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ORCHIDS

The Bulletin of the American Orchid Society

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Joane Molenock

FRONT COVER

Modern hybridizing in Oncidiinae has produced some incredibly spectacular results such as this *Oncidium Iliia Ferrusi* 'Iliia's Beloved' AM/AOS (Lisa Devos × Kevin Cobbledick) registered by the late Mario Ferrusi in 2015. Photograph by Jay Norris.

AMERICAN ORCHID SOCIETY

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

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

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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>.

Aerangis (Aerangis (air-RANG-iss))
Aerides (air-EE-deez)
Alba ((Al-bah)
Aliceara (al-iss-ARE-a)
anosmum (an-OSS-mum)
aurantiaca (aw-ran-tee-AY-ka)
barbatum (bar-BAY-tum)
belizensis (bel-eez-EN-sis)
bictoniensis (bik-tone-ee-EN-sis)
bowringiana (bow-ring-ee-AY-na)
Brassia (BRASS-ee-a)
Bratonia (bra-TONE-ee-a)
buccinator (buk-kin-AY-tor)
Bulbophyllinae (bulb-oh-fill-EE-nee)
Bulbophyllum (bulb-oh-FILL-um)
Calanthe (kal-AN-thee)
candida (KAN-dee-dah)
Catasetum (kat-a-SEE-tum)
Cattleya (KAT-lee-a)
Caucaea (KOW-kah-ee)
cernuum (SIR-nyew-um)
charlesworthii (Charles-WORTH-ee-eye)
Cirrhopetalum (sir-ho-PET-a-lum)
Clowesia (KLOW-see-a)
clowesii (KLOW-see-eye)
cordigerum (kor-DIJ-er-um)
cuneata (kew-nee-AY-ta)
Cynoches (SIK-noh-keez)
Cymbidium (sim-BID-ee-um)
Cynorkis (sin-ORE-kiss)
Dactylorhiza (dak-till-oh-RYE-za)
Dendrobieae (den-DROH-bee-ee)
Dendrobiinae (den-droh-BEE-ee-nee)
Dendrobium (den-DROH-bee-um)
devonianum (deh-vone-ee-AY-num)
Diaphanthe (dye-aff-an-AN-thee)
Dracula (DRAK-yew-la)
Encyclia (en-SIK-lee-a)
endresii (en-DRESS-ee-ey)
Epidendrum (eh-pih-DEN-drum)
Eulophia (yew-LOH-fee-a)
fitzgeraldii (fitz-jer-ALD-ee-eye)
flavescens (fla-VESS-enz)
gibbosa (gib-BOH-sa)
Grammatophyllum (gram-mat-oh-FILL-lum)
Guarianthe (gwar-ee-AN-thee)
Guaricyclia (gwar-ee-SIK-lee-a)
Hartmannii (hart-MANN-ee-eye)
hookeri (HOOK-er-eye)
ignea (IG-nee-a)
lone (ee-OH-nee)
ivanii (ee-VAHN-ee-eye)

kingianum (king-ee-AY-num)
krabiensis (krab-ee-EN-sis)
labiata (lab-ee-AY-ta)
lawrenceana (law-ren-see-AY-na)
lindleyanum (lind-lee-AY-num)
longifolium (lon-gee-FOL-lee-um)
Lycaste (lye-KAS-tee)
macrocarpum (mak-roh-KAR-pum)
macrochila (mak-roh-KYE-la)
madidum (MAD-ih-dum)
Masdevallia (mas-deh-VAIL-lee-a)
Maxillaria (maks-ill-AIR-ee-a)
medusae (meh-DOO-see)
Megaclinium (meg-a-KLIN-ee-um)
Miltonia (mil-TONE-ee-a)
Miltoniopsis (mil-tone-ee-OP-sis)
misera (MIZ-er-a)
Monacanthus (mon-a-KAN-thus)
monodon (MON-oh-don)
moreliana (more-el-lee-AY-na)
Mormodes (more-MOH-deez)
Myanthus (mye-AN-thus)
Myrmecophila (mir-meh-KOF-ill-a)
nobile (NOE-bih-lee)
nutans (NEW-tanz)
Oberonia (oh-ber-OH-nee-a)
Odontoglossum (oh-don-toe-GLOS-sum)
odorata (oh-dore-AY-ta)
odoratissima (oh-dore-a-TISS-ih-ma)
olivacea (ol-iv-AY-see-ah)
Oncidium (on-SID-ee-um)
Oncostele (on-koe-STEE-lee)
Paphiopedilum (paff-ee-oh-PED-ih-lum)
pendula (PEND-yew-la)
Peristeria (pair-ih-STAIR-ee-a)
Phalaenopsis (fail-en-OP-sis)
phasmida (FAZ-mih-da)
Phragmipedium (frag-mih-PEED-ee-um)
Phyllorchis (fill-ORE-kis)
pileatum (pil-lee-AY-tum)
planifolia (plan-ih-FOL-lee-a)
Platystele (plat-ee-STEE-lee)
Pleurothallis (plur-oh-THAL-liss)
pompona (pom-POE-na)
Rhynchobrassoleya (rin-koe-brass-oh-LEE-a)
Rhynchosia (rink-OH-nee-a)
Rhynchostele (rink-oh-STEE-lee)
Rodrumnia (rod-RUM-nee-a)
roezlii (ROZE-lee-eye)
rufilabris (roo-fee-LAY-bris)
saccifera (sak-IFF-er-a)
santanae (san-TAN-ee)

Sarcophilus (sar-koe-KYE-luss)
schroederianum (shroe-der-ee-AY-num)
scriptum (SKRIP-tum)
sinuata (sy-nyew-AY-ta)
skinneri (SKIN-ner-eye)
speciosum (spee-see-OH-sum)
spectabilis (spek-TAB-ih-liss)
spiculata (spik-yew-LAY-ta)
Stanhopea (stan-HOPE-a)
tahitensis (ta-hee-TEN-sis)
Teagueia (TEAG-ee-a)
thomsoniana (tom-son-ee-AY-na)
Thunia (TUNE-ee-a or THUNE-ee-a)
Tolumnia (tol-LUM-nee-ah)
tonsbergii (tonz-BERG-ee-eye)
toppingii (top-PING-ee-eye)
 trianae (TREE-an-ee)
triodon (trye-OH-don)
tuxtlensis (tuks-LEN-sis)
Vanda (VAN-da)
Vanilla (van-ILL-la)
vespirtilio (ves-per-TEE-lee-oh)
vexillaria (veks-ill-LAIR-ee-a)
viduata (vid-yew-AY-ta)
viridis (VEER-ih-diss)
warszewiczii (var-shuh-VITZ-ee-eye)

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Orchids in the Wild 2020



P. bellatulum

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



S. amabilis

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



Caladenia discoidea

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

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– **Conservation**

Lynn S Wians

– **Technology**

Joyce Medcalf

Wes and Laura Newton

Puerto Rico Judging Center

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PRESIDENT'S MESSAGE

THE PAST FEW weeks, I have been reflecting a lot on my life. I think it started when my only niece (who I held within the first 30 minutes of her life) turned 20. Where did the time go? It seems like yesterday (when she was just able to walk) that she started to go judge orchids with me and the rest of the judges from the center. Or it could be that I have been getting way too many phone calls from Medicare Supplement insurance agents, because I will be turning 65 in November. With all of this reflection, it makes me wonder, what will happen to my orchids; who will take care of them if something should happen to me? Do you have an orchid care plan in case something should happen to you?

We make arrangements for our children — who will take care of them if something happens to us (the parents). Well, I have heard people say their orchids are their kids. So, if you cannot make it out to your greenhouse, who is going to help?

I have a member in my local orchid society who has a key to my greenhouse and can take care of my orchids should something happen. He has taken care of my orchids when I have been traveling and they need to be watered. Plus, while I am gone, he does check the greenhouse even though he is not watering. So, I am very lucky; thank you Richard!

A lot of people have an app on their smart phone to tell them when their greenhouse is getting too hot or too cold. But what happens when the app is telling you your greenhouse is in trouble and you are not available? You could be out of town (or country) or maybe you cannot leave work to see to the problem. Do you have a plan or someone that can run over to look over the situation and help you so you do not lose your collection? Can you hide a greenhouse key close to your greenhouse so if this emergency happens someone can help you?

Being President of my local orchid society, I am the one that receives the call from family members when a member of our society dies and the family wants to donate their orchid collection to the society. That is a nice thought, but usually orchid collections are the last thing a grieving family thinks about and when they do, the collections may be past saving.

Could we start an orchid rescue program? A resource that could be called upon to do the basic care of said orchids (temporarily) or help arrange for orchid "adoption?" These are all questions we

should be asking ourselves because we love our plants so much and might be the only person in our family who even knows how to take care of them.

If you have ideas about what to do with collections, especially those with rare species, when a member can no longer care for their plants, please send your suggestions at the email address at the end of this article so we can all make sure our orchid children are thriving when we are not able to care for them. If we get helpful ideas, you will see them in an upcoming issue of *Orchids* magazine.

The fall 2019 American Orchid Society Members' Meeting is just weeks away, October 16–20, in Homestead, Florida, in conjunction with the East Everglades Orchid Society show. I hope you have already registered, but if not, please do so immediately.

The spring 2020 AOS Meeting will be held in Sacramento, California on April 15–19. The hotel location is just a few blocks away (walking distance) from Old Towne Sacramento, where you can walk on wooden sidewalks and enjoy the cobblestone streets. There are some great restaurants in the area as well as a river walk just outside the hotel and the famous (at least in this area) Tower

Bridge. Sacramento is less than two hours from Lake Tahoe and just over an hour from the Napa Valley and its wine country. Plus, the gold country in the foothills surrounding Sacramento has a lot of great wineries to enjoy. So, think about coming to Sacramento for the Members' Meeting and add a few extra days to enjoy the scenery around it! At least mark your calendars now.

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

The document to the right was drafted by Carlo A. Balistreri, Balistreri Law Office, and was published in the July 1994 *American Orchid Society Bulletin*, 63(7):799–800, as a potential option for the protection of a significant collection of orchid plants. Neither the author nor the American Orchid Society is engaged in providing specific legal help. Anyone desiring to utilize this document should consult a lawyer familiar with estate planning.

Webinars-Coming Attractions!



When	October 03, 2019 8:30pm EDT Thursday	October 07, 2019 8:30pm EDT Monday	November 07, 2019 8:30pm EST Thursday	November 12, 2019 8:30pm EST Monday
Topic	Greenhouse Chat (Orchid Q&A) <i>Send in your Questions!</i>	Conservation & Ecology of North American Cypripediums	Greenhouse Chat (Orchid Q&A) <i>Send in your Questions!</i>	How to Buy and Grow Bulbophyllums
Presenter	Ron McHatton Chief Education and Science Officer	Tara Luna Pacific NW Field Botanist & Ecologist	Ron McHatton Chief Education and Science Officer	Charles Wilson Accredited AOS Judge and Education Committee Member

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

Cannot make it on the scheduled date or time? No need to worry. Register anyhow!
We digitize the webinars and they are available to view at your leisure from the same webpage.

Webinar announcements are posted to Facebook,

Instagram and in the AOS Corner of your affiliated society's newsletter.

Send your Greenhouse Chat questions and photos to: greenhousechat@aos.org

The (Grantor's Name) Collection Protection Trust

This Trust Agreement is made this ___ day of ___, 1994 between (Grantor's Name) of ___ County, State of ___ as Grantor and (Grantor's Name) as Initial Trustee. Its purpose is to preserve the viability and health of Grantor's orchid collection during Grantor's lifetime and provide for the proper and timely disposition of the collection upon Grantor's death.

The Grantor hereby transfers to the Trustee the property described in the attached schedule along with all records, written or electronic, pertaining to the same. That property, and any other property that may be received by the Trustee hereunder, shall be held and disposed of as herein-after set forth.

ARTICLE I. POWER TO AMEND OR REVOKE

A. During the Grantor's lifetime. Grantor may revoke or amend this trust, in whole or in part, by an instrument in writing signed by the Grantor and delivered (personally or by mail) to the Trustee; provided, however, that the duties and liabilities of the Trustee shall not be substantially changed without the Trustee's written consent. On revocation, the Trustee shall deliver the trust estate or the revoked portion thereof to the Grantor.

B. All of the Grantor's powers to revoke and amend are personal to the Grantor and, in the event of disability, may be exercised on the Grantor's behalf only by a guardian with court approval or by the holder of a durable power of attorney for the purpose of making gifts or taking other actions that are authorized by express provisions of the durable power.

C. After the death of the Grantor this trust agreement may not be revoked or amended.

D. The Grantor or another may transfer and convey other property to the Trustee and may increase this trust or any part hereof by bequest, devise or beneficiary designation, all subject to acceptance thereof by the Trustee.

ARTICLE II. TRUSTEE'S RESPONSIBILITIES DURING GRANTOR'S LIFETIME

As long as the Grantor is alive, the Trustee may perform any act in the management, supervision, and care of the orchid collection, and shall have immediate access to the collection for assessment and care purposes. Trustee agrees to provide regular care for the collection, including, but not limited to: watering, fertilizing, pest control, fungus and rot control and sanitary functions. Trustee agrees to use only equipment and supplies that Trustee is familiar with and that are consistent with the care given the collection before appointment. If Trustee is not familiar with the equipment and supplies used by the Grantor, Trustee agrees that Trustee will use Trustee's own equipment to provide the care contemplated by this document.

ARTICLE III. DISPOSITION UPON DEATH, TERMINATION OF TRUST

Grantor recognizes that the plants will not survive the administration of Grantor's estate without immediate and regular care. Grantor's heirs may not have an interest in the continuation of the collection. They may not know how to care for and dispose of the collection properly. Grantor authorizes the Trustee to consult with Grantor's spouse and/or next of kin and Grantor's personal representative about the immediate care and appropriate disposition of the plants to insure their continued viability and the conservation of the individual clones. They need not keep the collection intact. They shall, however, be responsible for accounting to the personal representative of the estate for any disposition made.

This trust shall terminate immediately upon the final disposition as set forth in the above paragraph. Under no circumstances shall this trust be in existence any longer than five years after the date of death of the grantor. In the event any assets remain in this trust at the end of five years from the date of death of the grantor, the trustee shall be empowered to dispose of the remaining asset, prepare a final accounting and terminate the trust.

ARTICLE IV. CONSIDERATION

Grantor agrees to reimburse the Trustee for the reasonable cost of any equipment and supplies required for the care of the collection. In addition Grantor agrees to reimburse Trustee for mileage expenses in a manner agreed upon by the parties.
(optional)

[Grantor and Trustee agree that the Trustee shall receive no compensation under this agreement. Rather, Grantor will donate \$ ___ per day of service to the (orchid organization of Grantor's choice) to use in their educational programs for orchid conservation.]

If Grantor dies, this provision be legally binding upon Grantor's estate until it disburses the collection. It shall be considered an administrative expense of Grantor's estate, necessary to preserve its assets.

ARTICLE V. DISCLAIMERS

The Trustee shall not be liable for any damage or loss to the collection occurring during the duration of this agreement except for that caused by the gross negligence of the Trustee.

Trustee agrees that the Grantor shall not be liable for any loss, damage or injury to the Trustee occurring on Grantor's property during the duration of this agreement, except that caused by the gross negligence of the Grantor.

ARTICLE VI. SUCCESSOR TRUSTEES

In the event that the Grantor declines or is no longer able to act as Trustee under this Agreement at any time and for any reason. Grantor nominates _____ as Successor Trustee. In the event she (or he) declines or is unable to act for any reason. Grantor nominates and appoints _____ to act as Trustee. Each Trustee named in this paragraph is empowered to do all things specified in this document.

IN WITNESS WHEREOF, the parties have executed this instrument on the date first written above.

_____, Grantor

_____, Initial Trustee

WITNESS:

Many Faces of Floriferousness

By Jean Allen-Ikeson

FLORIFEROUSNESS IS IMPORTANT to orchid growers, breeders and judges: it is one time that more is better and on which most of us will agree. But where the agreement starts to wobble is over just what is floriferousness and how judges should describe it.

The easy answer is that it is the number of flowers on x number of inflorescences. Such a definition is reasonable when you have 2,383 flowers and 38 buds on 87 inflorescences. With so many flowers and so many inflorescences, the numbers are so overwhelming that it could be argued that no more information is necessary, except perhaps reporting that the inflorescences covered all sides of the plant. When the number of flowers, buds and inflorescences is a smaller number where, for instance, 38 flowers on one inflorescence is not quite the same as 38 flowers on three inflorescences, there is justification for more information. Here are some examples of ways in which floriferousness could be defined:

- 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 by product of “how fully flowered” the plant is)
- Number of inflorescences per growth
- Branching

Floriferousness, depending on the plant, could be all these and as such should be reported where possible. At times this may be impractical, but it should be remembered that the purpose of a description is to write a picture of the flowers, inflorescences and plant but also to provide judges looking at the same species or hybrid at a later date with a clear picture of the previous award.

This seems clear but there are gray areas that should be considered. Are 38 flowers on three inflorescences each from separate growths the same as a single inflorescence with 38 flowers? Should they be scored the same? The first reflects a more mature plant, the second reflects genetic potential. If the three inflorescences are on a complex odontoglossum-type hybrid and all come



Given a Certificate of Cultural Merit of 85 points, *Cymbidium Cricket* ‘Pala Pala’ CCM/AOS (*devoniamum* × *madidum*) carried 485 flowers and 223 buds on 16 inflorescences.

from a single growth, this is yet another aspect of floriferousness. All are the result of good culture. Breeders would be impressed by both three inflorescences on a single growth and 38 flowers on a single inflorescence. Clones that are more likely to produce multiple inflorescences per growth are sought after. A commercial plant with two inflorescences on a pseudobulb is worth more than one with a single inflorescence. It is an aspect of quality and an advance in breeding that is not simply culture dependent. But would you define a total of 38 flowers on three inflorescences on three pseudobulbs as the same as three inflorescences on a single pseudobulb? Same number of flowers on each. Breeders would tell you that the second certainly has better floriferousness because it reflects genetic potential in addition to good culture.

Paphiopedilums that normally only have a single flower per inflorescence are judged on the paphiopedilum scale. There are no points for floriferousness because it is assumed that one flower is one flower and floriferousness is not an issue because, besides having a single flower, the potential is only for a single flower per inflorescence. That would assume that the only definition of floriferousness is number of flowers per inflorescence and that total number of flowers is insignificant. What if you have a plant such as *Paphiopedilum charlesworthii* that has eight inflorescences? You are judging for quality, not culture. Is it reasonable to say that plant, if everything else is equal to the plant with a single inflorescence, should not have any points for floriferousness? No other example or groups are not given points for a more robust plant with more

flowers and where the total number of flowers is not considered. However, the Handbook says to use the Paphiopedilum Scale. The only alternative is to use the General Scale. However, besides 10 points for floriferousness, there are 10 points for habit and arrangement of the inflorescence, which does not fit. It is a conundrum.

While you could argue that branching is part of habit and arrangement, branching also reflects genetic potential for and adds to floriferousness. A higher number of points given for floriferousness should reflect an inflorescence that shows this genetic potential. For example, a well-grown *Phragmipedium lindleyanum* will branch and add grace and balance to the inflorescence besides increasing the number of flowers although some clones are more prone to branching than others. It is why it is so important to include branching of an inflorescence in the description so that the plant is appreciated for this rather just the form and color of a single flower.

The bottom line: include in the description, in addition to the number of flowers and inflorescences, any branching, number of inflorescences per growth if more than one, the length of the longest inflorescence, the number of flowers on the most floriferous inflorescence (genetic potential) if it is significantly different from the others, the number of buds “plus additional developing buds,” and immature, developing inflorescences. All this gives a more complete picture of floriferousness.

— Jean Allen-Ikeson chairs the AOS Editorial Board. She is an accredited judge in the Toronto Center and serves as the Center’s Training Coordinator (email: jean.ikeson@gmail.com).

Dear Editor:

IN THE *ORCHIDS* issue for May of this year, Rubén Sauleda and Claudia Elena Gutiérrez commented on a few points of a book review I wrote for the second volume of *Orchids, a Colombian Treasure*, by Pedro Ortiz Valdivieso and Carlos Uribe Vélez.

In particular, Rubén and Claudia Elena confirm the Colombian record of *Encyclia belizensis*, answering my suspicion that “the name of Colombian populations is misapplied, as it seems difficult to explain such a broad disjunction between the populations of northern Nicaragua and those of Colombia.” It is now clear that the “Colombian” record of this species is from the island of San Andrés, just 80 km from the east coast of Nicaragua. This is no doubt correct on political grounds, but it is biogeographically wrong, as I suspected, and confirms my hypothesis that a taxon exclusively known from northern Central America cannot, normally, bridge the isthmus to South America. The flora of the overseas territories should, in my opinion, always be treated in a special chapter, in order not to give an erroneous impression about the natural distribution of plants. Nobody, I guess, would include *Dichaea pendula* in an orchid flora of France, even though the type was described from the “ultramarine” French territories of Guyana.

Rubén and Claudia Elena also discuss my statement about *Encyclia macrochila* (recently reinstated by Sauleda and Esperon [2017] as a good species, a point upon which I agree), where I considered that only “a careful study of genetic and morphological variation within and among the populations through the whole distribution range of the group, can resolve the taxonomy of *Encyclia cordigera*.” Here I have to maintain my opinion, and take the opportunity to expand upon my explanation.

The type of *Epidendrum* (*Encyclia*) *cordigerum* is from Venezuela, not far from the Caribbean coast. According to the type specimen conserved in Paris, its lip must have been solid purple, as it dried in a characteristic orange color. Nevertheless, specimens from the same region of the type may be quite variable as to the coloration of the lip, varying from solid purple to various degrees and shades of purple, rose-purple, rose with white margins, etc. Plants of *Encyclia* cf. *cordigera* with solid purple lips are

known northward to Panama, but not in Costa Rica. Here, and probably in Nicaragua, it is substituted by a taxon with a white, and differently shaped, lip striped with purple in front to the callus, which was originally described as *Epidendrum macrochilum* (today *Encyclia macrochila*). Further north, a pale rose-purple-lipped *Encyclia* species reappears in El Salvador, and other populations with various degrees of purple lips are found in Guatemala and southern Mexico.

Now, my rationale is simply that, unless we support the quite improbable idea of two independent migration routes of *Encyclia cordigera*, one through the terrestrial bridge of the isthmus north to Panama, and the other via the Antillean arc to Mexico and then south to El Salvador, we cannot explain the absence of a purple-lipped taxon in Nicaragua and Costa Rica. The only rational explication for this absence is, in my opinion, that the purple-lipped populations of *Encyclia* from the northern portion of the Central American isthmus, treated as *Encyclia cordigera*, belong to one or more different taxa. So, it may well be that there is one (or more) species in this complex in South America, one of which must be the true *E. cordigera*, then *E. macrochila* in Costa Rica and Nicaragua, and then one or more species of the complex in northern Central America.

I did not discuss the validity of the experimental crosses carried out by Rubén and his colleagues, which confirms that self-pollination of *E. macrochila* always produces white-lipped progeny, whereas the crossing of purple forms always results in progeny with “light purple to reddish purple” lips. What I discussed was whether the South American purple forms and the purple forms from northern Central America are the same species, and how the “hole” occupied by Costa Rica and Nicaragua can be explained. I continue to hypothesize that the taxonomy of the *E. cordigera* complex may be resolved only through genetic studies through the whole distribution range of the group, which can rationally explain the recorded variation on a solid phylogeographic basis.

—Franco Pupulin, Lankester Botanical Garden, University of Costa Rica.

October: The Month of Harvest

By Thomas Miranda

ALL ACROSS THE Northern Hemisphere, farmers are reaping the results and rewards of their hard work over the spring and summer. Gardeners are seeing their annuals and perennials going to seed and hopefully collecting the heirloom varieties to plant next year, or share in an upcoming seed exchange. Orchid growers are witness to the maturation of pseudobulbs on cattleyas, lycastes and cymbidiums, as well as the new leaves on phalaenopsis, vandas and angraecoids, as well as their promise of spectacular new flowers in season. Your earnest efforts this year in cultivating your orchids, with consistent repotting, watering, fertilizing and attention to light levels, temperatures and humidity are about to pay off.



Thomas Miranda

I compare it to our own life efforts. We certainly all have our individual challenges, and not everything in our lives “blooms” the way we might like it to.

