

# ORCHIDS

THE BULLETIN OF THE AMERICAN ORCHID SOCIETY

VOL. 89 NO. 10 OCTOBER 2020



# Mark Your Calendars!

The American Orchid Society's  
Virtual Silent Auction is coming.  
Bidding will be open between  
**October 16, 8:00AM EDT - October 22, at 6:00PM EDT\***



## You are invited to join this fun online event!

The virtual auction is part of our upcoming (Virtual) Fall Members Meeting. We'll have a multitude of orchids and orchid-themed items to bid on.



\*Orchids pictured in this ad are for illustration purposes only and not the actual plants to be auctioned.

## Proceeds will benefit key projects

and support our education, conservation, and research endeavors. Details and instructions will be posted at [www.AOS.org](http://www.AOS.org), our social media, and also included with the upcoming Fall Members meeting information.



American Orchid Society  
*Education. Conservation. Research.*



# ORCHIDS

The Bulletin of the American Orchid Society

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October 2020 Volume 89 Number 10

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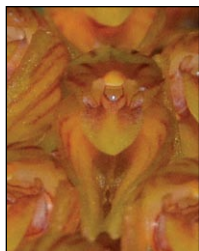
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*Paphiopedilum* Magical Illusion AQ/AOS (Magically Wood 'Serenity × Red Illusion 'Lehua's The Only One' HCC/AOS) exhibited by Lehua Orchids. Photograph by Ramon de los Santos

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

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

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The American Orchid Society provides leadership in orchids

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## PRONUNCIATION GUIDE

Pronunciation of orchid names can be daunting for the novice and experienced grower alike. Presented below is a simplified pronunciation guide specific to the names found in this issue of *Orchids* magazine. An attempt has been made to represent each syllable using easily recognized sounds or words separated by hyphens and not standard phonetic symbols. Check out the Orchidist's Glossary on our website at <https://www.aos.org/orchids/orchidists-glossary.aspx>.

- acaule* (a-KAW-lee)  
*Acianthera* (ay-see-AN-ther-a)  
*africana* (af-rih-CAN-a)  
*Agrostophyllum* (ag-ross-toe-FILL-um)  
*albiflorum* (al-bee-FLOR-um)  
*alpinum* (al-PYE-num)  
*altigena* (al-TIJ-eh-na)  
*ampliflora* (am-plee-FLOR-a)  
*anosmum* (an-OSS-mum)  
*antennatum* (an-ten-NAY-tum)  
*argus* (AR-gus)  
*Arpophyllum* (ar-poe-FILL-um)  
*Artorima* (ar-tore-EEM-a)  
*aureum* (AW-ree-um)  
*Barbosella* (bar-boh-SEL-la)  
*baueri* (BOW-er-eye)  
*beccarii* (beh-KAR-ee-eye)  
*bellatulum* (bell-LA-tew-lum)  
*bilabrata* (bye-lab-RAY-ta)  
*bowringiana* (bow-ring-ee-AY-na)  
*Brachypetalum* (brak-ee-PET-a-lum)  
*brachypus* (BRAK-ee-pus)  
*Brassavola* (brah-SAH-vohl-la)  
*Brassocattleya* (brass-oh-KAT-lee-a)  
*brunescens* (broo-NESS-senz)  
*Bulbophyllum* (bulb-oh-FILL-lum)  
*cabagre* (kab-AG-ree)  
*Cadetia* (ka-DET-ee-a)  
*Caladenia* (kal-a-DEEN-ee-a)  
*Calanthe* (kal-AN-thee)  
*callosum* (kal-LOH-sum)  
*cardinale* (kar-din-AL-ee)  
*carinata* (ka-rin-AY-ta)  
*carinulata* (ka-rin-yew-LAY-ta)  
*Catasetum* (kat-a-SEE-tum)  
*caulescens* (kaw-LESS-senz)  
*Ceratostylis* (ser-at-oh-STY-liss)  
*chinensis* (chye-NEN-sis)  
*cleistogamma* (clye-sto GAM-ma)  
*Cochlopetalum* (kok-loh-PET-a-lum)  
*Concolor* (KON-kuhl-ur)  
*cordata* (kore-DAY-ta)  
*Corybas* (KORE-ee-bas)  
*crassavolae* (kras-SAH-vohl-lee)  
*Crepidium* (kreh-PEED-ee-um)  
*cuthbertsonii* (kuth-bert-SON-ee-eye)  
*Cymbidium* (sim-BID-ee-um)  
*Cypripedium* (sip-rih-PEED-ee-um)  
*Cyrtochilum* (sir-toh-KYE-lum)  
*decorata* (dek-ore-AY-ta)  
*Dendrobium* (den-DROH-bee-um)  
*dichromaticum* (dye-kroh-MAT-ih-kum)  
*Dicksonia* (dik-SON-ee-a)  
*Dracula* (DRAK-yew-la)  
*Epiblastis* (eh-pih-BLAS-tiss)  
*Epidendrum* (eh-pih-DEN-drum)  
*erubescens* (er-roo-BESS-senz)  
*fibrosa* (fye-BROS-sa)  
*fructicola* (frook-tih-KOE-la)  
*Galeandra* (gal-ee-AN-dra)  
*Gastrodia* (gas-TROH-dee-a)  
*giganteum* (jye-GAN-tee-um)  
*glicensteinii* (glih-sen-STYE-nee-eye)  
*Glomera* (GLOH-mer-a)  
*Glossorhyncha* (gloss-oh-RINK-a)  
*godfreyae* (GOD-froy-eye)  
*Goodyera* (good-YEAR-a)  
*Guarianthe* (gwar-ee-AN-thee)  
*Habenaria* (hab-ee-NARE-ee-a)  
*hetaeroides* (heh-tare-ee-OY-deez)  
*jamaicense* (ja-may-KEN-see)  
*Kegeliella* (keg-el-ee-EL-la)  
*labiata* (lab-ee-AY-ta)  
*Laceana* (lase-AY-na)  
*Latouria* (la-TOOR-ee-a)  
*lawrenceanum* (law-rense-AY-num)  
*laxiflorum* (laks-ee-FLOR-um)  
*lejolyana* (leh-jol-ee-AY-na)  
*Lepanthes* (lee-PAN-theez)  
*lepanthiflorum* (lee-pan-thee-FLOR-um)  
*leucochilum* (loo-koh-KYE-lum)  
*lilacinum* (lye-la-KYE-num)  
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*Liparis* (LIP-a-riss)  
*longibracteatum* (lon-jee-brak-tee-AY-tum)  
*luteum* (LOO-tee-um)  
*Lycaste* (lye-KAS-tee)  
*macrantha* (mak-RAN-tha)  
*major* (MAY-jor)  
*majus* (MAY-jus)  
*Malaxis* (mal-AKS-iss)  
*Masdevallia* (mass-deh-VAHL-ee-a)  
*mastersianum* (ma-sters-ee-AY-num)  
*Maxillaria* (maks-ill-AIR-ee-a)  
*Mediocalcar* (mee-dee-oh-KAL-kar)  
*medium* (MEED-ee-um)  
*megalanthum* (meg-a-LAN-thum)  
*micrantha* (mye-KRAN-tha)  
*Miltoniopsis* (mil-tone-ee-OP-sis)  
*monticuprina* (mon-tik-yew-PRY-na)  
*morphoglossum* (more-foh-GLOSS-um)  
*muriculata* (mew-rik-yew-LAY-ta)  
*niveum* (NEE-vee-um)  
*Oberonia* (oh-ber-OH-nee-a)  
*ochyrea* (oh-KYE-ree)  
*Octarrhena* (ok-ta-REEN-a)  
*Oncidium* (on-SID-ee-um)  
*pachynureus* (pak-ee-NUR-ee-us)  
*Paphiopedilum* (paff-ee-oh-PED-ih-lum)  
*papuana* (pa-poo-AY-na)  
*papuanum* (pa-poo-AY-num)  
*Parvisepalum* (par-vee-SEEP-a-lum)  
*Peristylus* (per-ee-STY-luss)  
*Phalaenopsis* (fail-en-OP-sis)  
*phantasma* (fan-TAS-ma)  
*Pholidota* (foe-lee-DOH-ta)  
*Phreatia* (FREET-ee-a)  
*pittieri* (pit-ee-AIR-ee)  
*Planipetalum* (plan-ee-PET-a-lum)  
*platyrachis* (plat-ee-RAK-kiss)  
*Polystachya* (pol-ee-STAK-ee-a)  
*pomatophila* (poh-mat-OFF-ih-la)  
*Porpax* (PORE-paks)  
*Prosthechea* (pros-THEK-ee-a)  
*Pteroglossa* (ter-oh-GLOSS-sa)  
*Pterostylis* (ter-oh-STY-liss)  
*purpuratum* (pur-pur-AY-tum)  
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*squarrosum* (skwar-OH-sum)  
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*Stolzia* (STOLT-zee-a)  
*subteres* (sub-TER-eez)  
*sukhakulii* (sook-ha-KOOL-ee-eye)  
*takeuchi* (tak-ee-OO-chee)  
*Telipogon* (tel-lee-POE-gon)  
*thaianum* (tye-AY-num)  
*Thelasis* (thel-LAY-sis)  
*thomense* (tom-EN-say)  
*triarnus* (try-AR-nuss)  
*tricornoides* (try-kor-NOY-deez)  
*Tridactyle* (try-DAKT-ee-lee)  
*tridentatum* (try-den-TAY-tum)  
*unicaudatum* (yew-nih-kaw-DAY-tum)  
*vampira* (vam-PEER-a)  
*Vanilla* (va-NILL-a)  
*venustum* (ven-OOS-tum)  
*Veyretella* (vay-reh-TELL-la)  
*wardii* (WARD-ee-eye)  
*wernerii* (VER-ner-eye)  
*zeuxinoides* (zook-seen-OY-deez)

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*In addition to vital support through membership dues, the American Orchid Society relies on grants, bequests and other gifts to support its programs. We would like to thank the following donors for gifts received between August 1, 2020 and August 31, 2020.*

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– **Jean Hollebene**  
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### In lieu of a speaker's fee

– **Martin Motes**  
Central Florida Orchid Society (Motes Award)

Central Ohio Orchid Society (Motes Award)  
Miami Valley Orchid Society (Motes Award)  
Martin Motes (Motes Award)

### In memory of

– **Ron Frendreis**  
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Orchid Society of the Palm Beaches  
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## Call For Nominations

The AOS Board of Trustees seeks nominations for members of the Board of Trustees of the American Orchid Society, for four trustees (for 2021–2024). Members may nominate any member in good standing, including themselves, and shall provide a rationale as to why they should be considered. All nominations will be evaluated by the Nominating Committee and a slate will be announced, in accordance with the by-laws, prior to the election at the Members Meeting in the spring of 2021. The following competencies have been determined by the Board and will be used in the evaluation.

All nominees shall:

- be members of the AOS, and embrace the mission and priorities of the AOS;
- exhibit integrity and ethical behavior;
- possess strong interpersonal and communications skills;
- have board experience (preferred but not required), preferably with a non-profit organization.

Expertise in some of the following is desirable and will weigh in the evaluation:

- finance, business and/or investment strategies,
- legal background,
- development/fund raising,
- strategic planning and implementation,
- marketing,
- conservation, research or education.

Responsibilities:

- attend conference-call type meetings when called (potentially two per month for officers, one for trustees);
- attend two face-to-face members' meetings annually (must pay own travel expenses, there is no compensation);
- actively participate and contribute in Board activities and work;
- financially support the organization in a manner commensurate with one's ability, while seeking additional financial support elsewhere;
- advocate on behalf of the organization and be ambassadors to the orchid community.

Send nominations to:  
nominating\_committee@aos.org  
Nominations will be accepted up to close of business October 15, 2020.



## PRESIDENT'S MESSAGE

THE YEAR 2020 has been anything but normal. We hear that word constantly in phrases such as “the new normal” or “getting back to normal.” Hopefully, this will fade away like footprints on the shoreline. But, what is normal in our orchid world? How is 2020 affecting the American Orchid Society? The word here is different. Judging is different, as are awarding, learning and socializing.

The judging of orchids has all but come to a complete stop. It is a loss to the orchid grower, the judges and the American Orchid Society. We all take such pride in our collections because of all the hard work we put into them. For more than half of 2020, the fruits of our labor have only been seen in social media. And, sadly, not everyone uses social media. So, that cymbidium with those amazing blooms may have to wait to be judged at a later time. It would be a loss for the grower and the judge, as well as the AOS.

Judging is very different right now, adding that becoming a judge is not easy to begin with. It takes years of commitment, studying, application and resources to become a judge. Because of this, we are a proud group and it shows when we are evaluating a plant. We keep our skills fresh and current with a continuum of judging events, interaction with other judges and having the plants to judge. An awarded plant does not get evaluated by one judge. A team of judges confer, measure, observe and measure again all the parts of the plant to determine, collectively, if it merits an award.

Because judging is taken very seriously and the rules are clear, virtual judging is not allowed. The plant must be assessed in person. This way, judging is kept true to form.

Few orchid growers this year have experienced that euphoria of receiving an AOS award that they will wear as a badge of honor for the rest of their lives. The award process this year greatly contrasts from years past. It has slowed down due to fewer judging events, but this is only temporary.

Education in the orchid world has seen many changes. Student judges do not have that one-on-one with accredited judges to learn hands-on about evaluating the plant and recording all of the data that is necessary in the learning process.

Classes are held virtually, omitting that personal touch of being in a physical classroom setting. However, it does not interfere with the student's ability to master the subject matter. The students are benefitting, regardless. Throughout

the year, I have seen that our students are focused and not prone to distractions from being at home.

In any event, everyone does their part to the best of their ability...and the work gets done and goals are met.

Orchid society meetings engage us in an activity that feeds our souls and our minds and quenches the thirst of our interests in orchids that we cannot get in a virtual meeting. A simple interaction with another orchid enthusiast can move someone in a new direction of orchid cultivation or education. In orchid society meetings we see, in person, orchids other members have brought, and we may engage our fellow members in conversation to learn more about their collections.

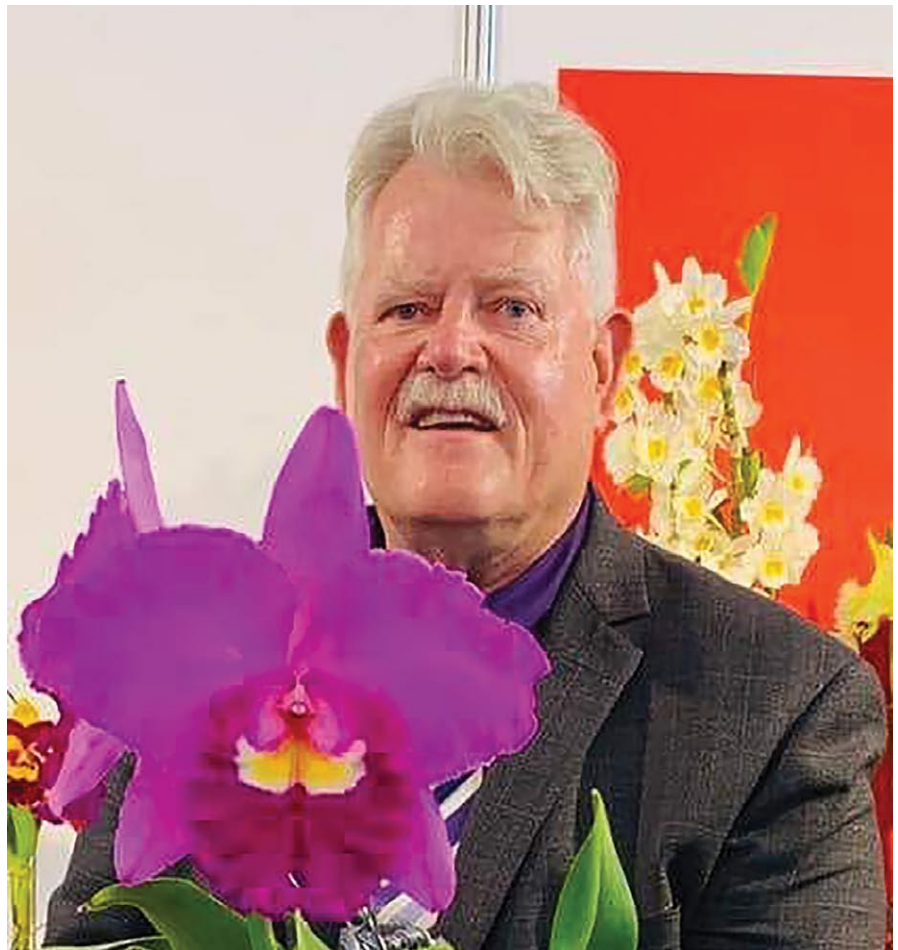
Speakers are invited to meetings to share their love and knowledge of orchids with society members. Specialty cultivars are introduced to orchid lovers instilling in them, perhaps, a new interest in an orchid genus not considered before. For the most part, monthly meetings are currently online with little or no interaction. It is disappointing, no question, for every society to change their meeting format and deprive members of that personal

engagement with such knowledgeable speakers. But it is equally important to reach out to the society members and try to keep the routine the same, as much as possible.

