Tourmaline* after maturation.

[19] *Pectabenaria Cockateil* (*Habenaria Tanager* × *Pecteilis hawksiana*)

[20] *Habenaria crinifera*

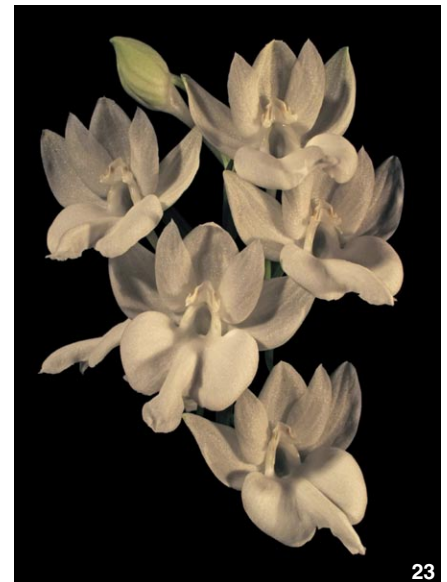


Tanager × *Habenaria medusa*). Why Chrysaor? Well, for those who remember their mythology, when Perseus slew Medusa, we all know that from her neck emerged Pegasus, but Pegasus was not the only one. A sibling (?) named Chrysaor also emerged. Depending on which version of the myth you choose, Chrysaor was either a large flying boar or a large humanoid with a golden sword (where the sword originated during his emergence is unclear). Because I had a cross for Pegasus, I thought it only fair to have one for Chrysaor, too. The flowers varied in color from pink to yellow, white, and scarlet, all with fringed lateral lip lobes; however, the shapes were very variable and the largest flower was about 1 inch (2.5) in natural spread.

*Pectabenaria Cockateil* (*Habenaria* Tanager × *Pecteilis hawksiana*) has leaves that are low on the plant, like the *Pecteilis* parent, with a tall inflorescence. The yellow-lipped form of *Hab. Tanager* was used in this hybrid. The results would have been different using the scarlet or orange-lipped form and I may have to try that next year. Unlike many habenarias where the petals are fused or at least adpressed to the dorsal sepal to form a hood, the petals of this hybrid are free of the dorsal sepal, a light pinkish to straw color, and not reflexed. The lip is almost an orange-butterscotch color.

There was a problem with *Pectabenaria Tourmaline* (*Habenaria* Tracy × *Pecteilis hawksiana*). When the buds began to open, the emerging flower looked grotesque, but eventually opened to form an interesting flower. The cross was originally named because the colors of the lateral sepals reminded me of those of a watermelon tourmaline. I thought that this was the final color, but a few weeks later the flower color changed to the color of a pink tourmaline. The petals are well-separated from the dorsal sepal, and the natural spread of the flower is about 1 inch (2.5 cm).

Up until now, most of *habenaria* hybrids were made using a small group of species, an equally small group of genera in the intergenerics and a small pool of hybridizers. This has led to a number of very similar looking hybrids. All this has changed. Many more people are making *habenaria* hybrids now such as Edgar Stehli, of Windswept in Time, in Ohio; Greg Griffiths at Longwood Gardens, in Pennsylvania; Charlot Teng & Chu in Taiwan, Nicholas Rust of RustyExotics in Georgia; Mike Dorris in the United States; Marni Turkel in California; Dr. Harold Koopowitz, also in California; some in Thailand and others,



elsewhere. In addition to an expanding pool of hybridizers, new species are being added to the mix. These include *Habenaria crinifera* and *Habenaria medioflexa*, and others. As of August, 2021 about 85 hybrids of *habenaria*, both generic and intergeneric, have been registered (How many have not been registered?) and by January, 2022 there were about 91. Many more will be coming this year.

One example of these newer lines is *Habenaria Cerebellum* (*medioflexa* × *carnea*) made by Chu & Teng in Taiwan. This hybrid produces a very full flower with green sepals and petals and an extremely pale pink to white lip, with fine toothing on the edge of the lateral lobes of the lip. The flower can be over 1 ½ inch (3.8 cm) natural spread, Nice on its own, with great further breeding potential.

In 2011, I registered a hybrid *Pectabenaria Little Angel* (*Habenaria carnea* × *Pecteilis hawksiana*). At that time, I used a pink *Hab. carnea* and the progeny were a light pink. In 2020, I repeated the cross but used *Hab. carnea* f. *nivosa*, the white form of the species. This time most of the progeny came out pristine white with a very few plants having extremely pale pink flowers. Individual flowers are over 1 ¼ inch (3.2 cm) in natural spread and, as is typical with *Pectabenaria* hybrids, the petals are separated from the dorsal sepal.

As the number of *habenaria* breeders and the number of hybrids increase, with many new species added to the mix, we do not know how many wonderful and beautiful hybrids will be made or what new flower forms, colors, color combinations and patterns will be introduced. The future

[21] *Habenaria medioflexa*

[22] *Habenaria Cerebellum* (*medioflexa* × *carnea*)

[23] *Pectabenaria Little Angel* (*Habenaria carnea* × *Pecteilis hawksiana*) made with the pure white form of *Hab. carnea*, (f. *nivosa*).

of *habenaria* breeding is very exciting.

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— Leon Glicenstein, PhD is an international lecturer who speaks to orchid and plant societies. He has grown orchids for more than 55 years and was a breeder of novel orchid hybrids for the former Hoosier Orchid Company, especially in the *Gongorinae*, *Zygopetalinae*, *Pleurothallidinae*, *angraecoids*, *jewel* and *painted-leaf* orchids; Orlando Avenue, State College, Pennsylvania 16803 (email:



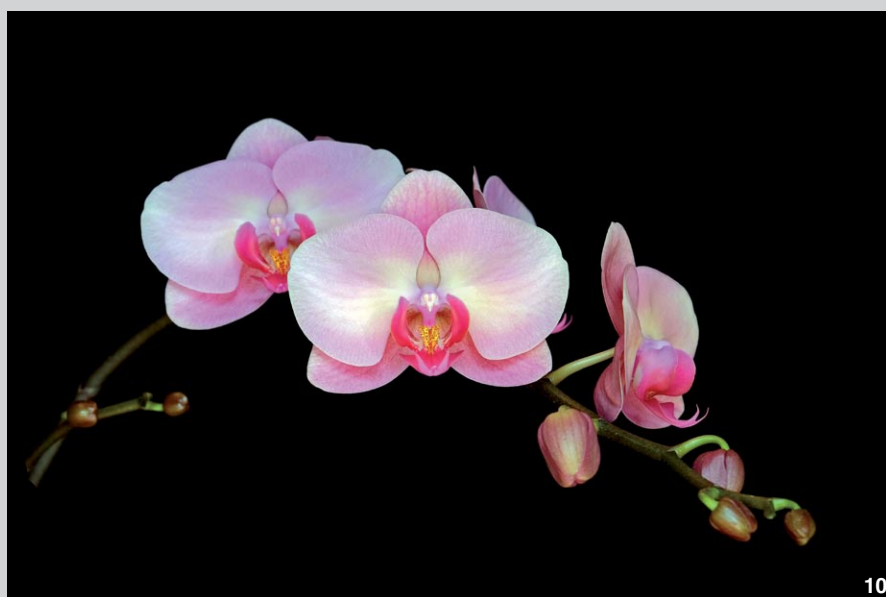
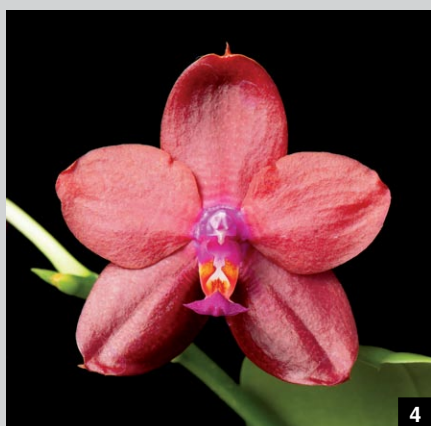
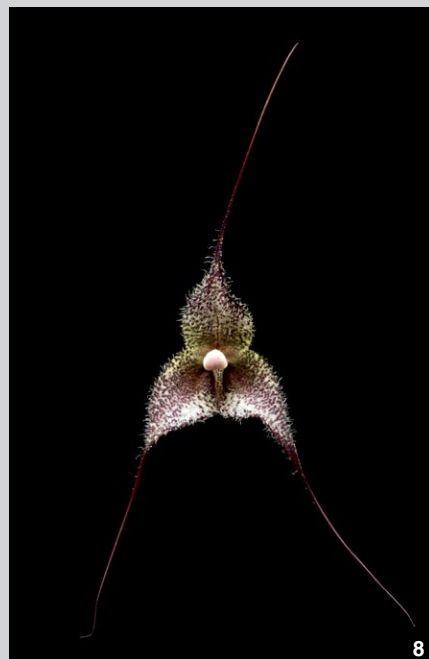






- [1] *Caulaelia* Mizoguchi 'Princess Kiko' AM/AOS (Snowflake x *Laelia anceps*) 80 pts. Exhibitor: Soroa Orchids; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [2] *Phalaenopsis* Walnut Valley Love Pixie 'Bryon & Max' AM/AOS (Brother Love Hero x Zuma's Pixie) 80 pts. Exhibitor: Max Thompson and Bryon Rinke; Photographer: Bryon Rinke. Great Plains Judging
- [3] *Phalaenopsis* Merriman's Red Hope 'Marvin Wilson' HCC/AOS (Chingruey's Blood-Red Sun x Krull's Red Hot) 79 pts. Exhibitor: Max Thompson and Bryon Rinke; Photographer: Bryon K Rinke. Great Plains Judging
- [4] *Chytroglossa* Ben Berliner 'Bryon Kelly Rinke' AM/AOS (*aurata* x *marileoniae*) 81 pts. Exhibitor: Bryon K. Rinke; Photographer: Bryon K Rinke. Great Plains Judging
- [5] *Dendrobium* Gowan's Tangelo 'Max' CCM/AOS (*mohlianum* x *melinanthum*) 87 pts. Exhibitor: Max C. Thompson; Photographer: Bryon K Rinke. Great Plains Judging
- [6] *Phragmipedium* Stairway to Heaven 'Max' CCE-AM/AOS (*warszewiczianum* x *humboldtii*) 92-81 pts. Exhibitor: Max C. Thompson; Photographer: Bryon K Rinke. Great Plains Judging
- [7] *Paphiopedilum* Petula's Distinction 'Slipper Zone After Thought' AM/AOS (Macabre Contrasts x Petula's Magic) 84 pts. Exhibitor: Lehua Orchids; Photographer: Glen Barfield. Hawaii Judging
- [8] *Cattleya lueddemanniana* (Lara) 'Here Comes Sunshine' HCC/AOS 77 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [9] *Tolumnia* Walnut Valley Queen 'M & B Snowball' AM/AOS (Calypso Queen x Walnut Valley) 80 pts. Exhibitor: Max Thompson and Bryon Rinke; Photographer: Bryon K Rinke. Great Plains Judging
- [10] *Paphiopedilum* Hawaiian Spectacular 'Slipper Zone Kapuna Bettah' HCC/AOS (Presidential Moon x Hawaiian Kapuna) 79 pts. Exhibitor: Lehua Orchids; Photographer: Glen Barfield. Hawaii Judging
- [11] *Oncostele* Eye Candy 'Pinkie' AM/AOS (Catatante x *Oncidium* Barossa Delight) 80 pts. Exhibitor: Okika Ltd. Glen Barfield; Photographer: Glen Barfield. Hawaii Judging
- [12] *Stenosarcos* Hoosier Cardinal 'Bryon' AM/AOS (*Sarcoglottis homalogastra* x *Stenorhynchos albidomaculatum*) 82 pts. Exhibitor: Bryon K. Rinke; Photographer: Bryon K Rinke. Great Plains Judging
- [13] *Cattleya amethystoglossa* 'Okika' AM/AOS 87 pts. Exhibitor: Okika Ltd. Glen Barfield; Photographer: Glen Barfield. Hawaii Judging
- [14] *Paphiopedilum* Graciously Hawaiian (Hawaiian Kapuna 'Slipper Zone Masterful' x *hookerae* 'Galant Giant') AQ/AOS. Exhibitor and Hybridizer: Lehua Orchids; Photographer: Glen Barfield. Hawaii Judging
- [15] *Cattleya jongheana* 'Isabel Rosalia' CCE-AM/AOS 90-83 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging









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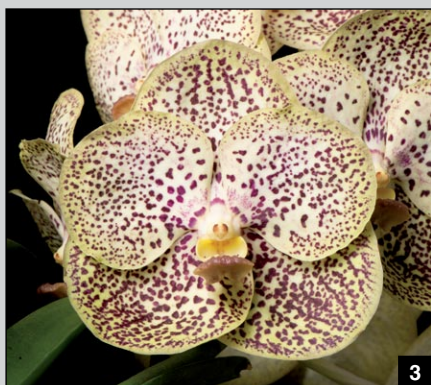
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- [1] *Vanda* William Motes 'Garrett's It's A Winner' AM/AOS (Molly Fairwater x *curvifolia*) 82 pts. Exhibitor: Sharon and David Garrett; Photographer: Wes Newton. Florida North-Central Judging
- [2] *Phalaenopsis* Yin's Red Tiger 'Whisper Hear Me Roar' AM/AOS (Chingruey's Tiger x Zheng Min Tyrannosaurus) 81 pts. Exhibitor: Laura and Wes Newton; Photographer: Wes Newton. Florida North-Central Judging
- [3] *Papilionanda* Arjuna 'Krull's Hallelujah' AM/AOS (Mimi Palmer x *Vanda tessellata*) 87 pts. Exhibitor: Krull-Smith; Photographer: Brian Monk. Florida North-Central Judging
- [4] *Phalaenopsis* Krull's Red Dragon 'Orchid Festival' HCC/AOS (Ken Avant x Dragon Tree Eagle) 77 pts. Exhibitor: Krull-Smith; Photographer: Brian Monk. Florida North-Central Judging
- [5] *Dendrobium farmeri* 'Boon Bryson' HCC/AOS 78 pts. Exhibitor: Boon Bryson; Photographer: Wes Newton. Florida North-Central Judging
- [6] *Papilionanda* Ben Fragrance 'Garrett's Golden Leopard' AM/AOS (*Vanda Memoria* Thianchai x Mimi Palmer) 83 pts. Exhibitor: Sharon and David Garrett; Photographer: Wes Newton. Florida North-Central Judging
- [7] *Cattleya loddigesii* 'Mirtha Isabel' AM/AOS 80 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [8] *Dracula chimaera* 'OrchidFix Ivan's Best' AM/AOS 84 pts. Exhibitor: The Orchid-Fix Nursery, Inc.; Photographer: Glen Barfield. Hawaii Judging
- [9] *Laeliocatanthe* Taiwan Orange 'Karen's Joy' CCM/AOS (*Laelia lueddeman-nii* x *Cattlianthe* Trick or Treat) 87 pts. Exhibitor: Karen Davenport; Photographer: Tom Kuligowski. West Palm Beach Judging
- [10] *Phalaenopsis* Pink Lady 'Louisiana' HCC/AOS (Doris x Lavender) 75 pts. Exhibitor: Alan Taylor; Photographer: Susan Hathorn. Louisiana Judging
- [11] *Paphiopedilum* Alluringly Wood 'Slipper Zone One in Four' HCC/AOS (Captivatingly Wood x Excitingly Wood) 76 pts. Exhibitor: Lehua Orchids; Photographer: Glen Barfield. Hawaii Judging
- [12] *Paphiopedilum* Dream Wind 'Slipper Zone Cream Charm' AM/AOS (Dreaming Green x Icy Icy Wind) 80 pts. Exhibitor: Lehua Orchids; Photographer: Glen Barfield. Hawaii Judging
- [13] *Paphiopedilum* Perfectly Superb 'Slipper Zone Perfectly Almost' HCC/AOS (Fred Perfected x Superb Fred) 79 pts. Exhibitor: Lehua Orchids; Photographer: Glen Barfield. Hawaii Judging
- [14] *Paphiopedilum* Macabre Dream 'Slipper Zone Proven' AM/AOS (Grand Fred x Macabre Pops) 82 pts. Exhibitor: Lehua Orchids; Photographer: Glen Barfield. Hawaii Judging
- [15] *Dendrobium* Miva Abracadabra 'Fco Katiana' AM/AOS (*atroviolaceum* x *polysema*) 81 pts. Exhibitor: Francisco Martinez Rivera; Photographer: Marínés Torres. Puerto Rico Judging
- [16] *Bulbophyllum* falcatum (Yellow) 'Krull-Smith' CCM-CHM/AOS 84-84 pts. Exhibitor: Krull-Smith; Photographer: Brian Monk. Florida North-Central Judging



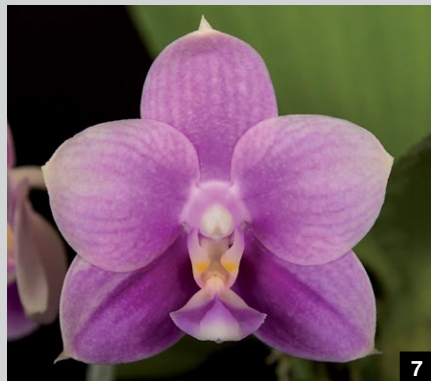






- [1] *Renanthera imschootiana* 'Crystelle' CCE-FCC/AOS 100-91 pts. Exhibitor: Krull-Smith; Photographer: Brian Monk. Florida North-Central Judging
- [2] *Dendrobium tangerinum* 'The Orchid Den' CCE-AM/AOS 90-80 pts. Exhibitor: Joshua Jones; Photographer: Brian Monk. Florida North-Central Judging
- [3] *Vanda* Jim Krull 'Krull's Lemon Leopard' AM/AOS (Kulwadee Fragrance x Somsri Gold) 86 pts. Exhibitor: Krull-Smith; Photographer: Brian Monk. Florida North-Central Judging
- [4] *Phalaenopsis* Lamb's Passion 'Bredren's Star' AM/AOS (Zheng Min Etching x Hannover Passion) 82 pts. Exhibitor: Bredren Orchids and Phillip Hamilton; Photographer: Brian Monk. Florida North-Central Judging
- [5] *Bulbophyllum* Dezherae's Delight 'Jim Krull' AM/AOS (More Than Aghast x Manchind) 82 pts. Exhibitor: Krull-Smith; Photographer: Brian Monk. Florida North-Central Judging
- [6] *Vanda curvifolia* f. *franksmithiana* 'Shocking Pink' CHM-AM/AOS 86-85 pts. Exhibitor: Krull-Smith; Photographer: Brian Monk. Florida North-Central Judging
- [7] *Encyclia* Dr Robert H Palmer 'Glen's Choice' HCC/AOS (*Encyclia cordigera* x *Encyclia pyriformis*) 79 pts. Exhibitor: Palmer Orchids; Photographer: Brian Monk. Florida North-Central Judging
- [8] *Vanda* Motes Ruby Pixie 'MV Frank's Gift' AM/AOS (*cristata* x *testacea*) 80 pts. Exhibitor: Stuart Henderson; Photographer: Brian Monk. Florida North-Central Judging
- [9] *Vandachostylis* Orchidkraft's Sapphira 'Krull's Green Apple' AM/AOS (Sasicha x *Vanda tessellata*) 80 pts. Exhibitor: Krull-Smith; Photographer: Brian Monk. Florida North-Central Judging
- [10] *Paphiopedilum wenshanense* 'Scott Ware' AM/AOS 84 pts. Exhibitor: Springwater Orchids and Thanh Nguyen; Photographer: Brian Monk. Florida North-Central Judging
- [11] *Vanda lombokensis* 'MV Longwood' AM/AOS 80 pts. Exhibitor: Stuart Henderson; Photographer: Brian Monk. Florida North-Central Judging
- [12] *Phalaenopsis* Krull's Red Dragon (Ken Avant 'Krull-Smith' AM/AOS x Dragon Tree Eagle 'DT168') AQ/AOS. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [13] *Phalaenopsis* Krull's Red Dragon 'Krull's Embers' AM/AOS (Ken Avant x Dragon Tree Eagle) 83 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [14] *Phalaenopsis* Krull's Red Dragon 'Ponkan' HCC/AOS (Ken Avant x Dragon Tree Eagle) 79 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [15] *Paphiopedilum* Lebaudyannum 'Wing-Dreams' AM/AOS (*haynaldianum* x *philippinense*) 84 pts. Exhibitor: Julio and Eileen Hector; Photographer: Kay Clark. Florida North-Central Judging
- [16] *Phalaenopsis* Krull's Red Dragon 'Jim Krull' AM/AOS (Ken Avant x Dragon Tree Eagle) 83 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging









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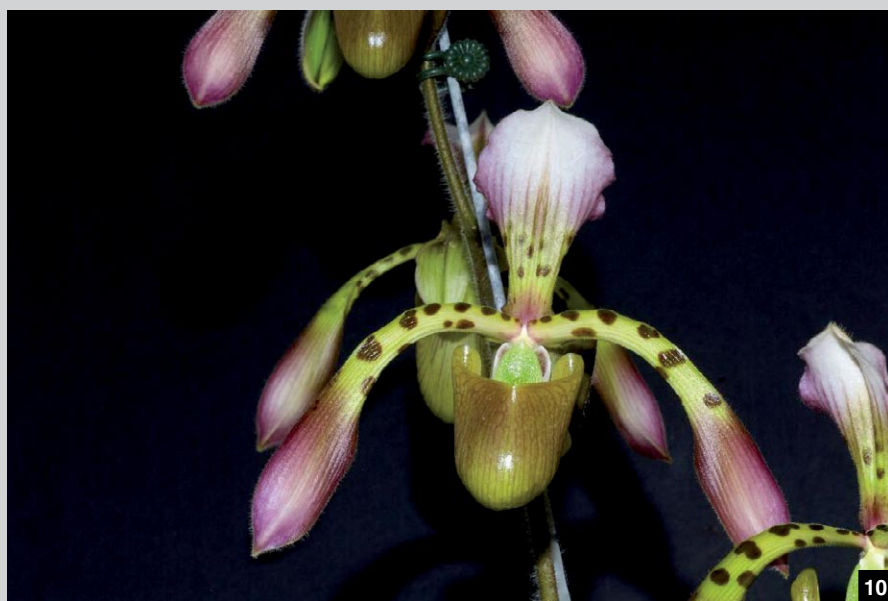
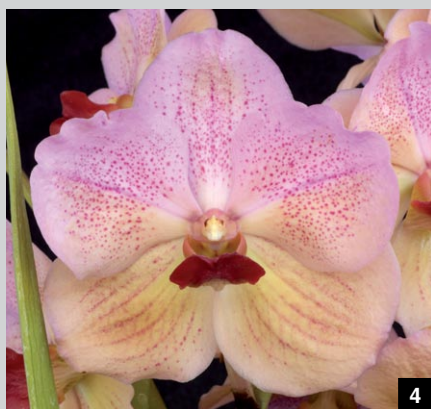
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- [1] *Dendrobium chrysotoxum* 'Julie Wert' CCE-AM/AOS 94-82 pts. Exhibitor: Cheryl Finke; Photographer: Kay Clark. Florida North-Central Judging
- [2] *Rhyncattleanthe* Vision Quest 'Peyote Sunrise' AM/AOS (Orglade's Happy Face x Elaine Taylor) 88 pts. Exhibitor: Keith and Dina Emig - Winter Haven Orchid Nursery; Photographer: Kay Clark. Florida North-Central Judging
- [3] *Epidendrum* Panama Ruby 'Whisper Hidden Gem' AM/AOS (*medusae* x *peperomia*) 83 pts. Photographer: Kay Clark. Florida North-Central Judging
- [4] *Phalaenopsis* Krull's Yellow Prince 'Green Apple' AM/AOS (Pylo's Eagle Passion x Dragon Tree Eagle) 82 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [5] *Phalaenopsis* Florida Rainbow 'Julien Baruch' AM/AOS (Tzu Chiang Chrisna x George Vasquez) 84 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [6] *Phalaenopsis* Florida Rainbow 'Krull-Smith' AM/AOS (Tzu Chiang Chrisna x George Vasquez) 82 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [7] *Phalaenopsis* Florida Rainbow 'Ponkan' AM/AOS (Tzu Chiang Chrisna x George Vasquez) 80 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [8] *Phalaenopsis* Krull's Yellow Prince 'Granny Smith' AM/AOS (Pylo's Eagle Passion x Dragon Tree Eagle) 83 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [9] *Vanda* Paula Zabik 'MV Grape Jelly' HCC/AOS (Karnda (1981) x Violeta) 77 pts. Exhibitor: Stuart Henderson; Photographer: Kay Clark. Florida North-Central Judging
- [10] *Vanda* Violeta 'Happy Accident' AM/AOS (*coerulea* x *tessellata*) 83 pts. Exhibitor: Naoki Kawamura; Photographer: Kay Clark. Florida North-Central Judging
- [11] *Vanda perplexa* 'Ponkan' CHM/AOS 82 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [12] *Vandachostylis* October Twenty Second 'Jordon Winter' AM/AOS (*Vanda tessellata* x Pine Rivers) 84 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [13] *Rhyncattleanthe* Lily Marie Almas 'Laura' HCC/AOS (Orange Nuggett x *Cattleya* Jalapa) 77 pts. Exhibitor: Carolyn Clay; Photographer: Susan Hathorn. Louisiana Judging
- [14] *Vanda perplexa* 'Krull-Smith' HCC/AOS 78 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [15] *Vanda testacea* 'MV Naoki's Gift' CCM/AOS 86 pts. Exhibitor: Stuart Henderson; Photographer: Kay Clark. Florida North-Central Judging
- [16] *Paphiopedilum* Hsinying Anita 'Fajen's Monster' AM/AOS (Lady Isobel x *anatum*) 88 pts. Exhibitor: Fajen's Orchids; Photographer: Kay Clark. Florida North-Central Judging
- [17] *Paphiopedilum* Conco-bellatulum 'Fajen's Floriferous' CCM/AOS (*concolor* x *bellatulum*) 86 pts. Exhibitor: Fajen's Orchids; Photographer: Kay Clark. Florida North-Central Judging