It is a basic truth that the effort we put into learning, into practice, and relationships, over time, builds our lives into something greater, something beautiful and something profound. As we mature and find many blessings in our lives coming to fruition, I like to think that we earned them with our passionate energy and determination. Like a well-bloomed orchid plant, our success is based on our ability to understand something beautiful both inside and outside of ourselves.

PHALAENOPSIS Although actual flowers may be scarce this month, happily, this is the time most phalaenopsis are initiating spikes. It is so exciting to see those upturned growths appear and start to elongate around now. Not everyone understands, though, that this spiking is the result of two environmental factors that you should pay attention to: temperature and photoperiod. As temperatures naturally dip in the fall months, phalaenopsis are triggered to start their inflorescences. Do not miss out on this subtle trigger. If your plants are indoors and you keep your temperatures constant year-round, it is possible that your phalaenopsis may not get the signal to set a spike. I also believe that photoperiod plays a role in blooming. As days shorten and nights lengthen, the



Miltonia Anne Warne ‘Ruth Kelly’ CCM/AOS (Bluntii × *spectabilis*) photographed by Arnold Gum. Although registered as a hybrid of *Miltonia spectabilis*, the actual species used was most likely *Miltonia moreliana*, long considered a varietal form of *Milt. spectabilis*.

plants can sense which season it is. Often, folks growing plants under lights might miss this subtle signal as well, especially if they keep their photoperiod constant year-round and do not vary daylengths with the natural seasons of the year.

CYMBIDIUMS These magnificent plants make amazing specimens over time and can put on a plentiful and long-lasting show of marvelous flowers. These are heavy feeders, and it is fun to watch these vigorous plants produce bigger and bigger pseudobulbs each year. However, many growers do not understand the basics of their cultural needs. Most standard cymbidiums need cooler temperatures starting this time of year in order to set their spikes. Nighttime temperatures in the 40s F (5–9 C) are often necessary. Depending on where you live, this can be almost impossible to achieve. South Florida and Southern California climates can be problematic. Even temperate growers where appropriate cold temperatures are occurring outside might miss this important factor because they bring plants inside into the heat too early in the season. Let plants chill this month before protecting them from frost and you will see excellent spike initiation. Happily, even if you live in a climate that does not allow you to bloom these well,

new, showy, warmer-tolerant cymbidiums have been (and continue to be) bred that will allow all of us to grow and bloom these outstanding orchids to perfection.

CATTLEYAS By this month, your cattleyas should have developed fine, plump maturing pseudobulbs and each new growth should have a sheath from which their buds will emerge over the next six months. Fall blooming types, such as *Cattleya labiata* and *Cattleya trianae* and their hybrids as well as hybrids of *Guarianthe bowringiana*, *Guarianthe skinneri* and *Guarianthe aurantiaca* should be swelling with buds and blooms already. Sometimes it is advisable to remove the sheaths gently and carefully to allow unfettered bud development. High light levels and air movement are still pretty important for these spectacular plants to bloom their best. A little less watering and fertilizing, as well as somewhat cooler nighttime temperatures, mid-50s to 60s F (13–18 C) are also helpful to initiate spikes. Make sure not to overcrowd them so they get excellent airflow, and pay attention to individual plants. You want to search for, and eliminate, harmful pathogens such as Boisduval scale for the best results.

DENDROBIUMS October is the peak of the blooming season for the long-lasting

and floriferous hard cane dendrobiums. These statuesque plants are wonderfully elegant and can bloom magnificently this time of year. Giving them warm temperatures, high light and excellent air movement are the keys to success. Later in the winter and spring is the time for the deciduous species and hybrids of *Dendrobium nobile* and *Dendrobium anosmum* and others. Although cool temperatures play a role in the blooming of these plants, dryer conditions starting around now will get bud formation going. If you water them too much this time of year, you will likely get keikis rather than flowers. Most of us would rather have the blooms, even though keikis are a nice consolation prize. Either way, a harvest of flowers or adventitious growths is a fine reward for a summer of hard work watering and feeding your orchids.

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

MAKE SURE PEOPLE CAN REACH YOUR AFFILIATED SOCIETY

Our records are only as good as the information our affiliates provide. We recommend our affiliates update their AOS record periodically — at least after every annual election — using our online form:

<http://affiliatedsocieties.americanorchidsociety.org/update/>

Pay particular attention to:

- proper points of contact
- accurate society information — we use this for the Affiliated Societies search on our website and preparation of the annual Orchid Source Directory listings

Help us ensure the AOS Corner, renewal notices and important correspondence reach you.

The American Orchid Society on Social Media Find Us on Facebook - More than Pretty Pictures

DID YOU KNOW that the American Orchid Society Facebook page has exceeded 32,000 members? Did you even know we had a Facebook page? Maybe you have never heard of Facebook but there are more than 32,000 orchid lovers that visit the American Orchid Society group frequently. They post photos and videos of their blooming orchids, ask questions, add comments and share their passion for the flowers we all love. In *real time* too.

According to a random Google search — the official stated purpose of Facebook is to make the world more open and connected. Facebook's latest mission statement is that people use Facebook to stay connected with friends and family, discover what is going on in the world, share, and express what matters to them. More than 32,000 people think orchids matter.

Facebook is a networking service that can be accessed from devices with internet capability. The American Orchid Society has had a presence on Facebook since the group was created on March 19, 2009. We are truly growing a global community. Some may scoff at the term social media. Those that do not use it have no idea how far reaching it really is.

Every day there are new requests to join our group page. They come from around the world. Open our page (<https://www.facebook.com/groups/52597049839>) on any given day and you will be amazed by the variety of orchids our group members grow.

Orchids are survivors. Published records report evidence of orchid pollen trapped in amber dating back 45 to 55 million years ago. Orchids adapt well to so many different growing conditions. Perusing the posts, one thing we all need

to keep in mind is that the resources we each have available to help our orchids grow are as varied as the orchids themselves. Potting media, fertilizers, water quality, pots, mounts, even down to the components of shade houses or greenhouses vary, from locale to locale. We make do with the materials we have on hand. Some are fortunate to have access to quality resources, but many do not have the same opportunity. They choose to grow orchids anyway.

It is eye opening to see the many different orchids that our group members share. Some of these orchids we may otherwise never see in person. Although there are some general guidelines for growing orchids, it is not a one-size-fits-all endeavor. Our page bears out that orchid growing truly is a global passion. If you have contributed to our page, thanks for sharing a part of your world with us.

When you are on our page, if you just want to see orchid photos (<https://www.facebook.com/groups/52597049839/photos>) and you see something you like and would like to know more about it, click on the photo and read the comments. Orchid videos are found at <https://www.facebook.com/groups/52597049839/videos/>.

On Facebook there are different orchid pages for societies, clubs, judging centers, growers, sellers, traders, rescuers and everything else in between. There are other pages dedicated to species, allied genera and habitat. There are pages for native orchids. There is no shortage to the number of orchid-related pages on Facebook.

— *Eileen Hector is an AOS Marketing and Membership Committee volunteer, an AOS Facebook Moderator (email: em.hector@verizon.net).*

The American Orchid Society would like to become the trusted authority for information on orchids. To accomplish this we are looking for a few dedicated team members to help moderate our Facebook page. Duties will include, but are not limited to, reviewing prospective member Facebook profiles for AOS page membership, responding with orchid-based knowledge to inquiries, directing prospects to nearby affiliated societies, and increasing the number of AOS members.

The Membership and Marketing Committee is in the process of creating a guide for our volunteer Facebook moderators. If you are interested in helping with our AOS Facebook page please send an inquiry to Bill Bodei, Committee Chair, wbodei@aos.org and include AOS Facebook Moderator in the subject line.



Sylvia Strigari

Bulbophyllum medusae

Text by Melissa Díaz-Morales and Franco Pupulin/Watercolor by Sylvia Strigari

Tribe DENDROBIEAE
Subtribe DENDROBIINAE
Genus BULBOPHYLLUM *Thouars*

Bulbophyllum medusae (Lindl.) Rchb.f., *Annales Botanices Systematicae* 6: 262. 1864. *Cirrhopetalum medusae* Lindl., *Edwards's Botanical Register* 28: t.12. 1842. *Phyllorchis medusae* (Lindl.) Kuntze, *Revisio Generum Plantarum* 2: 677. 1891. TYPE: Singapore, *H. Cuming s.n.* (holotype, K).

An epiphytic, small *herb* up to 25 cm tall, often forming large clumps. *Rhizome* creeping, 5.5–6.0 mm in diameter, the internodes elongate, the pseudobulbs 5–8 cm apart. *Pseudobulbs* ovoid, slightly triquetrous, to 4.3 × 3.0 cm, unifoliate. *Leaves* oblong, obtuse, coriaceous, bending backwards, base deeply conduplicate, midgreen, 12.5–15.3 × 1.9–2.8 cm, the base of the younger shoots covered by two or three glumaceous, enveloping, triangular-ovate bracts, becoming dry and papery with age, the upper one larger, to 3.6 × 3.0 cm. *Inflorescence* erect to gently arching, unbranched, subumbellate, many-flowered (to 15), 14.5–15.5 cm long; peduncle terete, light green, up to 15 cm long, enclosed by four ovate, subacute, conduplicate, tightly adpressed, glumaceous, yellow bracts, 22.5–30.5 × 5.2–6.5 mm; rachis very short, with the flowers spirally and tightly carried in an umbrella-like arrangement. *Pedicellate ovary* subclavate, light green, slightly arcuate, rounded in section, 10.0–10.5 × 2.0–2.5 mm including the pedicel. *Flowers* white with purple spots on the base of the abaxial surface of sepals; hyaline petals white, lip pale yellow, suffused with dark red on the base of the abaxial surface; the white column hyaline, with dark purple spots on the base of the stigma. *Sepals* strongly dissimilar in size and shape. *Dorsal sepal* lanceolate, acuminate, 20.5–25.0 × 4.0–5.0 mm at the base, five-veined, the apex recurved and bending backwards, ca. 0.4 mm broad at apex. *Lateral sepals* lanceolate, long-caudate, slightly bending backwards, much longer than the dorsal sepal, 107.0–120.5 × 3.5–4.1 mm at the base, ca. 0.3 mm broad at apex, five-

veined, the tails somewhat wavy. *Petals* triangular-lanceolate, acuminate, 9.0–9.5 × 2.5–3.0 mm at the base, ca. 0.2 mm broad at apex, three-veined. *Lip* trilobed, unguiculate, 7.0–1.1 × 3.8–6.1 mm, the claw transversely obovate, decurrent under the lamina, the lateral lobes subrectangular, erect, forming a channel, the midlobe narrowly triangular, convex to distinctly conduplicate; disc provided with two lateral, low, rounded keels running and convergent toward the apex. *Column* semiterete, straight, ventrally strongly convex, 7.2–8.6 mm long, provided with narrow triangular, acuminate, subfalcate, stigmatic stelia longer than the column, 10.5–11.0 mm long; stigma subapical, ventral, rectangular, 1.2–1.5 × 2.4–2.9 mm. *Anther cap* cucullate, cordate, tetralocular, 9–10 mm long. *Pollinia* four, in two similar pairs, triangular-ovate, strongly flattened, 3.3–3.6 × 7.5–7.7 mm, without stipes and caudicles.

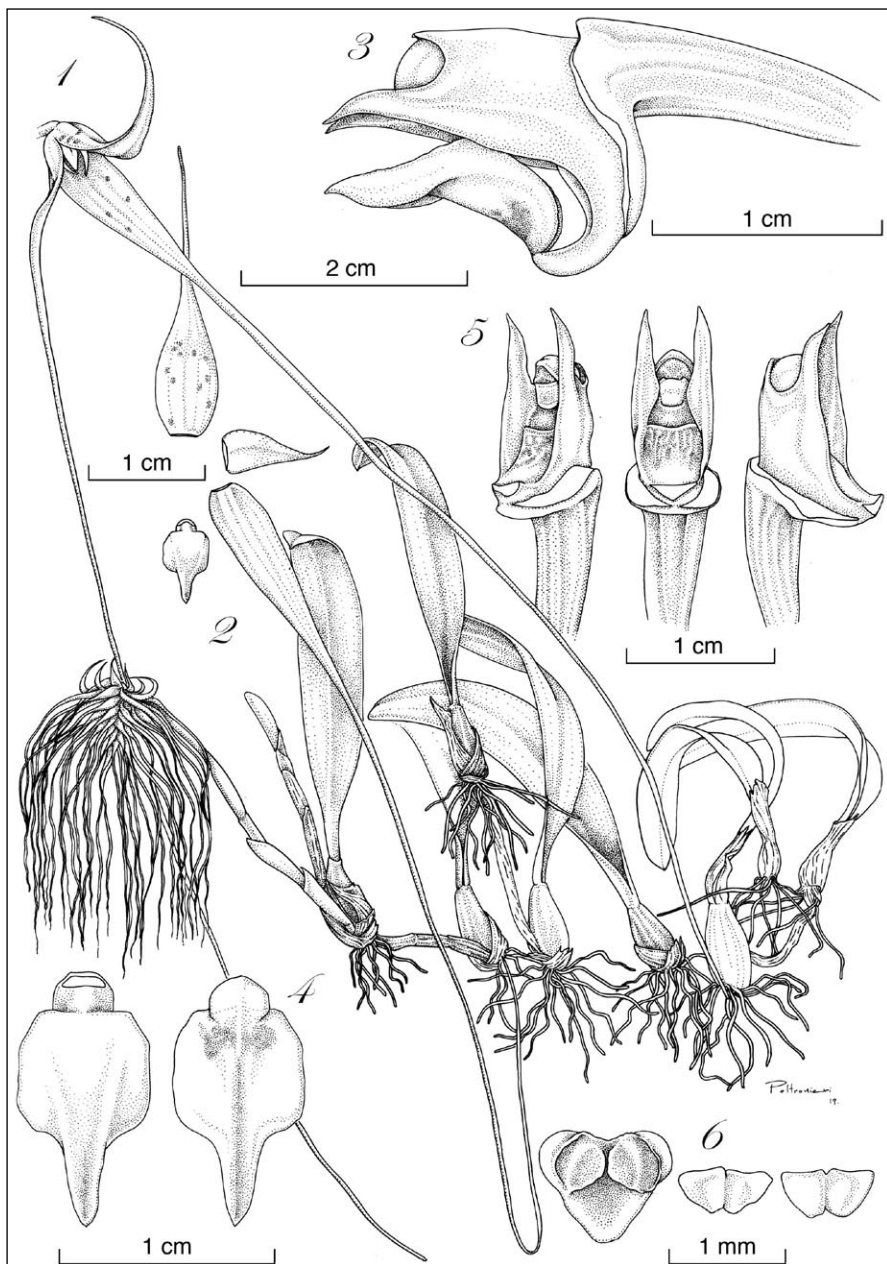
Bulbophyllum, in its broadest circumscription, represents the largest genus in the whole family Orchidaceae, with over 2,000 recognized species. It is also one of the few groups of advanced orchids having a worldwide distribution, with the largest number of species recorded in the tropical and subtropical regions of the planet, but also with a few taxa extending into temperate regions. The richest area in *Bulbophyllum* diversity is New Guinea, with more than 600 documented species, and this region east to Wallace's Line is usually considered the dispersion center for the genus, which is then more diverse in Asia and less so in Madagascar (a second dispersion center) and the equatorial regions of the African continent. Only a few species (for the size of the genus), probably around 100, found their way to colonize the tropical regions of America, where they are distributed in the West Indies, and Central and South America.

Due to the diversity of the species in the genus as to plant habit, vegetative architecture, structure of the inflorescence, floral size (varying from a few millimeters to almost half a meter), and morphology, taxonomists have traditionally regarded *Bulbophyllum* as

a complex of related genera. Only a few years after the French botanist Louis-Marie Aubert Du Petit-Thouars (1758–1831) described *Bulbophyllum* (today typified by *Bulbophyllum nutans*), John Lindley segregated the first groups of species under the genera *Megaclinium*, *Cirrhopetalum* and *Ione* (Lindley 1826, 1830, 1853), and to date some 64 different genera have been proposed to accommodate the overwhelming variation in *Bulbophyllum* sensu lato.

Nevertheless, the diagnostic characters traditionally used to circumscribe genera in the Bulbophyllinae have, so far, proven to be mostly homoplasious (evolved independently in different evolutionary lineages to have similar functions so that they do not provide evidence of a common ancestry) in all the results obtained from molecular analyses based on combined plastid and nuclear molecular data (i.e., Smidt et al. 2011, Hosseini et al. 2012, 2016). This favored the adoption of the systematic treatment adopted in *Genera Orchidacearum* (Gravendeel and Vermeulen 2014), where all the genera proposed in the Bulbophyllinae are included under *Bulbophyllum* in a broad sense. Now the Australian Tropical Herbarium is leading a project aimed at a new analysis of the evolutionary relationships in the Bulbophyllinae utilizing a next-generation sequencing approach, which could reveal the evolution of key morphological characters and the spatiotemporal evolution of the group, and in particular of the Asian/Australasian clade (Schulte 2019).

In 1842 John Lindley (1799–1865) described *Bulbophyllum medusae* under the name *Cirrhopetalum medusae* from a plant cultivated at the Loddiges & Sons Nursery, in the London borough of Hackney, where it had been originally imported from Singapore. The plant was likely sent to London by Mr. Hugh Cuming (1791–1865), known as the “prince of collectors,” an English naturalist especially interested in collecting and studying mollusk shells (the bivalved mollusk *Cumingia* is named after him). The Loddiges nursery started to import



Bulbophyllum medusae. The plant. [All drawn from *JBL-28197* by Sara Poltronieri]

1. Flower.
 2. Dissected perianth.
 3. Column and lip, lateral view.
 4. Column, lateral and frontal views.
 5. Lip, frontal and dorsal views.
 6. Anther cap and pollinia.
- All drawn from *JBL-28197* by Sara Poltronieri.

tropical orchids around 1812, and soon, under the guidance of Conrad Loddiges and especially his son George, this group of plants became one of the mainstays of the firm's business. Like other nurseries in England, Loddiges also worked together with a number of professional collectors, including H. Cuming (Jenny 2008). In spite of Cuming's special interest in mollusks, he also made valuable contributions to botany and other fields, being one of the initiators of the practice of sending living specimens on ships (Melvill 1895). After his visit to South America — where he resided in Valparaíso, Chile — and his first expeditions throughout the South Pacific islands, he returned to England to find himself with a remarkable reputation among the scientific community. He

was then encouraged to explore the tropical Eastern Hemisphere, where the Philippines would be his destiny this time. After more than four years, on his return journey, he also made passing visits to Malacca, Singapore, St. Helena and the Malayan Peninsula (Melvill 1895).

Lindley named the species in honor of the Gorgon Medusa, a Greek mythological character. According to some versions of the myth, Medusa was raped by the sea god Poseidon in the Temple of Athena, and this triggered the rage of goddess Athena, who transformed Medusa and her sisters (Stheno and Euryale) into creatures with hairs made of venomous snakes and a gaze that turned those who looked upon it into stone. Medusa was the most beautiful of the three sisters, and the only mortal of the Gorgons. She was brutally beheaded by Perseus, as a request from King Polydectes. Perseus used Medusa's head as a weapon in his battles and then he gave it to Athena, who used it to adorn her shield (García 2013). Nevertheless, in the description of *Cirrhopetalum medusae* Lindley offers an alternative outcome to the myth:

"Certainly if ever there was a Medusa this must be the prototype, before her Gorgonship's beautiful tresses were changed into serpents; nor are wanting the scales with which her form was safely guarded. We believe that this young lady was carried out of harms way into the ocean of India by Neptune [the Roman counterpart of the Greek god Poseidon], and that all they tell us about Perseus having cruelly killed her is a fable; for is not here the proof?" (Lindley 1842)

Bulbophyllum medusae can be found from sea level to 400 meters in Borneo, Sumatra, Malaysia, peninsular Thailand, Singapore and the Philippines, growing either on limestone or as an epiphyte (O'Byrne 2001, Siegerist 2001). This species can be cultivated in well-draining baskets or pots under warm and lightly shaded conditions using sphagnum moss and coconut fiber as substrate. The humidity should be constant as well as the application of fertilizer.

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Selected Botanical Terms

abaxial - lower surface of a leaf
 acuminate - tapered to a point
 acute - pointed
 adaxial - upper surface of a leaf
 adpressed - lying closely to the adjacent part
 arcuate - curved like a bow
 bifid - divided into two parts by a deep cleft
 caudate - having a stalk or tail
 caudicle - slender, elastic structure to which the pollen masses are attached (plural = caudicles or caudiculae)
 clavate - club-shaped
 claw - narrowed basal portion
 concave - bowl-shaped
 conduplicate - folded lengthwise along the middle
 congested - closely spaced
 connate - fused to form a single part
 convex - curved outward like the surface of a sphere
 cordate - heart-shaped
 coriaceous - leathery
 cucullate - hooded
 deflexed - downturned
 denticulate - finely toothed
 distichous - opposite vertical rows

erose - irregularly notched
 falcate - sickle-shaped
 flexuous - flexible, full of bends and curves
 glabrous - smooth
 glumaceous - chaffy or in a dense head
 homoplasious - evolved independently and not indicating a common ancestor
 hyaline - glassy, translucent
 imbricate - overlapping
 internode - portion of stem between nodes
 lamella - plate of tissue
 lanceolate - a narrow oval tapering to a point at both ends
 ligulate - strap-shaped
 oblanceolate - narrow at attachment, rounded apically
 obovate - egg-shaped with the wide end up
 obtuse - blunt or rounded
 ovate - egg-shaped with the narrow end up
 panic - loose, branching cluster
 papyraceous - papery
 pedicel - a stem carrying a single flower
 peduncle - the lower part of the inflorescence below the first bud

petiole - the stalk joining a leaf to a stem or pseudobulb
 raceme - flowers arranged along a central stem
 rachis - portion of the inflorescence carrying the flowers
 recurved - bent or curved backward or downward
 semiterete - partially terete
 steldia - small teeth
 stipe - a small stalk
 subacute - moderately pointed
 subapical - below the apex
 subclavate - nearly club-shaped
 subfalcate - somewhat sickle-shaped
 subrectangular - nearly rectangular
 subtterminal - at the end of a stem
 subumbellate - almost an umbel
 tetralocular - four-chambered
 triquetrous - triangular in cross-section
 type - specimens on which a description is based
 unguiculate - having a narrow, stalk-like base
 viscidium - the sticky pad on the caudicle or stipe of the pollinarium that attaches the pollinarium to a pollinator

Fall Preparations

Text by Sue Bottom/Photographs by Terry Bottom

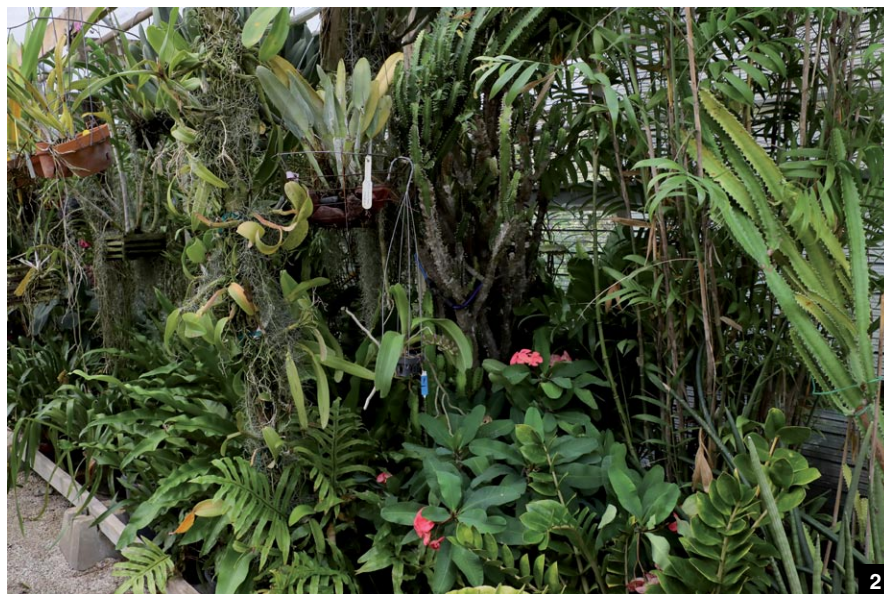
THE WELCOME TRANSITION to fall is upon us; the temperatures are starting to moderate and the humidity is going down. Our orchids are responding by entering their fall growth spurt when you see new green root tips start to emerge. If you have any plants that need repotting, this is your last chance this year. Enough of the growing season is left for them to get re-established. You may increase watering a bit during this brief period, as the lower humidity allows pots to dry out more quickly.