This is a very important year for the American Orchid Society, commemorating 100 years of orchid education, conservation and research. The AOS Centennial Celebration on the calendar for October of 2021 will relish in the glory of this milestone. All the planning that is taking place to ensure the success of the event will not be lost on anyone; so many people working together, not just for the 100 years of the AOS but for the next 100 years. The proceeds of the Centennial Celebration are earmarked for orchid conservation, so that orchids will be around for generations to come. And that should never change.

It will be considered a win if, in 2021, all the changes, and not just those to the orchid world, but to the entire world, would be for the better; to get back to a real normal, not a virtual one.

I am confident it will happen and there will be no “new normal”; everything will just be great! — *Robert Fuchs (email: bob@rforchids.com)*



MICHAEL CORONADO



## COMING IN 2021 Renee and Marvin Gerber Award

In 1966, through a gift to the American Orchid Society from Mrs. Rachel Butterworth Dietz in memory of her parents, John and Nancy Butterworth, and of George Butterworth, past president of the AOS, the first of the AOS's endowed annual special awards — The Butterworth Prize for outstanding orchid culture — came into being. Over the years, 23 additional endowments have been added to recognize outstanding displays, hybridizing, and specific genera or breeding groups. Most recently, the Board of the American Orchid Society approved the creation of the Renee and Marvin Gerber Award, underwritten by generous donations from Marvin Gerber's family and friends, to recognize the year's most outstanding example of a hybrid using a brassavola as one parent.

Because the prizes are funded from the dividends and interest income on the respective endowments and the timing of board approval of this new award, the first recipient will be announced in the spring of 2022, selected from awards received this year. The 24 individual endowments that support these awards are active investments and all donations to any of them are welcome, increasing the principal underwriting each award.

For a list of the 24 special annual awards, please see our website at <https://www.aos.org/orchid-awards-judging/aos-awards.aspx>.



DEBRA TRYON

*Brassocattleya* Mary Dodson 'Magda Finch' AM-CCE/AOS (*Brassavola nodosa* × *Cattleya schilleriana*), exhibited by Magda B. Finch will be one of the candidates vying for the Renee and Marvin Gerber Award come next fall.

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# October: The Month of Showing Up

By Thomas Miranda

ORCHIDS ARE OUR respite from the troubles of the world. They bring us comfort and joy when news and events seem too much to bear. They are precious balm for us to endure whatever daily crises are screamed at us through our televisions and smart phones. I depend on them for so much as do, I think, so many who read this monthly column.



Thomas Miranda

If the orchid world is a microcosm of the larger world we live in, then we can, and should, be a model for the values of a new paradigm; one that holds and esteems *life* and its diversity, beauty and sanctity above other worldly concerns. Orchids, miracles of nature that they are, represent the many extraordinary life-affirming entities that evolved on this vast planet, the only place we know of where life exists. Let us value it, treasure it, nurture it and consider its future.

IT'S ALIVE! Many orchid growers become alarmed this time of year as our orchids seem to be shutting down. It is true that among many of the most popular orchids, growth has ceased. But the observant grower will see that this slowdown also shows maturity of this past season's growths. Phalaenopsis leaves have extended to their full size and are hardening up. Pseudobulbs on cymbidiums, cattleyas, dendrobiums, oncidiums and lycastes are plump and girthy with stored nutrients. Catasetums alarm us even further by dropping their impressive leaves. But all of this is gearing up for the glories coming this winter and spring.

PARADIGM SHIFTS Although we can agree that some things need to change in the world, October is the month where the cultural efforts of your collection need to shift as well. The onset of shorter days, longer nights and generally cooler temperatures in the Northern Hemisphere are all environmental cues to your plants that it is time to use all that stored energy from the spring and summer towards flowering. This month, look at the basal portion of phalaenopsis for the upturned nubs that will elongate into flower spikes by December and January. Cattleyas should have developed sheaths by now, which is always a good sign. If a sheath is present, they will generally bloom in

season. Look for imminent flowers on *Guarianthe boweringiana*, *Cattleya labiata* and their many hybrids around now.

CULTURAL CONSIDERATIONS As the seasons shift so must our cultural activities; like not wearing white shoes after Labor Day. It is time to water and feed less when day lengths and temperatures slow down plant growth. Some say that feeding should be entirely stopped around now as this cessation of nutrients will be an additional trigger for plants to bloom. Less water should be applied in general, but it is important to differentiate between wet tropical forest plants that still get occasional rains and seasonally dry forest plants that become parched in the winter and often go completely deciduous.

A GREEN WAVE Although so many orchids prefer to be dryish this time of year, cooler-growing plants from cloud-forest habitats are finally being relieved of the stresses they experience in the dog days of summer and are putting out verdant flushes of new growth. Such plants need water and food now more



than they did a few months ago. Make sure that high-mountain plants are getting the attention they need now that cultural conditions for them are returning to their preferred parameters.

Finally, a word about the future. It is essential that anyone who cares about the world and its biodiversity searches their conscience, shows up and makes their feelings known. If you love this planet and care about the future of its inhabitants, be they human, animal or plant, please consider valuing life over profit. Put another way, we likely cannot change the world, but maybe we orchid people are here to contribute harmony, grace, balance, truth and love to a troubled planet, making it just a little better.

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

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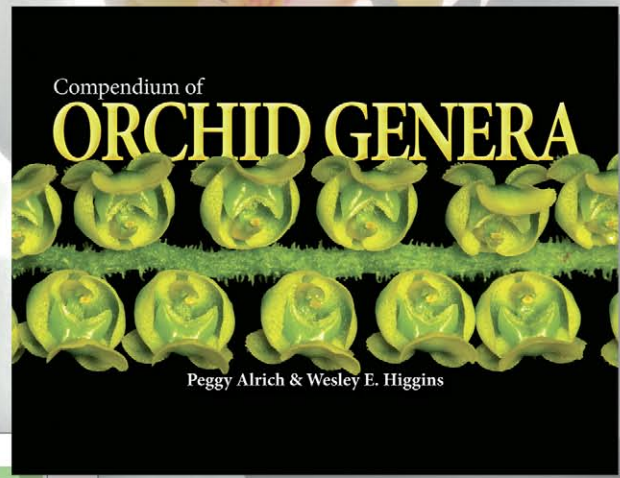


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**Angraecum** Reyer  
*Epiphytanthus* Vahl; *Angraecium*  
Upp. Bot. Africae, 1: 396, t. 19 (1866).

**ETYMOLOGY:** From the Latinized form of the Malay word (*Angraek* or *Angrek*) for the epiphytic orchids that resemble *Aerides* and *Vanda* in habit. The name *Angraecum* originated with Georg Eberhard Rumphius (1628-1702), who coined it from the word *Angraek*, a name also given by the Malabars to "parrot-like" *Lycodiscus* plants, the meaning of which has not been discovered. From *Fragebitter* Kuntze (1851-1730) we learn that *Angraek* or *Angrek* is also the name used by the Indians for these plants.

**GENETIVE:** *Angraecum chrysanthum* Reyer  
(Illustration: Angraecum sp.)

More than two-hundred twenty-one, very small to very large monopodial epiphytes, a few lithophytes or rare terrestrials have a wide range of distribution in humid, low to mid elevation, coastal to hill scrub, savannas to montane evergreen forests of mainly tropical Africa (Guinea to Somalia, Calicut to Zanzibar and South Africa), Madagascar, Mauritius to Réunion, although one species is found as far away as the Seychelles and Sri Lanka. These miniature to large, rambling to clump-forming, warm to cool growing plants are vegetatively and florally quite diverse. The short to long, sometimes branched stems are leafy throughout with fleshy to leathery, channelled, unequally bilobed, usually ditch-like leaves. The one to several, short to long, solitary to few-flowered inflorescences have long-lasting, small to large flowers in shades of white, ivory or green with sepals and petals free, usually spreading. The flowers are noted for their spots of widely varying lengths from quite long to short. The flowers have a thick, almost leathery texture, an exceptionally long flowering period, and an extraordinarily heavy nocturnal fragrance (usually within the long spurred species) and the lip is larger than the other segments. The shell or boat-shaped, simple or obscurely lobed lip is usually quite concave, its base more or less encircles the column, and it has a central callus. The flowers have a very short, footless column with deeply divided lobes. Pollinia 2, waxy, each attached to its own narrow or elliptic viscidium. **Culture:** Growing conditions and habitat options vary widely from species to species. Generally they do best mounted on a fern slab with good drainage and most of the species benefit from a resting period of reduced watering. Provide intermediate conditions, bright to diffused light, high humidity and good air movement.

**Valid Angraecum Synonyms**

**Aerobion** Kuntze ex Sprengel  
*Syst. Veg. (Sprengel)*, ed. 18, 8: 679 & 716 (1826).  
**Ernooson** Greek for air and life. Referring to the epiphytic habit of the plants.  
**Lectrorreus** *Aerobion asperulum* (Thunberg) Sprengel (*Angraecum* Thomson)  
*Angraecum* Gen. list, 80: 96 (1871).  
 Now recognized as belonging to the genus *Angraecum*, *Aerobion* was previously considered to include twenty-four epiphytes found in warm, mid elevation, montane forests of Madagascar and the Mascarene Islands.

**Angraecoides** (Candolle) Schlachter, Mynik & Grochoccka  
*Biologicalia*, *Exc. Conservation*, 28: 9 (2013).  
**Ernooson**, *Angraecum*, a genus of orchids, and Greek for likeness or form. Refers to a similarity to *Angraecum*.  
**Tve Secks** *Angraecoides pinguis* (Frappet) Schlachter, Mynik & Grochoccka (*Angraecum pinguis* Frappet)  
 Now recognized as belonging to the genus *Angraecum*, *Angraecoides* was previously considered to include twenty-five epiphytes found in cool, mid elevation, hill scrub and montane forests in northwestern Madagascar, Mauritius and Réunion.

**Arachnangraecum** (Schlechter) Schlachter, Mynik & Grochoccka  
*Biologicalia*, *Exc. Conservation*, 28: 11 (2013).  
**Ernooson**, Greek for spider and *Angraecum*, a genus of orchids. Refers to the long, spider-like segments.  
**Tve Secks** *Arachnangraecum ramosum* (Thunberg) Schlachter, Mynik & Grochoccka (*Angraecum ramosum* Thunberg)  
 Now recognized as belonging to the genus *Angraecum*, *Arachnangraecum* was previously considered to include thirteen epiphytes found in cool, mid elevation, hill scrub and montane forests in found in northwestern Madagascar, Mauritius and Réunion.

**Bonnieria** Condamine  
*Exc. Gén. Bot.*, 11: 416, t. 10-11 (1899).  
**Ernooson**, In appreciation of Eugène Marie Gaston Bonnier (1853-1932), a French botanist, editor of *Revue Générale de Botanique* and publisher of Candolle's notes on the orchids of Réunion.  
**Tve Secks** *None designated*  
 Now recognized as belonging to the genus *Angraecum*, *Bonnieria* was previously considered to include two epiphytes found in mid to upper elevation, bushy montane rain forests of Réunion.

**Boryangraecum** (Schlechter) Schlachter, Mynik & Grochoccka  
*Biologicalia*, *Exc. Conservation*, 28: 12 (2013).  
**Ernooson**, Named for Jean Baptiste Bory de Saint-Vincent (1778-1848) a French naturalist and author of *Voyage dans les îles d'Afrique*. And *Angraecum*, a genus of orchids.  
**Tve Secks** *Boryangraecum pumilio* (Schlechter) Schlachter, Mynik & Grochoccka (*Angraecum pumilio* Schlechter)  
 Now recognized as belonging to the genus *Angraecum*, *Boryangraecum* was previously considered to include three epiphytes found in cool, mid elevation, hill scrub and montane forests in found in Madagascar, Mauritius and Réunion.



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COLLECTORS' ITEM

# The Good, the Bad — and the Real Stinkers!

*Bulbophyllum* section *Racemosae*  
Text and photographs by Charles Wilson



IN A ROOM crowded with orchid growers, it will not be long before someone asks, "Which *Bulbophyllum* stinks most of all?" Although there are many growers who maintain that *Bulbophyllum beccarii* leads the list of big stinkers, with an odor alleged to resemble that of "a hundred dead elephants," there is also an entire section of bulbophyllums, section *Racemosae*, that consistently presents an odor palate only their pollinators could truly appreciate or enjoy.

The 38 or so species of this section have a broadly sweeping range in forested elevations below 4,000 feet (1,200 m) from India, Nepal and Bhutan through southern China and south to Myanmar, Thailand, Vietnam, Laos and into peninsular Malaysia.

The combined length of the pseudobulb and leaf is not necessarily big in this section, the largest being about 12 inches (30 cm). However, the creeping and scandent growth habit for most of the species, with as much as 6 inches (15 cm) between pseudobulbs, can often present a challenge to the grower in keeping it confined to a pot. With this untidy, straggling growth habit, and when combined with the propensity for many of the species in this section to have relatively short, downward-arched inflorescences, particular attention should be paid to comparing the suitability of standard pots versus using tree fern posts or similar rafting materials for maximum inflorescence presentation. For growers not comfortable with this post- or slab-style of culture, these species also adapt readily to growing in large baskets that allow them to ramble freely, even onto the outside of the basket, whether filled with sphagnum moss or bark mix.

Most of the inflorescences of this section have upright sturdy flowerless peduncles (the bottom part of the inflorescence) that continue with abruptly downturned or arched proper racemes (hence the name *Racemosae* for the section), covered tightly in spirals of malodorous flowers. The racemes may have from as few as 15 to as many as 200 small, but very stinky flowers. The columns of the flowers are tipped with two tiny fangs or horns (called stelia). Often a magnifying glass can be instrumental in appreciating the finer details of the flowers and sharing their intricacies with greenhouse visitors. Regardless of how small the flowers may seem, rest assured that just having one inflorescence in bloom will permeate the entire atmosphere of the



- [1] *Bulbophyllum tridentatum* 'Whisper Dangling Particles', with a long distance between pseudobulbs and its arched inflorescences, is an ideal subject for mounting on a tree fern totem.
- [2] *Bulbophyllum lilacinum* has nearly 6 inches (15 cm) between pseudobulbs and grows better as a raft, whether on tree fern or cypress knee. The species' name refers to its lovely flowers not its fragrance. These flowers stink as bad as any others in the section.
- [3] *Bulbophyllum longibracteatum* 'Golden Cascade' CCM/AOS. This species has a compact pseudobulb spacing.
- [4] *Bulbophyllum morphoglossum* can be trained to stay in a pot, but the arched inflorescences will need to be trained to grow over the edge of the pot. The distinctive stelia or horns on the end of the column can be seen in the inset photograph.





5

greenhouse.

#### CULTURAL CONSIDERATIONS

**LIGHT** The species in this section, like most bulbophyllums, thrive in bright, indirect light, avoiding direct sun for any prolonged periods. Many actually can enjoy the higher light levels often appreciated by some cattleyas provided adequate air movement and humidity is provided. If a leaf feels hot to the touch when in full light, it is most likely getting too much sun, which could result in burned leaves.

**TEMPERATURE** Although most *Bulbophyllum* species in this section prefer intermediate to warm temperatures with nighttime minimums of 60 F to even 75 F (15.5–23.8 C), they can tolerate day temperatures into the 90s F (>32.2 C) provided they have excellent air movement and high humidity (75% or more). These species will continue growing year-round if kept warm and adequately watered. Temperatures below 55 F (13 C) at night can slow growth and reduce or even preclude blooming.