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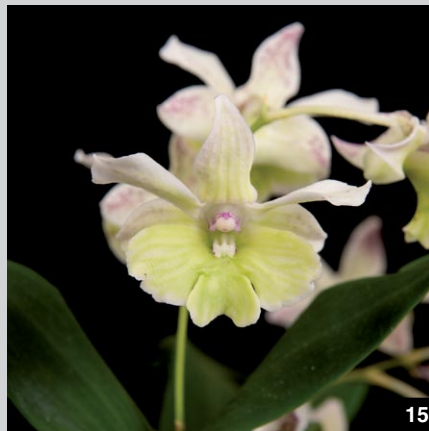
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- [1] *Paphiopedilum* Shen-Liu William Ani 'Krull-Smith' AM/AOS (William Ambler x *anitum*) 83 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [2] *Cymbidium* Easter Fire 'Jaybee' HCC/AOS (Fifi x Ernest Hetherington) 75 pts. Exhibitor: Ed Dumaguin; Photographer: Ramon de los Santos. California-Sierra Nevada Judging
- [3] *Phalaenopsis* Mainshow Dragon 'Ponkan' HCC/AOS (LD Double Dragon x Dragon Tree Eagle) 78 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [4] *Papilionanda* Hadassah's Pride 'Susie' AM/AOS (Mevr. L. Velthuis x *Vanda* Kulwadee Fragrance) 81 pts. Exhibitor: Cecil Bullard; Photographer: Ramon de los Santos. California-Sierra Nevada Judging
- [5] *Vandachostylis* Orchidkraft's Sapphira 'Julien Baruch' AM/AOS (Sasicha x *Vanda tessellata*) 83 pts. Exhibitor: Krull-Smith; Photographer: Kay Clark. Florida North-Central Judging
- [6] *Paphiopedilum* Fanaticum 'Bubble Pipe' AM/AOS (*malipoense* x *micranthum*) 83 pts. Exhibitor: Carson Barnes; Photographer: Charles Wilson. Atlanta Judging
- [7] *Phalaenopsis* Fangmei Sweet 'Feeling' AM/AOS (Little Gem Stripes x Dou-dii Golden Princess) 85 pts. Exhibitor: Jon Crate and Firelli Alonso; Photographer: Charles Wilson. Atlanta Judging
- [8] *Sarcochilus* Kulnura Khaleesi 'Melen-cia' AM/AOS (Kulnura Kaleidescope x Roberta) 80 pts. Exhibitor: Ramon de los Santos; Photographer: Ramon de los Santos. California-Sierra Nevada Judging
- [9] *Sarcochilus* Pixie Princess 'Chunky' AM/AOS (Glowing Embers x Kulnura Festival) 83 pts. Exhibitor: Ramon de los Santos; Photographer: Ramon de los Santos. California-Sierra Nevada Judging
- [10] *Paphiopedilum* haynaldianum 'Mary Morton' AM/AOS 84 pts. Exhibitor: Jeanne Buchanan; Photographer: Charlotte Randolph. Alamo Judging
- [11] *Sarcochilus* Kulnura Phase 'Monster' JC/AOS (Roberta x Ice Magic). Exhibitor: Ramon de los Santos; Photographer: Ramon de los Santos. California-Sierra Nevada Judging
- [12] *Sarcochilus* Susie 'Good Choices' HCC/AOS (Maria x Kulnura Absolute) 79 pts. Exhibitor: Anne Kimmerlein; Photographer: Ramon de los Santos. California-Sierra Nevada Judging
- [13] *Sarcochilus* Kulnura Rage 'Kiki' AM/AOS (Kulnura Dazzel x Kulnura Drive) 85 pts. Exhibitor: Anne Kimmerlein; Photographer: Ramon de los Santos. California-Sierra Nevada Judging
- [14] *Paphiopedilum* Mystically Contrasting 'Reece' HCC/AOS (Mystically Wood x Macabre Contrasts) 77 pts. Exhibitor: Tyler M. Albrecht; Photographer: Ramon de los Santos. California-Sierra Nevada Judging
- [15] *Dendrobium* Charlotte's Web 'Minty Confetti' HCC/AOS (Micro Chip x Maiden Charlotte) 77 pts. Exhibitor: Sarah Patterson; Photographer: Jeremy Losaw. Carolinas Judging
- [16] *Cymbidium* Pinata 'Jaybee' HCC/AOS 77 pts. Exhibitor: Ed Dumaguin; Photographer: Ramon de los Santos. California-Sierra Nevada Judging



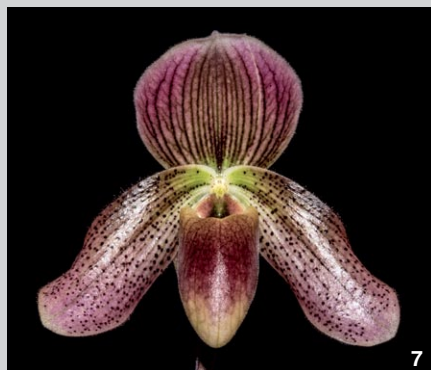
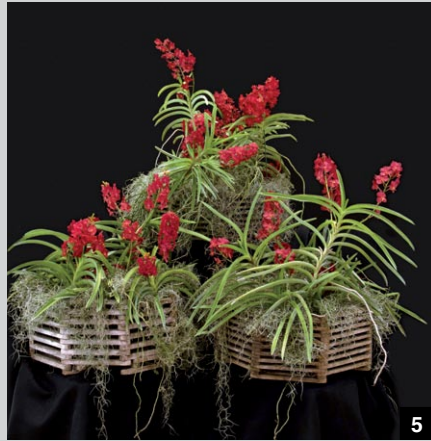