CLEAN UP YOUR PLANTS Use the delightful fall months to spend some quality time with your plants. Inspect each plant individually and clean it up in advance of moving it to its winter home. Start at one end of your growing area and, plant by plant, remove dead flower spikes, any unsightly leaves, etc. Give the plants a bath to make sure that you are only bringing in your plants, and not any critters. Spray them with a hose-end sprayer set to remove any spiderwebs, etc. Clean off leaves with lemon juice or white vinegar to remove the messy buildup of minerals on the leaves.

DRENCHES This is a good time to practice some preventative maintenance. You can mix up a jug of suitable and compatible chemicals and pour it through the pots to eliminate some potential problems. You do not want to introduce ants and roaches into your porch or home for the winter. A Sevin drench can help eliminate these pests.

Remove papery sheaths to reduce the number of places that insects have to hide. Watch for signs of scale and mealybugs, any kind of white fuzzy mass. If you do find any annoying critters, you can treat small spots with rubbing alcohol or spray all the plant surfaces with a suitable insecticide. Alternatively, you can add one of the systemic insecticides such as acephate (trade name Orthene) or imidacloprid (sold sometimes as tree and shrub insecticide) to your insecticide jug and pour through the pots to be absorbed into the plant and kill these insects from the inside out.

SPRAYS You can spray plants while they are still outside to prevent problems during the winter. Just make sure chemicals are compatible and follow personal protection guidelines. Consider



spraying with one of the summer oils to smother pests, spraying upper and lower leaf surfaces. This will also remove some of the hard-water deposits so your leaves will be shiny. If you have a problem with mites, use one of the combined miticide-insecticide products. A spray with one of the broad-spectrum fungicides containing quaternary ammonium compounds (Phyosan, Consan, Green Shield) or, for nonsensitive genera, copper, is good preventative medicine. If you have or have had specific problems, select a fungicide that has targeted effectiveness for a given disease.

[1] The hoophouse is empty in the summer; no plants are allowed. It can be weeded and sanitized before plants are moved in the fall.

[2] If the hoophouse was used during the summer, there would be no room for the orchids and tropicals when cold weather rolls around.

WINTER HOMES Our phalaenopsis and most of the cattleyas are grown year-round in the greenhouse; other plants grow in outdoor shade houses. Most of these outdoor growers are moved into a heated hoop house or greenhouse before the cold weather sets in. The hoop house sits empty all summer so there is plenty of time for it to be cleaned, weeded and sterilized prior to moving plants inside, and of course, the heater and spray system are checked for functionality.

WATERING The shorter fall day lengths, less intense sunlight and cooler temperatures typical of fall cause changes to the growth rates of your orchids. Many orchids rest during cool weather, so they enjoy being watered only a third to a half as frequently as during the growing season. Let the pots dry out an extra day or two between watering, checking the mix a few inches (centimeters) into the pot before watering to see if the mix is approaching dryness. The need for mineral nutrition is likewise reduced, and some growers discontinue fertilizing altogether during the winter months; others apply fertilizer at half the summer rate. Most orchids resent repotting during these periods of slower growth and will not quickly reestablish. Delay repotting until you notice active root growth unless there are extenuating circumstances such that the plant might not survive without an emergency repotting. This general approach to orchid care during the cooler months works for most of the more commonly grown orchids, such as cattleyas, the oncidium intergenerics, bulbophyllums, many dendrobiums, phalaenopsis and vandas.

PREP PLANTS Evaluate how well your plants grew during the summer months and try to identify things you wish you had done differently. Here is my general approach for preparing different types of orchids for the transition to winter.

VANDACEOUS ORCHIDS Our vandas all grow in a sunny hoop house with an automated overhead spraying system that saturates the roots and leaves for 10 minutes daily, often with a second spraying. To get the vandas ready for their winter move, they are all sprayed, roots and leaves, to remove the algae. You can use quaternary ammonium compounds (Consan, Physan, pool algicide), and you may have to spray twice. Then water blast the roots to clean them up. If the wooden baskets are deteriorating, replace them with S hooks and attach using zip ties. If the roots are dead or the bottom stem has become woody, you can cut away the



stem up to healthy tissue. Look at the stem for signs of fusarium, the characteristic reddish purple band around the outside edge of the stem. If you find fusarium, keep cutting until you find clean tissue, sterilizing your shears between each cut. If you find the sandpapery purple to black diamond-shaped lesions on the leaves characteristic of *Phyllosticta*/*Guignardia*, remove the infected leaves to prevent the spores from spreading. A final spray with thiophanate methyl (Thiomyl, Banrot, Cleary's 3336) and the plants are prepped for winter.

BULBOPHYLLUMS The bulbos here all grow in a shadier hoop house with an automated overhead spraying system that runs for 10 minutes each day. These bulbos are mostly grown on horizontal plaques or baskets with some Spanish moss draped around them. New additions also had a thin layer of long-fibered

[3] *Catasetums* cram a year's worth of growing into about eight months, so they like plenty of light, air, water and fertilizer during the growing season.

[4] *Catasetums* endure prolonged drought in their natural habitat by shedding their leaves until the rainy season returns.

sphagnum moss under the plants to help get them established. Inspection of these plants revealed that the sphagnum moss had lots of mold and algal growth, so the moss had obviously stayed too wet, even for the water-loving bulbos. This sphagnum was water blasted away from the plants and some Spanish moss draped over the top for water retention. After a protective spray with copper the plants were ready for their move to the heated hoop house.

CATASETUMS The *catasetums* are in

their glory during the summer and early fall. Ours are growing in the shade house under 50% shade cloth, hanging in clay pots filled with Styrofoam in the bottom and sphagnum moss on top. Many are blooming for the third or fourth time this year, and very few have yellowing leaves. An inspection reveals a few keikis growing on some pseudobulbs, and upon closer inspection, the mother bulbs were found to be soft and rotting. The soft bulbs were removed and the remaining plant returned to the shade house, and the keikis potted up while there was still time for them to become established. Spider mites do not seem to be much of a problem in the shade house, perhaps in part because of the wet early summer we had. These plants require no special preparations this time of year except to clean up fallen leaves and flowers. As the leaves yellow and the plants begin to enter dormancy, they are moved to a separate area so they will not be watered. The other plants are coaxed into dormancy, first by eliminating the fertilizer in their diet in October and then allowing more time between waterings. If they have not shed their leaves by mid-December, water is withheld to force dormancy. *Catasetums*, *clowesias*, *cynochos* and *mormodes*, as well as a few others such as pseudobulbous *calanthes*, are dormant during the winter months. They need no water at all until the new growth starts in the spring. Find a place to group these together where you know you will not water them. Some people turn the pots on their sides as a reminder.

DENDROBIUMS You can divide your dendrobiums into two general groups, those that enjoy a coolish, dryish winter and those that grow well with cattleyas. Culture tips are available on the SAOS and AOS websites. Group those plants that grow similarly or mark the pots with different colored tags so that you will know that they can be watered or not watered and fertilized or not fertilized according to their needs. The dendrobiums all grow under the shade house receiving rainwater or being watered on a daily or every-other-day basis. Their winter cultural requirements are quite different.

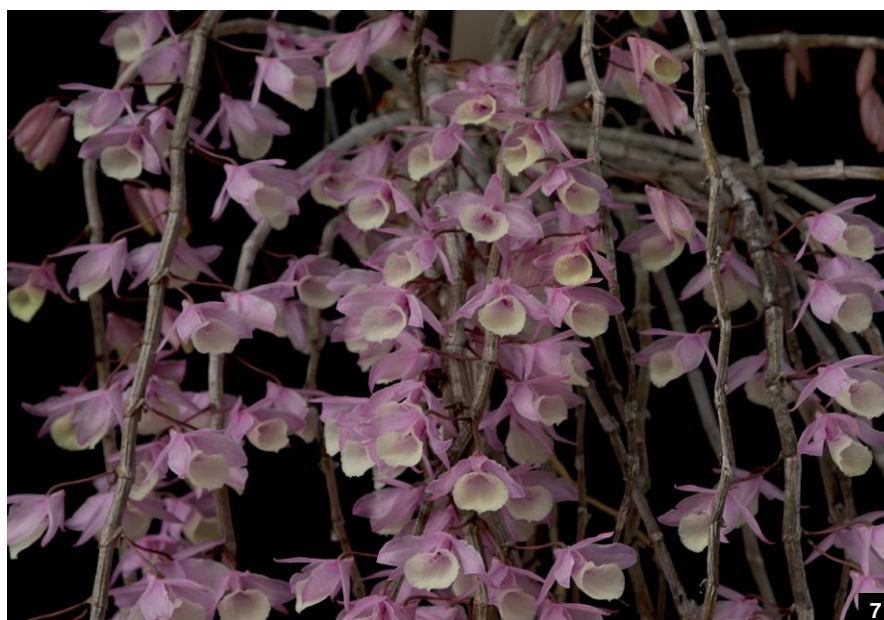
The spring-blooming section *Dendrobium* species and hybrids (the upright *nobiles* and pendent *seminobiles*) and the *Densiflora* (*Callista*) section with the grape-cluster flowers all enjoy a coolish, dryish winter rest. Some of the Australian dendrobiums such as *kingianum* and *speciosum* can also tolerate cold temperatures. These dendrobiums



5



6



7

look great after the summer rains, with abundant growths. Some few leaves are starting to yellow by late summer/early fall. Their vegetative growth phase is over for the year and fertilizer can be restricted. They will be moved under the eaves of the potting shed by the end of November to limit rainfall and they will be watered only once or twice a month; some people restrict all watering from Thanksgiving until after flowering in the spring. They are moved into a heated structure only if temperatures are projected to dip into the 35–38 F (1.7–3.3 C) range.

The rest of our dendrobiums are grown like cattleyas. Take a few moments to inspect the plants. They spend so many years in the same pots that weeds and ferns can easily become established. Either pull the weeds or spray/paint the weeds with a herbicide containing Diuron (Karmex, Parrot, and other trade names). Look at the leaves for evidence of leaf-spotting cercosporoid fungi. Remove and destroy infected leaves and spray the plant with a suitable fungicide such as one containing chlorothanil (trade name Daconil) or thiophanate methyl (trade names Banrot, Cleary's 3336 or Thiomyl). These dendrobiums are grown in the heated greenhouse along with the cattleyas.

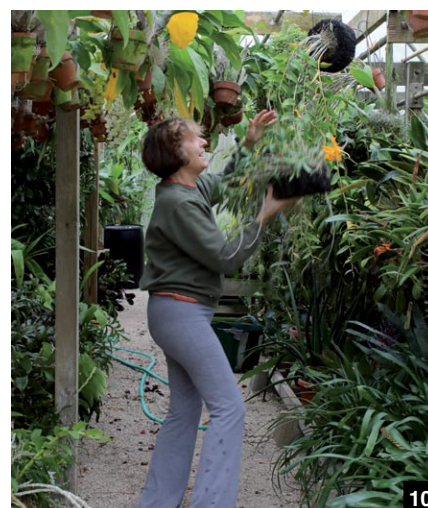
PHALAENOPSIS The phalaenopsis grow year-round in the greenhouse. They benefit from an antibacterial spray with copper before cold weather arrives. They are top dressed with a little Purely Organic or timed-release fertilizer in early fall to enhance their spring blooms. Phalaenopsis require a significant day-to-night temperature change to initiate spikes. We usually get our first cold snap around Halloween; allow the plants to chill during this cool weather with nights in the upper 50s F (13.9–15 C) as long as the day temperature rises above 80 F (26.7 C). Leave phalaenopsis outdoors or place them next to an open window during this cool weather. After two or three weeks of exposure to this drop in nighttime temperatures, phalaenopsis should be moved to their winter homes. They should be on schedule to spike by Christmas and have buds opening by Valentine's Day.

Have a plan to protect your plants during the winter months and prepare your plants and the winter growing area during the fall transition. For Florida growers, the St. Augustine Orchid Society website contains links to cultural recommendations. The Seasonal Tips page addresses watering during each



season and the fall preparations for winter. The Culture by Genus page addresses the specific needs of a variety of orchids. Do a little research to understand the cold tolerance of your different plants; guidelines are available on the St. Augustine Orchid Society website. In general, vandas, phalaenopsis and phalaenopsis-type dendrobiums are the least cold tolerant, so get them situated before nighttime temperatures drop below 55 F (12.8 C). Most of your other plants can easily tolerate nighttime temperatures into the 45–50 F (7.2–7.4 C) range. The cool fall weather is a great time to spend quality time with your plants. By the Thanksgiving holidays, your plants should all be situated in their winter homes, waiting for the next growing season.

— Sue Bottom started growing orchids in Houston in the mid-1990s after her husband Terry built her first greenhouse. They settled into St. Augustine, Florida, Sue with her orchids and Terry with his camera and are active in the St. Augustine Orchid Society, maintaining the society's website and publishing its monthly newsletter. Sue is also a member of the AOS Editorial Board (sbottom15@gmail.com).



- [5] The pendent seminobile dendrobiums have beautiful green foliage by summer's end.
- [6] The pendent soft canes often drop their leaves during the winter and develop buds in early spring.
- [7] Dendrobiums such as this *Dendrobium cucullatum* put on quite a show in the spring, blooming from leafless canes.
- [8] This dendrobium leaf is infected with one of the leaf-spotting cercosporoid fungi. This seems to be contagious in dendrobiums; remove and destroy the leaf.
- [9] This is the bottom of the same dendrobium leaf. You can see how the chlorotic spots on the top match up with the brown splotches on the bottom.
- [10] Many of the orchids and tropicals winter in a heated hoop house. The more cold-tolerant orchids are squeezed in before a projected frost.



CATASETUM LONGIFOLIUM.

Catasetum by Peggy Alrich and Wesley Higgins

A South American Genus



Catasetum Richard ex Kunth Syn. Pl. (Kunth), 1:330 (1822).

ETYMOLOGY From the Greek for down (*kata*) and Latin for bristle (*seta*) referring to the two appendages or antennalike processes of the column that turn downward in the male flowers of most species.

GENERITYPE *Catasetum macrocarpum* Richard ex Kunth

One hundred eighty-four large, sympodial epiphytes, lithophytes or accidental terrestrial species are found in low to middle elevation, hill scrub, rocky crevices, palm groves and montane oak-pine to evergreen forests from central Mexico to Bolivia, Trinidad, the Guianas, Venezuela, northern Argentina, Paraguay and Uruguay, with the center of diversity in Brazil.

This genus has some quite unusual orchids with their unisexual, rarely bisexual, flowers. Unusual morphological features make this an extremely difficult genus to classify. Sex of the flowers is

determined by light intensity and growing conditions. Bright sunlight triggers female flowers and shade produces male flowers. The female flowers, borne on separate inflorescences, are mostly green or yellow green with maroon or brown spots or blotches; strongly bent or turned-backward segments; a thick, helmet-shaped lip; and not much variation between the various species. The more numerous male flowers are usually more brightly colored, have strongly bent lateral sepals and the fleshy lip is hooded or not. The male flowers vary in shape and color, and emit a strong, musky fragrance to attract specific species of male bees. The male flowers have an erect, thickened, slightly curved column with or without a pair of antennae at the base. The female flowers have a shorter, thicker column that is without antennae, but is bent forward at the tip. These large plants have fleshy, ovoid, conical or spindle-shaped pseudobulbs with several internodes, subtended by leaf sheaths when young,

each with several large, pleated leaves that are shed at the end of the growing season. The two pollinia are ovate and grooved.

In *Catasetum* the rostellum is extended into two curved tapering horns called antennae. If these are touched, even very lightly, they convey stimulus to the membrane that connects the disc of the pollinarium with the adjoining surface, causing it to rupture instantly, forcibly ejecting the pollinia a considerable distance onto the pollinator.

CULTURE Plants have strict growing and resting periods and are almost always deciduous. Place these species in baskets with a mix of coarse bark, dried manure, charcoal and sphagnum. Provide intermediate to cool conditions, bright light (but protect from full sun), high humidity and good air movement.

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

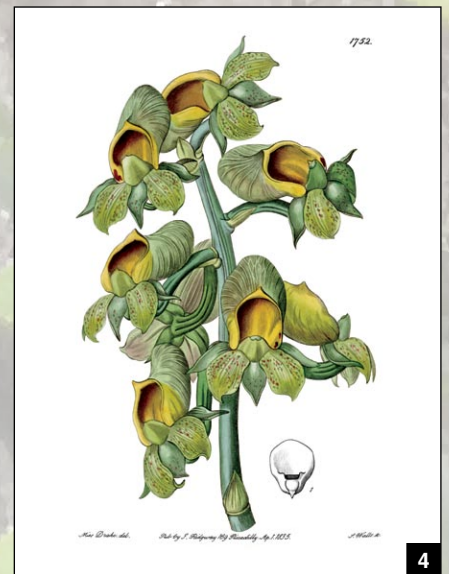
— *Wesley Higgins is an AOS accredited judge (higgins@ufl.edu).*



H. Moon



CATASETUM MACROCARPUM



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Antique Plates — *Catasetum*

- [1] *Catasetum longifolium* — *Orchid Album*, 11:t.456 (1893).
- [2] *Catasetum pileatum* — *Reichenbachia*, 1:t.90 (1888).
- [3] *Catasetum macrocarpum* — *Illustration Horticole*, 33:t.641 (1886).
- [4] *Catasetum cernuum* as *Monachanthus viridis* — *Botanical Register*, 21:t.1752 (1836).
- [5] *Catasetum barbatum* as *Myanthus barbatus* — *Paxton's Magazine of Botany and Register of Flowering Plants*, 2:124 (1836).
- [6] *Catasetum triodon* as *Catasetum monodon* — *Orchis*, 1(6):t.6 (1906).
- [7] *Catasetum cernuum* — *Botanical Magazine*, 89:t.5399 (1863).



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GENUS OF THE MONTH

Miltonia — Brazilian Jewels

By Thomas Mirenda



ALTHOUGH SEEMINGLY EVERY orchid has a distinctive or mysterious feature that makes it stand out, there are a few special ones that have the power to grab hold of, and impress, new onlookers. These are orchids that have that je ne sais quoi? — that WOW factor or charisma. It is also true that winning awards comes naturally to these plants, which often have large colorful flowers in great abundance on a well-grown specimen. These plants are usually the subject of orchid show posters and fine art photography. Combine such beauty and character with ease of culture and the result is a plant that should be grown by every orchid enthusiast. *Miltonia moreliana* is a prime example such a marvelous orchid.

Although the name *Miltonia* is used by many growers for most of the pansy orchid hybrids, these Brazilian species should not be mistaken for the more finicky cool-growing Andean *Miltoniopsis* that hail from higher elevations. Many of these “true” miltonias are instead from the coastal areas of southern Brazil, where they occur in intermediate to warm conditions. Indeed, if grown in the same light conditions as phalaenopsis, these plants easily tolerate daytime temperatures into the mid to high 80s F (29–31 C). If grown in higher light, more moderate temperatures are required most of the year. For example, 75–80 F (24–26 C) days and 58–65 F (14–18 C) nights achieve excellent results. A scandent plant, *Milt. moreliana*, although simple enough to grow, is difficult to keep in its pot. The plant grows much better when treated as a mounted specimen or set in a basket, where its freewheeling nature is an advantage. Each pseudobulb will produce two new leads, increasing the plant’s size exponentially with each growth cycle. The plants branch and become large specimens in a short period. The flowers, though fewer in number than their Andean counterparts, are held erect and present themselves proudly and successively from their shorter inflorescences. A well-grown specimen in full flower is a spectacle. The spectacular *Milt. moreliana* has the deepest plum purple segments and brilliant purple lip. It has been used in myriad orchid hybrids, including *Aliceara* Marfitch (*Bratonia* Charles M. Fitch × *Oncidium* Fremar), and its color and form are evident in many of the oncidium intergenerics making their way to our greenhouses. Several color forms of the very closely related *Miltonia spectabilis* are available readily from orchid nurseries, including alba, semialba,



- [1] *Miltonia spectabilis* photographed by Greg Allikas.
- [2] *Miltonia cuneata*
- [3] *Miltonia clowesii*
- [4] *Miltonia moreliana* ‘Jackie’s Pride’ FCC/AOS
- [5] *Oncidium schroederianum*. Long classified as a *Miltonia*, this species is an excellent example of convergent evolution and is not closely related to the superficially very similar *Milt. clowesii*.





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rosea and bicolor forms.

Although possibly somewhat less charismatic, there are several other worthy species in this genus, including *Miltonia clowesii*, with its exotically banded segments; *Miltonia cuneata*, with its brilliant white lip; and the vigorous *Miltonia flavescens*, with starry yellow flowers on longer inflorescences, which can make an extraordinary specimen plant.

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



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- [6] *Miltonia* Brasilia 'Everglades' HCC/AOS (Anne Warne x Goodale Moir).
- [7] *Miltonia* Seminole Blood 'Everglades Campfire' AM/AOS (Parana x *spectabilis*)
- [8] *Miltonidium* Robin Pittman 'Everglades' AM/AOS (*Miltonia spectabilis* x *Oncidium* Les Landes). Introduction of warm-growing former odonts into cool- to cold-growing former odonts results in dramatically increased warmth tolerance; this awarded cultivar was grown and flowered in Homestead, Florida.
- [9] *Miltassia* Royal Robe 'Commander' HCC/AOS
- [10] *Miltonia flavescens* 'Sunburst' CCE/AOS
- [11] *Miltonia candida* 'Reba' HCC/AOS
- [12] *Rhynchosia* Pacific Paranoia 'Everglades' HCC/AOS (*Rhynchostele bictoniensis* x *Miltonia* Honolulu)
- [13] *Miltonia* Bluntii 'Adrienne' AM/AOS (*spectabilis* x *clowesii*); the manmade equivalent of the natural hybrid x*bluntii* described by Reichenbach filius in 1879.

Miltoniopsis:

Historical Perspective and Culture

DAVID ROSENFELD, MD

WHAT IS A MILTONIOPSIS? THAT IS A good question. Today's *Miltoniopsis* were formerly lumped into the genus *Miltonia* by the famous English botanist John Lindley in 1837. He named the genus for Lord Fitzwilliam Milton (1786–1857), a patron of English horticulture and an orchid enthusiast. Lindley united two very different groups of orchids. His genus encompassed approximately 25 species from different geographic regions and climates. What we now call *Miltonia* is endemic to southeastern Brazil, except for one species from Peru. Those we now call *Miltoniopsis* have their ancestry in the mountain cloud forests of South and Central America from Costa Rica to Peru. The three main species are endemic to Columbia. One species is found in the Andean highlands of Peru and one in the mountain cloud forests of Costa Rica and northern Panama. In addition to being from different geographic regions, *Miltoniopsis* and *Miltonia* have significant morphological differences.

Not being a botanist or a taxonomist, it is difficult for me to figure out why Lindley placed these two diverse groups in a single genus. It appears that he was trying to separate *Miltonia* from *Oncidium* and *Odontoglossum* (*Odontoglossum* is now again synonymous with *Oncidium*) by the shorter column in *Miltonia*. Additionally, Lindley separated *Miltonia* from *Brassia* by the different shape of their auricles (protusions adjacent to the column). In general, miltonias are larger plants with bifoliate pseudobulbs. *Miltoniopsis* plants are much smaller with unifoliate pseudobulbs. The inflorescences of *Miltoniopsis* are generally shorter, except for the single-flowered *Miltonia spectabilis* and *Miltonia moreliana*. The pseudobulbs of *Miltoniopsis* are tightly clustered, while those of *Miltonia* are generally more widely separated on a long horizontal to climbing rhizome.

Miltoniopsis was first described as a genus in 1889 but not generally accepted until 1976, following publication by Leslie Garay and G.C.K. Dunsterville in



MAURICE MARIETTI



ARTHUR PINKERS



MAURICE MARIETTI



CHARLES M. FITCH

- [1] *Miltoniopsis* Freebyrd 'Miltonia Man', HCC/AOS (Lorene x Saffron Surprise) awarded in March of 2010 was grown by the author and his wife Joan.
- [2] *Miltonia moreliana* 'Surprised', FCC/AOS was grown by Don Goss, Redondo Beach, California.
- [3] *Miltoniopsis* Snow Charm 'Derian Jacob', AM/AOS (Pikake x Edwidge Sambourin) was grown by the author and his wife Joan.
- [4] *Miltonia clowesii* 'Alpine', JC/AOS, grown by Marc Hachadourian, was awarded for its floriferousness and exceptionally dark color.