#### POTTING AND WATERING

Because bulbophyllums typically have threadlike or fibrous fine roots, a shallow layer of potting mix (e.g., we use seven parts small bark, one part small Perlite and one part small charcoal) atop an ample bottom layer of expanded polystyrene “peanuts” in a shallow pot or basket will provide the needed perfect drainage. The shallow layer of bark allows for the grower to water nearly every day with little worry of rotting the mix. This method very closely resembles the natural cycle in which epiphytes with fine roots can rapidly absorb rain or dew and mimics the way *Bulbophyllum* species grow in the wild — on top of tree trunks and limbs. Many growers also achieve similar results with sphagnum moss.



Charles Wilson for over 40 years.

— Charles Wilson, an accredited AOS judge out of the Pacific Northwest Judging Center, has been growing orchids

[5] *Bulbophyllum tricorroides* also has somewhat closer spaced pseudobulbs, but the pendent inflorescences presents a challenge to train them to grow outside the pot

*He is Chair of the AOS Conservation Committee and a member of the AOS Species Identification Task Force. His special interests include Bulbophyllum, Cattleya, Coelogyne, Dendrobium, Paphiopedilum and about everything else, too (email: zooemeritus@gmail.com).*

# IX International Conference on Orchid Conservation "Soroa 2021"

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<b>Topic</b>	Greenhouse Chat (Orchid Q&A) <i>Send in your Questions!</i>	Paphiopedilum, Their Care and Understanding	Greenhouse Chat (Orchid Q&A) <i>Send in your Questions!</i>	Greenhouse Chat (Orchid Q&A) <i>Send in your Questions!</i>
<b>Presenter</b>	<b>Ron McHatton</b> Chief Education and Science Officer	<b>Dave Sorokowsky</b> Owner Paph Paradise Awarded grower and AOS Judge	<b>Ron McHatton</b> Chief Education and Science Officer	<b>Ron McHatton</b> Chief Education and Science Officer

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*Sylvia strigari*



# Arpophyllum giganteum

Text by Grettel Salguero, Adam Karremans and Franco Pupulin/Watercolor by Sylvia Strigari

Tribe EPIDENDREAE  
Sutribe LAELIINAE  
Genus ARPOPHYLLUM Lex.

**Arpophyllum giganteum** Hartweg ex Lindley, *Ann. Nat. Hist.* 4:384. 1840. Type: Mexico. Oaxaca: between Tonatzé and Talea, Hartweg s.n. (holotype, K). *Arpophyllum alpinum* Lindl., *Pl. Hartw.* 93. 1842. *Arpophyllum cardinale* Linden and Rchb.f., *Bonpl.* 2:282. 1854. *Arpophyllum medium* Rchb.f., *Beitr. Orchid.-K. C. Amer.* 89–90. 1866. *Arpophyllum squarrosom* R.H.Torr. ex Lubbers, *Cat. Pl. Rar. San Donato* 15. 1880. *Arpophyllum jamaicense* Schltr., *Repert. Spec. Nov. Regni Veg.* 16:443–444. 1920. *Arpophyllum stenostachyum* Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 19:32–33. 1923.

Plant epiphytic, creeping, robust herb, to 60 cm tall. Roots terete, rugose, slender, 2–3 mm in diameter. Rhizome elongate, with about 3–4 internodes between pseudobulbs. Pseudobulbs unifoliate, cylindrical, strongly compressed apically, subterete at the base, 10–15 cm long, covered by conduplicate, tight, rugose, scarious-fibrose sheaths. Leaves subcoriaceous to fleshy, basally conduplicate, sessile, lanceolate, dorsally keeled, acute, 30–50 cm long, and 2.0–3.0 cm wide. Inflorescence terminal, dense, the scape 12.5 cm long, enclosed by a spatheous, tubular, conduplicate bract, supporting a cylindrical to globose raceme 11.5 cm long and 3.0 cm wide, peduncle compressed, the rachis pilose, purplish, with flowers spirally arranged. Ovary sessile, subcylindrical, with blackish mucilaginous scales. Flowers 8–10 mm across, small, nonresupinate, spreading, with the sepals and petals light purple, and the lip dark purple, odorless, with abundant nectar. Sepals free, subequal, recurved; dorsal sepal elliptic-lanceolate, acute and apiculate, 6 mm long and 3.5 mm wide; lateral sepals obovate, elliptic-lanceolate, obtuse at the apex, somewhat connate and concave at the base and forming a broad mentum, 6.5 mm long and 3.5 mm wide. Petals spatulate, recurved, apically rounded and with an erose margin, 5.5 mm long and 2 mm wide. Lip, divided into a basal saccate nectary, a median caniculate region, and an expanded distal part, the latter with the apical margin erose, 7.5 mm long and 5

mm wide, the sides embracing the column and with a barely apparent callus. Column stout, 4.5–5.0 mm long, with a short foot and forming a concave nectary where joined with the lip; stigma entire and very broad. Anther cap cucullate, papillose, incompletely bilocular, each cell with septa that imperfectly delimit four cavities, pollinia eight, obovoid-subclavate, attenuate at the base, oblique, not laterally compressed, minutely rugose, violet-green to greyish, united to the caudicles in two sets, the caudicles granulose, yellowish green united to a distinguishable viscidium.

*Arpophyllum* is a relatively small genus with just three recognized species, and little variation in flower structure (Dressler 2000). This mainly Mesoamerican genus is most diverse in Mexico where all three species have been reported (Pridgeon et al. 2006), but its range extends all the way down to northern South America (Colombia and Venezuela) through Central America, and Jamaica. Despite their broad distribution, species of *Arpophyllum* are generally restricted to the montane rain forests at elevations above a 1,000 meters (up to over 2,000 m), but populations can be found also in humid lowlands down to about 350 meters above sea level. The name of the genus comes from the Greek *arpe*, sickle, scimitar, and *phyllon*, leaf, referring to the falcate leaves of the type species, *Arpophyllum spicatum* (Pridgeon et al. 2006).

*Arpophyllum giganteum* was described by John Lindley based on a specimen collected in the state of Oaxaca (Mexico) by Hartweg. Karl Theodor Hartweg (1812–1871), was one of the first collectors hired by the Royal Horticultural Society to explore the lands of Mexico and Central America (Ossenbach 2009). The London Horticultural Society sent him on a collecting expedition to Mexico, on which he spent seven years and sent back valuable collections of seeds and botanical specimens. Hartweg arrived in Mexico in 1836 and went on to Guatemala, where he collected until 1841. After that, he continued collecting in Ecuador and Colombia (Eastwood 1939, Brendel 1879). On describing the species, Lindley recognized Hartweg as the author of the then unpublished name and kept his intended epithet as originally written on the

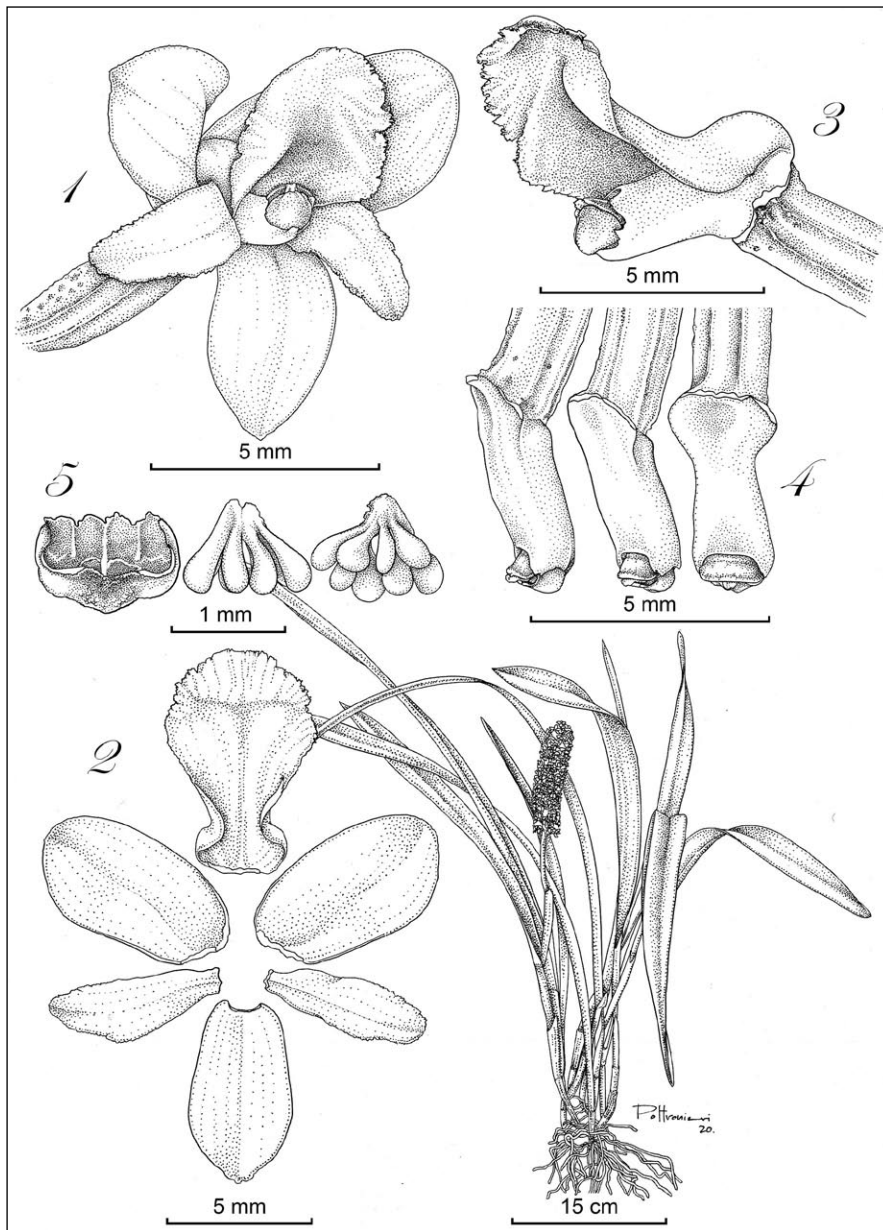
specimen's label.

*Arpophyllum giganteum* forms robust clumps on the large, horizontal branches of tall trees (Hunt 2012). It is the largest species in the genus and this feature is referred to in the epithet of its name. Its exuberant plants can produce dozens of elongate, dense spikes with hundreds of tiny purple flowers. It is the most common and widely distributed species in the genus, ranging from Mexico to Colombia and Venezuela, and the West Indies (Garay 1970, Pridgeon et al. 2006). Interestingly, the species has never been recorded from Panama (Bogarín et al. 2014).

In its natural habitats, *Arpo. giganteum* is usually found growing in the cool cloud and montane rainforests, where it gets plenty of humidity all year round. There, plants of this species flower from the end of the rainy season, and more frequently during the months of February to April.

The unremarkable vegetative and floral morphologies of *Arpophyllum* species makes them difficult to delimit and distinguish. Correll (1947) only recognized two species in the genus. Garay (1974) later recognized five species, but Dressler (2000) reduced them again to three, *Arpophyllum spicatum*, *laxiflorum* and *giganteum*, with three subspecies recognized under the latter. According to Dressler (2000) the three subspecies of *Arpo. giganteum* can be recognized as follows: 1) *Arpo. giganteum* subsp. *giganteum* with lateral sepals 4–5 mm long and spikes with a length of 10–16 cm; 2) *Arpo. giganteum* subsp. *alpinum* with lateral sepals 6–9 mm long and shorter spikes, only 3–7 cm long; and 3) *Arpo. giganteum* subsp. *medium* also with long lateral sepals (6–9 mm), but with longer inflorescences, reaching 10 cm in length (Dressler 2000). There are neither registered *Arpophyllum* hybrids, nor intergeneric hybrids using species of this genus as a parent (Hunt 2012).

Pollination of *Arpophyllum* species has not been well documented. However, the tiny, bright pink, magenta, or carmine-colored flowers, cryptic grayish pollinaria, and abundant nectar, led Dressler (1971) to suspect a hummingbird pollination syndrome. His hypothesis was that grayish or purplish-colored pollinia reduced the contrast between the pollinarium and the



*Arpophyllum giganteum*. The plant.

1. Flower.
  2. Dissected perianth.
  3. Column and lip, lateral view.
  4. Column, lateral and ventral view.
  5. Pollinarium, two views and anther cap
- Drawn from D. Bogarín 5755 by Sara Poltronieri.

bird's beak, and therefore would reduce the chances of the bird spotting it and attempting to clean its beak by removing them. At Lankester Botanical Garden in Costa Rica we documented the rufous-tailed hummingbird, *Amazilia tzacatl*, visiting the inflorescences for a few seconds several times during the day, pecking every tiny flower with great precision. The cryptic gray pollinia were observed to appear and again disappear from the underside of the beak's tip as the bird inspected the flowers. Lines of minute fruits developed shortly after, clearly following the bird's pecking pattern.

*Arpophyllum* plants must be cultivated under high humidity and light intensity, they benefit from strong air movement. Most species need cool conditions, but specimens from the lowlands may do well under warm conditions (Pridgeon et al 2006). Large

specimens of *Arpophyllum* may be quite a spectacle when in full bloom, and the plants are commonly seen in cultivation. Even though most horticultural guides suggest growing *Arpo. giganteum* under filtered or dispersed light, avoiding exposure of the plants to the direct rays of the sun, at Lankester Botanical Garden we have large mats of this species grown *en plein air*, where they receive plenty of sunlight all day long, and they flower spectacularly. Strong air movement should be ensured at all times. Under natural conditions, during the winter (which largely corresponds to the dry season in Central America), plants of *Arpophyllum* experience a significant reduction in water availability, but we avoid leaving our plants of *Arpo. giganteum* remaining dry for too long, so that the slender pseudobulbs do not wrinkle, and we maintain the substrate constantly moist. In general, occasional fogging in the early morning between infrequent watering is sufficient. Fertilization should be eliminated until new growths appear and more watering begins in the spring.

In Costa Rica, *Arpo. giganteum* is not a very rare plant, but as a highly appreciated plant, it is frequently exploited by collectors.

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## Selected Botanical Terms

abaxial – lower or reverse surface  
 acuminate – tapering to a long point  
 acute – pointed  
 adaxial – upper or front surface  
 apiculate – ending abruptly in a small point  
 attenuate – gradually tapered into a petiole-like base  
 basal – at the very base of a segment  
 bilocular – two-chambered  
 caniculate – grooved longitudinally  
 caudicle – slender stalk of the pollen masses  
 clavate – club-shaped  
 cleistogamous – type of self-fertilization that occurs in a completely unopened flower  
 complanate – held in a single plane  
 concave – curved inward like the inside of a sphere  
 concolor – of one color  
 conduplicate – folded lengthwise  
 connate – united to form a single part  
 convex – curved like the exterior of a sphere  
 coriaceous – leathery  
 cucullate – hooded  
 elliptic – oval  
 epiphyte – growing on another plant for

support and not as a parasite  
 erose – irregularly notched  
 fibrose – fibrous  
 globose – spherical; ball-shaped  
 granulose – surface covered in granules  
 hysteranthous – having leaves emerge after flowers are open  
 incumbent – resting on another segment  
 incurved – curve inward  
 internode – space between two joints  
 lacinate – divided into deep, narrow, irregular segments  
 lanceolate – narrow oval tapering to a point at each end  
 mentum – chinlike protuberance  
 mucilaginous – gelatinous  
 nonresupinate – having lip uppermost  
 oblanceolate – narrow at attachment, rounded apically  
 oblique – slanting  
 obovate – egg-shaped with the wide end up  
 obtuse – blunt or rounded  
 ovate – egg-shaped, narrow end up  
 ovoid – egg-shaped, narrow end up  
 papillose – bearing minute, pimplelike protuberances  
 pedicel – a stem carrying a single flower  
 peduncle – main stalk of the inflores-

cence  
 petiole – stalk connecting leaf to stem  
 pilose – covered in soft hair  
 pollinium – coherent mass of pollen grains  
 raceme – cluster of pedicellate flowers  
 rachis – portion of the inflorescence carrying flowers  
 recurved – bent or curved backward  
 resupinate – lip lowermost  
 rugose – wrinkled  
 saccate – pouch-shaped  
 scandent – climbing, rambling  
 scarious – dry and membranous  
 septum – membrane separating two chambers  
 sessile – joined without a stalk  
 spathaceous – resembling a spathe  
 spatulate – spoon-shaped  
 stelia – horns on the column  
 sub – somewhat less than; i.e., subspherical would refer to almost but not quite a sphere  
 terete – cylindrical or pencil-shaped  
 unifoliate – having one leaf  
 viscidium – sticky pad to which orchid pollinia are attached.