- [1] *Phragmipedium humboldtii* 'Fortuna' AM/AOS 81 pts. Exhibitor: Graham Ramsey; Photographer: Jeremy Losaw. Carolinas Judging
- [2] *Paphiopedilum* Prince Edward of York 'Lucy' HCC/AOS (*rothschildianum* x *sanderianum*) 79 pts. Exhibitor: Hausermann's Orchids, Inc.; Photographer: Anne Kotowski. Chicago Judging
- [3] *Phragmipedium lindenii* 'Hannah' AM/AOS 89 pts. Exhibitor: Graham Ramsey; Photographer: Jeremy Losaw. Carolinas Judging
- [4] *Phragmipedium* Paul Eugene Conroy 'Robin Mentha' AM/AOS (*warszewiczianum* x *longifolium*) 82 pts. Exhibitor: T. Anthony Curtis; Photographer: Jeremy Losaw. Carolinas Judging
- [5] *Dendrobium* Miva Abracadabra 'Sunprarie' AM/AOS (*atroviolaceum* x *polysema*) 82 pts. Exhibitor: Bil Nelson; Photographer: Anne Kotowski. Chicago Judging
- [6] *Cattleya* Lacey Michelle Matherne 'Kathleen' HCC/AOS (*aclandiae* x *tigrina*) 76 pts. Exhibitor: William Rogerson; Photographer: Anne Kotowski. Chicago Judging
- [7] *Paphiopedilum* Bel Royal 'Sadie' CCM/AOS (*rothschildianum* x *kolopakingii*) 82 pts. Exhibitor: Hausermann's Orchids, Inc.; Photographer: Anne Kotowski. Chicago Judging
- [8] *Phragmipedium* D. Hiden Ramsey 'Granny' HCC/AOS (x *richteri* x Lutz Röllke) 77 pts. Exhibitor: Graham Ramsey; Photographer: Jeremy Losaw. Carolinas Judging
- [9] *Cattleya schilleriana* (1857) 'Kathleen IV' AM/AOS 85 pts. Exhibitor: William Rogerson; Photographer: Anne Kotowski. Chicago Judging
- [10] *Cattleya schilleriana* (1857) 'Paul II' AM/AOS 87 pts. Exhibitor: William Rogerson; Photographer: Anne Kotowski. Chicago Judging
- [11] *Paphiopedilum* Bel Royal 'Owen' CCM/AOS (*rothschildianum* x *kolopakingii*) 81 pts. Exhibitor: Hausermann's Orchids, Inc.; Photographer: Anne Kotowski. Chicago Judging
- [12] *Cattotes* Emilia Santiago 'Woodlands' AM/AOS (*Leptotes bicolor* x *Cattleya crispata*) 80 pts. Exhibitor: Woodland Orchids; Photographer: Jeremy Losaw. Carolinas Judging
- [13] *Phalaenopsis* Mituo Princess 'Red-2' AM/AOS (LD Double Dragon x LD's Bear King) 82 pts. Exhibitor: Mike Mims; Photographer: Jeremy Losaw. Carolinas Judging
- [14] *Guarechea* Black Comet 'Indigo Blue' JC/AOS (Miva Etoile Noire x *Prosthechea cochleata*). Exhibitor: Hausermann's Orchids, Inc.; Photographer: Anne Kotowski. Chicago Judging
- [15] *Maxillaria variabilis* 'Pinto's Delight' CCM/AOS 86 pts. Exhibitor: Kay Perry; Photographer: Anne Kotowski. Chicago Judging









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- [1] *Paphiopedilum armeniacum* 'Sunshine' CCM/AOS 85 pts. Exhibitor: New Vision Orchids; Photographer: Richard Noel. Cincinnati Judging
- [2] *Cattlianthe* Ladybug 'Zora Lee' AM/AOS (Rojo x *Guarianthe aurantiaca*) 81 pts. Exhibitor: Janet Smith; Photographer: Richard Noel. Cincinnati Judging
- [3] *Vanda* William Motes 'Aunt Betsy's Beau' HCC/AOS (Molly Fairwater x *curvifolia*) 78 pts. Exhibitor: Motes Orchids, Inc.; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [4] *Phalaenopsis mannii* 'Max Thompson' AM/AOS 80 pts. Exhibitor: Max C. Thompson; Photographer: Bryon Rinke. Great Plains Judging
- [5] *Vanda* William Motes AQ/AOS (Molly Fairwater 'Barbara Sutton' AM/AOS x *curvifolia* 'Redland Rose' AM/AOS). Exhibitor and hybridizer: Motes Orchids, Inc.; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [6] *Phalaenopsis* Walnut Valley Yellow Sun 'Bryon & Max' HCC/AOS (Blessed x Taisuco Date) 77 pts. Exhibitor: Max Thompson and Bryon Rinke; Photographer: Bryon Rinke. Great Plains Judging
- [7] *Paphiopedilum* Conco-Callosum 'Alejandro Ramos' AM/AOS (*concolor* x *callosum*) 80 pts. Exhibitor: Max C. Thompson; Photographer: Bryon Rinke. Great Plains Judging
- [8] *Cymbidium* Volcanic Flash 'Tim Tam' HCC/AOS (Mimi x Volcano) 78 pts. Exhibitor: Hideka Kobayashi; Photographer: Richard Noel. Cincinnati Judging
- [9] *Cymbidium* Auntie Mary Kovich 'Memoria Merritt Huntington' AM/AOS (*sinense* x *insigne*) 83 pts. Exhibitor: Hideka Kobayashi; Photographer: Richard Noel. Cincinnati Judging
- [10] *Papilionanda* Batram 'Soroa Pumpkin Pie' AM/AOS (Mimi Palmer x *Vanda denisoniana*) 85 pts. Exhibitor: Soroa Orchids; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [11] *Paphiopedilum* Larry Cox 'Elektra' HCC/AOS (Shin-Yi Williams x *adductum* var. *anatum*) 78 pts. Exhibitor: Larry Cox; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [12] *Dendrobium* Tiny Twister 'Christian Bielecki' AM/AOS (*carronii* x *mirbelianum*) 81 pts. Exhibitor: Thad Bielecki; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [13] *Dendrobium* Swiss Mountain Palace 'Phlox Vision' AM/AOS (*cuthbertsonii* x Mtn's Butterfly Kisses) 83 pts. Exhibitor: New Vision Orchids; Photographer: Richard Noel. Cincinnati Judging
- [14] *Eulophia guineensis* 'Bryon' CCE/AOS 94 pts. Exhibitor: Bryon K. Rinke; Photographer: Bryon Rinke. Great Plains Judging
- [15] *Vanda ampullacea* 'Redland Amethyst' AM/AOS 83 pts. Exhibitor: Motes Orchids, Inc.; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [16] *Sarcophyton pachyphyllum* 'Auntie Jenny' CCM/AOS 87 pts. Exhibitor: Cynthia White; Photographer: Carmen Johnston. Florida-Caribbean Judging