Venezuelan Orchids Illustrated. However, even in 2013 some orchidists continue to call *Miltoniopsis* “miltonias.”

To me, the most amazing aspect of *Miltoniopsis* is the fact that, up until fairly recently, the great diversity of flower color and patterns in the hybrids has been developed by continued crossing of hybrids originally obtained from three Columbian species: *Miltoniopsis vexillaria*, *Miltoniopsis roezlii* and *Miltoniopsis phalaenopsis*.

THE SPECIES

MILTONIOPSIS VEXILLARIA

Endemic to the Andean highlands of Columbia and northern Ecuador, this species is an epiphyte found in the humid mountain clouds forests at 4,000–6,500 feet (1,200–2,000 m). It was discovered around 1870 by Gustav Wallis and Benedikt Roezl while working for the Belgium firm of Jean Linden. It was first flowered in cultivation by the famous English orchid firm of Veitch in 1873. The inflorescences are longer than the leaves and carry 4–7 large, pansy-like flowers. Flowers come in various shades of pink to pure white with a yellow central mask. The flowers of this species are the largest of the genus, reaching up to 4 inches (10 cm) across. *Miltoniopsis vexillaria* imparts its flower size, long inflorescence and number of flowers per inflorescence to its progeny.

MILTONIOPSIS ROEZLII

Endemic to western Columbia, with an additional variant found in contiguous Panama, this species was also discovered by the famous one-armed orchid collector Benedikt Roezl in 1873. It was then described by the 19th century’s most renowned orchid expert, H.G. Reichenbach of Dresden, as *Odontoglossum roezlii*. It is found at a much lower elevation than *Mps. vexillaria*, at 1,000–2,500 feet (300–760 m). Plants are smaller than *Mps. vexillaria* and the inflorescence is shorter with typically only two or three flowers, but occasional cultivars can produce up to five. Frequently the inflorescence does not extend beyond the leaf tips. The flowers are also smaller than those of *Mps. vexillaria*. Typical flowers are white with a reddish purple splash at the base of the petals; the central mask is yellow. *Miltoniopsis roezlii* was the second most common species, *Mps. vexillaria* being the first, used in early hybrids. The red color at the base of the petals contributed important red color genes to later hybrids, which eventually led to the “classical” red forms. The lovely fragrance we associate with modern *Miltoniopsis* hybrids also



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JUDITH HIGHAM



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FRED RINDLISBACHER



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GREG ALLIKAS, ORCHIDWORKS.COM



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JAY NORRIS

derives from *Mps. roezlii*. There are pure white and yellow forms, which provide the genes for modern yellow hybrids. Coming from lower elevations, this species grows in a much warmer climate than the others and imparts a

[5] *Miltoniopsis vexillaria* ‘Adele’, CCE/AOS, expertly grown by Poul Hansen of Victoria, BC, carried 65 flowers and eight buds on 13 inflorescences when awarded last year in June.

[6-8] The three color forms of *Miltoniopsis roezlii*: *Mps. roezlii* ‘Jean Inouye’, HCC/AOS grown by Ivan Komoda in Hawaii is a Panamanian form [6], *Mps. roezlii* ‘Monica’, HCC/AOS grown by Jose Fernando Londono in Manizales, Colombia is an example of the white form [7] and *Mps. roezlii* ‘DiCiommo’, HCC/AOS, grown by Di Ciommo’s Orchids in Ontario, Canada is one of the rare yellow cultivars [8].

wider range of temperature tolerance to its hybrids.

MILTONIOPSIS PHALAEOPSIS

Endemic to Columbia on the western slopes of the Andes, *Miltoniopsis phalaenopsis* grows in shady, humid locations at 4,000–6,500 feet (1,200–2,000 m). This species was originally discovered by Louis Schlim for the firm of Mssrs. Linden of Brussels in 1850. It was described by H.G. Reichenbach in 1854 as *Odontoglossum phalaenopsis*. These are smaller plants and the inflorescence is shorter than the leaves. The flowers are much smaller than those of either *Mps. vexillaria* or *Mps. roezlii* at 2–2½ inches (5–6.5 cm) across. The delightful flowers are white with reddish purple streaks extending vertically to varying degrees on lip midlobe and side lobes. It is from this species that the waterfall and teardrop lip patterns of many of today’s modern hybrids have been developed.

MILTONIOPSIS WARSZEWICZII (ENDRESII)

The fourth species to be discovered in the 19th century, *Miltoniopsis warszewiczii* is the only species not found in Columbia. It is endemic to Costa Rica and northern Panama. *Miltoniopsis warszewiczii* was discovered by Joseph Warszewicz in 1849. It is found at elevations of 4,500–6,500 feet (1,400–2,000 m). Reichenbach described it in 1852 as *Odontoglossum warszewiczii*. The second half of the 19th Century was a difficult period for botanists and taxonomists. Communication between them was slow, physical locations of species in the wild were often closely guarded secrets or even falsely reported to protect one firm’s supply and the situation was compounded by Reichenbach’s closely kept herbarium. As a result, many species described during the period have multiple synonyms. *Miltoniopsis warszewiczii* wasn’t immune. H.G Reichenbach described it in 1852 as *Odontoglossum warszewiczii*. There has been some confusion over the correct name of this species because there is also a *Miltonia warszewiczii*. After 1976 this *Miltoniopsis* species was transferred into the genus *Miltoniopsis* where it has been generally referred to as *Miltoniopsis endresii*, although *Mps. warszewiczii* is the correct name.

The small flowers, less than 3 inches (7 cm) across, are white with a pale reddish purple blotch on either side of the lip mask. The growth habit and flower shape is similar to a poor *Mps. roezlii*. In fact it was not used in hybridization until 1957. The only outstanding attribute



CHARLES M. FITCH
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IVAN KOMODA
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is the production of more than one inflorescence per pseudobulb, often two and sometimes three or more.

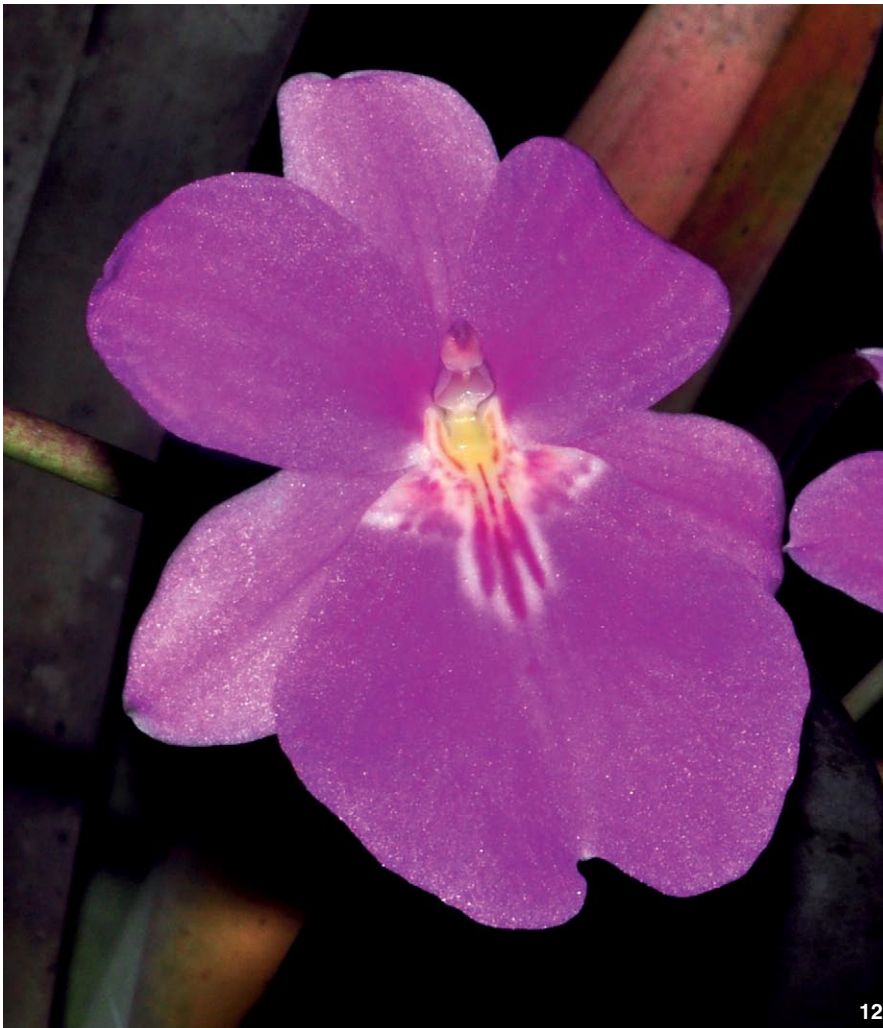
MILTONIOPSIS SANTANAE

In 1976, Garay and Dunsterville described a new species similar to *Mps. roezlii* var. *alba* that they named *Miltoniopsis santanae*. This species is found in Columbia and adjacent regions of Ecuador and Venezuela at elevations of 1,900–3,300 feet (630–1,000 m). Like *Mps. roezlii*, these plants are more warmth-tolerant, tolerating maximum daytime temperature up to 87 F (30 C). While little-used in hybridizing, the flowers are similar to *Mps. roezlii* var. *alba*, and there

[9] *Miltoniopsis phalaenopsis* ‘John Leathers’, AM/AOS, grown by David Grove in Armonk, NY, is an excellent example of this beautiful species.

[10] *Miltoniopsis warszewiczii* (*endresii*) grown by Ivan Komoda on the island of Maui.

[11] *Miltoniopsis santanae* grown by Ivan Komoda. The taxon is now considered a synonym of *Miltoniopsis roezlii*.



ERICA MORÓN DE ABAD

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are now several new hybrids with *Mps. santanae* as one of the parents. Because this species is so similar to *Mps. roezlii* var. *alba* and their distributions overlap, it has been proposed that *Mps. santanae* and *Mps. roezlii* var. *alba* are synonymous. I will leave that determination up to the taxonomists. *Miltoniopsis santanae* and *Mps. roezlii* bloom in cultivation at somewhat different times, winter into early summer for the former and late summer into spring for the latter, although the seasons do overlap. In addition, they are said to breed differently. Second- and third-generation hybrids of *Mps. santanae* do not breed well, and exhibit frequent aneuploidy, whereas similar hybrids of *Mps. roezlii* var. *alba* continue to function well as stud plants. Currently the World Checklist of Selected Plant Families considers *Mps. santanae* a synonym of *Mps. roezlii*.

MILTONIOPSIS BISMARCKII

The most recently described new species, *Miltoniopsis bismarckii*, was discovered by Klaus von Bismarck in 1985 and formally described by Dodson and Bennett in 1989. It is found in the Andean highlands of Peru at 3,300 feet (1,400 m). The flowers are pastel pink to dark pink and are the smallest of the genus at 1½ inches (4 cm). The flowers have an open shape and a small pink lip. The positive attributes of this species are the 4–6 flowers per inflorescence and the species' tendency to produce 2–3 inflorescences per pseudobulb. Recently a few hybrids have been made that have dramatically improved size and shape while preserving the generous flower count and multiple inflorescences.

EARLY MILTONIOPSIS HYBRIDIZATION

Miltoniopsis hybridization began in the late 19th century. The hybridizers used the best collected cultivars in developing primary and secondary hybrids. The cornerstone of breeding at the time was *Mps. vexillaria*. From 1873 to 1930 the Royal Horticultural Society (RHS) awarded 48 cultivars of *Miltoniopsis vexillaria*. Paintings of the most outstanding were documented by the RHS. The first hybrid was *Miltoniopsis* *Bleuana* (*vexillaria* × *roezlii*) registered in 1889 by Bleu. The standard color form of *Mps. roezlii* was used in these early hybrids. Later generations were mainly crosses of the best *Mps.* *Bleuana* cultivars. This resulted in contributing red color genes to hybrids, especially on the central areas of the petals. Among the best early examples were *Mps.* *Bleuana* 'Princess Elizabeth'



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- [12] *Miltoniopsis bismarckii* photographed in situ in the Leimebamba (Leymebamba) district in the province of Chachapoyas, northern Peru. Leimebamba lies at about 6,500 feet (2,000 m) above sea level.
- [13] *Miltoniopsis* *Bleuana* 'Princess Elizabeth', FCC/RHS (*vexillaria* × *roezlii*) awarded in 1889 and expertly painted by Nelly Roberts, the official RHS illustrator of the time.
- [14] *Miltoniopsis* *Princess Mary* 'Rosea', AM/RHS (*Bleuana* × *Hyeana*) was an example of the state-of-the art *Miltoniopsis* breeding of its day. Painting by Nelly Roberts.

Miltoniopsis Culture

BEFORE DISCUSSING MY CULTURAL METHODS FOR *Miltoniopsis*, I should first state that this genus is not the easiest to grow unless you are living in a region that naturally has temperature, humidity and light similar to the Andean highlands of South America or the mountain clouds forests of Central America. At my home in New Jersey, I have artificially simulated the native habitat as much as possible. Our summer temperatures result in a somewhat hostile environment for *Miltoniopsis*. The species are mostly found in the moist humid mountain cloud forests. Elevation varies from 1,000 to 3,000 feet (600–1,700 m) for *Miltoniopsis roezlii* to 4,000–7,000 feet (1,200–2,100 m) for *Miltoniopsis vexillaria*. For all species there is almost no variation in maximum and minimum temperatures throughout the entire year. The maximum temperature for *Mps. vexillaria* only varies between 79 and 82 F (26–27.8 C) and the minimum temperature from 57 to 59 F (14–15 C). *Miltoniopsis bismarckii* and *Miltoniopsis santanae* have slightly higher temperature maxima, while *Miltoniopsis warszewiczii* has slightly lower minima and maxima. It is abundantly clear that these species require some assistance to get through the summer months in most locations in the country.

Ideal temperatures are 60 F (15.5 C) at night and 75–80 F (24–26.8 C) during the day. They will tolerate temperatures into the upper 50s F (about 15 C) for brief periods in the early morning and can tolerate temperatures in the low 90s F (about 32 C) in the daytime for a few days, but these extremes are certainly not recommended. I am fortunate to have an evaporative cooler operating in my greenhouse and outdoor humidity low enough to keep the daytime maximum below 80 F (26.8 C) except on the hottest, most humid days. The cooler also provides good air movement and abundant humidity. Unfortunately, most orchidists do not have the luxury of a greenhouse with a swamp cooler. Summer temperatures outdoors can be tolerated with lots of humidity and very good air movement. A cool basement with artificial light is also an excellent option.

Extremely important considerations to promote superior culture are when and how often to repot. *Miltoniopsis* flower from late winter to early summer, with peak flowering in May. The plants languish in warmer summers. They usually start exhibiting new growth in late August or early September. Repotting should begin in late summer and be completed by early October. *Miltoniopsis* do not tolerate decomposing media and need to be repotted every year, ideally when the new growths are 2–3 inches (5–8 cm) high and when the new roots are just emerging. Small, 3½-inch (9-cm), plastic pots with very good drainage are ideal for all but the largest specimens. The roots are fine and thread-like and are easily damaged if the medium is too dry or wet and soggy. The roots rarely grow out of the pot. Six months after fall repotting, the plants should be pot-bound. Overpotting will keep the roots too wet and they will rot. I usually fill the bottom of each pot with Styrofoam peanuts to aid in drainage. I use three parts fine seedling bark, one part medium bark and one part small-grade Perlite. Other growers use six parts seedling bark, one part coarse peat moss or Pro-mix and

one part coarse Perlite. Regardless of the exact makeup of the chosen medium, the goal is a rapidly draining mix that allows ample air circulation throughout the roots while retaining sufficient moisture for the plant's needs.

As far as watering is concerned, as you might infer from their natural habitat, *Miltoniopsis* never want to be dry. They grow best when well hydrated. I water twice a week. The frequency will vary a little depending on time from last repotting and the potting mix chosen. As a general rule, during warm periods, water more frequently and when conditions are cool, gray and dull, water less often. Luckily the plants will tell you when they are unhappy. Pleating or wrinkling of the leaves occurs when they are not receiving enough water. This could be due to watering too infrequently or lack of adequate roots to absorb the water you are providing. If you feel that the problem lies with the plant's root system, take the plant out of the pot and check the condition of the roots. They should be firm and abundant not soft and mushy. One important point about the leaf wrinkling that accompanies insufficient water: it is permanent for that leaf and will not disappear when appropriate moisture is restored. A well-grown *Miltoniopsis* will produce wide, somewhat stiff leaves that do not droop excessively. The production of two new growths per pseudobulb is an excellent indicator of good culture. Happy *Miltoniopsis* are vigorous growers, especially the hybrids.

Miltoniopsis produce the most flowers of the best quality when they receive as much light as they can tolerate without foliage damage; 1,000–2,000 foot-candles or between 80 and 85 percent shade. This is moderate light, similar to that provided multifloral paphiopedilums and a little less than that for cattleyas. Luckily, *Miltoniopsis* leaves will also tell you when the light level is optimal. A reddish pink tinge to the distal portions of the leaves is an indication of maximum light. Excessive light will result in yellowing of the leaf tips and, if you aren't careful, outright sunburn of the foliage. Cultivars with a higher predominance of *Mps. vexillaria* will develop this pinkish cast to the leaf tips at slightly lower light intensity. When this is observed the plants should be placed in a slightly shadier location. The flowers are long-lasting and remain in excellent condition for four to six weeks. There are some late-blooming hybrids, especially those utilizing *Miltoniopsis bismarckii*, which extend the blooming period into the summer.

Miltoniopsis are endemic to a region of high humidity. Ideally, 70–80 percent relative humidity should be the goal, with usually somewhat lower humidity in the mid- and late afternoon. These plants will thrive with even higher humidity as long as the air movement is substantial.

As far as fertilizer is concerned, you should use the fertilizer that you employ with the rest of your collection, just at somewhat reduced concentration. I use Jack's Professional 16-4-20 at ¼ strength with each watering and a plain-water flush once a month. In addition, plants are top-dressed at the time of repotting with Nutricote 14-14-14 (180-day release) time-release fertilizer. — David Rosenfeld, MD



IVAN KOMODA



IVAN KOMODA



JAMES MCCULLOCH



- [15] The roots of *Miltoniopsis* are fine and thread-like. Use small pots and fine medium. Six months after repotting in the fall, plants should be pot-bound.
- [16] The accordion-pleating of these leaves is a permanent reminder that this plant was grown too dry.
- [17] The leaves of this plant have taken on a reddish tinge indicative of high light levels.
- [18-19] Two cultivars of an excellent red *Miltoniopsis* hybrid from the Golden Age; [18] *Miltoniopsis* Edie Brown 'Sparkling Diamond' and [19] *Mps.* Edie Brown 'Heart of Gold'.
- [20] The most famous hybrid of the Golden Age is *Miltoniopsis* *Lycaena* (Lord Lambourne x Princess Margaret) registered by Charlesworth & Co. in 1925. While three cultivars were used by breeders of the time, *Mps.* *Lycaena* 'Stamperland', AM/AOS, FCC/RHS figured most prominently. The cultivar was exceptionally vigorous and floriferous as illustrated here by *Mps.* *Lycaena* 'Stamperland', CCE/AOS expertly grown by Bill and Suzi Porter of Grand Ledge, Michigan. When awarded the plant carried 76 flowers on 19 inflorescences on a plant growing in a 6-inch (15-cm) pot.

and *Mps.* *Bleuana* 'Eximia'. Subsequent generations of *Mps.* *Bleuana* hybrids progressively extended the red color onto a greater proportion of the sepals, petals and the lip. An good example is *Miltoniopsis* *Princess Mary* 'Rosea', AM/RHS where the red color has been mostly spread over the entire flower. The most notable early hybrid using *Mps.* *vexillaria* and *Mps.* *phalaenopsis* was *Miltoniopsis* *Venus* registered in 1917 by Charlesworth and Company. This produced the first waterfall patterns on the lip, but resulted in smaller flower size influenced by the *Mps.* *phalaenopsis* parent.

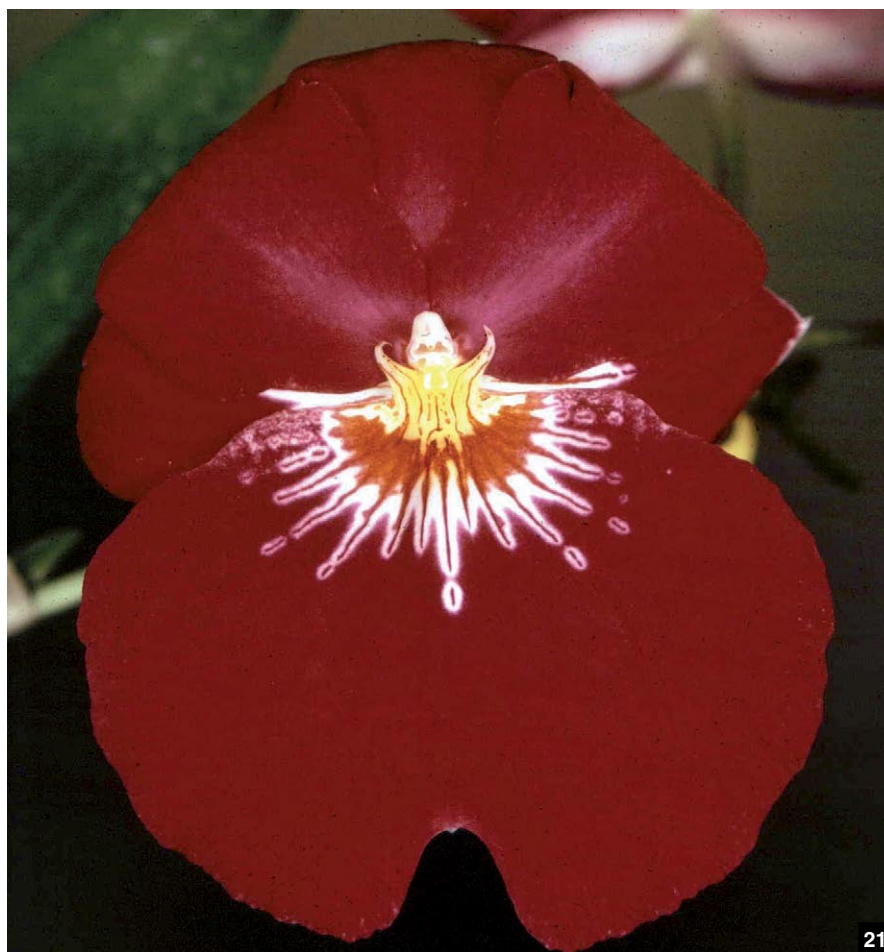
THE GOLDEN AGE

The pinnacle of *Miltoniopsis* breeding was the interwar period from 1918 to 1940. Approximately 250 new hybrids were registered and the genus composed a substantial portion of British and European collections. The most significant development was the evolution of the large red hybrid. *Miltoniopsis* *vexillaria* has no red pigment. The red color comes from the intense red color on the inner portions of the petals of *Mps.* *roezlii*. Eventually, the entire flower exhibited a beautiful red color accented by varying amounts of yellow in the mask. These flowers were also larger with broader and fuller segments as well as 44a larger, flatter lip. Modern examples include *Miltoniopsis* *Bert Field* and *Miltoniopsis* *Edie Brown*. Certainly the most famous hybrid of this era was *Miltoniopsis* *Lycaena* registered by Charlesworth and Co. in 1925. Three awarded cultivars were used in hybrids but *Mps.* *Lycaena* 'Stamperland' FCC/RHS figures most prominently. This cultivar has large flowers of flat, relatively full shape with abundant amounts of red on the lip and the petals. The margins are white, further highlighting the rich red. This cultivar is still in cultivation today.

The popularity of *Miltoniopsis* waned during the late 1930s. They never attained the popularity in the United States that they did in Europe, especially in England. American commercial growers had great difficulty replicating the English cultural successes. *Miltoniopsis* could not be utilized in the cut flower industry because the flowers wilt only a few hours after being cut. World War II had a disastrous effect on orchid collections throughout Europe. It is estimated that only 30 percent of the *Miltoniopsis* in cultivation at the time survived the rigors of the war.