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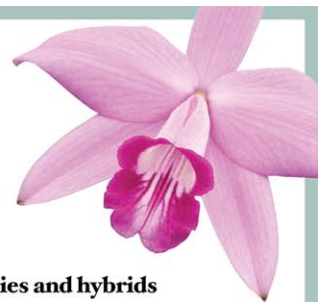


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# The Writhlington School Orchid Education Grant

By Phyllis S. Prestia



JANE JAMES

THE FOCUS OF the American Orchid Society's Education Committee is to promote and support the passion for orchids through education, one of the three overarching pillars of the Society. To that end, the Committee develops, implements, maintains and supports comprehensive educational programs that embrace orchid community learners of all levels and ages. It is my pleasure to announce that the Education Committee now joins the Conservation and Research Committees in funding grants that support exceptional educational orchid projects.

One of the Committee's emphases is on youth learning, including a focus on learning through technology. This first grant has been awarded to the Sarawak Community Orchid Education Initiative, which aims to develop orchid education and conservation. The work will be focused in the Sarawak Schools, Malaysia, emphasizing student-to-student learning. As in many areas of the world, orchid species in this area of Malaysia are threatened. Sarawak students are learning to propagate indigenous orchid species from seed *in vitro* in an effort to conserve the species.

The initiative is led by Simon Pugh-Jones, a science teacher at the renowned



ED JAMES

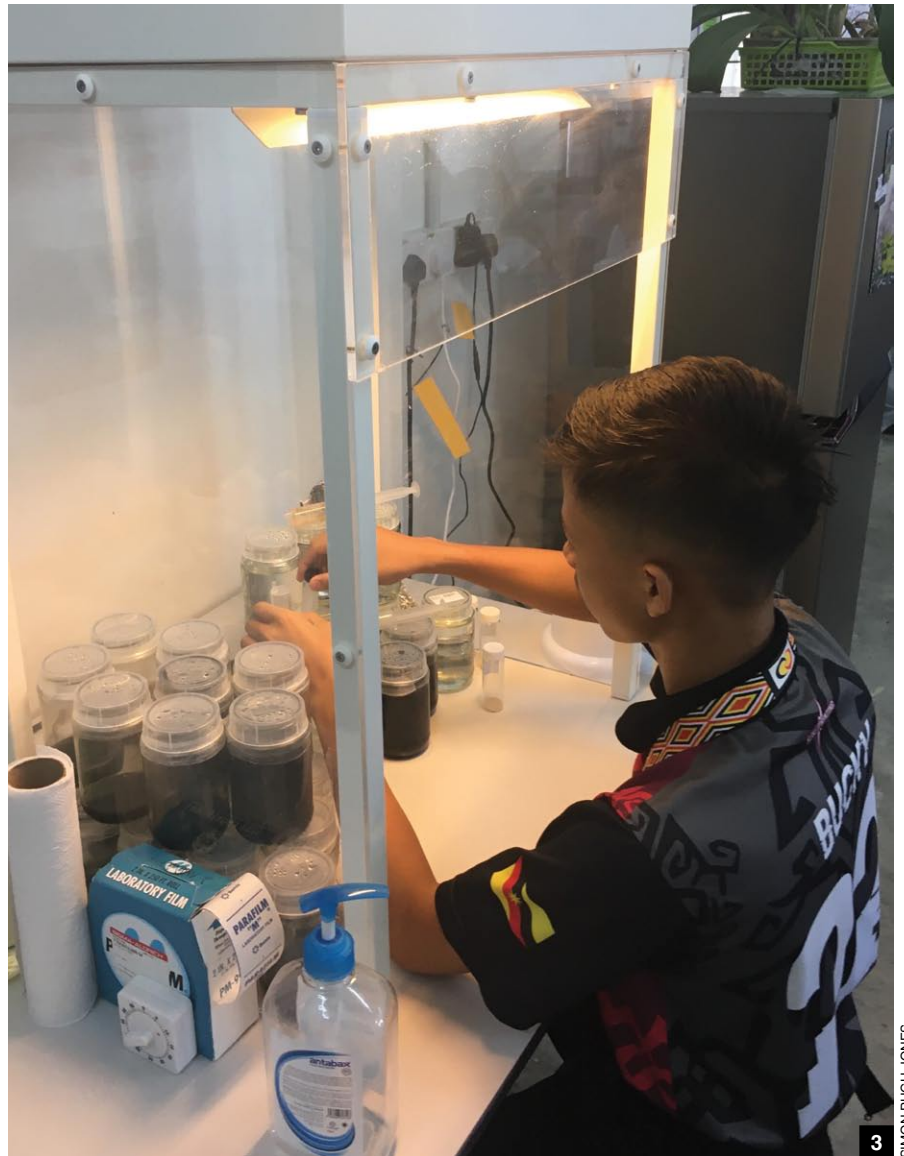


Writhlington School in Radstock, UK. Pugh-Jones has won recognition as an educational innovator through project-based learning in the UK and around the world. In 1991, he set up the Writhlington School Orchid Project as a vehicle for developing student expertise in biotechnology and enterprise. Simon's students develop and carry out significant original research, engage in design projects, and communicate with a global community of students and scientists.

In 2019, a group of students from the Writhlington School traveled to Sarawak to set up and commission an orchid propagation laboratory and provide workshops to the students at Sarawak on orchids, botany, field techniques, threats to biodiversity, propagation techniques, and deflasking. During 2020, taking into account the COVID-19 pandemic, Simon and students from the UK are continuing to engage Sarawak students through video workshops using distance learning. In 2021, Writhlington students will travel to Sarawak for the public launch of the initiative. During 2021, students from both schools plan to involve approximately 2,000 students from other schools in other communities to work with sustainable orchid seedlings, broadening the range of science and conservation activities, and involving greater numbers of students.

Collecting and analyzing information is an integral part of the community experiment. Work on monitoring and evaluation continues through the initiative by all parties. A project event is planned in 2022 to bring together all those involved to share outcomes and successes.

— Phyllis S. Prestia, Ed.D., a retired educator and school principal, has served youth for over 30 years. She is an AOS accredited judge and is the chairperson of the American Orchid Society's Education Committee (email: education\_committee@aos.org).



SIMON PUGH-JONES

- [1] Students from the UK and Sarawak exploring orchids in-situ in the Santubong National Park close to the Sarawak school in Kuching.
- [2] Simon Pugh-Jones holding *Pholidota chinensis*, an orchid from China.
- [3] Sarawak student working on *Dendrobium anosmum*, an orchid whose Sarawak range has been much reduced do to habitat loss.

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# Finca Dracula

## A Heavenly Panamanian Jewel

By Thomas Miranda

I AM QUITE thankful that in the past few years, I made it a priority to visit a lot of long-neglected orchid friends. One of the perks of writing for *Orchids* magazine is the invitations, the chance to go to exotic places and see how orchids are cultivated in the far corners of our globe. One invitation I had been anxious to accept was that from Andres Maduro, the owner and visionary leader of Finca Dracula in Cerro Punta Panama. Located in the lovely and legendary Chiriqui region, this area of Panama is higher in elevation, therefore cool, humid and lush with luxuriant plant growth; a perfect place to cultivate a huge variety of orchids.



Thomas Miranda

I first met Andres about 20 years ago when, as a teenager of maybe 14 or 15 years, he accompanied his father, Andrew, and several other orchid experts visiting Ecuador for one of the early Andean Orchid Conferences. Pepe Portilla (Ecuagenera) graciously arranged for a bus tour for several of us to see wild orchids. It was clear to me already, at that early age, young Andres was a keen botanist and horticulturist with a deep love and appreciation for the natural world, and the amazing plants within it. His father operated a successful cut-flower farm, Maduros Tropical Flowers, and had a great love of orchids, particularly native Panamanian species, and started developing exceptional collections, especially in rare and difficult genera such as *Telipogon* and of course, *Dracula*.

Many of us were shocked and saddened when Andrew Maduro passed away several years ago and wondered what would become of Finca Dracula. We need not have worried as the businesses are still thriving. But in addition, Andres Junior saw the potential of the collections, and the lush landscape and has created out of it what is, in essence, now a world class botanical garden. It was thrilling to see such amazing progress and vision with many interestingly themed garden sections (Cloud forest, Japanese, arid, cacti and succulents, meditation and of course, an Orchid Garden). All collections that are well curated by a loyal and passionate team.



1



2



3

- [1] Most of us think of Panama as the hot lowlands of the Panama Canal, but the highlands of the Chiriqui Region offer year-round springtime weather and magnificent vistas.
- [2] Andres Maduro, Finca Dracula's owner.
- [3] *Dracula vampira*
- [4] *Maxillaria carinulata*

- [5] It was impossible to miss the bright red flowers of this spectacular cool grower.
- [6] *Prosthechea brassavolae*
- [7] Finca Dracula's beautiful display house where the best of the day's flowering plants are displayed.
- [8] Orchids grow like veritable weeds in the climate of Finca Dracula.

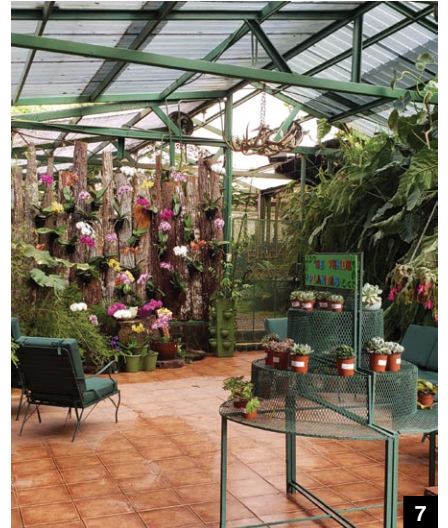


It was a full day's travel by bus from my brother's house in Costa Rica to get to the nearest bus station to the Finca. Andres's partner, Errol, gathered me from the bus station in the late afternoon and we drove an additional 2 hours to get to Cerro Punta. It was somehow fitting to have arrived at Finca Dracula at night. Even though I knew the farm was named after the orchid genus *Dracula*, it was exhilarating, if a bit spooky, to think that Nosferatu might be waiting beyond the gates of the farm. While it was too late to see much this particular evening I was warmly welcomed into the wonderfully eclectic family home and had a nice barbecue dinner, before hitting the sack.

In the morning I was not fully prepared for the exceptional beauty of the place. Awakened by a dawn chorus of strange and rare birds, the light revealed a paradise of stunning plants flanked by lakes, streams and waterfalls, totally my kind of place. I wanted to see it all in the short time I had but doubt I did. I do plan to be back. First up was a visit to the plant collections under glass and shade. Perhaps the most incredible being the outstanding collection of *Dracula* species. I suspect they have a complete set of the known species. Over the years, the culture of draculas has been perfected here with appropriate light levels, humidity, coolish temperatures and the purest of rainwater. There were no brown tips on the foliage and most plants were bearing their bold and amazing flowers.

Although draculas are clearly a specialty here, about 2,200 species of orchids are grown at the orchid farm. Some in the extensive greenhouses but many in the landscape and trees. I was thrilled to see a stunning *Maxillaria carinulata* (also known by its synonym *Maxillaria ampliflora*) grown almost as a hedge with an exceptionally large and colorful flower. The orchid gardens, where plants are grown epiphytically as they are found in nature, had many local species of *Maxillaria*, *Epidendrum*, *Oncidium Cyrtochilum* and pleurothallids in full bloom for all the visitors to see. Of their greenhouse plants, all the best bloomers are brought daily to a display area where they can be admired by all, including an area reserved strictly for the masdevallias and draculas. I was in heaven having all these great orchids together in such close proximity.

I see great things happening in the future for the Maduro family and the botanic garden they are nurturing. It will certainly continue to be a repository of rare Panamanian species as well as a wonderful



respite for travelers from around the world who find themselves in this spectacular part of Panama. Whether it is birds, butterflies, reptiles, amphibians, orchids or other exotic plants there is so much to see at this amazing place. Andres has been very active on the internet producing a great series of short films explaining orchid culture and exposing the world to Finca Dracula and its many splendors. As testament to the wonders of this place, Andres complains (with a smile on his face) how he is often awoken by quetzals in the morning. Considering their extreme beauty and rarity in the world, perhaps my greatest regret on this last visit was that my sleep was not disturbed by their raucous calls. I hope to experience that wonder on my next visit to the incomparable Finca Dracula. By all means, visit their wonderful website at <https://fincadracula.com/en/>.

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





# Repotting in NZ Tree Fern Fiber

Text and photographs by Graham Ramsey

AS A NOVICE or well-seasoned orchid enthusiast, you have faithfully attended all the orchid programs and asked all the right questions. You are confident that you have come up with the perfect recipe: three parts of this, one part of that, and another handful of that. Now, it is time to repot your cherished orchids. But then, someone asks you, "Have you tried tree fern fiber?" And your response is, "What the heck is tree fern fiber?"

Tree fern has been around for ages, more commonly as mounting plaques. The typical tree fern products on the market are very coarse. New Zealand tree fern, *Dicksonia fibrosa* is quite different and is soft and spongy, similar to *Osmunda*, with excellent water retention. This product hit the US market a few years ago and has quickly become a reliable repotting option. After using it for more than two years, I have experienced encouraging success, growing many different genera in this substrate. For more details about New Zealand tree fern, refer to *Orchids* July 2018 Vol. 87 No.7.

A potting medium should have the capacity to hold moisture with a level of predictability. The medium should also facilitate ventilation and good drainage. It is all about the roots. Orchid roots have to breathe. Lastly, the medium should have a long pot life, thus avoiding issues such as pH fluctuations, nitrogen availability problems and the need to repot due to the medium decomposing too quickly.

**PREPARING THE MEDIUM** Like a lot of orchid potting media, tree fern fiber does not come out of the bag ready to use. It requires some necessary preparation. Spread out some newspaper, a piece of cardboard, or pull out a plastic tub. Remove the amount of product you plan to use. When tree fern is packaged, it is mostly hydrated, but it is a long haul from New Zealand, so the substrate might be a bit on the dry side. That is okay. If it is dusty and dry, mix in a little water for this first step. Then crumble and fluff the fiber, breaking it up into a fine, loose consistency. The more crumbly the better. You can expect to find some chunks that will not break up. Put those aside for later. One can find many creative uses for this part of your tree fern. Now that you have finished crumbling, you should



have a pile of loose, soft, consistent fiber. To begin potting with the prepped fiber, it should be slightly damp, almost dry, not wet. This is important. If your pile of prepped fiber is wet, let it dry down in the open air for a day or two. Similar to sphagnum moss, you do not start potting with wet, soggy moss.

**POTTING YOUR ORCHID** If you have a paphiopedilum growing nicely in a 4-inch (10-cm) pot and it has a nice healthy root ball, then it is time to repot. You have removed it from the old pot, trimmed any dead roots, and cleaned up the foliage. When using tree-fern fiber, I start by placing the plant on the pile of prepped medium. Then gently start working the fiber into the center of the root system. Roll the plant over and over, tucking and lightly packing until you have worked the fiber into all the cavities. Now you are holding a ball of tree fern fiber and roots. Many growers at this point will line the bottom of the new pot with Styrofoam peanuts or similar drainage material to help increase ventilation and avoid buildup of damp soggy medium in the bottom of the pot. Remember those chunks you set aside earlier. Well, now is the time to put those to good use. They can be a great option over peanuts. Whether it is peanuts or the tree-fern chunks that end up in the bottom of your pot, sprinkle about a ½ inch (1.3 cm) of loose fiber on top to create a nest for your orchid to sit on.