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- [1] *Acianthera sicaria* 'Bryon Kelly Rinke' AM/AOS 80 pts. Exhibitor: Bryon K. Rinke; Photographer: Bryon Rinke. Great Plains Judging
- [2] *Cattleya schilleriana* (1857) 'Euphrosyne' AM/AOS 85 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [3] *Paphiopedilum* Hawaiian Appeal 'Slipper Zone One of Three' HCC/AOS (Hawaiian Volcano x Presidential Pops) 79 pts. Exhibitor: Lehua Orchids; Photographer: Glen Barfield. Hawaii Judging
- [4] *Dracula* Poe 'Bonobo' HCC/AOS (Raven x *marsupialis*) 78 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [5] *Paphiopedilum* Enchanting Pleasure 'Slipper Zone Stridently' AM/AOS (Enchantingly Wood x Luna Pleasure) 83 pts. Exhibitor: Lehua Orchids; Photographer: Glen Barfield. Hawaii Judging
- [6] *Episcydia* Bloody Nose 'Windy Hill's Watercolor' HCC/AOS (*Episcydia* René Marqués x *Encyclia phoenicea*) 76 pts. Exhibitor: Marilyn LeDoux; Photographer: Matthew Nutt. Mid-America Judging
- [7] *Cattleya warszewiczii* var. *sanderiana* 'Bodacious' AM/AOS 80 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [8] *Cattleya lueddemanniana* (Lara) 'Dark Jewel' AM/AOS 81 pts. Exhibitor: Island Sun Orchids; Photographer: Glen Barfield. Hawaii Judging
- [9] *Cattleya violacea* 'Redondinha' AM/AOS 80 pts. Exhibitor: The OrchidFix Nursery, Inc.; Photographer: Glen Barfield. Hawaii Judging
- [10] *Paphiopedilum* Petula's Vision 'Slipper Zone With Thanks' HCC/AOS (Macabre Contrasts x Petula's Pride) 79 pts. Exhibitor: Lehua Orchids; Photographer: Glen Barfield. Hawaii Judging
- [11] *Oncostele Succubus* 'Chianti' AM/AOS (*Oncidium fuscatum* x Blackata) 82 pts. Exhibitor: Okika Ltd. Glen Barfield; Photographer: Glen Barfield. Hawaii Judging
- [12] *Paphiopedilum* Calvert Sunrise 'Elaine' HCC/AOS (*spicerianum* x *victoria-mariae*) 75 pts. Exhibitor: Derek Lowenstein; Photographer: Malcolm McCorquodale. Houston Judging
- [13] *Paphiopedilum* Fred's Enchantment 'Graham's Shout' AM/AOS (Friedrich von Hayek x Magically Wood) 81 pts. Exhibitor: Orchids & Tropicals; Photographer: Malcolm McCorquodale. Houston Judging
- [14] *Cattleya schilleriana* (1857) 'Mammoth' AM/AOS 82 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [15] *Cattleya granulosa* 'Orchid Eros' AM/AOS 81 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [16] *Cattleya warneri* var. *alba* 'Kilimanjaro' HCC/AOS 78 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [17] *Phragmipedium* Suzanne Decker 'Timbucktoo' AM/AOS (kovachii x Cape Sunset) 80 pts. Exhibitor: Sarah Pratt; Photographer: Bryon K Rinke. Great Plains Judging



## JUNE

**3-5—New Orleans Orchid Society's Show and Sale**, Lakeside Mall, 3301 Veterans Memorial Blvd, Metairie, LA; Contact: Marian Prigmore, 504-810-9832; woodenbox@bellsouth.net

**11-19—2022 PHS Philadelphia Flower Show**, FDR Park, South Philadelphia, 1500 Pattison Ave & S Broad St, Philadelphia, PA; Contact: Jenna Celius, 215-988-8850; jcelius@pennhort.org

## JULY

**8-10—Baton Rouge Orchid Society Show**, LSU Botanic Garden at Burden—Conference Center, 4560 Essen Lane, Baton Rouge, LA; Contact: Jim Morrison, 225-247-1543; jwmorrisoniii@msn.com

**23—Central Iowa Orchid Society Speaker's Day**, Johnston Lions Club Community Center, 6401 Merle Hay Road, Johnston, IA; Contact: Carson Whitlow, 515-993-4841; slipperguy@aol.com

**29-31—Hilo Orchid Society's "Orchid Ohana—Blending Beauty and Aloha,"** Edith Kanaka'ole Stadium, 350 Kalanikoa St, Hilo, HI; Contact: Karl Mendonca, 808-217-7078; karlsandi@comcast.net

## AUGUST

**5-6—International Phalaenopsis Alliance Symposium**, Hilton Garden Inn, Apopka City Center, 580 E Main Street, Apopka, FL; Contact: Eileen Hector, 813-368-7353; ipa.eileen@gmail.com

**6—Houston Orchid Society Summer Workshop (Outreach Judging)**, First Christian Church, 1601 Sunset Blvd, Houston, TX; Contact: Randy Johnson, 225-205-8181; randy.johnsonian2000@gmail.com

**28-29—"Ohio Valley Orchid Fest,"** Emmanuel Lutheran Church, 4865 Wilmington Pike, Dayton, OH; Contact: Eric Sauer, 937-212-0462; eric@rvorchids.com

## SEPTEMBER

**17-18—Wisconsin Orchid Society's "Fall in Love with Orchids,"** Mitchell Park Horticultural Conservatory, 524 S Layton Blvd, Milwaukee, WI; Contact: Richard Odders and Bil Nelson, 262-632-3008 and 414-467-6642; odders2445@gmail.com and qorchids@att.net

**17-18—Ridge Orchid Society's Diamond Jubilee "60 Years of Orchids,"** WH Stuart Center, 1702 US Hwy 17 S, Bartow, FL; Contact: Keith Emig, 863-412-4762; dkemig@gmail.com

**17-18—Foothills Orchid Society "Orchids For Everyone,"** Deerfoot Inn & Casino, 11500 35 St SE #1000, Calgary, AB, Canada; Contact: Marguerite Salsberry, 403-973-2687; msalsberry@telus.net

**23-24—Great Divide Orchid Society Show and Sale**, Wingate of Helena, 2007 N Oakes, Helena, MT; Contact: Nancy Horn & Cheri Bergeron, 406-459-9252; nancylhorn@outlook.com

**30-2—Kentucky Orchid Society Show**, St Mathews Episcopal Church, 330 N Hubbards Lane, Louisville, KY; Contact: Jan Smith & Stephen Benjamin, 502-893-0500 & 502-348-1787; jansmithroberts@gmail.com & stephenb@oakknob.com