REBIRTH: 1970s and '80s

A renewed interest, centered in the Pacific Northwest, developed during this time. The climate of the region compares



favorably with that of the Andean highlands of Colombia. Innovative hybridizers were Dan Harvey at the Beall Company on Vashon Island, Washington, and Gary Baker and William Chantry of Woodville, Washington. Preeminent growers of the 1980s were Maria and James Riopelle of Portland, Oregon. They made just a limited number of hybrids, notable among them the highly awarded *Miltoniopsis* *Jeannette* Brashear and *Miltoniopsis* *Maurice* Powers. As attractive as these hybrids were, nothing could compare with the famous *Miltoniopsis* *Gordon Hoyt* 'Dolores' FCC-CCM/AOS (Susan Lynn × J.M. Black). The cross was not actually made by the Riopelles but by Gordon Hoyt; however, the cross was registered by the Riopelles, recognizing Hoyt's breeding. When this cultivar received its 95-point CCM in 1981 it had 158 large flat mulberry red flowers on 43 inflorescences! Later the inflorescences were described as being "24 inches (60 cm) long and as thick as your little finger." *Miltoniopsis* *Gordon Hoyt* 'Dolores', FCC-CCM/AOS, was a stunning accomplishment and a great tribute to the hybridizers and the growers of the time.

RECENT HYBRIDIZING TRENDS

In the last 22 years, Ivan Komoda, on the island of Maui, has continued the resurgence of *Miltoniopsis* hybridization. Ivan's cultural success not only stems from his encyclopedic knowledge of the genus but also from the utilization of Maui's microclimates. He grows his *Miltoniopsis* on the slopes of Haleakala volcano, using the elevation and trade winds to maximal advantage, resulting in superb culture. Ivan was fortunate to benefit from his close friendship with Hajime Ono, who had been hybridizing *Miltoniopsis* for 30 to 40 years. His most important hybrid was *Miltoniopsis* *Pearl* Ono (Echo Bay × Lorene). Ono imparted his knowledge and generously gifted a few key outstanding hybrids to Ivan, and Ivan's outstanding hybrid *Miltoniopsis* *Hajime* Ono (Martin Orenstein × Pearl Ono) was registered to honor his mentor.

I am not a hybridizer, nor do I have Ivan's extraordinary insight when it comes to producing new and exciting hybrids, but I do want to describe a few examples of current trends. As mentioned previously, although discovered in 1849, the first hybrid of *Mps.* *warszewiczii* did not appear for over 100 years. Initial attempts were disappointing. Ivan made

the first outstanding hybrid in 1997: *Miltoniopsis* Lady Snow (*warszewiczii* × Edwidge Sabourin). The snow-white flowers of a shape and configuration different from traditional *Miltoniopsis* are still very pleasing. Plants are floriferous, often producing seven flowers per inflorescence, and beautifully displayed with usually two or even three inflorescences per pseudobulb. A lovely similar primary hybrid is our awarded *Miltoniopsis* Mary Catherine Messina 'David's Snow Storm', AM/AOS (*roezlii* [*santanai*] × *warszewiczii*).

To enhance color and improve shape of the two infrequently utilized species, Ivan crossed one of the backbones of his hybridization program, *Mps.* Pearl Ono (Echo Bay × Lorene) with *Mps. warszewiczii* and *Mps. bismarckii*. *Miltoniopsis* Pearl Ono crossed with *Mps. warszewiczii* makes *Mps.* Princess Diana. Among the best of the cross is our *Mps.* Princess Diana '3 Daughters', HCC/AOS. The *Mps.* Pearl Ono improved the shape and fullness of the segments and added attractive color, especially to the petals. When awarded in 2010, there were 26 flowers and nine buds on nine inflorescences. The two beneficial characteristics passed on from *Mps. warszewiczii* were the compact growth habit and the production of three inflorescences per flowering lead. Overall the effect is very attractive.

Another example is the cross of *Mps.* Pearl Ono with the recently discovered Peruvian species *Mps. bismarckii*, *Miltoniopsis* David Rosenfeld. *Miltoniopsis bismarckii* is a small-flowered pink species with very open segments and a narrow lip. Crossing this species with *Mps.* Pearl Ono dramatically enlarged the flowers and the individual parts. Additionally, the color is strikingly enhanced. Some cultivars exhibit a lovely waterfall pattern on the lip. Again, as with *Mps. warszewiczii*, multiple inflorescences are produced from each flowering lead. Two examples that display the grex's variability are *Mps.* David Rosenfeld 'M & E's 50th', AM/AOS, with excellent dark pink color and *Mps.* David Rosenfeld 'Pink Panther', with a lovely waterfall pattern on the lip and fuller segments. I was honored when Ivan registered this cross in my name.

Ivan has also made major advances in the development of yellow hybrids. In the past, yellow hybrids lacked vigor and frequently the yellow color would fade over time. Recent hybrids utilizing yellow forms of *Mps. roezlii* have resulted in more vigorous and rapidly growing plants. Flower size and shape have been



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- [21] The incomparable *Miltoniopsis* Gordon Hoyt 'Dolores', FCC/AOS (Susan Lynn × J.M. Black). A year before this plant received its remarkable 95-pt CCM (CCE today), it was shown by the Riopelles with 25 flowers and eight buds on six inflorescences where it received a coveted 90-pt FCC. One year later, almost to the day, it was reshowed with 158 flowers and 56 buds on 43 inflorescences – a more than six-fold increase in just a year!
- [22] *Miltoniopsis* Pearl Ono 'Iliwai', AM/AOS (Echo Bay × Lorene) exhibited by the Hilo Orchid Farm in 2001.
- [23] *Miltoniopsis* Hajime Ono 'Maui Falls', AM/AOS (Martin Orenstein × Pearl Ono) grown by Ivan Komoda illustrates the exceptionally beautiful waterfall mask that many cultivars of the grex possess.



24 IVAN KOMODA



25 MAURICE MARIETTI



26 MAURICE MARIETTI

improved and the yellow color is uniformly clear and nonfading. An excellent example is *Miltoniopsis* Lee Harold Fister, Jr. (Maui Sunset × *roezlii*). We have had two cultivars awarded: ‘Soleil Jaune’, HCC/AOS and ‘David’s Yellow Sunrise’, HCC/AOS.

CUTTING EDGE HYBRIDIZATION

In the past few years Ivan Komoda has been interested in developing new hybrids that exhibit unusual “sport” traits that show up in breeding. For example, spots on the flower, rather than the usual waterfall pattern on the lip. *Miltoniopsis* Maui Fusion produced attractive saturated pink flowers with varying degrees of waterfall lip patterning; however, a selfing of one cultivar from the grex has resulted in offspring exhibiting varying amounts of spots on the petals and lip.

Genetic mutations from cloning are another source of new breeding lines, particularly the peloric mutation that resulted from cloning of *Mps.* Hajime Ono ‘Raspberry’. *Miltoniopsis* Hajime Ono ‘Raspberry’ is a bright raspberry pink, with classical waterfall pattern on the lip. One plantlet from the mericlone process was produced without the developed waterfall pattern but with the expression of the lip mask on both the lip and the petals. *Miltoniopsis* Hajime Ono ‘Raspberry Butterfly’ has proven to be a stable peloric flower and mericlones now in community pots.

In the future, continued advances in hybridization will hopefully produce new and exciting hybrids. I especially look forward to continued progress in yellow breeding, possibly with the development of waterfall patterns on the lip. Additionally the use of *Mps. warszewiczii* and *Mps.*

[24] *Miltoniopsis* Lady Snow ‘Paper Doll’, AM/AOS grown by Ivan Komoda. While breeding with *Mps. warszewiczii* does not result in full classic form, the hybrids are floriferous and have a charm all their own.

[25] *Miltoniopsis* Mary Catherine Messina ‘David’s Snow Storm’, AM/AOS grown by the author and his wife.

[26] *Miltoniopsis* Princess Diana (Pearl Ono × *warszewiczii*) produced a stunning array of ranging from pure whites with small yellow masks through whites variously marked with pink to nearly solid pink cultivars. This cultivar, *Mps.* Princess Diana ‘3 Daughters’, HCC/AOS, grown by the author and his wife is one of the most striking.



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bismarckii should continue to result in new and exciting hybrids to complement the traditional *Miltoniopsis*. Lastly, new lip patterns and peloric forms will expand and diversify the pool of already varied and beautiful hybrids.

ACKNOWLEDGMENT

I thank Ivan Komoda for his expert editing and important contributions to this manuscript.

— David Rosenfeld, MD, has been growing orchids with his wife Joan for 35 years. David is a recently 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 and strive to obtain cultural awards as described David's article "Growing for Perfection" in the April 2013 issue of *Orchids*. As evidence, the Rosenfelds have garnered 60 AOS awards, which include 21 cultural and 16 *Miltoniopsis* flower quality awards.



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IVAN KOMODA



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IVAN KOMODA

[27] This group shot of *Miltoniopsis* David Rosenfeld (Pearl Ono × *bismarckii*) can only hint at the wonderful range this hybrid exhibits.

[28] *Miltoniopsis* Hajime Ono 'Raspberry Butterfly', a chance peloric exhibiting lip mask patterns on the petals and the lip, resulted from a cloning of *Miltoniopsis* Hajime Ono 'Raspberry'.

[29] The spots expressed on the petals of this *Miltoniopsis* Maui Fusion have very interesting potential for further breeding of spotted hybrids. The trait appeared from a selfing of a normally colored cultivar of *Mps.* Maui Fusion.

Orchids in Watercolor

Oncostele (Wilsonara) Romance

Marcia Whitmore

ONCOSTELE ROMANCE IS a 2010 cross between *Oncostele* Catatante and *Oncidium* Petite Shine. It is a beautiful plant that produces gorgeous orange-red flowers during the winter. My plant grows in the greenhouse on the south end where it receives morning sun, part shade in the afternoon and some late afternoon sun. I fertilize using MSU's formulation for rainwater at ¼-strength, for three waterings and a plain water flush the fourth watering. The plant is growing in a 6-inch (15-cm) clear plastic pot with a medium of equal parts medium Orchiata, medium charcoal, medium Perlite and expanded clay pellets. I completed this watercolor on a sheet of 14-inch × 17-inch (35.6-cm × 43.2-cm), 300 lb (136.4 kg) cold-pressed paper.

I have been asked several times as to how long it takes to finish a painting from initial plant decision to final painting. It often depends on my choice of plant...detail, color, size of work...and once the drawing is complete to my satisfaction (often lots of redrawing, repositioning) the drawing is transferred to the final watercolor paper. Most paintings take an average of two weeks from start to finish with an average of three work hours a day.

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



Che Romance 'Oro Rojo

M. Whitmore '19

The Catasetinae — Part 3

Breeding with Goblins — The Latest Developments in Mormodes Hybrids

BY FRED CLARKE/PHOTOGRAPHS, UNLESS OTHERWISE CREDITED, BY FRED CLARKE

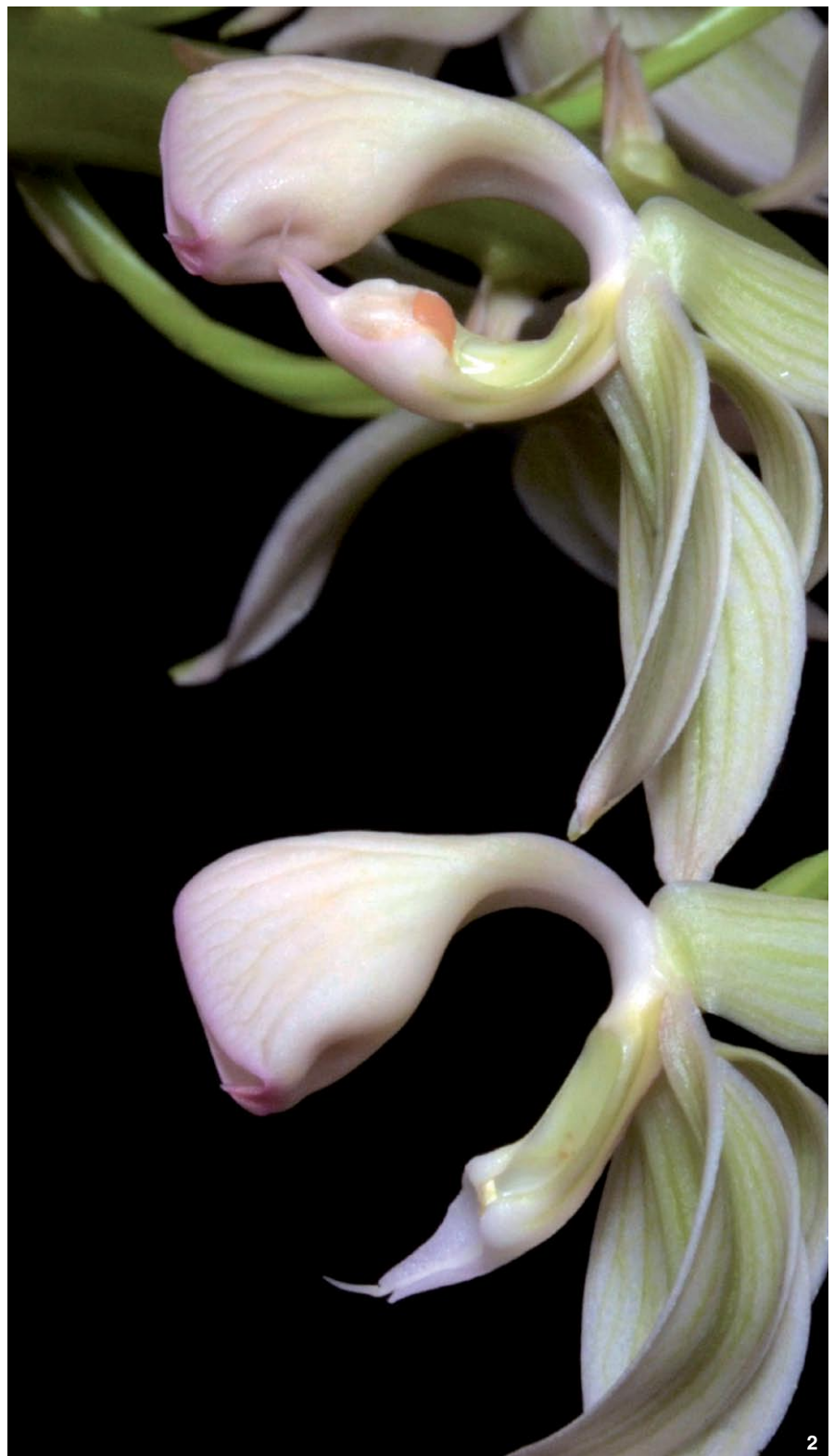


ALL BREEDING STARTS with species. *Mormodes* species are commonly known as goblin orchids, because of their twisted asymmetric flower form and outrageous colors. Distinguished by their saddle-shaped lips and twisted columns, the flowers are highly fragrant and usually brightly colored, often with complex patterning. Flower longevity is generally 2–3 weeks. Unlike *Catasetum* and *Cycnoches*, their close relatives, *Mormodes* produce perfect flowers with pollinia and stigmatic surfaces present in each blossom.

For many years, I have been intrigued by pollination strategies in *Catasetinae*. Within this subtribe, *Mormodes* are unique in that removal of pollinia causes the twisted column to straighten, producing a significant increase in the exposed area of the stigmatic surface. Interestingly, there is a simultaneous change in the viscosity of the stigmatic “goo,” which becomes stickier and thus better at holding pollinia. These adaptations would be expected to reduce the likelihood of self-pollination and improve the chances of a flower being pollinated after the pollinia have been removed. Amazing! *Mormodes* are some of the latest *Catasetinae* to flower in each growing season, often doing so on leafless bulbs in December and January. This is a nice way to finish up the blooming season.

SPECIES There are about 80 described *Mormodes* species, but only a few have been utilized in breeding. This may be because of the narrow environmental conditions under which these species grow in nature, making them challenging to cultivate outside of their native habitat. The species *Mormodes buccinator*, *Mormodes hookeri*, *Mormodes ignea*, *Mormodes lawrenceana*, and *Mormodes sinuata* have proven easier (for me) to cultivate, and because they grow well, these species have been chosen for breeding. Although *Mormodes* species are more challenging to cultivate, there is a phenomenon in orchid breeding called “hybrid vigor,” in which the progeny of two species grow more vigorously and flower sooner than the parental species. This well-documented hybrid vigor is observable in the hybrids of *Mormodes* and is passed along from generation to generation. The modern complex *Mormodes* hybrids grow and flower similarly to their better-known *Catasetinae* relatives.

HYBRIDS There have been 34 registered *Mormodes* hybrids, 24 primary (crosses between two species) and 10



complex hybrids (crosses with at least one hybrid parent). Among these, 19 AOS awards have been given to eight different hybrids — 24% of all those registered to date! The hybrid vigor displayed by *Mormodes* crosses contributes to their ease of cultivation, helping hobbyists to grow these plants successfully and increasing the likelihood that blooming

[1] *Mormodes* Exotic Treat ‘Sunset Valley Orchids’ AM/AOS (*sinuata* × *tuxtensis*)

[2] The upper flower has the pollinarium attached. The lower flower with pollinarium removed has a straightened column, and is more receptive to pollination.



ARNOLD GUM
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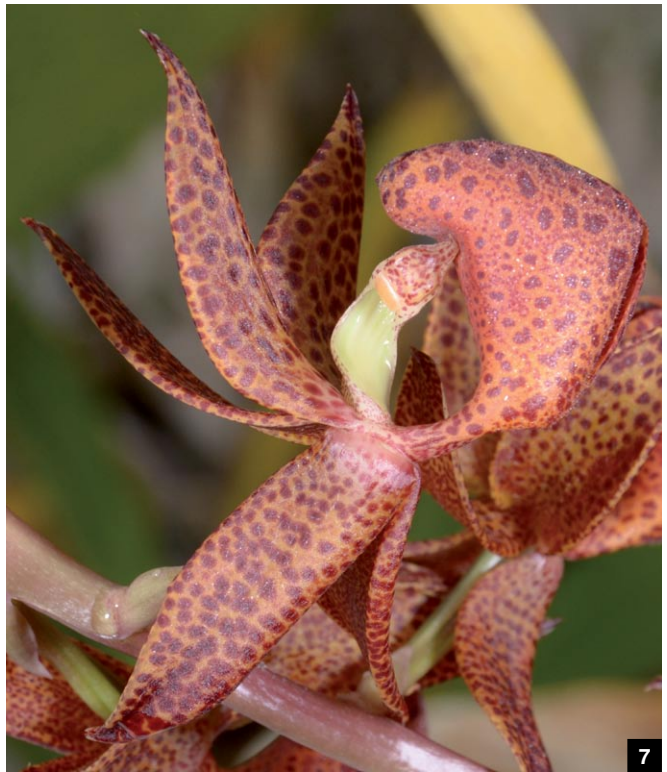
ARNOLD GUM
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- [3] *Mormodes* Jumbo Bacia 'Sunset Valley Orchids' AM/AOS (*badia* × *unica*). Jumbo Bacia is noted for its deep color and remarkably high flower count, with some cultivars carrying as many as 37 flowers per inflorescence.
- [4] *Mormodes* Virgen Del Valle 'SVO Dark Horse' AM/AOS (*sinuata* × *hookeri*). Virgen Del Valle exhibits the hirsute (hairy) lip of *hookeri* along with the dark red striped petals and sepals from *sinuata*.
- [5] *Mormodes buccinator* (Aureum form) 'Golden Green'
- [6] *Mormodes hookeri* 'Fuzz'
- [7] *Mormodes* Mimi (*ignea* × *lawrenceana*). Mimi is an excellent grower with great colors and lots of spots. Both *ignea* and *lawrenceana* have boldly spotted, brightly colored flowers, and these qualities carry through to this attractive primary hybrid.
- [8] *Mormodes* (Virgen del Valle × Morm. Nitty-Gritty). Ease of growth, multiple inflorescences and high flower count are the hallmarks of this unregistered hybrid.
- [9] *Mormodes ignea* 'Orange Blaze'
- [10] *Mormodes* Midnight 'SVO' (*sinuata* × *buccinator*). Midnight produces larger flowers than either parent in colors of deep burgundy, with sturdy upright stems that hold the flowers high.
- [11] *Mormodes* Midnight Hooker 'Hot Lips' (Midnight × *hookeri*). Midnight Hooker was one of the first complex *Mormodes* hybrids. Flowers range in color from dark burgundy to red, many with a hirsute lip. The name of the grex is a combination of the parents' names.



plants will be presented for judging.

The most successful hybrids have increased flower size, intensified coloration and beautiful patterning. One of the most noteworthy is a hybrid bred by Exotic Orchids of Maui: *Mormodes Exotic Treat* (*sinuata* × *tuxtlensis*), which has received five AOS quality awards. Plants of this grex grow vigorously, produce bright yellow flowers with bold burgundy spotting, and are capable of carrying 20+ blossoms per inflorescence.

There are a number of excellent *Mormodes* hybrids, some of which are providing the foundation for the next generation of complex hybrids. We have just begun to scratch the surface with *Mormodes* breeding, and there are still many species whose breeding potential has yet to be explored. With recent advancements in complex *Mormodes* hybrids, the opportunity for truly amazing flowers will continue to improve. More importantly, continued breeding will develop plants with hybrid vigor that makes them easier to cultivate and flower. This is an exciting frontier in *Catasetinae* breeding, and there will be many spectacular developments in the years to come. Jump on board!

CULTIVATION *Mormodes* species are adapted to the environmental conditions in their local habitat: a warm, wet summer followed by a dry winter. As a result, *Mormodes* have evolved to begin growing and rooting just before the rainy season begins. They develop pseudobulbs during the rainy season and then flower at the beginning of the dry season.

Mormodes experience other seasonal environmental changes that are important in their development: lengthening days in the spring, warm nights and long days of summer, shortening days of autumn, and short days and cool nights of winter. These, along with the wet/dry cycle, are the necessary environmental signals for *Mormodes* plants to know when to start growing in the spring and summer, when to prepare for dormancy and flowering, and when to enter dormancy. Dormancy is an adaptation to conserve moisture during the pronounced dry winter. *Mormodes* plants sense the onset of the fall season. The shortening day length, cooler temperatures and reduced frequency of rains trigger a physiological change in the plant. The pseudobulbs harden, and, most notably, the leaves turn brown and drop off. The plants need to conserve moisture and carry developing capsules all winter so they can disperse their seeds while waiting for spring





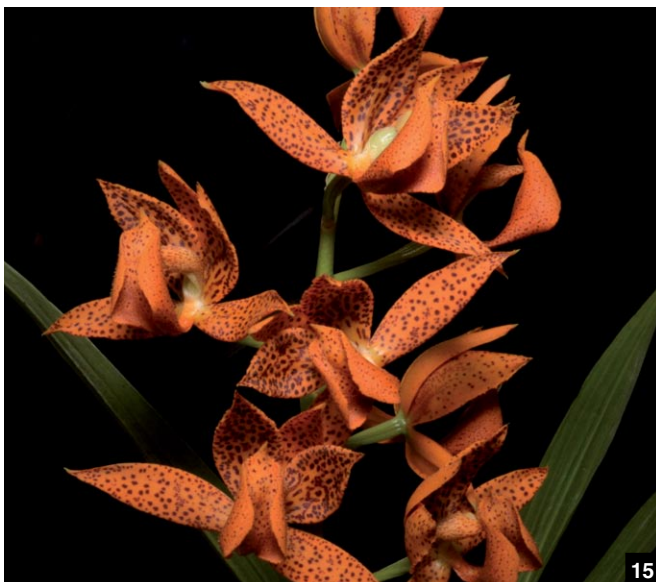
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ARTHUR PINKERS



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RICHARD CLARK

- [12] *Mormodes* Nitty-Gritty 'SVO II' (Exotic Treat × *rolfeana*). Nitty-Gritty is a successful complex hybrid for flower color, size and ease of culture. The majority displayed a bright yellow base color, densely spotted with burgundy, and some were dark burgundy throughout.
- [13] *Mormodes* Mark Mills 'Hot Lips' (Jumbo Bacia × Virgen Del Valle). Mark Mills is a recent complex hybrid, incorporating four species (*badia*, *uncia*, *hookeri*, *sinuata*). This is one of the easiest *Mormodes* hybrids plants to grow and flower, and the many-flowered inflorescences produce dark burgundy blooms with deep red lips.
- [14] *Mormodes lawrenceana* 'SVO'
- [15] *Mormodes* Aftermath 'SVO Nuclear Fallout' AM/AOS (Midnight Hooker × Mark Mills). Aftermath is the most recent *Mormodes* hybrid to be registered and the most complex yet produced, with five species in its background. The amazing flower color inspired the name of the grex as well as the name of the first cultivar to be awarded, *Morm.* Aftermath 'SVO Nuclear Fallout'.
- [16] *Mormodes sinuata* 'Sunset Valley Orchids' HCC/AOS



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rains to begin. Few orchid plants go through such a dramatic change based on strongly seasonal conditions. Once you understand these requirements and provide suitable cultural conditions, *Mormodes* will become some of the most rewarding orchids in your collection.