I want to stress how important the following steps are when using tree fern fiber. Set your orchid in the pot and position it where you want it to be when the potting is complete. Hold it steady with one hand and start sprinkling fiber in with the other. Carefully work



the fiber in and around the roots being sure to tuck medium in all the nooks and crannies. It is always best not to have any unfilled cavities in the pot. The important point is to not pack the fiber tightly. If this tree fern is packed too tightly, you will lose the beneficial characteristics of this medium. It should be sprinkled in and lightly positioned around the roots until the pot is filled to the level you desire. Expect some settling after watering so put in a bit more than you think you need. You can always remove any excess. My favorite tool in the greenhouse is a small bamboo skewer that you can buy in any grocery store. This is perfect for any repotting project. Bamboo skewers can reach where your fingers cannot.

**WATERING...THE MAGIC** Now your orchid is in the pot filled with tree fern. You have followed the instructions by carefully filling the pot and not packing the medium. But you cannot help but notice your plant is a bit unstable, not secure in the pot like it should be after a proper potting job. The fact is whenever you finish repotting an orchid, it should be stable in the pot. There are many





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reasons for this. The most important one is any time new roots start to grow, they are fragile and the new root tips are susceptible to damage. If the plant is flopping around and the new roots are getting banged up, they will die.

This is what I call the *magic*. It is time to put water to the fiber. What will happen is the fines and small particles will start to wash down through the pot and out the bottom. The more water you run through it, the more will wash out. Now the magic. The fibers will begin locking and bonding together molding themselves around the pot and the roots, building a fiber network of ventilation and hydration. Suddenly the plant is stable and firm in the pot. With more watering and maybe a few taps of the pot on the countertop, to persuade the fines out, you are done.

**QUESTIONS AND ANSWERS**

**How often do I need to water with tree fern fiber?**

The first and most important thing to know is the culture requirements of your orchid. Once you learn what conditions are best for your plant, then you can water accordingly.

**Can I overwater using tree fern fiber?**

No. This medium can only hold so much water. It will immediately drain off excess water. If you watered every day, the medium would still get just so wet. But, again, know what your orchid needs. Many genera require being allowed to dry between waterings.

**How do I know when it is time to rehydrate tree fern fiber?**

When tree fern is fully hydrated, it is a dark brown color. As it dries, the surface will turn a lighter brown, but the best indicator that your tree fern is ready to water is the weight of the pot. When tree fern dries, it becomes noticeably light, like an empty cup of coffee.

**Should I water when the top surface turns light brown?**

No. One of the beneficial characteristics of tree fern is its wicking ability. By this, I mean that aside from the top surface, the tree fern fiber is constantly wicking throughout the pot, from top to bottom. The hydration level virtually stays the same throughout the pot giving your plant consistent hydration and a predictable dry down cycle. As long as the substrate does not become bone dry, it rewets immediately.

**Do I need to repot every year with tree**



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- [1] New Zealand tree fern fiber straight from the bag.
- [2] Wet fiber after prepping.
- [3] Tree fern fiber ready to use.
- [4] One of the author's *Phragmipedium* seedlings in tree fern fiber for a year.
- [5] A seedling *Coryanthes macrantha*.
- [6] Phalaenopsis roots diving into the tree fern fiber.





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**fern fiber?**

No. In fact, in the more than two years that I have been using this medium, there has been no indication of decomposition at all. The pH levels are the same as day one, around 6.5. You will likely need to repot only when your orchid outgrows the pot.

**Do I need to mix tree fern fiber with any other potting material such as Perlite or charcoal?**

No. The primary purpose of additives such as these is to enhance ventilation for the roots. Because tree fern fiber creates a natural network of ventilation, additives are not necessary. Would it hurt to mix in additives? No, as long as you do not use too much. Doing so could interrupt the wicking benefits.

**Can I use tree fern with any orchid?**

Yes and no. I do not recommend you go repot your entire collection in this substrate...or any substrate. Start slow, observe and learn how your plants react to the new medium. Your orchids will tell you if they are happy. I might discourage using tree fern fiber with orchids that require a rapid drying out after watering. I will close by saying one more time, know

your orchid's cultural requirements. And one of the best places to start is the American Orchid Society (<https://www.aos.org/orchids/culture-sheets.aspx>).

**Where can I buy New Zealand tree-fern fiber?**

New Zealand tree-fern fiber is supplied, in the US, by Acadian Supply. You can go to their website, [www.acadiansupply.com](http://www.acadiansupply.com) for more information on who in your area stocks these tree-fern products.

— *Graham Ramsey is a member and past-president of the Western North Carolina Orchid Society, as well as a member of the AOS Membership and Marketing Committee. Ramsey's passion is phragmipediums. He does his own propagation and breeding, and is available to give programs on Tree Fern and other repotting topics. (email: G\_Ram@yahoo.com)*



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[7] A bulbophyllum in a 4-inch (10-cm) pot of tree fern fiber with seven new growths.

[8] *Brassia Rex* growing happily in NZ tree fern fiber.

[9] Forty liter (approximately 10.6 gallon) bag of New Zealand tree fern fiber.



# Another Tree Fern Fiber Experience



The author's bulbophyllums making beautiful roots.



The author admits that she usually is not good with phalaenopsis as she tends to overwater, but has, so far, been successful with NZ tree fern.

I HAVE BEEN using New Zealand tree fern fiber for a little over a couple of years. I started by trying it with my bulbophyllums. As I know that they like to keep moist, I potted them in plastic pots. I have used packing peanuts in the bottom of some of them but have found that they actually do better without it. I typically potted my bulbophyllums in sphagnum moss to keep them damp, but my plants seem to be much happier in the NZ tree fern fiber and the new roots have nice, fine hairs on them, which tells me that the water-to-air ratio is perfect.

I have also potted up various other orchids in this tree fern fiber medium. I use clay pots for my cattleyas. I have just put my stanhopeas into net pots of NZ tree fern fiber and they are putting out nice roots already. The nice thing about this medium is that it tends to stay in the pot, so even if the pot falls over, it does not spill out.

When potting with it, I tend to pack it in semi-firmly —not tight by any means —but not loose either. For those of you who might have used osmunda fiber in the past, this is the closest thing that I have found to that medium. The best thing about it is that when I repot my plants (especially those in plastic pots), I can just pop out the whole thing, place it into a larger pot and fill around it. In the time that I have used NZ tree fern fiber, it does not seem to show any break down whatsoever. Only time will tell just how long I can keep up-potting with it.

— *Text and photographs by Laura Newton. Newton is the AOS Award registrar and an Accredited Judge in the Florida North-Central Judging Center. She lives on a 15 acre (6 ha) horse farm in Brooksville, FL with her family where she has two greenhouses chock-full of approximately 2500 Orchids and she has earned over 100 AOS awards in a variety of genera.*

# Growing Orchids is a Partnership

Text and photographs by Allan Watson

I STARTED GROWING orchids from scratch in New Zealand in 1992 and had some interesting challenges. I started with cymbidiums but in 2005, another grower challenged me to grow a miltoniopsis, which started me down this pathway that I have described as being the partnership approach to growing orchids.

I was asked to be involved with two trials that began in February of 2019, one a fertilizer trial and the other with tree fern fiber substrate. New Zealand tree fern is different from the South American tree fern fiber and plaques. This product comes from our native New Zealand tree fern, is more moisture retentive and spongy, and the plaques prepared from it are softer. I have been reporting on their respective successes separately in our New Zealand Miltoniopsis Growers newsletter, copies of which can be found on the International Odontoglossum Alliance website at <http://www.odontalliance.org/>.

THE PARTNERSHIP I approach culture as an orchid partnership. We may not realize it, but the moment we start growing orchids we are entering into a partnership between light, temperature, air movement and water. Without this basic interplay, our plants would not survive in the first instance. Once started, we then tend to play around with the potting mix and fertilizers we use. Hence, the trials I have become involved with deal with these two aspects.

Having recently completed a number of talks to various orchid societies on “The Rebirth of *Miltoniopsis*,” I found some growers insistent that bark is the only medium, others that swear sphagnum moss is the only way to go, and others who happily mix their potting media. Few had given our tree fern fiber a try.

A similar set of varied answers were provided when it came to fertilizers. Few seemed to know the electrical conductivity (EC) or total dissolved solids (TDS) content of their fertilizer solutions (for more information, see Sue Bottom, “For the Novice: Soluble Salts” *Orchids*, July 2020) or the pH level of their water supply. They seemed to base their fertilizer strategy around the quantity of nitrogen in the product being used. Most said they opted for an above 12 (N) nitrogen level product (similar to American 30% levels) — their thinking was that high nitrogen



levels produce greater growth. They tended to liken it to an agricultural crop. At this point, I became convinced there is a strong requirement to match fertilizer to potting mix to get the best result.

MAKING IT WORK FOR YOU I am of a strong opinion that successful partnerships result in producing win-win results. In orchid terms, this means your plants look better, their flowers are more vibrant and your overall inner-grower pride is lifted.

In most cases, light and temperatures are managed by your growing environment followed by the genera that you intend to grow in that environment. In terms of watering, I have found that a change to NZ tree fern fiber requires only about 50 percent of the water required by other media.

Take extra notice of the fertilizer you intend to use so that it will produce the results that you expect. In the past I was like most — pick out what was on special and apply using the little-and-often principle. Since adopting an orchid-specific fertilizer, I have noted accelerated growth, better flower production and cost saving of over 30 percent from the previous season despite a 15 percent increase in the number of plants in the collection.

Look at your potting medium whether it is bark, a mix of bark and something else, or tree fern fiber. The right medium should be matched not only for your plants but it must also suit the way you water and fertilize.

LIGHT AND TEMPERATURE These two aspects of orchid culture go hand in hand. Knowing what light levels and temperature conditions your plants grow best under is often a bit of hit and miss. We have all been there. High light, low

[1] Two of the author's test miltoniopsis plants established in NZ tree fern fiber.

[2] Root growth has been excellent.

[3] A bench of test plants for the 2019–2020 season.

light and shade seem to be the levels commonly described yet we often struggle with measuring such levels. If you want to be accurate, you can now get light meter applications for your smart phones but if you place your hand about 12 inches (30 cm) above your plants when the sun is at its peak and you can see a light shadow across the plant, then it is a reasonable light level for most orchids.

Temperature within the growing environment can, to some extent, be controlled. For example, for my miltoniopsis, I try to maintain a minimum night temperature of 54 F (12 C). A concrete floor in your growing environment can also act as a heat sink for energy release during the night.

POTTING MEDIUM Here the fun begins and before I go any further, I need to stress that I operate under the principle of what works for me, may not necessary work for you. Yes, I have tried straight sphagnum, I have tried that old hand-me-down recipe, I have tried straight bark and a bark-pumice mix and now I



am experimenting with tree fern fiber. At this point, results in tree fern fiber are far ahead of any other potting mix that I have used to date under my conditions.

**WATER AND FERTILIZING** Like most, I started by applying water and fertilizer as I saw fit (remember — whatever was on special and applied little and often). My results were, in hindsight, fair at best. I have now adopted a timeline approach and the results are positive. I have the various genera within my collection separated so that I can manage and observe the requirements. Most importantly, this process is undertaken in conjunction with EC readings to test for the amount of nutrients the plants are receiving. I am using a low nitrogen fertilizer. Samples are taken at random locations each time I water or fertilize to ensure all plants are receiving the same amounts of water and fertilizer.

**FLOWERING AWARD WINNING PLANTS** Having a plant that flowers is a challenge but having a plant with many flowers is a great result. First start off with quality plants or seedlings. It takes as much effort, space and supplies to grow quality plants as it does those that produce poor quality flowers. Those bargains might not be bargains after all. Be prepared to monitor your plants' development and change when poor performance is noted.

**LINING THESE FOUR KEY ELEMENTS UP**

This is not always as easy as it sounds. It may take, in some cases, more than one growing season to establish a true baseline. We tend to look at a plant that is not doing well and say to ourselves: something needs to be done with this plant; perhaps shifted into perhaps more light, higher up in the greenhouse, more shaded, different potting mix — and on goes the list. We may ask another grower or see the plant in another grower's collection and try to copy the location in our own environment. Unfortunately, we often do not ask about that grower anything about his or her water and fertilizer programs.

Since being involved with the two ongoing trials and having established some measures of success, I have found that simple records can plot the progress of your plants.

**SUGGESTED STEPS TOWARDS IMPROVEMENT** Group your collection by genus in your growing environment. The warmer growing onto higher shelves, and the cooler on lower shelves. This makes it easier to see which are growing better than the others, unless you can provide a genus-specific growing environment.

Establish a program for watering and fertilizer. Some will say that this should be ad-hoc — in other words, lifting pots and if they feel light, water and feed. I suggest a better way is to establish a timeline. For example, in the summer months, every two days and, once daylight savings time finishes in the fall, extend the period by double until the end of winter (four days, etc.). This, of course, depends on your local weather conditions.

Measure the strength of the fertilizer being applied (EC) and if possible plot against a graph to see performance gained. This way you can forecast flowering to some extent. The easiest way to do this is to purchase an EC meter. This tool will provide you with an indication of the strength of the fertilizer mix you are applying. It will take into account the background dissolved salt content and pH of your water supply and the nutrient effects of the fertilizer. I have found it best to work backward from a projected flowering or show date. For instance, maintain a reasonable flat EC reading of 0.4 mS each time you water and fertilize. Then about two months out from the flower or show date, increase the fertilizer content progressively to reach a peak EC reading of 0.8 mS at one week out. Flower size and quality should be the end result.

Be prepared to change to a blossom-booster fertilizer once spiking has occurred.

Observe what is happening with your potting mix. If you are not getting growth, then consider a change. As I said earlier, I recently changed to NZ tree fern and have been, to say the least, blown away by the results. I moved from bark to bark-pumice mix to tree fern fiber substrate within a six-month growing cycle.

**THE TRIALS** I now find myself awaiting the results of the trials I am undertaking. I am hoping to see more flowers and more spikes. In general, to date my miltoniopsis plants have averaged four flowers per inflorescence and two inflorescences per plant.

Fifteen pairs of miltoniopsis plants formed the basis of the initial trial. As a result of that, a further 50-plus miltoniopsis have been transferred into tree-fern fiber substrate along with around 50 odontoglossum-type oncidiums and other genera including some 100 promeneas. I am already seeing results in terms of plant development and budding and am waiting for the flowering stage.

I also have a number of different genera attached to tree fern fiber slabs or rafts to see how they progress. So far,

I am seeing positive results with plants showing signs of attachment to the slab after only a month.

**COMMENTS, CONCLUSIONS, RECOMMENDATIONS**

- Everyone has their own way of doing things. My comments reflect mine. There are almost as many ways as there are growers — each providing both success and failure. I simply share my way with my results and invite you to try it and the challenges that arise. I am also progressively changing all my odontoglossum-type oncidiums into tree fern fiber substrate.

- There is definite value in the establishment of a unified approach. Getting the right plants for the growing environment; the right substrate or potting medium for the plants, and the right fertilizer for the potting medium and maintaining reasonable records of plant and product performance.

- For some, recommendations are an individual thing considering that not all factors are available when the decision is made. Stop, take time to look at your collection; your prize plants. Ask yourself, will they grow any better if I continue to treat them the same way as the last growing season or is there any particular part of your orchid culture that warrants improvement? If yes, make the change. An alternative approach is to take a sample of a particular genus, implement the changes and monitor the results.

- Most importantly, you need to enjoy growing. Share experiences and be prepared to learn as I believe we are all learners when it comes to orchids. I am and, as such, I am happy to share.

**Acknowledgements**

Thanks must go to Greg Barnes of Bio Leaf for asking me to participate in the trial of the fertilizer he promotes ([www.bioleaf.co.nz/](http://www.bioleaf.co.nz/)) as well as to Alan Ford who had faith that I would provide a fair assessment of NZ tree fern fiber substrate over a two-year trial period ([www.fernwoodnz.com](http://www.fernwoodnz.com)).