## OCTOBER

**15-16—Denver Orchid Society's "Orchid Renaissance,"** Denver Botanic Gardens, 1005 York St, Denver, CO; Contact: Marion Allen, 303-987-3005; orkdivr@comcast.net

**22-23—Gainesville Orchid Society's "Orchids in the Garden,"** Kanapaha Botanical Gardens, 4700 SW 58th Dr, Gainesville, FL; Contact: Ghislaine Carr, 305-804-9495; Ghislainecarr@yahoo.com

**22-23—Eastern Iowa Orchid Society's**

**Orchid Show and Sale "Orchids are a Scream,"** Elks Lodge Hall, 801 3rd Ave SW, Cedar Rapids, IA; Contact: Andy Coghill-Behrends, 319-512-8076; mistercoghill@hotmail.com



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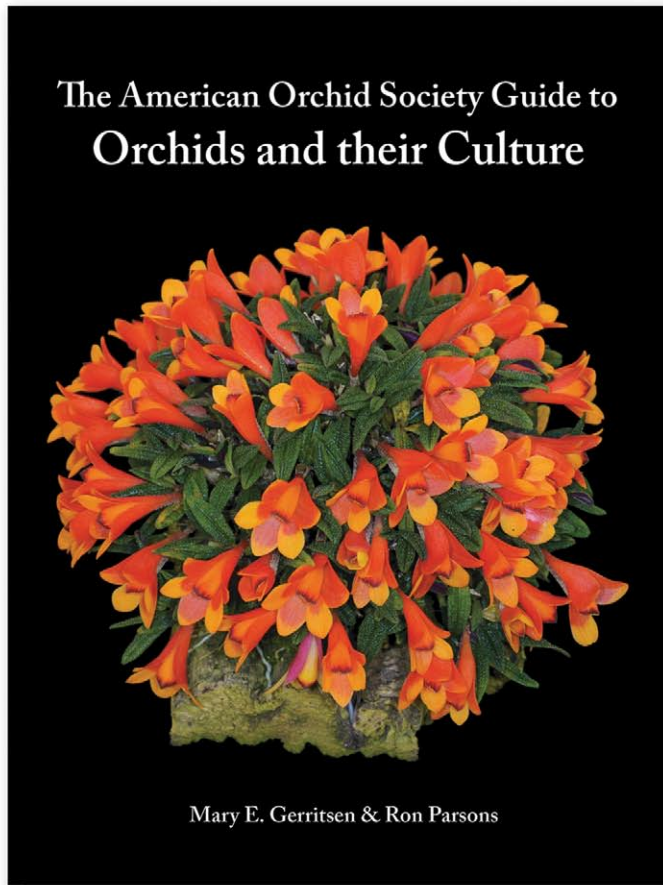


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The AOS welcomes the submission of manuscripts for publication in *Orchids* magazine from members and non-members alike. Articles should be about orchids or related topics and cultural articles are always especially welcome. These can run the gamut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

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# The Japan Grand Prix International Orchid and Flower Show 2022

By Clare Hermans, Johan Hermans and Makiko Sato

ONE OF THE highlights of the orchid year is the Japan Grand Prix International Orchid and Flower Show or JGP, held each February in the Tokyo Dome stadium, not surprisingly the past two years have been different. Last year due to the pandemic, it was moved to the end of March and was smaller in scale but still had over 15,000 visitors during the seven days. Continuing restrictions this year meant it was again held in March in the same venue, however there were nearly 17,500 visitors. Once more there were no overseas visitors or traders and no formal opening ceremony. Instead, Her Imperial Highness Princess Takamado, a great supporter of the show made a private visit.

Fortunately, there were still quality plants to admire and judge with over 500 entries. The theme of the show was “In full bloom” and the entrance, a traditional style “Orchid Gate” was framed in light blue and used pale colored flowers to represent early spring. A path led through “Spring Valley” and at the end was an avenue of the class winners culminating in a dais for the Grand Champion, a magnificent plant of *Calanthe* Yutaka ‘Shinryoku no Toki’ owned by Hiroshi Yamamoto. The parents of this hybrid are *Calanthe* Takane and Satsuma it was registered by Hiroshi Yamamoto in 1997. The pale green flowers were popular with visitors due to their similarity to new green shoots of spring. Although the Mercedes car was once more absent there was the same substantial cheque for ¥2,000,000 (approx. \$16,000) for Mr. Yamamoto.

*Pinalia obesa* ‘Nana’ winner of the RHS Trophy for Supreme Excellence in Cultivation, was owned by Yoshitaka Karaki. The species comes from eastern Nepal to Thailand and was first described by John Lindley in 1830 in *The Genera and Species of Orchidaceous Plants* as an *Eria* from a specimen found by Nathaniel Wallich. ‘Nana’ was a fine specimen with 600 flowers on 90 spikes on a plant 7 inches (18 cm) wide.

The winner of the AOS Trophy for showing the greatest skill in cultivation of an oriental and Japanese orchid was *Calanthe* Tokyo Bay-River ‘Red Star’ owned and registered by Hiroshi Yamamoto. The



1

MAKIKO SATO



2

MAKIKO SATO

parents of this hybrid are *Calanthe* Fuji and Wakamatsu it was registered in 2018. ‘Red Star’ had 51 flower spikes with an average of 10 flowers on each. Another of Mr Yamamoto’s hybrids, *Calanthe* Tokyo Bay-Dolphin ‘Sawayaka’ won the

same trophy in 2021. Mr Yamamoto the owner of a nursery specialising in *Calanthe*, *Ponerorchis* and Japanese cymbidiums had another very successful show.

It is hoped that there will be a 33 JGP International Orchid and Flower Show in





3



4



5

- [1] The “Orchid Gate” grand entrance to the show
- [2] Visitors admiring the *Dendrobium* classes.
- [3] *Calanthe* Tokyo Bay River ‘Red Star’ winner of the American Orchid Society Trophy for the best Asian species.
- [4] *Calanthe* Yutaka ‘Shinryoku no Toki’ the Grand Champion of the 2022 Japan Grand Prix.
- [5] *Pinalia obesa* ‘Nana’ winner of the Royal Horticultural Society Trophy.

2023 and for those planning a trip to Japan next spring it should be a date to put in their diary.

— Clare Hermans is chairman of the RHS Orchid Committee (email: [clarejepson@btinternet.com](mailto:clarejepson@btinternet.com)). Johan Hermans an honorary research associate of the Royal Botanical Garden, Kew and vice-chairman of the RHS Orchid Committee (email: [orchids1@btinternet.com](mailto:orchids1@btinternet.com)). Makiko Sato has offices in Tokyo and London and is one of the organizers of the Japan Grand Prix International Orchid and Flower Show.

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