Acknowledgments

I am greatly honored and indebted to have Ron Kaufmann and Sue Bottom as my editors; their combined insights and wisdom are truly beneficial.

— Fred Clarke owns and operates

Sunset Valley Orchids, located near San Diego, California, USA. His interest in Catasetinae spans over 30 years. He is recognized as the foremost breeder of plants in this group and received an AOS Outstanding Hybridizer Award for his work in the alliance. His hybridization efforts and commitment to the worldwide education of hobbyists in the culture of Catasetinae has created renewed interest in this amazing group and helped to establish Catasetinae as rewarding plants for growers of all types (www.

[17] *Mormodes* have a symmetrical growth habit, growing rapidly during the rainy season with plump pseudobulbs, blooming late in the year after the leaves have yellowed and dropped (inset). Keep them dry during dormancy to prevent problems with rot.

sunsetvalleyorchids.com, email: fred.clarke@att.net).

Vanilla in Puerto Rico

BY PAUL BAYMAN/PHOTOGRAPHS BY PAUL BAYMAN UNLESS OTHERWISE CREDITED





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VANILLA BREAKS THE rules. It is one of the few orchid genera that grow as vines. It is the only one more appreciated for its fruits than for its flowers — though the flowers are beautiful. Thanks to its immense popularity in ice cream, vanilla has come to be a synonym for white — even though the cured vanilla bean itself is dark. And vanilla is sometimes used to describe something as bland, boring and generic, even though vanilla is tropical, exotic, unique and — lately — scandalous.

Vanilla planifolia is the vanilla of commerce (though the related *Vanilla × tahitensis* [*odorata × planifolia*] and *Vanilla pompona* are also used). It was domesticated in Mexico centuries ago. Recent reports of previous use in the Middle East are spurious (Daley 2018). Hernán Cortés was one of the first Europeans to taste vanilla mixed with chocolate in the court of Moctezuma. It was transported around the world but did not bear fruit for lack of pollinators. The vanilla industry outside of Mexico did not grow until Edmond Albius, a 12-year-old slave on the island of Bourbon (now Réunion) discovered the trick of manual pollination. The history of its cultivation is described in entertaining books by Rain (2004) and Cameron (2011) and an article by Schmidt (2019).

COMMERCIAL CULTIVATION *Vanilla planifolia* grows wild as a vine that climbs on tropical and subtropical forest trees, so it needs both support and shade. Some

commercial plantations train vanilla vines on trees. These can be forest trees, shade trees on coffee farms, or crop trees such as oranges and oil palms (Hernández-Hernández 2018). Others grow vanilla in shade houses on supports made of living trees, wood, bamboo, PVC tubes, cement or other materials. Shade houses are more densely planted than agroforestry farms. This makes them more productive but also more resource intensive, more expensive to maintain, and more susceptible to pests and diseases, which are often density dependent. *Vanilla* plants have both terrestrial roots and aerial roots. The aerial roots are mostly for support, so growing them on artificial posts such as PVC is fine. Roots in the soil absorb nutrients, but they are superficial. They are often colonized by mycorrhizal fungi, which supply nutrients to the plant (Porras-Alfaro and Bayman 2007). These fungi thrive in rotting wood and leaf litter, so vanilla plants are often mulched.

Vanilla is a labor-intensive crop (Childers and Cibes 1948, Brownell 2018). Flowers need hand pollination and only last a day, so growers have to be vigilant during the flowering season. Fruits take nine months to mature and a further several months to cure after harvesting (Hernández-Hernández 2018).

Nonetheless, vanilla is attractive as an additional income source for rural families in developing countries. It can be combined with existing crops or trees with minimal investment in infrastructure.

- [1] Newly-planted vanilla cutting at the base of a forest tree, Veinte Soles Farm, Arecibo. Inset photograph, taken by Naya Marciano, is the flower of *Vanilla planifolia*, the *Vanilla* species of commerce.
- [2] First meeting of people in Puerto Rico interested in growing vanilla, Bartolo Farm, Castañer, February 2018.

Part of its appeal is that it is adaptable to agroforestry systems that encourage conservation and biodiversity (Flanagan and Mosquera-Espinosa 2016, Flanagan et al. 2018). Like shade-grown coffee, vanilla is wildlife friendly, making these farms a wonderful place to visit. Vanilla is also popular for agrotourism

THE VANILLA INDUSTRY TODAY Madagascar has spectacular flora and fauna, including orchids — as described by Hermans and Hermans (2018). Today, Madagascar produces over half of the world's vanilla, so problems there trickle down to ice cream everywhere. Recent problems in Madagascar include Cyclone Enawo in 2017, which damaged an estimated 30–50% of the vanilla crop. Socioeconomic problems include widespread theft of vanilla beans from farms, limited transportation and communication networks, and a notoriously corrupt government. The risk of theft and storm damage can pressure growers to harvest too early, which decreases quality. An outbreak of bubonic plague in 2017 caused over 200 deaths (WHO 2017).

These problems have caused the wholesale price of vanilla beans to jump from less than \$23/lb (\$50/kg) in 2015 to \$295/lb (\$650/kg) in 2018. Suddenly, cured vanilla beans are worth their weight in silver!

High prices are a mixed blessing for vanilla growers for two reasons. First, they increase income, but they also stimulate overplanting. The current price spike has excited interest in planting vanilla in many countries, which will eventually lead to oversupply and a price crash. The last vanilla price crash went from over \$204/lb (\$450/kg) in 2004 to less than \$23/lb (\$50/kg) in 2005 (Brownell 2018). Second, exorbitant prices can cause food and perfume manufacturers to switch from high-quality natural vanilla to lower-quality synthetic vanillin. The switch applies to a range of products including candies, candles, colognes and condoms. This decreases demand, which further depresses prices. And when prices come down, not all manufacturers will switch back to natural vanilla (Brownell 2018).

VANILLA IN PUERTO RICO

A TANGLED HISTORY *Vanilla planifolia* is found growing wild in many of Puerto Rico's forests, though it is probably not native (Ackerman 2014). Plants were brought from Mexico and Florida in the early 1900s. After coffee farms were devastated by Hurricane San Felipe II in 1928 (a Category 5 storm), the Federal Experiment Station in Mayagüez offered vanilla to coffee growers as a supplementary crop to help recovery (Bayman 2018). (The Federal Experiment Station was later renamed the Tropical Agricultural Experiment Station, or TARS, and is still going strong.)

Over the next few decades Puerto Rico became one of the world's top-10 vanilla producers, and the Federal Experiment Station became an important center for research on vanilla cultivation and processing. The publications of Childers and co-workers (1946, 1948, 1959) are still widely read today and provide sound advice on cultivation. The industry was structured as a growers' cooperative. Fruits were cured in a central facility in Castañer in the heart of the island.

But the industry collapsed in the early 1950s. The chief cause was root rot caused by the fungus *Fusarium oxysporum*. *Fusarium* is still a problem for vanilla



growers worldwide (and for other crops as well). Vanilla prices were high after WWII, so growers intensified planting and over-pollinated their vines, making plants more susceptible to disease. Several disease-resistant vanilla hybrids were created at the Federal Experiment Station, but all traces of them have been lost in the subsequent decades.

CAN THE VANILLA INDUSTRY CLIMB BACK? History goes in cycles. In September 2017, another major hurricane, Maria, destroyed coffee farms in Puerto Rico (Mariño et al. 2018). Once again vanilla looks attractive as a supplementary crop, especially in light of the record-high market prices previously mentioned.

In April 2018, we formed a new

IF YOU GO

THE VANILLA INDUSTRY in Puerto Rico is just getting started, so do not expect to see large farms of mature plants or locally sourced vanilla beans for sale. VisitRico (<https://www.visitrico.org/>) and Vainilla Castañer (<https://www.facebook.com/vainillacastanerllc/>) can offer advice on farm visits and arrange tours.

About 140 orchid species grow wild in Puerto Rico (Ackerman 2014). Many can be seen in El Yunque National Forest or the 20 state forests throughout the island (<http://drna.pr.gov/tag/bosques-estatales/>).

company, Vainilla Castañer LLC. Its goal is to re-establish the vanilla industry in Puerto Rico, this time with emphasis on agrotourism. Once again, plants have been imported from Mexico and Florida for distribution to growers. Once again, the plan is to involve many growers, mostly coffee farmers, and to process the harvest at a central facility in Castañer. Centralized processing will allow more uniform quality control and be more appealing to buyers than having each grower process his or her own crop. Both intensive cultivation in shade houses and agroforestry are welcome, depending on the needs of each grower. For example, Pedro Bengochea is planting vanilla on forest trees on his coffee farm, along a trail dating back to the Spanish empire.

Agrotourism plays a key role in this project. Many coffee farmers want to encourage tourists to visit their farms, buy products directly from the farms, and, in some cases, stay on the farms. Labor is more expensive in Puerto Rico and Hawaii than in other coffee- and vanilla-producing countries because of U.S. labor laws. This increases production costs and makes it harder to compete. Coffee farmers in both Puerto Rico and Hawaii see high-quality specialty coffees as their best option. In many cases, this includes selling directly to the public. Vanilla will be an additional draw, especially for European tourists.

To promote vanilla agrotourism, the first Vanilla Festival was held in November 2018 in the mountain town of Adjuntas. It attracted several hundred visitors, many of whom expressed interest in growing vanilla in their own farms or gardens. An international congress on Vanilla in Gastronomy and Agrotourism is planned for October 26–27, 2019, and will include visits to farms where vanilla has been planted (although flowers and fruits are unlikely at that time of year).

Can Vanilla climb back? It is too early to tell. I hope that in 10 years you will find high-quality Puerto Rican vanilla beans and extract in a supermarket near you! It is another way to indulge your taste for orchids.

VANILLA IN THE DOMINICAN REPUBLIC Mark Lineweaver and his family are farming the forest in the lush mountains of the Dominican Republic. His farm is in the Cibao, an area famous for cacao and other crops. A sculptor from Long Island,



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he moved to the Dominican Republic for an art show 25 years ago and has lived there since. He put in a couple of vanilla plants on trees on his farm and forgot about them. Several years later, a worker went up one of the trees and harvested over a hundred vanilla fruits. It is a mystery what animal pollinated them:

- [3] Newly-planted vanilla cuttings in a shadehouse, Villas de Sotomayor Farm, Adjuntas.
- [4] Planting vanilla cuttings in the forest, Bartolo Farm, Castañer.
- [5] Vanilla plants and products at the first Vanilla Festival, Villas de Sotomayor Farm, Adjuntas, November 2018.

the farm forest has many kinds of birds, bees and butterflies. Lineweaver now has thousands of vanilla plants climbing the trees. As he scales up production of his high-quality Blue Mountain Forest Vanilla, buyers from the United States and Europe come calling.

— Paul Bayman is Professor of Biology at the University of Puerto Rico (UPR)—Río Piedras. He has worked extensively on mycorrhizal relationships of tropical orchids, often in collaboration with the famous orchidologist James D. Ackerman (also at UPR Río Piedras). His main research focus at present is diseases and pests of coffee. He is one of nine partners in Vainilla Castañer LLC. Depto. de Biología, Universidad de Puerto Rico—Río Piedras, San Juan PR 00931-3360 (email: bayman.upr@gmail.com).

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[6] Rooted vanilla plants are always well-received.

[7] Mark Lineweaver harvesting his Blue Mountain Vanilla, Dominican Republic.

Sarcochilus Update

Tips to Flower Them

BY JEAN ALLEN-IKESON

SARCOCHILUS IS A genus of charming miniatures that can produce a specimen-sized plant with multiple inflorescences in a 4- or 5-inch (10.2-12.7-cm) pot. Most have a white background with varying amounts of pink or red patterning or spots on them, although more recent breeding has introduced yellow backgrounds and the rare orange hybrid is starting to appear.

People always ask me how I get them to flower. Typically, they have a few plants and have not been able to bloom them or only sporadically. There are a few explanations that fit for most orchids. If the plant is a seedling or near-blooming size, it just may not have reached puberty. Orchids, like people, do not all reach puberty at the same age. Commercial growers will tell you that for the most part, if they have a tray of 32 seedlings, a few will bloom the first year that flowering begins, more the second year and after four years, there still may be the odd, otherwise healthy-looking plant that has not bloomed. Some species of long-petal paphiopedilums are notorious for taking up to ten years to bloom from flask. Indeed, the red clone of *Sarcochilus fitzgeraldii* named 'Lorraine Fagg', which created a revolution of reds in the genus, took ten years to bloom. This may have been peculiar to this particular clone as crossing it to other clones improved the vigor and time of first blooming.

The other important aspect is fertilizer. Orchids, like tomatoes and fruit trees, need potassium (the third number in a fertilizer such as 10-5-15) to flower and fruit. Many of us experienced greatly improved flowering with larger and more flowers in our collections when we moved away from a 10-10-10, 10-20-10 or similar fertilizer to a high-potassium one. The Michigan State Formula became the standard about 15 years ago and included other macro and micro nutrients. Since then, slow-release fertilizers that only need application once every 60 or 90 days with high potassium have become available that work well on orchids and are locally available from major manufacturers for tomatoes in garden centers.

Beyond this, what else is important



to specifically flower *Sarcochilus*? I am a great believer in observing my orchids from year to year. When I lived in Nova Scotia, Canada, where we had a coastal climate, my greenhouse had 4-foot (1.2-m) deep benches with a 2-foot (0.6-m) deep bench about 2-feet (0.6 m) above the lower, larger bench. This gave me three grow areas: the higher one, which got more light, the lower

- [1] *Sarcochilus* Amber 'Apricot' AM/AOS
- [2] *Sarcochilus* Carol Ann 'Dazzling' AM/AOS
- [3] *Sarcochilus* Cherie 'Julie Anne' HCC/AOS

that was not covered with less light, and the area under the upper bench with more shade depending on the time of the day.

I had bought a hundred or so seedlings of *Sarcochilus hartmannii* and a hybrid of it from a bankruptcy. The ones that I placed on the upper bench bloomed while the ones on the lower bench did not. So light level is important. Note that Nova Scotia nights are usually 55-65 F (12.8-18.3 C) in the summer and the spring can be cloudy. *Miltoniopsis* loved the climate as well.

I always suspected that there was more to blooming them than fertilizer and light. I now have anecdotal evidence from Ontario, Canada where I live about an hour north of Niagara Falls, close to the western tip of Lake Ontario, that perhaps it is fall temperatures as well as lowering light levels. Eric Lee, a grower north of Toronto, showed me pictures a few weeks ago at the Ottawa show of one of his greenhouses with *Sarcochilus* in abundant bloom including a bright orange one! He moaned that most of them had sulked when it came to flowering for four years until this year. I also had better blooming with more plants, more flowers and brighter colors than I have ever had.

Recently, my April issue of *Orchids Australia* arrived, which had an article in it called 'Poor flowering of *Sarcochilus* orchids in 2018 season in Sydney – a grower's perspective'. Just the opposite of what we were experiencing in Ontario. Australia is the land of *Sarcochilus* with most of the species occurring in the wild there. They have orchid shows devoted to the genus and last spring in Australia, the Revesby Workers Native Orchid Club cancelled their show because of poor blooming. The past Australian summer (our winter in North America) prior to their spring blooming period was exceptionally hot for long periods and it extended into the fall. Chan and Chan (2019) keep records of their plants, first blooming and dates of reblooming. This allowed them to do a comparison of flowering of their 250 flowering-size *Sarcochilus* for the summer and fall temperatures prior to late winter and spring blooming for 2017 and 2018. 2017 also had a hot summer but it was the hot fall of 2018 that seemed to make the difference. The extreme warmth had persisted into the fall in 2018, whereas it did not in 2017. What they saw was an approximately 40% drop in the total number of plants that flowered compared to the previous year. Of the plants that had flowered the previous year, one-third did not flower at all. They concluded that it was the lack of a cooling period in the fall



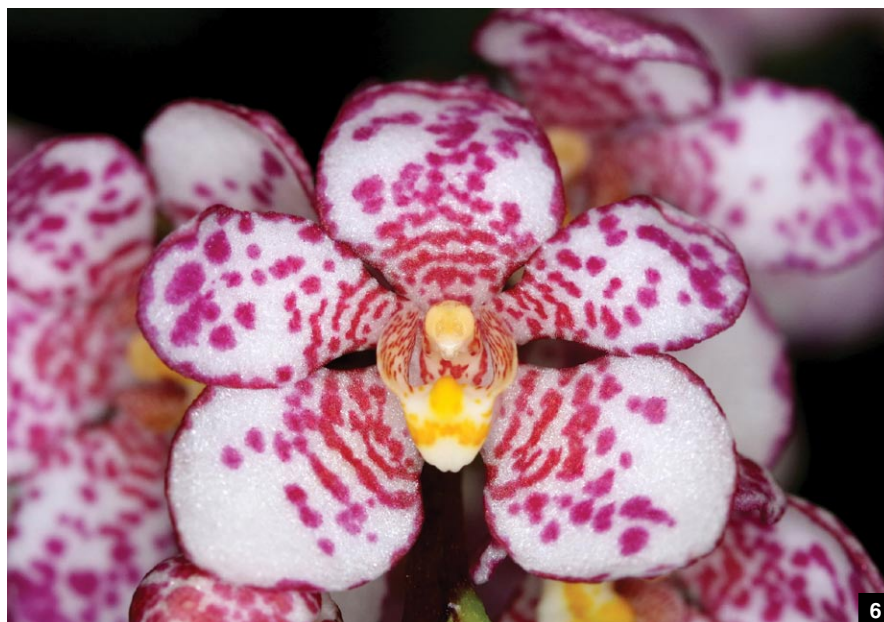
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that caused all the grief.

They went on to look at the pedigrees of the plants that flowered as a percentage of those that flowered the previous year. The percentage that reflowered and were mainly *Sarcochilus hartmannii* breeding was approximately double that of those with a lot of *Sarco. fitzgeraldii*. In some ways, that is hardly surprising. *Sarcochilus hartmannii* has been used as the pillar for vigor and form by breeders whereas *fitzgeraldii* had added heavy doses of reds, but is fussier to grow, although not usually as fussy as the 'Lorraine Fagg' clone!

So what has the hot fall in 2018 and subsequent poor flowering in Australia have to do with abundant flowering in southern Ontario in 2019? We had a miserable fall, winter and spring that went from a much sunnier than normal September and early October to much colder, overcast and frequent drizzle almost overnight on October 12. Daytime temperatures averaged 67.5 F (19.7 C) for the first 11 days of the month and 50 F (10 C) for the last 21 days (Environment Canada). We were lucky to get a half day or a day with sun for the 60 days that followed October 12 and November was equally cool. The winter was not much better and the spring has been late with cool, damp, and lots of cloudy weather. While Eric Lee and I both grow in greenhouses with a minimum temperature for the fall and winter maintained by furnaces, what we do not get is the warming from the sun when it is cloudy or raining, which means the daytime temperatures were also cooler last fall than the normal mix in the greenhouse that is normally moderated by solar heating even if the outside temperature is cold.

What this all suggests is that *Sarcochilus* prefer cooling and perhaps lower light levels in the fall to bloom well in the late winter and spring. How am I going to change my culture? My sarcs are going under the back bench onto the cooler gravel floor on October 1 this fall in my attached greenhouse in which the back bench is under the area built into a barn and shadier and cooler. Do not forget, however, that the ones that had higher light in the summer in Nova Scotia bloomed. So while they do not like extreme light levels, they can be grown in cattleya or near-cattleya light levels in the summer with shade, so long as they are kept below 86 F (30 C), which has been suggested to be stressful for their growth and development (Chan & Chan 2019). They would prefer not going over 80 F (26.7 C) but that does not always work in my greenhouse. While they are a close relative of vandas and *Phalaenopsis*,



MAURICE MARIETTI

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they can tolerate cooler temperatures than phals, which makes culture easier in greenhouses, in cooler conditions on windowsills or in cooler basements.

Sarcochilus are also like *Tolumnia* and odontoglossum-type oncidiums in that the color and depth of patterning can vary among the flowers and along the inflorescence. It is suspected that temperature and light during bud development causes this variability. Indeed, with the miserable cool dark spring, my sarcs had better color than ever. My *Sarcochilus* Allure 'Elegant Twin' HCC/AOS bloomed almost completely red this spring compared to last year when it was awarded. It is not unusual for the color to improve in the second and third blooming over the initial one.

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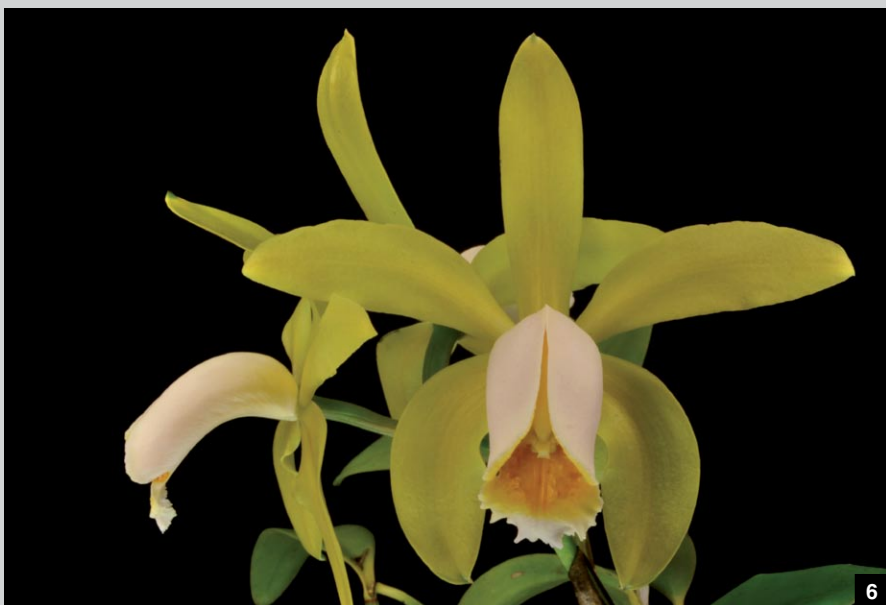
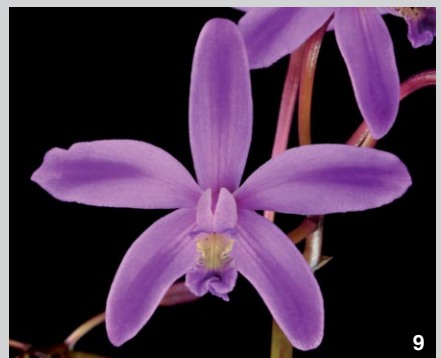
—Jean Allen-Ikeson is an accredited American Orchid Society judge and chairs the AOS Editorial Board. She previously authored the 2011 AOS annual supplemental issue *Sarcochilus* available from the AOS or our website at <http://secure.aos.org/Category/55-book-orchidcare.aspx?PageIndex=2>. Jean last wrote for *Orchids in September 2019* (email [jean.ikeson@gmail.com](mailto:ikeson@gmail.com)).