— *Allan Watson started growing orchids in 1992 as a result of seeking out a new hobby that both he and his wife could participate in. After a major collection disaster due to a freak weather issue, Allan had a break from orchids until 2007. Now he is back enjoying the hobby with increased passion and learning experiences. 15 Warkworth Grove, Bell Block, New Plymouth 4312, Taranaki, New Zealand.*

# Another Method for Reducing Seed Loss

Text and photographs by Charles Wilson



HOW FRUSTRATING IT is when a hobby hybridizer (or even a professional) is absent from the greenhouse for only a few days and returns to find that a seed capsule has split and all the seed has scattered away! Harvesting seed capsules while they are still green is risky. If they are removed too early, the seed embryos can be underdeveloped or have reduced or even no fertility. The accompanying photographs illustrate a simple solution for collecting dry seed with the use of a coffee filter and a few clips. The coffee filter also serves as a visual “flag” in the greenhouse reminding the grower to check on the seed capsule development.

It is always advisable to clean excess debris from the end of the capsule to ensure as clean a seed harvest as possible. The inflorescence may benefit

from supportive staking, depending on its sturdiness. The coffee filter is placed around the capsule and creatively clipped so the capsule inside can be checked on a regular basis. Should the filter accidentally get wet while watering, it typically will dry out in a matter of hours. When the capsule splits, it can be removed along with the coffee filter and the seed carefully knocked out. The coffee filter then serves as a convenient, and clean, containment for transport to the lab or for mailing to a flasking service.

— *Charles Wilson, an accredited AOS judge out of the Pacific Northwest Judging Center, has been growing orchids for over 40 years. He is Chair of the AOS Conservation Committee and a member of the AOS Species Identification Task Force. His special interests include*

Two seed capsules on the end of a thin inflorescence benefit from a supporting stake. Without the stake, the weight of the developing capsules could result in collapse of the inflorescence. The upper inset shows a simple coffee filter creatively clipped around the capsules so as to catch the seed upon dehiscence (splitting open). Keeping an opening at the top of the coffee filter (lower inset) allows the grower to check on the progress of the ripening capsules.

*Bulbophyllum, Cattleya, Coelogyne, Dendrobium, Paphiopedilum and about everything else, too (email: zooemeritus@gmail.com).*

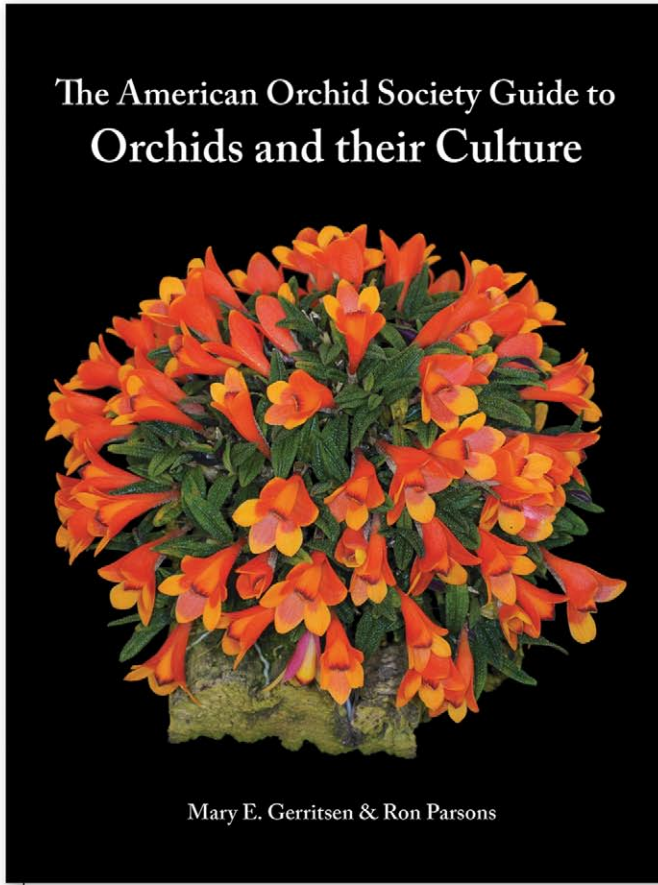


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# Smelting an Orchid Legacy

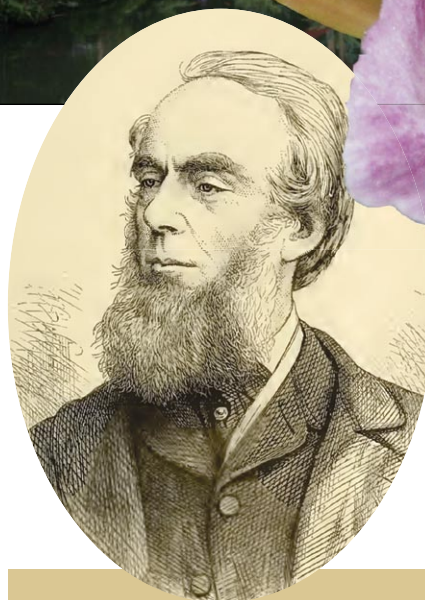
by Peggy Alrich and Wesley Higgins



## Biddulph Grange

JAMES BATEMAN (1749–1824), the grandfather and namesake for James Bateman (1811–1897) was established as an ironmonger in Deansgate, Manchester, England by 1773. His son, John Bateman purchased country estates for their mineral wealth, notably coal and became one of the largest manufacturers of cast iron products and stationary steam engines. Grandfather and father Bateman made a fortune and retired to Knypersley Hall in Staffordshire. Such wealth was amassed that the next two generations of Batemans did not to have to work at all.

James Bateman, the horticulturist, was born on July 18, 1811 at Redivals, Bury, Lancashire, England to John Bateman and Elizabeth nee Holt. His parents were avid gardeners at their home, Knypersley Hall and gave that love to their son. He was a precocious boy of eight when his interest in native English orchids started. James matriculated at Lincoln College, Oxford in 1829 graduating from Magdalen College Oxford with a BA in 1834 and an MA in 1845. While studying at Oxford, he became totally enamored with orchids during a visit to Thomas Fairburn who had been a



gardener to Sir Joseph Banks.

In 1833 he sponsored a plant hunting expedition to Demerara and Berbice (Guyana) on the northern coast of South America led by collector Thomas Colley, who had worked for Fairburn. Colley sent back 60 different orchid species, one third of them were new to cultivation. Afterwards Bateman published a description of the expedition in Loudon's *Gardeners' Magazine*, page 571, 1834.

As a collector and scholar on orchids, Bateman was elected a fellow of the Linnean Society and he served on the Royal Horticultural Society's Plant Exploration Committee. Sir William Jackson Hooker, editor of the *Botanical Magazine*, dedicated the entire 1837 annual volume to Bateman.

While Bateman was studying at the Museum of Natural History in Manchester he came across specimens of birds and insects that George Ure Skinner had sent from Guatemala. Skinner had started a mercantile company in Guatemala whose main business was commerce in cochineal

### PLATES:

#### *The Orchidaceae of Mexico and Guatemala*

- [1] *Artorima erubescens* as *Epidendrum erubescens*, t.32
- [2] *Sobralia macrantha*, t.37
- [3] *Galeandra baueri*, t.19





the early developers of orchid cultural techniques. He pioneered “cool orchid cultivation” which allowed odontoglossums (now included in *Oncidium*) to be cultivated in England, copying the cool arid climate of the cloud forests in South America where these exotic plants are found. The preface to *A Guide to Cool Orchid Growing* (1864) states “The following pages are not intended for botanists...”

He published two additional lavish orchid books with hand-colored lithographic plates based on paintings by Walter Hood Fitch. Bateman issued *A Monograph of Odontoglossum* (1864–1874) with just 30 plates commenting in the introduction “What wealth of *Odontoglossa* Peru may possess, I must leave some future botanist to unfold.” The other, *A Second Century of Orchidaceous Plants* (1867) with 100 hand-colored plates designed to be a continuation of Sir W.J. Hooker’s *A Century of Orchidaceous Plants*, published in 1846.

Although Bateman is best known to botanists for his work in connection with orchids, he had a great interest in collecting and cultivating tropical plants. He was the first person to successfully mature and fruit the Southeast Asian *Averrhoa carambola* (star fruit) in England. In 1838, he married Maria Sybilla Egerton-Warburton, British horticulturalist and botanist, from one of Cheshire’s most distinguished families. Together with wife Maria and his friend Edward William Cooke (artist and geologist), Bateman created the magnificent gardens at Biddulph Grange, Staffordshire. The garden was James Bateman’s vision on how the combination of diverse areas of complex gardens could be linked together and form a harmonious whole. He spent more than 20 years collecting plants from all over the world, selecting plants for the garden environment where they could grow the best. James Bateman published a series of articles with plans and drawings in *The Gardener’s Chronicle* in 1856 and in 1862. The Biddulph Grange gardens were famous (and still are) all over Europe and are maintained by the UK National Trust.

In 1861 James and Maria Bateman moved to Kensington, London. This enabled him to participate in the activities of the organizations he belonged to: The Royal Horticultural Society, the Royal Society, the Linnaean Society, and the Geographical Society.

#### REFERENCE

Lee, S. and L. Stephen. 1901. James Bateman, page 199 in *Dictionary of National Biography, Sup. Vol 1*. London: Smith, Elder, & Co.

from which the natural dye carmine is derived. Bateman thought there must be a rich harvest of orchids in unexplored Guatemala. Without any introduction he wrote to Skinner, a complete stranger, asking him to send orchid plants. Bateman’s letter described orchids and contained little sketches which induced Skinner to send a box of orchids. This was the start of their 30-year relationship. Within a few years, James Bateman had the finest Guatemalan orchid collection in England. This was the

source material for his 40-page elephant folio book titled *The Orchidaceae of Mexico and Guatemala*, (1843) based on Skinner’s discoveries. The color paintings were by various artists (Sarah Ann Drake, Augusta Innes Withers, Samuel Holden, Jane Edwards) with black and white vignettes by George Cruikshank. Only 100 copies were published for royalty and tycoons and with its publication Bateman became an international botanic sensation.

Horticulturist Bateman was one of

2







# Seeing Spots!

*Paphiopedilum sukhakulii* and its Hybrids

ESTEBAN (STEVE) GONZALEZ-COSTA





SINCE ITS DISCOVERY, *Paphiopedilum sukhakulii* has rapidly become one of the more influential Asian slippers to come into cultivation. When not in bloom, it offers attractive mottled-green foliage. It is a warmer-growing paphiopedilum and offers a cultivation cycle that can be easily followed as it takes in monsoonal waterings from late spring through the summer months when we like to water more often. Then, plants can bloom throughout the year, but more often produce flowers in the late-summer to fall months. Normally this species needs a rest, requiring less water and slightly cooler temperatures when we also cut back during winter months. Flowers of *Paph. sukhakulii* display acutely green-veined dorsal sepals on a pure-white background, a colorful brick-red to mahogany contrasting pouch, and chartreuse-green petals that are usually perfectly perpendicular displaying fine-to-small, cordovan-to-brown spots that are sometimes so dense they coalesce at the petal tips. Flowers also have good longevity lasting up to two months. Intermediate in its demand for light, it will also let you know if light is too bright by bleaching its leaves.

Like some other slipper orchids brought to cultivation in the last half century, *Paph. sukhakulii* has a peculiar history. While most orchids are discovered in the wild, *Paph. sukhakulii* was found in a consignment shipment sent to northern Europe by Mr. Prasong Sukhakul, manager of the Bangkrabue Nursery in Bangkok, in 1964. Reports describe that, upon blooming, two plants differed from the remainder of a consignment shipment of *Paphiopedilum callosum* plants. These had been collected in northeastern Thailand near the Laotian border in the province of Loei in the foothills of the Phu Luang Mountains along streams at lower elevations, 820–3,281 feet (250–1,000 m). A description (Wellenstein and Wellenstein 2014) said the following: This newly discovered species was uniquely endowed with wide, flat petals showered with spots, hundreds of them, and sported a nice reddish shaded lip, along with excellent natural spread of the flower, for the petals of most of the species are held nearly flat out, and are nearly perpendicular to the stem.

The species is now classified as part of the subgenus *Sigmatopetalum*, section *Planipetalum*, along with *Paphiopedilum purpuratum* and *Paphiopedilum wardii*. The plant has foliage that is mottled darkly and yellow-green with no purple spotting



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RAMON DE LOS SANTOS



JULIE MCMILLAN

on the leaf undersides. Leaves are typically three to five at a time, up to 5.1 inches (13 cm) long and 1.2–2 inches (3–5 cm) wide. Inflorescences are single-flowered, yielding a 4.3–5.9-inch (11–15-cm) flower. Outside of the known typical or coloratum flowers originally discovered, albinistic forms exists, described as f. *aureum*,

- [1] *Paph. sukhakulii* 'Newberry' HCC/AOS; grower: Carter and Holmes Orchids. Photograph by Greg Allikas.
- [2] *Paph. sukhakulii* 'Brier Hill' CCM/AOS; grower: Arnold Klehm.
- [3] *Paph. sukhakulii* 'Peace of Mind' AM/AOS; grower: Sergey Skoropad.
- [4] *Paph. sukhakulii* f. *aureum* 'Green River' FCC/AOS; exhibitor: Bob and Lynn Wellenstein.
- [5] *Paph. sukhakulii* 'Sorrento' AM/AOS; grower: Yamato-Noen Orchids, Ltd.
- [6] *Paph. sukhakulii* f. *aureum* 'Albarino' AM/AOS; grower: Dave Sorokowsky.
- [7] *Paph. sukhakulii* 'Galactic Storm' FCC/AOS; grower: Marriott Orchids.

which vary from clear bright green to clones with varying yellow or cream overlays. It is interesting to see that the two other mottled-leaf paphiopedilums of this section *Planipetalum* do not come from the immediate proximity of where *Paph. sukhakulii* is found. *Paphiopedilum purpuratum* is found over 808 miles (1,300 km) to the east and north near and outside of Hong Kong and in the province of Guangdong, China. *Paphiopedilum wardii* with its more drab (dull) green *Paphiopedalium venustum*-like mottled foliage is found well over 560 miles (900 km) northwest of Loei.

One big question is why *Paph. sukhakulii* would receive such popularity as a species and with hybrids compared to other slipper species. The reason may simply be the size, form, flatness and potential for larger, more profuse spotting that is unique to this species. Incredibly colored, *Paph. purpuratum* has 18 flower awards, although it is slightly smaller, being at most 3.5–3.9 inches (9–10 cm) wide (natural spread [NS]). It does not have profuse spotting, and the dorsal sepal also reflexes strongly apically, rolling back and reducing its size. Petals also roll and twist frequently in *Paph. purpuratum*. Spots and hairy warts are found in other paphiopedilums, but not as profusely and consistently as found on *Paph. sukhakulii*. An exception is *Paph. wardii*, which also has excellent color and profuse spotting, although the spot size is much smaller. Overall, the flower size in *Paph. wardii* is also slightly smaller, averaging 3.9–4.7 inches (10–12 cm) NS mostly due to the down-swept petals.

*Paphiopedilum sukhakulii* has been used extensively in hybridization with great success. After discovery, it is clear that many of the traits of this new species were recognized and a flurry of hybridization ensued. Some of the features that *Paph. sukhakulii* brought as a newly discovered species, and to its progeny, include the following:

- spots: it has petals with uniform spots that are larger and distinct from those found in other species;
- an overall larger and flatter flower form, with a fairly “straight” horizontal petal habit;
- a larger, balanced pouch with strong coloring throughout or in most of the pouch’s upper half;
- strong, upright, tall inflorescence;
- ease of culture (wet warm summers, dryer cooler winter rest period);
- tolerance of some shade, not extremely light demanding; and



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- ease of maintaining album and vinicolor forms into its sib crosses and hybrids.

Incredibly enough, as a species *Paph. sukhakulii* has had a prominent role in paphiopedilum species awards since the first award was granted in 1966. Table 1 shows how it led the charts in awards as of January 2015. As of March 2020, *Paph. sukhakulii* has had nearly 200 AOS awards and is surpassed only by *Paphiopedilum macranthum*. All these fabulous awards can be enjoyed through *OrchidPro* online (American Orchid Society) along with great photos from the Japan and Taiwan Orchid Growers Associations’ awards.

Overall, *Paph. sukhakulii* has been granted many awards for continuous improvement through line breeding of its form, colors and size over the original “ancestral” types. But sometimes, some features work against the overall beauty, symmetry and balance of this beautiful flower. Petals can twist or roll inward, pouches might be too small to provide a pleasant balance with the remainder of the segments, or dorsal sepals could be too small in proportion. Of course, for a flower that is fairly uniform and simple in the “cross” shape it forms, symmetry can be completely off and unfortunately easier to judge than a more complex paphiopedilum hybrid.

**BETTER EXAMPLES OF PAPH. SUKHAKULII** It is interesting to see that most of the FCCs to *Paph. sukhakulii* have been granted only since 2005. *Paphiopedilum sukhakulii* ‘Emerald Tower’ FCC/AOS (93 points) granted in 2011 to Hadley Cash of Marriott Orchids had a gigantic 6.7-inch (17-cm) NS. The interesting thing about this flower is that it was an album variety

that probably exceeded the common type forms up to that time. Typically we think of alba or album varieties as smaller and less full than the normally colored forms. Not so with *Paph. sukhakulii*. Here, these recently developed album varieties are as full, balanced and dimensionally close or well beyond the average non-album (coloratum or type), awarded-flower dimensions.

Looking at *Paph. sukhakulii* ‘Jeff’s Favorite’ FCC/AOS awarded in 1990, it is a colorful, dark, saturated flower, with excellent even-sized spotting typical of the species, although the petals are slightly down-swept, slightly lowering its width to 5.8 inches (14.7 cm), the dorsal sepal is average width and shorter, particularly when compared to the size of the pouch. Another more recent award from 2015 is *Paph. sukhakulii* ‘Galactic Storm’ FCC/AOS. This flower was among the largest with a 6.5-inch (16.5-cm) NS. This superb flower not only has a symmetrical, broad dorsal sepal and a wide-petaled, large flower, it is among the highest point score for any awarded *Paph. sukhakulii*. It also does not suffer from the overly pointy segments that afflict many *Paph. sukhakulii* flowers. This flower is also a great example of fuller, larger dark spots that go from the petal base to its tip. All these examples show how the synsepal (range 1–1.2 inch [2.5–3 cm]) is mostly obscured by the pouch width, which is typically 0.2–0.4 inches (0.5–1-cm) wider.

Looking at awarded plants, most have great symmetry and most show full proportions that are in balance with the overall flower. Many recent awards show an increasing trend that is likely line-bred for rounder segments. Regarding size,



**Table 1** A Comparison of *Paph. sukhakulii* versus other highly awarded *Paphiopedilum* species.

Species	Total	FCC	AM
<i>sukhakulii</i>	177	6	90
<i>micranthum</i>	176	12	103
<i>rothschildianum</i>	144	26	70
<i>bellatulum</i>	159	1	78
<i>lowii</i>	127	4	71
<i>delenatii</i>	126	0	54
<i>superbiens (curtisii)</i>	119	1	53
<i>fairrieianum</i>	121	3	45
<i>armeniicum</i>	113	19	60
all <i>Paphiopedilum</i> species	3,529	93	1589

most awarded plants have increased NS over time by 0.6–0.8 inches (1.5–2 cm) to 5.6 inches (14.2 cm) and petal widths have improved almost a half-inch (nearly 1 cm) to 1.2 inches (3.1 cm) by 2004 (Koopowitz 2008). As I mentioned before, since there are no significant step increases in most of the size brackets for coloratum or album awards, then most of the criteria go away from any size stratification and focus purely on the color, form, fullness and symmetry of the flower at hand.

**HYBRIDIZING TRENDS AFTER DISCOVERY** As with most slipper orchids, the main initial focus of hybridization is breeding within similar, known species. In the case of *Paph. sukhakulii*, the most successful of 254 direct progeny involved the *Barbata* section from the same *Sigmatopetalum* subgenus (*Paphiopedilum barbatum*, *Paph. callosum*, *Paphiopedilum lawrencianum*). Other early hybrids were made with other single-flowering species from subgenus *Sigmatopetalum*, the subgenus *Brachypetalum*, and the multiflora subgenus *Polyantha*. Table 2 provides a list of many of the most well-known, grown and awarded progeny.

Registered hybrids using *Paph. sukhakulii* started to appear in the 1970s. Looking at the top-awarded hybrids, you can appreciate that over half of the most awarded hybrids were registered in the 1970s right after *Paph. sukhakulii* was introduced into cultivation.

Most of the focus in the early hybrids was on coloratum hybrids. Key hybrids are *Paphiopedilum* Makuli (Maudiae ×), *Paphiopedilum* Supersuk (William Matthews ×) and *Paphiopedilum* Papa Röhl (× *fairrieianum*). The trend with most of these changed in the late 1980s and early 1990s with the popular surge in vinicolor

Awards	Grege Name	parentage	year
148	Macabre	<i>sukhakulii</i> × Voodoo Magic	1990
94	Makulii	Maudiae × <i>sukhakulii</i>	1974
58	Iantha Stage	<i>sukhakulii</i> × <i>rothschildianum</i>	1973
30	Raisin Pie	<i>sukhakulii</i> × Clarissa	1989
26	Supersuk	William Matthews × <i>sukhakulii</i>	1973
21	Chiara	<i>sukhakulii</i> × <i>lawrenceanum</i>	1976
21	Raisin Jack	<i>sukhakulii</i> × <i>Gloriosum</i>	1989
20	Duguesclin	<i>sukhakulii</i> × <i>mastersianum</i>	1992
20	Papa Röhl	<i>sukhakulii</i> × <i>fairrieianum</i>	1972
19	Rory Jones	Satchel Paige × <i>sukhakulii</i>	2005
18	Francisco Freire	<i>sukhakulii</i> × <i>godefroyae</i>	1977
15	Evelyn Röllke	<i>sukhakulii</i> × <i>bellatulum</i>	1979
15	Double Deception	<i>sukhakulii</i> × <i>venustum</i>	1987
14	Hsinying Alien	(Raisin Pie × Supersuk)	2004
13	Colorkulii	<i>sukhakulii</i> × <i>concolor</i>	1973

**Table 2** *Paphiopedilum sukhakulii* first- and second-generation hybrids and their awards.



hybrids. Starting with a well-known hybrid that easily comes first to mind from the past, *Paph. Papa Röhl* uses, for better or for worse, the influence of the other parent, *Paph. fairrieianum*, to create color and pattern. About 20 awards were given to *Paph. Papa Röhl*, but achieving fame and glory is not so easy. Most *Paph. Papa Röhl* cultivars average about 3.9 inches (10 cm) in NS and have wavy petals and dorsal edges due to the *Paph. fairrieianum* shape. A classic awarded example is *Paph. Papa Röhl 'Prodigal'* AM/AOS, which achieves a fair-sized, 4.3-inch (11-cm) NS flower with 2.4-inch-long (6-cm-long) petals. It has distinctive dorsal veining but I believe the greatest achievement of this and the better clones of this hybrid brings

- [8] *Paph. purpuratum* 'Windy Hill' HCC/AOS; exhibitor: Marilyn and Brian LeDoux.
- [9] *Paph. ciliolare*
- [10] *Paph. argus*
- [11] *Paph. wardii* 'New Dimension' AM/AOS; exhibitor: The Orchid Inn, Ltd.
- [12] *Paph. Papa Röhl 'Prodigal'* AM/AOS; exhibitor: Emerson W. Charles.
- [13] *Paph. Makulii* 'Candor Blackheart' AM/AOS; exhibitor: Bob and Lynn Wellenstein.
- [14] *Paph. Makulii* 'Frank Smith' AM/AOS; exhibitor: Krull-Smith.
- [15] *Paph. Makulii* 'Kong' AM/AOS; exhibitor: Orchid Zone.

out fairly flat segments and the unique novelty of spots and warts that occur only along the linear length of the petals. This striped or stippled spotting is the real contribution from *Paph. fairrieantum* genes!

Next in the succession of success and hybridization came the famous *Paph. Makuli*. It was a breakthrough in hybridizing color and spots, and, with 95 awards, it is the second-most awarded progeny of *Paph. sukhakulii*. It is interesting to see that with most of these hybrids, we see the same progression of developing coloratum hybrids, then vinicolor hybrids (these came to us in the late 1980s), and possibly later, seeing the potential and superior characteristics of the album form of *Paph. sukhakulii*, green album varieties appear. Most AM-awarded *Paph. Makuli* flowers exceed 4.7 inches (12 cm) and can be close to 6.3 inches (16 cm) in NS. With the average *Paph. Maudiae* NS being 4.9 inches (12.32 cm) for awards over 85 points, we now achieve even larger size and a permanent improvement in the area where *Paph. sukhakulii* needed the most help: the larger, fuller, rounder, colorful, flat dorsal sepal! Also, petal width, length and flatness is not compromised from using *Paph. lawrenceanum* and *Paph. callosum*. Top-heavy *Paph. Maudiae* typically had dorsal sepal width (DSW) in the 2.8-inch (7-cm) range, *Paph. sukhakulii* had DSW in the 1.6–2-inch (4–5-cm) range and *Paph. Makuli* averages 2–2.4 inches (5–6 cm), perfectly intermediate while improving fullness and flatness. No doubt, *Paph. Makuli* was and is the benchmark of development for modern spotted *Paph. sukhakulii* hybrids.

THE DIRECTION GETS MACABRE When owned by Terry Root, the Orchid Zone registered *Paphiopedilum Macabre* (× Voodoo Magic) in 1990. To date with over 160 awards, he obviously took the game-changing, top-potential clones at the time back to the species to generate further improvements in single-flowered paphiopedilums. He also gave it a unique connotation and mystique by naming it Macabre. The result is a huge step improvement that now continues and is used in many hybrids, “vini” or not. *Paphiopedilum Macabre* ‘Crystelle’ FCC/AOS achieved a 5.9 × 4.3-inch (15 × 11-cm) NS and increases in petal width to 1.3 inches (3.2 cm), and a round, flat dorsal sepal that measured 2.5 inches (6.4 cm) wide on a well-balanced flower! *Paphiopedilum Macabre* ‘Krull’s Magic’, awarded a 93-point FCC in 2005, also



16  
GREG ALLIKAS



17  
GREG ALLIKAS



18  
BRYAN KELLY



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GLEN BARFIELD



came from this grex, making three of the total FCCs granted from this batch — not an everyday occurrence! Hybrid contributions continue today.

**BRACHYPETALUM BREEDING AND OTHER UNIQUE SUBGENUS SPECIES** Experimenting with the results that would come of combining *Paph. sukhakulii* with the rounder, firmer-substantiated *Brachypetalum* species such as *Paphiopedilum concolor*, *Paphiopedilum godefroyae*, *Paphiopedilum bellatulum* and *Paphiopedilum leucochilum* was also pursued early on in hybridizing. Many hybridizers have commented on how difficult and rare it is to obtain good form when breeding with subgenus *Brachypetalum* species (R. Hella, pers. comm.). Achieving better, improved flowers must have been difficult, with these crosses being registered in the 1970s achieving awards only later in the 1980s and more likely in the 1990s and afterwards. With usually flatter flowers and fine speckling, crossing *Paph. concolor* gave *Paphiopedilum Colorkulii*. The results were 3.5–4.3-inch (9–11-cm) NS flowers with interesting yellow-green flowers that maintained that fine speckling. Interestingly enough, many of these show veining along with the fine speckles that seem to follow in a pattern, especially along the dorsal sepal. Another benefit passed along in *Paph. Colorkulii* is that it should obtain two to three flowers per inflorescence. The next generation that clearly was driven towards more color and spotting included *Paphiopedilum* Francisco Freire (× *bellatulum*) and *Paphiopedilum* Evelyn Röllke (× *godefroyae*). This latter hybrid was more likely the result of what was known at the time as *Paphiopedilum godefroyae* var. *leucochilum*, which has the extensive color markings that were combined with the “chocolate-chip” spotting of *Paph. sukhakulii*. These two hybrids produce flowers on mature plants that are of good size, pleasantly open and flatter, but really achieve the patterns and dense and dark spotting and suffusion that one would look for in a superior flower. One thing that could work against a better flower could be a resulting cupped shape or smaller dorsal sepal that is not in balance with the remainder of the flower. Beyond this basic building block, one further step taken in the last 15 years was to remake these hybrids with superior, line-bred, *Brachypetalum* parents. In a limited way, one of these few achievements, which was awarded in 2004, was *Paphiopedilum* Hampshire Creek ‘Sun Fish’ AM/AOS (*sukhakulii* ×



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Lisa Ruud). The parents of *Paphiopedilum* Lisa Ruud are *Paphiopedilum* Psyche × *Paphiopedilum* Bella Lucia, which combine most *Brachypetalum* species and introduce a small amount of *Paphiopedilum niveum* into the mix. The result is a slightly larger 4.7–5-inch (12–13-cm) flower with wide, flat petals, in the 1.6-inch (4-cm) width range, with wide dorsals giving good pattern and color in a balanced flower. Recently, with the introduction of the diminutive *Paphiopedilum thaianum*, hybridizers have scrambled to cross it again using *Paph. sukhakulii* as a capsule parent. Recently out of flask, we might see the results in early 2021.

Looking at other pairings with other influential subgenera, such as *Parvisepalum* and *Cochlopetalum*, there have been a few hybrids made with these

- [16] *Paph. Macabre* ‘Diana Patricia’ AM/AOS; exhibitor: Jack Schendowich.
- [17] *Paph. Macabre* ‘Miami’ AM/AOS; exhibitor: Krull-Smith.
- [18] *Paph. Krull’s Formal Macabre* ‘Crystelle’ AM/AOS; exhibitor: Krull-Smith.
- [19] *Paph. Macabre Presence* ‘Lehua Green Splash’ HCC/AOS; exhibitor: Lehua Orchids.
- [20] *Paph. Colorkulii* ‘Penny’ HCC/AOS; exhibitor: A&P Orchids.
- [21] *Paph. Evelyn Röllke* ‘Adrienne’ AM/AOS; exhibitor: Bert and Adrienne Logsdon.
- [22] *Paph. Francisco Freire* ‘Bryon & Max’ AM/AOS; exhibitor: Bryon Rinke and Max Thompson.
- [23] *Paph. Hampshire Creek* ‘Sun Fish’ AM/AOS; exhibitor: Arnold J. Klehm Grower, Inc.
- [24] *Paph. lantha Stage* ‘Triple Gem Lehua’ AM/AOS; exhibitor: Lehua Orchids.

species or near-species hybrids, but none have obtained any significant awards over the years. This could be the proof that shows the difficulty involved in producing viable hybrids and awardable flowers in these combinations with *Brachypetalum*, *Parvisepalum*, and *Cochlopetalum* subgenus groups.

**MULTIFLORAL HYBRIDS AND PAPH. SUKHAKULII** Many attempts have been made, few successful, to cross with most multifloral species. One of the limiting factors in *Paph. sukhakulii* progeny is that flower count is cut to only two or maybe three flowers per inflorescence. Shape usually seems to be adversely affected with most primary hybrids, or their fullness and size are not improved. One novelty hybrid awarded in 2004 was *Paphiopedilum* Longfellow Serenade 'Suncoast' HCC/AOS (*sukhakulii* × *sanderianum*), which displayed three flowers that are described and can be seen to favor the multifloral parent. With an NS of 3.3 × 7.1 inches (8.5 × 18.1 cm), it produced fairly large, wavy, colorful sepals. I believe it inherited good traits from both parents. In the end, only one larger multifloral hybrid has greatly improved progeny. It is said that "one of the things that paph fanciers are fond of saying is that there are no bad rothschildianum hybrids" (J. Chang, pers. comm.). Registered in 1973 and to date with 58 awards, *Paphiopedilum* lantha Stage (× *rothschildianum*) meets these quality expectations. It is a supersized *Paph. sukhakulii* that takes full advantage of the balance, full segments, spots or maculations, stripes and overall base color from both parents. With a good flower, there is no sacrifice in presence as the size of AM-awarded plants is typically 7.9 inches (20 cm) in NS and 5.5–6.7 inches (14–17 cm) in vertical natural spread. The amount of flowers per inflorescence is not sacrificed with at least two to more commonly three and, in a rarer instance, four flowers per inflorescence.