RAMÓN DE LOS SANTOS

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- [4] *Sarcochilus* Coolendel 'Poached Egg' HCC/AOS
- [5] *Sarcochilus* Fiery Twin 'Fran Weaver' FCC/AOS
- [6] *Sarcochilus* Humming Bird 'Raspberry Ice Cream' HCC/AOS
- [7] *Sarcochilus hartmannii* 'Snow Day' CCE/AOS
- [8] *Sarcochilus* Kulnura Dragonfly 'Emma Jane' AM/AOS





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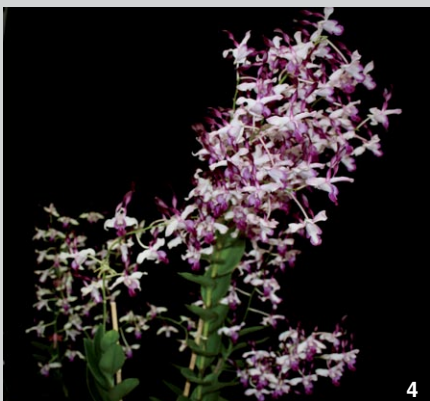
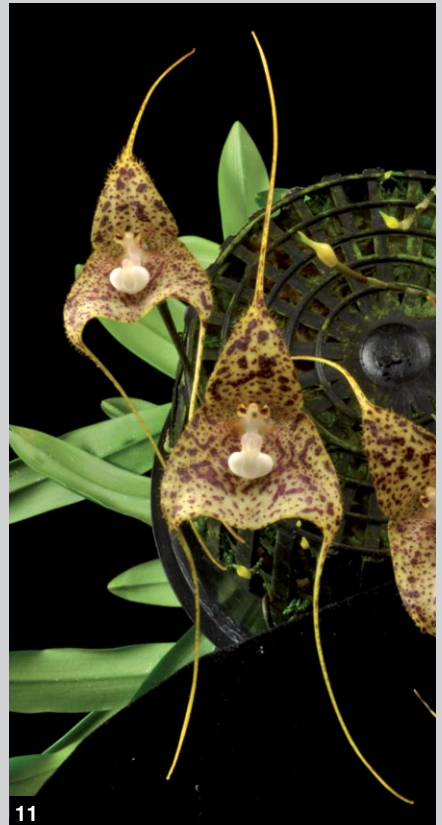


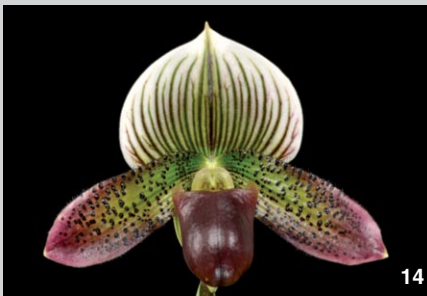
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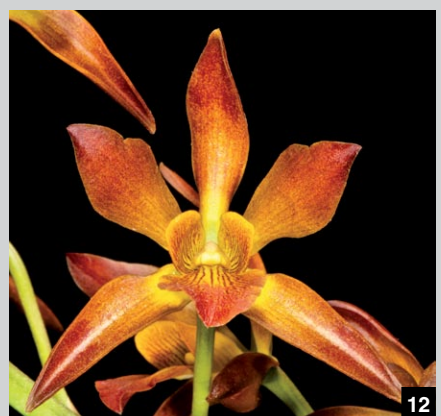
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- [1] *Stanhopea florida* 'Timbucktoo' AM/AOS 81 pts. Exhibitor: Sarah Pratt; photographer: Bryon Rinke. Great Plains Judging Center
- [2] *Paphiopedilum* Jacqueline's Spring Moon 'Slipper Zone Well I Never' AM/AOS (Spring Moonbeam x Jacqueline's Moon) 80 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [3] *Paphiopedilum* Luna Pleasure 'Slipper Zone Tall Grace' AM/AOS (Luna Shadow x Jewel Green) 81 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [4] *Paphiopedilum* Petula's Knight 'Slipper Zone Green Ninja' HCC/AOS (Petula's Flame x Ninja) 79 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [5] *Lycaste dowiana* 'Lehua's Taylor Treat' HCC/AOS 76 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [6] *Cattleya forbesii* f. *aurea* 'Sebastian Ferrell' AM/AOS 82 pts. Exhibitor: Orchid Eros; photographer: Glen Barfield. Hawaii Judging Center
- [7] *Cattleya* Mareeba Tiger 'Darth Sidius' AM/AOS (*tigrina* x *schilleriana*) 85 pts. Exhibitor: Orchid Eros; photographer: Glen Barfield. Hawaii Judging Center
- [8] *Paphiopedilum* Odette's Moon 'Slipper Zone Pink Halo' HCC/AOS (Luna Shadow x Odette's Charm) 76 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [9] *Cattleya ghillanyi* (Flamea) 'Isabel Rosalia' AM/AOS 85 pts. Exhibitor: Orchid Eros; photographer: Glen Barfield. Hawaii Judging Center
- [10] *Rhyncholaeliocattleya* Volcano Glory 'Perfection' AM/AOS (Volcano Star x Blanche Aisaka) 88 pts. Exhibitor: Shogun Hawaii- Matthias Seelis; photographer: Glen Barfield. Hawaii Judging Center
- [11] *Cattleya* Mareeba Tiger 'Kyro Ren' AM/AOS (*tigrina* x *schilleriana*) 83 pts. Exhibitor: Orchid Eros; photographer: Glen Barfield. Hawaii Judging Center
- [12] *Paphiopedilum* Oriental Green 'Slipper Zone Smallest' HCC/AOS (Oriental Jewel x *sukhakulii*) 76 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [13] *Miltoniopsis* Michiko Hayasuke 'Mango Dancer' AM/AOS (Tropical Punch x *roezlii*) 80 pts. Exhibitor: Winning Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [14] *Paphiopedilum* Spring Charm 'Slipper Zone Duo' HCC/AOS (Spring Jewel x Egret's Jewel) 76 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [15] *Cattleya coccinea* 'Melia' HCC/AOS 75 pts. Exhibitor: Orchid Eros; photographer: Glen Barfield. Hawaii Judging Center
- [16] *Cattleya tigrina* 'Gabriel Amaru' AM/AOS 83 pts. Exhibitor: Orchid Eros; photographer: Glen Barfield. Hawaii Judging Center





- [1] *Cattleya* Brazilian Midway 'Too Good Too' AM/AOS (*Iodigessii* x *harrisoniana*) 81 pts. Exhibitor: Orchid Eros; photographer: Glen Barfield. Hawaii Judging Center
- [2] *Cattleya* Sincomedia 'Gabriel Amaru' AM/AOS (*sincorana* x *intermedia*) 81 pts. Exhibitor: Orchid Eros; photographer: Glen Barfield. Hawaii Judging Center
- [3-4] *Dendrobium* Maui Sparkle 'Valley Isle Giant' AM-CCE/AOS (Blue Sparkle x Samarai) 86-93 pts. Exhibitor: Jadine Harriman; photographer: Michael Blietz. Hawaii Judging Center
- [5] *Cattleya purpurata* (Carnea) 'Isabel Rosalia' HCC/AOS 78 pts. Exhibitor: Orchid Eros; photographer: Glen Barfield. Hawaii Judging Center
- [6] *Grammatophyllum scriptum* 'Grasshopper' CCM/AOS 87 pts. Exhibitor: Peter and Vida Schell; photographer: Chuck Briggs. Hawaii Judging Center
- [7] *Renantanda* Sunrise 'Ruby Red' AM/AOS (*Vanda falcata* x *Renanthera imschootiana*) 81 pts. Exhibitor: Aloha Aina Orchids; photographer: Chuck Briggs. Hawaii Judging Center
- [8] *Paphiopedilum* Spring Egret 'Slipper Zone Hirsute Free' HCC/AOS (Egret's Moon x Spring Wolf) 79 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [9] *Paphiopedilum* White Promise 'Slipper Zone White Happens' AM-AD/AOS (Egret's Jewel x Oriental Jewel) 81 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [10] *Cattleya tenebrosa* (Alba) 'Pauwela' AM-CHM/AOS 81-83 pts. Exhibitor: Orchid Eros; photographer: Glen Barfield. Hawaii Judging Center
- [11] *Dracula vespertilio* 'Hayden and Drew' HCC/AOS 76 pts. Exhibitor: Jungle Mist Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [12] *Peristeria pendula* 'Natural World' AM/AOS 85 pts. Exhibitor: Tropical Orchid Farm; photographer: Michael Blietz. Hawaii Judging Center
- [13] *Bulbophyllum saurocephalum* 'Rainbow Mist' CCE/AOS 90 pts. Exhibitor: Maryetta Sciuto; photographer: Chuck Briggs. Hawaii Judging Center
- [14] *Paphiopedilum* Wonderful Shadow 'Slipper Zone Green Dynamite' AM/AOS (Luna Shadow x Mr Wonderful) 81 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [15] *Dendrobium amabile* 'Pukalani Passion' CCM/AOS 88 pts. Exhibitor: Aloha Aina Orchids; photographer: Chuck Briggs. Hawaii Judging Center
- [16] *Catasetum* Noir Beauty 'Jo Levy' AM/AOS (Boltieye x Pileabrosum Green) 85 pts. Exhibitor: Tropical Orchid Farm; photographer: Chuck Briggs. Hawaii Judging Center
- [17] *Paphiopedilum callosum* var. *warnerianum* 'Natural World' AM/AOS 81 pts. Exhibitor: Tropical Orchid Farm; photographer: Chuck Briggs. Hawaii Judging Center





- [1] *Brassavola perrinii* 'Elaine' CCE-AM/AOS 95-86 pts. Exhibitor: Derek Lowenstein; photographer: Malcolm McCorquodale. Houston Judging Center
- [2] *Tolumnia* Jairak Rainbow 'Plum Pretty' AM/AOS (Tsiku Vanessa x Catherine Wilson) 82 pts. Exhibitor: Tan Tran; photographer: Malcolm McCorquodale. Houston Judging Center
- [3] *Cattleya* Sarah Elizabeth 'EpiJim' AM/AOS (Mark Jones x Jungle Elf) 82 pts. Exhibitor: James Jeansson; photographer: Larry Hennessey. Houston Judging Center
- [4] *Phalaenopsis* David Lim 'Loretta' AM/AOS (*amboinensis* x *gigantea*) 81 pts. Exhibitor: Chris Rehmann; photographer: David Oldham. Mid-Atlantic Judging Center
- [5] *Paphiopedilum* Toni Semple 'Priscilla Ann' HCC/AOS (*haynaldianum* x *lowii*) 78 pts. Exhibitor: Stephen Gallagher; photographer: Julius Klehm. Houston Judging Center
- [6] *Paphiopedilum* Petula's Sensation 'Orchiddawg' AM/AOS (Macabre Contrasts x Petula's Flame) 80 pts. Exhibitor: David Potts; photographer: Larry Hennessey. Houston Judging Center
- [7] *Bulbophyllum* More Than Aghast 'Layla' AM-CCM/AOS (*agastor* x *echinolabium*) 85-81 pts. Exhibitor: Larry Hennessey; photographer: Larry Hennessey. Houston Judging Center
- [8] *Paphiopedilum* Lynleigh Koopowitz 'Yngwie' HCC/AOS (*delenatii* x *malipoense*) 78 pts. Exhibitor: Laurie and Sheila Skov; photographer: Larry Hennessey. Houston Judging Center
- [9] *Paphiopedilum* Moonstone 'Moonbeam' AM/AOS (Longwoodense x Mrs. F. Sander) 83 pts. Exhibitor: Mark Nelson Werther; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [10] *Dendrobium* *lindleyi* 'Sunshine Daydream' CCM/AOS 84 pts. Exhibitor: Little Brook Orchids; photographer: Duane Erdmann. Mid-Atlantic Judging Center
- [11] *Phragmipedium* Mountain Maid 'Ashley Anne' AM/AOS (*besseae* x *hirtzii*) 83 pts. Exhibitor: Richard Garrison; photographer: David Oldham. Mid-Atlantic Judging Center
- [12] *Guaricyclia* Epiorange 'Sentinel' AM/AOS (*Encyclia alata* x *Guarianthe aurantiaca*) 81 pts. Exhibitor: Mark Nelson Werther; photographer: David Oldham. Mid-Atlantic Judging Center
- [13] *Catasetum* Bel Tramonto 'Rare Earth Orchids' HCC/AOS (Bela Vista's Sangria x Chuck Taylor) 77 pts. Exhibitor: Steve Moffitt; photographer: Malcolm McCorquodale. Houston Judging Center
- [14] *Catasetum* Extravaganza 'Rare Earth Orchids' AM/AOS (Karen Armstrong x Louise Clarke) 80 pts. Exhibitor: Steve Moffitt; photographer: Malcolm McCorquodale. Houston Judging Center
- [15] *Cattleya purpurata* 'The Grads' AM/AOS 82 pts. Exhibitor: Joan and David Rosenfeld; photographer: David Oldham. Mid-Atlantic Judging Center
- [16] *Catasetum* Tom Pickens 'Rare Earth Orchids' HCC/AOS (Karen Armstrong x Alexa) 77 pts. Exhibitor: Steve Moffitt; photographer: Malcolm McCorquodale. Houston Judging Center





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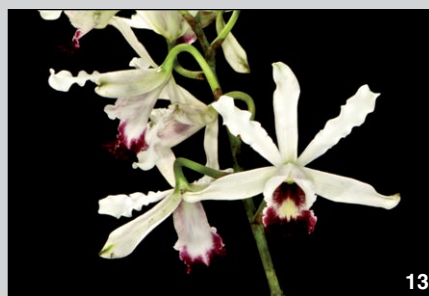
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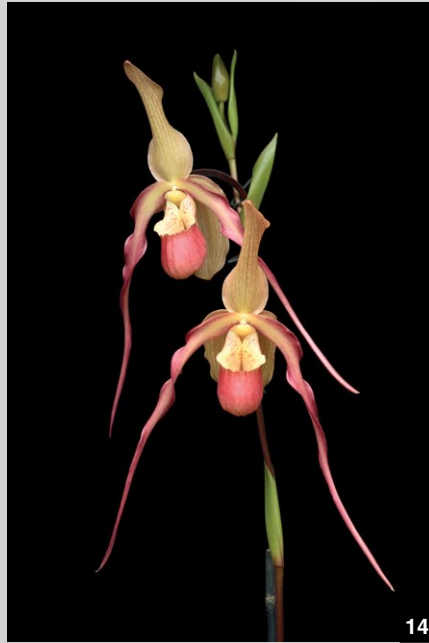
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- [1] *Paphiopedilum* Lady Booth 'Rogan's Gold' AM/AOS (Lady Isabel x Susan Booth) 84 pts. Exhibitor: John Rogan; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [2] *Cattleya warszewiczii* 'Chris Jr.' AM/AOS 82 pts. Exhibitor: Chris Rehmann; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [3] *Masdevallia* Gypsy 'HOF' FCC-CCE/AOS (Rubicon x Patricia Hill) 91-93 pts. Exhibitor: Longwood Gardens; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [4] *Disa uniflora* 'Longwood's Decisive Dynamo' JC/AOS. Exhibitor: Longwood Gardens; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [5] *Smitinandia micrantha* 'Longwood's Miniature Marvel' CCM/AOS 84 pts. Exhibitor: Longwood Gardens; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [6] *Platystele misera* 'Longwood's Spreading Starlight' CCM/AOS 86 pts. Exhibitor: Longwood Gardens; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [7] *Pleurothallis viduata* 'Longwood's Summer Snowfall' CCE/AOS 93 pts. Exhibitor: Longwood Gardens; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [8] *Promenaea Crawshayana* 'Longwood's Gilded Globe' CCE-AM/AOS (*stapelioides* x *xanthina*) 92-80 pts. Exhibitor: Longwood Gardens; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [9] *Dactylorhiza saccifera* 'Longwood's Lilac Light' CBR/AOS. Exhibitor: Longwood Orchids; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [10] *Paphiopedilum* Macabre Love 'Dark Magic' AM/AOS (Love Song x Macabre Contrasts) 81 pts. Exhibitor: Sergey Skoropad; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [11] *Cattleya* Amy Louise Off 'Beloved' HCC/AOS (*Calummata* x *aclandiae*) 78 pts. Exhibitor: Joe Grezaffi; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [12] *Propetalum* La Jolla Delight 'David's Sizzler' AM/AOS (*Promenaea stapelioides* x *Zygopetalum* Kiwi Dusk) 81 pts. Exhibitor: Joan and David Rosenfeld; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [13] *Myrmecophila thomsoniana* var. *thomsoniana* 'Joe's-Bobbie' AM-CCM/AOS 82-83 pts. Exhibitor: Joe Grezaffi; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [14] *Phalaenopsis* Tying Shin Fly Eagle 'Wilson' AM/AOS (*tetraspis* x Dragon Tree Eagle) 80 pts. Exhibitor: Chris Rehmann; photographer: Maurice Marietti. Mid-Atlantic Judging Center





- [1] *Masdevallia calura* 'Longwood's Crimson Cascade' CCM/AOS 85 pts. Exhibitor: Longwood Gardens; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [2] *Phragmipedium* Stairway to Heaven 'Un rêve éveillé' AM/AOS (*warszewiczianum* x *humboldtii*) 82 pts. Exhibitor: Mario Mireault; photographer: Michel Tremblay. Toronto Judging Center
- [3] *Phragmipedium* Nez Perce Creek 'Penns View' AM/AOS (Grande x Spot On) 81 pts. Exhibitor: Woodstream Orchids; photographer: Bryan Ramsay. National Capital Judging Center
- [4] *Aerangis spiculata* 'Jardin botanique de Montréal' HCC/AOS 78 pts. Exhibitor: Jardin botanique de Montréal; photographer: Michel Tremblay. Toronto Judging Center
- [5] *Paphiopedilum* Saint Swithin 'Rock Creek' CCM/AOS (*philippinense* x *rothschildianum*) 86 pts. Exhibitor: Jerry Rice; photographer: Bryan Ramsay. National Capital Judging Center
- [6] *Eulophia euglossa* 'Jocelyn Thibeault' AM/AOS 81 pts. Exhibitor: Thibault Mireault; photographer: Michel Tremblay. Toronto Judging Center
- [7] *Phragmipedium caudatum* 'Tristan Michaud' AM/AOS 80 pts. Exhibitor: Nomand Michaud; photographer: Thang Dam. Toronto Judging Center
- [8] *Propetalum* La Jolla Delight 'Julien Cédric Anne' AM/AOS (*Promenaea stapelioides* x *Zygopetalum* Kiwi Dusk) 82 pts. Exhibitor: Julien Cédric Anne; photographer: Thang Dam. Toronto Judging Center
- [9] *Paphiopedilum* Ho Chi Minh 'Ramble on Rose' AM/AOS (*delenatii* x *vietnamense*) 82 pts. Exhibitor: Little Brook Orchids; photographer: Bryan Ramsay. National Capital Judging Center
- [10] *Phragmipedium* Wössner Supergrande 'Poe Creek' AM/AOS (*longifolium* x *humboldtii*) 83 pts. Exhibitor: Woodstream Orchids; photographer: Bryan Ramsay. National Capital Judging Center
- [11] *Paphiopedilum* Spring Egret 'Penns View' FCC/AOS (Egret's Moon x Spring Wolf) 90 pts. Exhibitor: Woodstream Orchids; photographer: Bryan Ramsay. National Capital Judging Center
- [12] *Thunia alba* 'Jardin botanique de Montréal' CCM/AOS 83 pts. Exhibitor: Jardin botanique de Montréal; photographer: Thang Dam. Toronto Judging Center
- [13] *Paphiopedilum* F. C. Puddle 'Superbum' CCM/AOS (*Actaeus* x *Astarte*) 89 pts. Exhibitor: Robert Travers; photographer: James Winner. National Capital Judging Center
- [14] *Phragmipedium* Bouley Bay 'Poe Creek' AM/AOS (Eric Young x Grande) 85 pts. Exhibitor: Woodstream Orchids; photographer: Bryan Ramsay. National Capital Judging Center
- [15] *Habenaria* Bird of Paradise 'Scorpio' AM/AOS (Conure x *medusa*) 82 pts. Exhibitor: Sarah Hurdel; photographer: Julie Rotramel. National Capital Judging Center
- [16] *Brassidium* Scrambled Eggs 'With Bacon' AM/AOS (*Brassia Memoria* Bert Field x *Oncidium leucochilum*) 81 pts. Exhibitor: John Dunkelberger; photographer: Julie Rotramel. National Capital Judging Center





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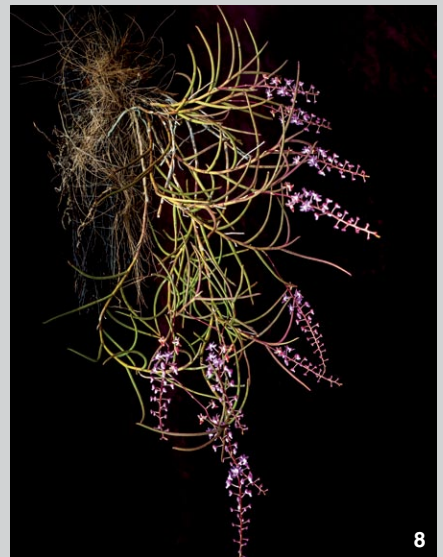
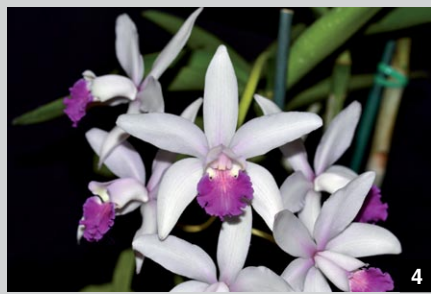


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- [1] *Diaphanthe odoratissima* 'Jardin botanique de Montréal' CCE/AOS 90 pts. Exhibitor: Jardin botanique de Montréal; photographer: Michel Tremblay. Toronto Judging Center
- [2] *Phragmipedium* Fliquet 'Briscoe Pond' AM/AOS (Grande x Memoria Dick Clements) 82 pts. Exhibitor: Woodstream Orchids; photographer: Julie Rotramel. National Capital Judging Center
- [3] *Dendrobium loddigesii* 'Deanna's Tintinnabulum' CCM/AOS 81 pts. Exhibitor: Dr Lawrence Schweitzer; photographer: Charles Marden Fitch. Northeast Judging Center
- [4] *Phragmipedium* America 'Purple Mountain Majesty' AM/AOS (Les Dirouilles x *kovachii*) 81 pts. Exhibitor: Peter Ma; photographer: James Winner. National Capital Judging Center
- [5] *Paphiopedilum* Magic Lantern 'Georgie Girl' FCC/AOS (*micranthum* x *delenatii*) 90 pts. Exhibitor: Patricia Freeland; photographer: Charles Marden Fitch. Northeast Judging Center
- [6] *Rhyncholaeliocattleya* Claire Cole 'Lovely' HCC/AOS (Cattleya Love Castle x Paradise Rose) 79 pts. Exhibitor: Arbec Orchids; photographer: Julie Rotramel. National Capital Judging Center
- [7] *Cynorkis gibbosa* 'Susan's Fireworks' AM/AOS 84 pts. Exhibitor: Chuck and Sue Andersen; photographer: Teck Hia. Northeast Judging Center
- [8] *Phragmipedium* x *tetzlaffianum* 'Penns Creek' CHM/AOS 84 pts. Exhibitor: William Goldner; photographer: Julie Rotramel. National Capital Judging Center
- [9] *Paphiopedilum* Michael Koopowitz 'Gemini' AM/AOS (*philippinense* x *sanderianum*) 86 pts. Exhibitor: Marc Kiriou; photographer: Julie Rotramel. National Capital Judging Center
- [10] *Phalaenopsis* Taida King's Caroline 'Taida Little Zebra Va' AM/AOS (Ever-spring King x Ho's Little Caroline) 81 pts. Exhibitor: Carri Raven-Riemann and the OrchidPhile; photographer: Maurice Garvey. Northeast Judging Center
- [11] *Paphiopedilum barbatum* 'Cleveland's' AM/AOS 82 pts. Exhibitor: Robert Cleveland; photographer: Teck Hia. Northeast Judging Center
- [12] *Dendrobium gerlandianum* 'Irene' CHM/AOS 83 pts. Exhibitor: Al and Irene Messina; photographer: Maurice Garvey. Northeast Judging Center
- [13] *Paphiopedilum* Johanna Burkhardt 'Asha' AM/AOS (*rothschildianum* x *adductum*) 83 pts. Exhibitor: Madhu Chintala; photographer: Maurice Garvey. Northeast Judging Center
- [14] *Vanda* Motes Ruby Pixie 'Beswick' AM/AOS (*cristata* x *testacea*) 81 pts. Exhibitor: Chuck and Sue Andersen; photographer: Teck Hia. Northeast Judging Center
- [15] *Masdevallia* Proud Prince 'Play in the Sunshine' AM/AOS (Prince Charming x *veitchiana*) 80 pts. Exhibitor: J&L Orchids; photographer: Maurice Garvey. Northeast Judging Center
- [16] *Paphiopedilum* Ho Chi Minh 'Bob' AM/AOS (*delenatii* x *vietnamense*) 84 pts. Exhibitor: Robert Cleveland; photographer: Teck Hia. Northeast Judging Center





- [1] *Lorenara* Laura Newton 'Sue's Tiger' AM/AOS (*Galabstia* Green Tyger x *Zygopetalum* Advance Australia) 83 pts. Exhibitor: Chuck and Sue Andersen; photographer: Teck Hia. Northeast Judging Center
- [2] *Cattleya* Little Red Seagull 'Gracie' HCC/AOS (*rupestris* x *coccinea*) 75 pts. Exhibitor: Ken and Amy Jacobsen; photographer: Ken Jacobsen. Pacific Central Judging Center
- [3] *Cattleya* Marriottii (1896) 'Bentley' HCC/AOS (*crispata* x *coccinea*) 77 pts. Exhibitor: Ken and Amy Jacobsen; photographer: Ken Jacobsen. Pacific Central Judging Center
- [4] *Cattleya* Exeter Grace 'Shirley' AM/AOS (*fournieri* x *intermedia*) 80 pts. Exhibitor: Ken and Amy Jacobsen; photographer: Ken Jacobsen. Pacific Central Judging Center
- [5] *Cymbidium* Kuranda 'Cats' AM/AOS (*madidum* x *suave*) 81 pts. Exhibitor: Carol Armendariz; photographer: Ken Jacobsen. Pacific Central Judging Center
- [6] *Masdevallia* ivanii 'Susan' HCC/AOS 75 pts. Exhibitor: Chuck and Sue Andersen; photographer: Teck Hia. Northeast Judging Center
- [7] *Epidendrum* falcatum 'Deanna's Eidolon' JC/AOS. Exhibitor: Dr Lawrence Schweitzer; photographer: Teck Hia. Northeast Judging Center
- [8] *Cleisostoma* williamsonii 'Susan' CBR/AOS. Exhibitor: Chuck and Sue Andersen; photographer: Robert Hesse. Northeast Judging Center
- [9] *Caucaea* olivacea 'Hawk's Gift' HCC/AOS 78 pts. Exhibitor: Carol Klonowski; photographer: Chaunie Langland. Pacific Central Judging Center
- [10] *Dendrobium* cuthbertsonii 'Bicolor Dream' AM/AOS 82 pts. Exhibitor: Golden Gate Orchids; photographer: Ken Jacobsen. Pacific Central Judging Center
- [11] *Oberonia* rufilabris 'Joey' CCM/AOS 88 pts. Exhibitor: Carol Zoltowski; photographer: Ken Jacobsen. Pacific Central Judging Center
- [12] *Paphiopedilum* Toni Semple 'MikeAl' AM/AOS (*haynaldianum* x *lowii*) 81 pts. Exhibitor: Michael Curtin; photographer: Ross Leach. Pacific Northwest Judging Center
- [13] *Rhyncho brassoleya* Everything Nice 'Gold Country' AM/AOS (*Rhyncho-laeliocattleya* Memoria Helen Brown x *Brassavola* perrinii) 80 pts. Exhibitor: Amy and Ken Jacobsen; photographer: Ken Jacobsen. Pacific Central Judging Center
- [14] *Stanhopea* Nicholas Swett 'Arya' AM/AOS (*ecornuta* x *inodora*) 84 pts. Exhibitor: Gerald Swett; photographer: Ross Leach. Pacific Northwest Judging Center
- [15] *Sarcochilus* Kulnura Iridessa 'Purple Edge' AM/AOS (Cherie Dawn x Bunyip) 80 pts. Exhibitor: Amy and Ken Jacobsen; photographer: Chaunie Langland. Pacific Central Judging Center
- [16] *Masdevallia* Redshine 'Casuka' CCM-FCC/AOS (Falcon Sunrise x Marguerite) 88-90 pts. Exhibitor: Masaki Asuka; photographer: Chaunie Langland. Pacific Central Judging Center





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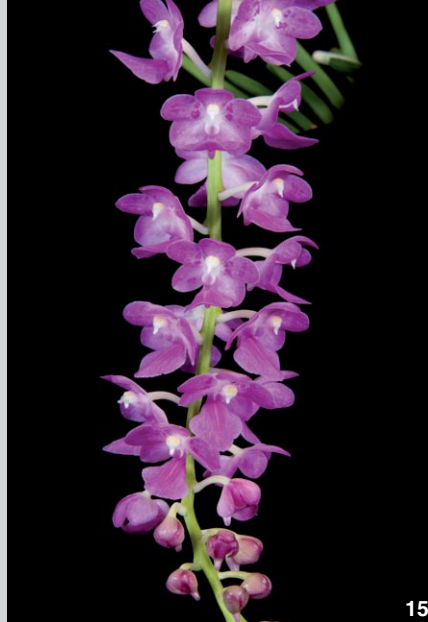
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- [1] *Teagueia phasmida* 'Cosmos' CBR/AOS. Exhibitor: Terry Thompson; photographer: Ross Leach. Pacific Northwest Judging Center
- [2] *Myrmecocattleya* Maku'u Mana 'Maku'u' HCC/AOS (*Cattleya* Lucia Cecilia x *Myrmecophila tibicinis*) 78 pts. Exhibitor: Gines Orchids Leonard Gines; photographer: Ross Leach. Pacific Northwest Judging Center
- [3] *Phragmipedium* Acker's Royalty 'Bell' Orchidea' HCC/AOS (Twilight x *fischeri*) 78 pts. Exhibitor: Phyllis Prestia; photographer: Arnold Gum. Pacific South Judging Center
- [4] *Maxillaria tonsbergii* 'Spooky' CCE/AOS 90 pts. Exhibitor: Betty Kelepecz; photographer: Arnold Gum. Pacific South Judging Center
- [5] *Phalaenopsis* Haur Jih Fancy 'San Jacinto' AM/AOS (Chingruey's Blood-Red Sun x Chingruey's Fancy) 88 pts. Exhibitor: Glenn F. Stall; photographer: Arnold Gum. Pacific South Judging Center
- [6] *Paphiopedilum barbatum* 'Arnie' AM/AOS 81 pts. Exhibitor: Arnold Gum; photographer: Arnold Gum. Pacific South Judging Center
- [7] *Catasetum* Dark Odyssey 'SVO Black Cherry' AM/AOS (Karen Armstrong x Darkness) 85 pts. Exhibitor: Fred Clarke; photographer: Arnold Gum. Pacific South Judging Center
- [8] *Masdevallia* Fraseri 'Griffin Mountain' AM/AOS (*coccinea* x *ignea*) 83 pts. Exhibitor: Liana Webb; photographer: Ross Leach. Pacific Northwest Judging Center
- [9] *Phalaenopsis* San Jacinto Fancy Rose 'Susan' AM/AOS (San Jacinto Rose x Chingruey's Fancy) 81 pts. Exhibitor: Glenn F. Stall; photographer: Arnold Gum. Pacific South Judging Center
- [10] *Oberonia toppingii* 'Audrey' CCM/AOS 87 pts. Exhibitor: William and Margaret Loy; photographer: Arnold Gum. Pacific South Judging Center
- [11] *Encyclia* Lee Ward 'Arnie' AM/AOS (*adenocaula* x *tampensis*) 80 pts. Exhibitor: Arnold Gum; photographer: Arnold Gum. Pacific South Judging Center
- [12] *Brassavola cucullata* 'Arnie' HCC/AOS 77 pts. Exhibitor: Arnold Gum; photographer: Arnold Gum. Pacific South Judging Center
- [13] *Paphiopedilum* Nancy Depauw 'Athena Marie' HCC/AOS (Barbie's Candy x *fairrieatum*) 77 pts. Exhibitor: Cheryl L. Adams; photographer: Arnold Gum. Pacific South Judging Center
- [14] *Phragmipedium* Mont Fallu 'Piedmont' HCC/AOS (*longifolium* x Grande) 78 pts. Exhibitor: John Hagee; photographer: Arnold Gum. Pacific South Judging Center
- [15] *Aerides krabiensis* 'Sawyer' AM/AOS 82 pts. Exhibitor: Alan Del Castillo; photographer: Arnold Gum. Pacific South Judging Center
- [16] *Paphiopedilum* Memoria Gordon Peters 'Oceanside' AM/AOS (Julius Irving x *philippinense*) 81 pts. Exhibitor: John Hagee; photographer: Arnold Gum. Pacific South Judging Center

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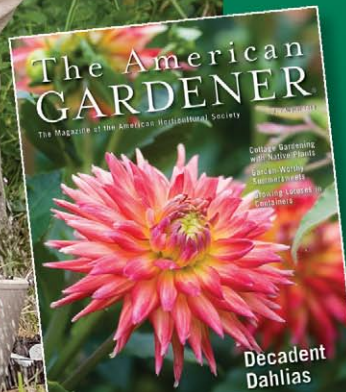
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2–13—Central California Orchid Society “The Big Fresno Fair Orchid Show,” Fresno Fairgrounds, 1121 S Chance Avenue, Fresno, CA; Contact: Gordon Wolf, 209–999–0181; gwsangca@yahoo.com

3–6—Maui Orchid Society – Maui Fair “Orchidland Show,” War Memorial Gymnasium, 700 Halia Nakoia St., Wailuku, HI; Contact: Bert Akitake, 808–250–1585; jakitake@hotmail.com

5—*Deep Cut Orchid Society Annual Orchid Auction, Monmouth Park Racetrack, 175 Oceanport Avenue, Oceanport, NJ; Contact: Joan Messander, 732–787–4660; jmesand1@verizon.net

5–6—Central New York Orchid Society Fall Show, Beaver Lake Nature Center, 8477 East Mud Lake Road, Baldwinsville, NY; Contact: Nancy Loveland, Nancy Loveland; rivergardening@yahoo.com

5–6—*Napa Valley Orchid Society 26th Annual Show and Sale “Explosion of Orchids,” Las Flores Community Center, 4300 Linda Vista Avenue, Napa, CA; Contact: 707–738–4128, details: nv-os.org

5–6—Riverside–San Bernardino Counties Orchid Society “23rd Annual Morongo Basin Orchid Festival,” Gubler Orchids, 2200 Belfield Blvd., Landers, CA; Contact: Ronald Lang, 951–663–5237; rflangx25@gmail.com

5–6—South Florida Orchid Society Show “Orchid Treasures,” University of Miami Watsco Center, 1245 Dauer Dr., Coral Gables, FL; Contact: Daniel Christensen, 954–252–8116; damorchid@aol.com

11–13—*Honolulu Orchid Society Show “Celebrating 80 Years of Orchids,” Washington Middle School Cafeteria, 1633 S. King St., Honolulu, HI; Contact: Katherine Leonard, 808–542–8672; kateleopard@hawaiiintel.net

12–13—Gainesville Orchid Society Show “Orchids in the Garden,” Kanapaha Botanical Gardens, 4700 SW 58th Dr., Gainesville, FL; Contact: Joan MacLeod, 352–665–2640; neilmacleod@bellsouth.net

12–13—Illinois Orchid Society Fall Show “Autumn Splendors,” Chicago Botanic Garden, 1000 Lake Cook Rd., Glencoe, IL; Contact: David A. Kirk, 847–563–0212; david.kirk.a@gmail.com

12–13—Tri–Cities Orchid Society Show & Sale, Red Lion Inn, 602 N. Young Street, Kennewick, WA; Contact: Randall Scheele, 509–628–8184; randys001@charter.net

16–20—Fall Members Meeting and East Everglades Orchid Society Show & Sale, members meeting begins October 16, the show is being held October 18 – 20, 2019 at R.F. Orchids, 28100 SW 182 Ave.,

Homestead, FL; Contact: Kimberly Belisle, 786–367–7177; kim@orchidseos.com

18–20—Club Peruano de Orquideas XIII Exposicion de Orquideas “Peru y sus orquideas,” Parque Reducto de Miraflores, Calle Ramon Ribeyro 490, Miraflores, Lima, Peru; Contact: Giancarlo Bonicelli, 0051–997386077; gbonicelliv@boniplant.com

18–20—The Huntington Library, Art Collections and Botanical Gardens International Orchid Show, The Huntington Library, Art Collections, and Botanical Gardens, 1151 Oxford Road, San Marino, CA; Contact: Brandon Tam, 626–405–3568; btam@huntington.org

19–20—Greater Cincinnati Orchid Show, Krohn Conservatory, 1501 Eden Park Drive, Cincinnati, OH; Contact: Jeanne Rhinehart, 513–383–3805; jeanws@me.com

25–27—Asociacion Alajuense de Orquideologia “Exposicion Nacional de Orquideas de Alajuela 2019,” Escuela Migel Obregón Lizano, Alajuela, Costa Rica; Contact: Jorge Giovanni Salazar, (508)8820–5608; suiza040@yahoo.com

25–27—Blue Ridge Orchid Society Show “Orchids and Ghosts,” Center in the Square, 1 Market St., Roanoke, VA; Contact: Lillian Gillespie, 434–324–4755; gillespielgh@rsnet.org

25–27—Delray Beach Orchid Society Show “Orchids on the Square,” Old School Square Fieldhouse, 51 N. Swinton Ave., Delray Beach, FL; Contact: Michele Owens, 954–695–9889; molovesorchids@gmail.com

26–27—Eastern Iowa Orchid Show & Sale, Cedar Rapids Elks Lodge #251, 801 33rd Ave. SW, Cedar Rapids, IA; Contact: Andy Coghill–Behrends, 319–512–8076; mistercoghill@hotmail.com

26–27—Fraser Valley Orchid Society Show “An Orchid is Born,” George Preston Recreation Centre, 20699 42nd Ave., Langley, BC, Canada; Contact: Frances Raphael, 778–822–2575; fjrphael@icloud.com

26–27—Michiana Orchid Society Fall Show, Holy Cross College, 54515 State Road 933 North, Notre Dame, IN; Contact: Sandy Ohlund, 219–778–4457; sohlund@frontier.com

26–27—Windsor Orchid Society Show “Orchid Spooktacular,” St. Cyril’s Slovak Centre, 1520 Chandler Road, Windsor, Ontario, Canada; Contact: Ed Cott, 519–819–4611; laelia@aol.com

NOVEMBER

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

2–3—Utah Orchid Society Show, Red Butte

Gardens, 303 Wakara Way, Salt Lake City, UT; Contact: Shawn Quealy, 801–831–7359; shquealy@comcast.net

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

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

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

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

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

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

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

21–24—Asociacion Altaverapacense de Orquideologia “XXXVI Exposición Internacional de Orquideas, Cobán,” Convent of Santo Domingo, Anexed to Catedral Church, 1th Avenue 1–31, Zona 1, Central Park, Coban, Alta Verapaz, Guatemala; Contact: Hemuth Ibañez, (502)5204–1846; yiel_1957@hotmail.com

DECEMBER

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

JANUARY

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

11–12—Florida West Coast Orchid Society Show, Seminole Recreation Center, 9100

113th Street, Seminole, FL; Contacts: Bill Nunez, 727-239-2700; biddison22@aol.com

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

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

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

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

31-February 2—Susquehanna Orchid Society Show “For the Love of Orchids,” Milton and Catherine Hershey Conservatory at Hershey Gardens, 170 Hotel Road, Hershey, PA; Contact: Lorna Deibert, 717-825-7827; lornadeibert@aol.com

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- Soroa Orchids • Sunset Valley Orchids • Tropical Gardens Orchids

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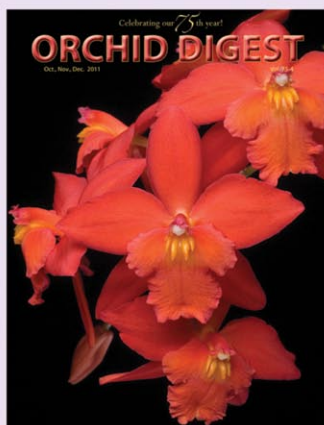
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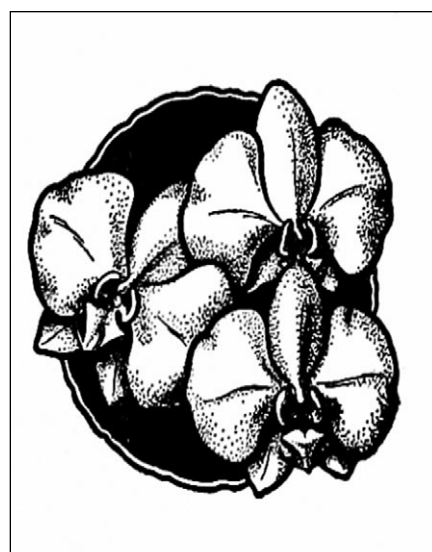
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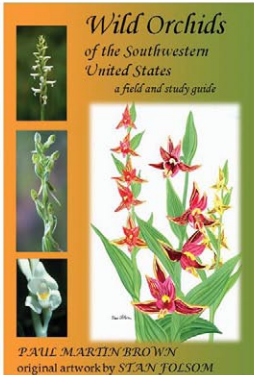
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NEW BOOK ANNOUNCEMENT!

Available in November 2019 from Koeltz Botanical Books



Brown, Paul Martin: Wild Orchids of the Southwestern United States (Arizona, California, Colorado, Nevada, New Mexico, and Utah). A Field and Study Guide. With original artwork by Stan Folsom. 2019. 353 col. photographs. 85 line drawings. 95 maps. 10 watercolors. approx. 330 p. gr8vo. Hardcover. (ISBN 978-3-946583-21-9) EURO 59.95 (approx. US\$ 66.00)

The southwestern United States may not always appear to be as hospitable to wild orchids as many other regions of North America, but nestled within these oft-arid mountains, clustered around the many springs, and gracing the lush meadows wild orchids have found a home.

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What this book offers is several new botanical combinations not previously published as well as several recently published new species for both the Southwest and to science that have not appeared in a field guide or book. It contains the newest (most recent 2019) species and hybrids.

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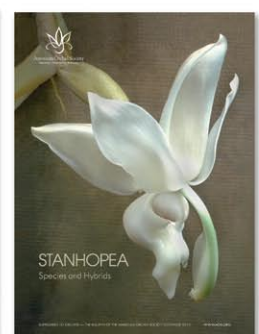
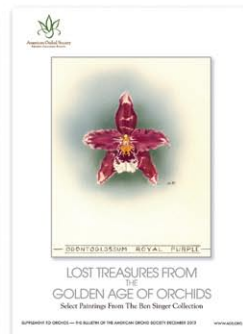
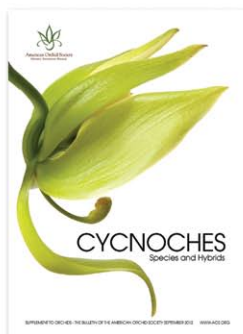
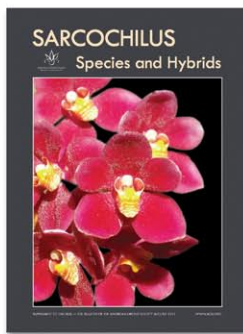
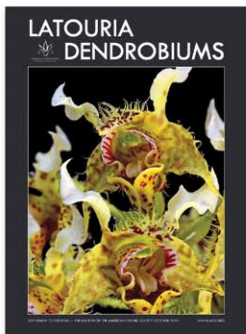
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Articles as well as inquiries regarding suitability of proposed articles should be sent to jean.ikeson@gmail.com or the editor at rmchatton@aos.org.

Growing Equitants — *Tolumnia* and *Rodrumnia* in Upstate New York

By Joane Molenock

IT ALL BEGAN when I decided that I finally wanted to do something that I liked, which is growing plants, primarily orchids and herbs.

We have a tempting site: a south-facing, gently sloping meadow that overlooks a pond and “the hollow” that was carved out by Sixmile Creek. Obviously, orchids would need a suitable home with plenty of sunlight and water. Upstate New York is notoriously gloomy. A greenhouse design by McGill University (north wall is 30 degrees while the south wall or roof is 60 degrees) seemed to be just the perfect greenhouse, with a little modification, of course (from the example on the Cornell campus) — just a little bigger, higher and insulated. So, a double-walled Exolite acrylic was chosen. In addition, the acrylic glazing was lighter than glass and provided insulation. With the interior painted white, it provided all the light one could hope for.

Water was another problem. There was no well and no municipal water. By now the pond had been taken over by birds, frogs, toads, turtles and who knows what else. I wanted rainwater, so Dan (support staff/husband) came up with an ingenious solution; a reverse siphon. When I’m watering the plants I still wonder how it works. A gutter from the south roof directs the water into the greenhouse, flows under the floor for a while, then emerges to fill 10 50-gallon (189-L) drums; the water is then ready for the plants. Obviously, I think light and water are the most important factors for growing equitants when coupled with other factors that are necessary for plants that are so far from their native homes.

Routine details; keep records.

Water plants when needed. I feed every week or two with half-strength fertilizer (20-20-20 or 10-30-20). These routine details are influenced by the weather.

Plants are potted in plastic pots with an airy mix. Whatever it is, it should allow for drainage and air circulation. Almost anything would be suitable.

Keep harsh chemicals to minimum.



Tolumnia Loveable ‘The Hollow’ AM/AOS. The author’s first awarded *Tolumnia* was purchased as a seedling from the Richella Orchids and received its Award of Merit of 84 points at the Genesee Region Orchid Society Show in Rochester, New York on April 15, 1988.

Beneficial insects can be used to keep harmful insects in check if necessary, but you cannot use most chemicals and still use beneficials. Indulge in integrated pest management. The use of beneficials to control pests in greenhouse reduces the need for chemicals that are not good for plants, or for the grower, for that matter. Keep records to see what works and what does not.

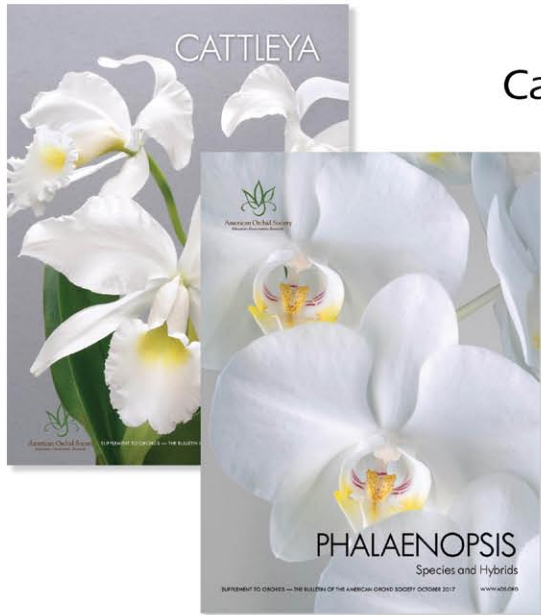
Of course, visit other growers and learn from them. I visited the Richella nursery to thank them for providing me with such healthy seedlings and because my first awarded plant was one of their seedlings (*Tolumnia* Loveable ‘The Hollow’ AM/AOS). When I was leaving, someone told me that I should provide music for the orchids and that he had a radio on every bench. First thing I did after I returned home was to get a source of music.

Consider other sources of useful plant information such as cooperative extension Master Gardener programs and lectures and classes at colleges are all good sources of information.

Why do equitants bloom in New York when they are usually considered intermediate-to-warm growing? I would like to think it is the quality of the light together with clean air and water. But perhaps the main factor is a concerned caretaker who waters just the right amount, or maybe the orchids are aware of my efforts or perhaps they thrive because of the smiling sprite on the back bench listening to Beethoven’s Sonata “Appassionata”: Who knows?

— Joane Molenock says her early interest in plants was modest: cacti and petunias. During her travels and studies she had seen orchids growing in many different environments. This turned out to be an extensive field study. However, orchids remained recreation and not part of the several subjects she studied. When she settled in Ithaca, New York, she found she needed a greenhouse. It was then she became a farmer, volunteered as a Master Gardener and created “The Hollow, Orchids and Herbs” (email: thesholloworchids@earthlink.net).

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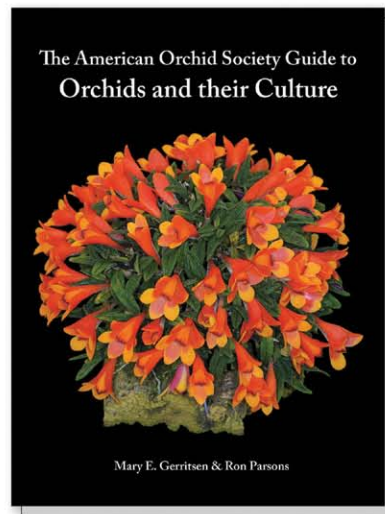
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