Line breeding has usually improved most species' variety and improved paphiopedilums hybrids by back-breeding into the species. This is clearly the case when we discover the effect of taking the best clones of *Paph. lantha* Stage and breeding them back into recent, more superior flowers of old hybrids. You could consider the result incremental, but it is a vast visual improvement that, as awards show, flatten, fill and widen the segments giving greatly improved flowers. The real effect still remains the beauty of this nicely colored, spotted, magnificently pleasant flat flower. Two recent examples



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- [25] *Paph. Hampshire Stage* 'Lime Sherbet' AM/AOS; exhibitor: Arnold J. Klehm Grower, Inc.
- [26] *Paph. Wood Wonder* 'Joan' AM/AOS; exhibitor: Dr. and Mrs. Stephen H. Feairheller.
- [27] *Paph. Sequin* 'Hsinying' AM/AOS; exhibitor: Ching Hua Orchids.
- [28] *Paph. Rory Jones* 'Memoria Gary Schreiber' AM/AOS; exhibitor: Eric and Ellen Lee.
- [29] *Paph. Raisin Hellen* 'Havin' Fun' HCC/AOS; exhibitor: Arnold J. Klehm Grower, Inc.
- [30] *Paph. Jeweled Venus* 'Slipper Zone The Sixth Too' AM/AOS; exhibitor: Lehua Orchids.



of improved line-bred hybrids are *Paph. lantha* Stage 'Michael' AM/AOS and *Paphiopedilum* Hampshire Stage 'Lime Sherbet' AM/AOS.

Outside of maintaining a colorful, balanced, full flower, newer hybrids using the legacy of this species seem to be geared toward intensifying color and seeing what can be achieved by breeding into more complex *paphiopedilum* hybrids. A colorful example of crossing a vinicolor *Paphiopedilum* Hilo Luanne with the heavily spotted *Paph. sukhakulii* 'Big Bang' achieved a color saturation that goes away from the typical blackish color to more of a raspberry-chocolate color. Another interesting and variable hybrid is *Paphiopedilum* Rory Jones (Satchel Paige × *sukhakulii*). Awarded plants of *Paph. Rory Jones* range from strong coloratum to pseudovinicolor and blackish, charred-petal flowers. A great example of this color saturation is *Paph. Rory Jones* 'Memoria Gary Schreiber' HCC/AOS, which shows a spectacularly colored, flat flower. Unfortunately, all these recent developments are flowers that barely range in the 4.7-inch (12-cm) NS. An exception with a 5.1-inch (13-cm) NS and 1.2-inch (3-cm) petal widths is *Paphiopedilum* Wood Wonder 'Joan' (Zellwood Station × Hsinying Maru) AM/AOS. Although within the lineage of *Paph. sukhakulii*, the majority of the vibrant colors and the improved size are likely from all the *Maudiae* (coloratum complexes) in their background. We have seen and obtained many of these from the hybridizing originating from and developed by Lehua Orchids in Hawaii.

A probable further improvement with larger sizes are recently awarded flowers where larger progeny of *Paph. sukhakulii* are crossed with complex hybrids. This improves the probability that there will be a size improvement, and shape (fullness) will be enhanced. Two good examples are *Paphiopedilum* Raisin Helen 'Havin' Fun' HCC/AOS, 76 points (Helen Eickoff × Raisin Cain) in 2008 and *Paphiopedilum* Sequin 'Hsinying' AM/AOS (Orchilla × *sukhakulii*), 82 points, awarded in 2008. Although they have smaller, 5.1-inch (13-cm) NS flowers, their wider dorsal sepal and petals represent what can be accomplished when developing what is available today with bulldog *paphiopedilum* hybrids.

Recently and only in the last two years, a rash of these *Maudiae* *paphiopedilum* hybrids have exploded into individual and group AOs (requiring 12 plants exhibited with at least one quality award and all from the same seed capsule).



JAY NORRIS

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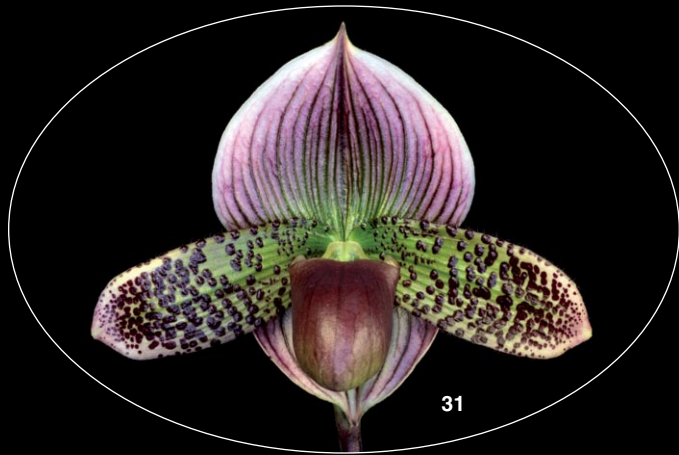
MILTON WITTMANN

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GLEN BARFIELD

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- [31] *Paph.* Magical Illusion 'Slipper Zone Formidable' AM/AOS; grower: Lehua Orchids; photographer Ramon de los Santos.
- [32] *Paph.* Jeweled Venus 'Spring Time' HCC/AOS; grower: Fred Capriccio; photographer: Arthur Pinkers.
- [33] *Paph.* Ghostly Contrasts 'Slipper Zone Super Stuff' AM/AOS; grower: Lehua Orchids; photographer: Glen Barfield.
- [[34] ]*Paph.* Delightfully Macabre 'JustPat' AM/AOS; grower: Paul Sheetz; photographer: Bayard Saraduke.
- [35] *Paph.* Ghostly Contrasts 'Sunprarie' AM/AOS; grower: Bill Nelson; photographer: Nile Dusdieker.
- [36] *Paph.* Petula's Sensation 'Black Wings' AM/AOS; grower: Fred Capriccio; photographer: Arthur Pinkers.
- [37] *Paph.* Krull's Black Jack 'Krull-Smith' AM/AOS; grower: Krull-Smith; photographer: Nick Nickerson.



Resulting from an increase in the quality and beauty, most are the direct result of the hybridizing programs at Lehua Orchids in Hawaii. It is interesting to see how these flowers have so much fuller, overlapping-segment flowers with fully flat dorsal sepals. The flowers, whether lighter colors ranging from greens or dark-saturated “charred” tones, exhibit vivid or vibrant tones. The flowers show a development that was rarely seen on our influential species *Paph. sukhakulii*: the synsepal. At an event in Minnesota (February 2018), Graham Wood gave us a great presentation and discussed how he is focusing on bringing out the synsepal and all the color it can add in his hybridizing efforts. Interestingly enough, there is varying background and influence from all three key building blocks: *Paph. sukhakulii*, which eventually led to *Paph. Makuli* and *Paph. Macabre*. The spots and their relative spread along the petals and diameter size tell you how far along these three building blocks progressed into the recent stream of hybrids. One of the first AQs in 2018 was *Paphiopedilum* Jeweled Venus (Jeweled Green × Parisienne), which is heavily influenced by *Paph. sukhakulii* in its background. The beautiful flowers tend to be greener and have finer spots. The distal petal-color flushes also are reminiscent of *Paph. venustum* and *Paphiopedilum mastersianum*. Granted an AQ in 2018, *Paphiopedilum* Puna Moon (Oriental Jewel × Macabre Moon) also has vivid and distinct green veining on large dorsal sepals and green, medium-spotted petals. Pouches are overlaid with a medium-to-dark mahogany-brown color.

A third AQ granted in 2018 that also had exceptional flowers was *Paphiopedilum* Ghostly Contrasts (Magical Contrasts × Macabre Contrasts) and many of the flowers had dark, but more pointy petals and dark purple, brown or black pouches. Although it has not received an AQ, *Paphiopedilum* Macabre Illusion (Hawaiian Illusion × Macabre Contrasts) cultivars seem to develop green dorsal veining that darkens basally (toward the base) while having dark petals and pouches.

In 2019, *Paphiopedilum* Petula’s Sensation (Macabre Contrasts × Petula’s Flame) was granted an AQ and also showed a variable range of colors from greener tones to darkly veined and spotted flowers. This hybrid had *Paph. Macabre* from both parents. The most recent hybrid to receive an AQ is *Paphiopedilum* Magical Illusion (Magically Wood × Red Illusion). The background has



heavy coloratum-vinicolor influence from *Paph. Makuli* and *Paph. Macabre* owing more color saturation from the *Paph. callosum* and *Paph. lawrenceanum* in its background. Some of these hybrids are not as large as a good *Paph. sukhakulii*, but they have evolved to produce much better flowers that will be enjoyed and become the building blocks for further improvements. So in the end, a big part of this entire story owes it all to two plants that flowered differently in Germany, sent by Mr. Sukhakul. Indeed, every time I see that photo of him, probably taken in his garden, and think of those spots of the flowers, it makes me smile.

THE EASY PART: CULTURE AND BLOOMING OF *PAPH. SUKHAKULII* AND MOST HYBRIDS As Lance Birk (1983) relates in his classic book, *Paph. sukhakulii* is “an exceptionally easy species to grow and flower.” Looking at the ecology from where it is found in northeastern Thailand, it comes from low elevations, near streams, with temperature ranges from 62–77 F (17–25 C), and it experiences a seasonal winter temperature drop in or around December and January. So outside of maintaining some humidity, it seems to be perfectly adaptable to any Northern Hemisphere temperate windowsill or basement habitat! The plant is in active growth and experiences a natural monsoonal wet and warmer season from June to almost October. Some reports point to plants in nature surviving temperature drops to around or even lower than 50 F (10 C) during this dry rest period. *Paphiopedilum sukhakulii* and hybrids seem to bloom more in the late winter to early summer, but looking at awards it seems they can flower at almost any time of the year. Grow in a fine bark mix with sphagnum or peat added to retain a bit more moisture. I grow some of the more generationally complex hybrids in pure New Zealand sphagnum moss with no difficulty; for the last four years, my plant of *Paphiopedilum* Hsinying Alien



(a macabre/dark-vini clone) was growing in bark and always seemed too dry, so I shifted to quality New Zealand sphagnum moss and it continues to double and triple in growths. Adding more moss or finer bark also seems to help against flower defects likely caused by lack of moisture. Others report that alba varieties do best with color when moved to a shadier environment when blooming. One last thing I should mention is that some of these hybrids do last over two months in bloom; I have recorded my *Paph. Hsinying Alien* to last 140 days. Be careful with those long inflorescences as some of these modern *Paph. sukhakulii* hybrids can exceed 12 inches (30 cm) tall and can bump against lamps and objects in their path!

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— Steve Gonzalez has been growing orchids for over 35 years since landing a neighborhood garden job repotting cactileyas in Rio Piedras, Puerto Rico. He is a past president and has been a member of the Orchid Society of Minnesota since 1991, and is currently an associate judge in the Chicago judging center. Living in the Caribbean and US Midwest and working as an international manager traveling Latin America over time has given him the opportunity to see plants in situ and meet many of the business and botanical experts in the Americas’ orchid world over the last 40 years (email [stevegonzalez@live.com](mailto:stevegonzalez@live.com)).

# Orchids in Watercolor

## *Cypripedium acaule*

BY MARCIA WHITMORE

*CYPRIPEDIUM ACAULE*, THE state flower of New Hampshire, is a lovely pink lady's slipper. The flower is magenta to whitish pink; sometimes the whitish pink flowers will have darker pink venation. Rarely flowers may be all white. This plant grows 6–15 inches (15–38 cm) tall and flowers generally between May and July. Pink lady's slippers also require bees for pollination. Bees are lured into the flower pouch through the front slit, attracted by the flower's bright color and sweet scent. Once inside, the bees find no reward, and discover that they are trapped, with only one point of escape. Inside the pouch, there are hairs that lead to a pair of exit openings, one beneath each pollen mass. The bee must pass under the stigma, so if it bears any pollen from a visit to another flower, it will be deposited before picking up a fresh load on the way out.

This watercolor, on Arches 300 lb coldpressed paper, was done from photos by Jim Fowler and with his permission. Fowler's photographs are featured on the new United States stamps released in February 2020. More of his gorgeous work can be seen at <https://www.fowlerphotography.com>.

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





*Cypripedium acaule*

mt. Whitmore '20



# Orchids of Papua New Guinea

Some Unusual Orchids from the Northeast Highlands

TEXT AND PHOTOGRAPHS BY SPIRO KASOMENAKIS





## KASOMENAKIS

A CHANCE ENCOUNTER with a photography book at the Strand bookstalls decades ago sowed the seeds for something that would have to wait 30 years to be realized! The book in question was a photography book with portraits of the native people of New Guinea, resplendent in feathers and paint, competing for attention with the extraordinary flora and fauna of their country. We did get to meet these people I glimpsed in that book so long ago: the Huli wigmen, the “mudmen” and several other tribes, and we saw a good representation of the very rich flora of this country. Papua, New Guinea, is the eastern half of a large, mountainous island north of Australia. The flora, especially the orchid flora, of this island is incredibly diverse, as are the native peoples. There are over 300 languages (not dialects!) spoken on the island. The trip was yet another Orchid Conservation Alliance (OCA) “Orchids in the Wild” trip, a first for this part of the world. Our focus was on orchids, and especially orchids of the highland regions of Mt. Hagen and Mt. Wilhelm; two mountains in the Western Highlands province with considerable areas of primary forest, rich in orchid species. A group of nine of us tramped about, and huffed and puffed at these high elevations (over 5,000 feet [1,524 m]), making sure to bundle up and stay warm during the cool nights. The weather was sunny during the daytime and misty/rainy/cold at night. It was comfortable enough for most of us used to temperate climates, but apparently not so much for the locals; most wore jackets and winter hats!

Botanists have been investigating this most extraordinary flora for over a century; orchid specialists such as Rudolph Schlechter and J. J. Smith, in the early part of the 20th century, published extensive firsthand accounts, which are still standard works on the subject a century later. Their floras are very important, but difficult and unwieldy to use, especially in the field. I managed to bring along P. Van Royen’s excellent work, *The Orchids of the High Mountains of New Guinea*, which provided some help in identifying species back at camp in the evenings. Another member of the group brought along André Millar’s book *Orchids of Papua New Guinea*, which is a wonderful introduction, but somewhat less useful for our purposes, as it deals mostly with showy lowland dendrobiums and such. A better resource would have been the website “Orchids of New Guinea” (www.



- [1] *Bulbophyllum brachypus*
- [2] *Agrostophyllum majus*
- [3] *Bulbophyllum antennatum*
- [4] *Bulbophyllum cf. sarcoglossum*

- [5] *Bulbophyllum lepanthiflorum*
- [6] *Bulbophyllum spongiola*
- [7] *Bulbophyllum takeuchi*



orchidsnewguinea.com), the work of Dr. Eduard de Vogel, Neville Howcroft and Wolfgang Bandisch, but unfortunately there is no internet service in the remote areas we stayed in. I would make great use of it back home, in addition to the classic works mentioned above. This part of the world is a hotspot of orchid diversity, having close to 3,000 species native to the island, many of them endemic. Some species have been familiar to orchid lovers for many years now; species such as the various *Latouria dendrobiums* from the lowlands, and highland types such as the spectacular and variable *Dendrobium cuthbertsonii*. We saw and photographed *Den. cuthbertsonii* in several locations, and I suspect most of you either grow or at least have seen pictures of the many awarded clones of this species. The same can be said for *Mediocalcar decorata*, *Dendrobium albiflorum* (*Cadetia potamophila*) and others. They are often seen in collections, and are wonderful subjects for cultivation. So I thought it would be of interest to share some photographs of the less often seen, or at least photographed, species from this part of the world. Interestingly, we did not see *Mediocalcar decorata* in the wild, but saw at least a half dozen other species of this genus, all with similar flowers in different combinations of red, white, yellow and green. The majority of the *Mediocalcar* species have single or pairs of leaves atop tiny pseudobulbs; one species on Mt. Wilhelm was quite succulent in habit, and looked almost like a tiny *Haworthia*. Identification for most of these plants, and many others, is difficult in the field, as dissections and measurements are needed, and collection of specimens is obviously not an option. Actually, most of the species of orchids we came upon in the forest were unfamiliar to most of us. We had to be satisfied with identifying plants to only the genus. Bulbophyllums and dendrobiums were two prominent groups that made up the bulk of orchids in the field, but there were also lesser known genera such as *Phreatia*, *Glossorhyncha*, *Octarrhena* and a bewildering array of terrestrial species, many not in bloom. Among the terrestrial species were two species of *Pterostylis*, a primarily Australian genus, *Pterostylis caulescens* and *Pterostylis papuana*, the first on Mt. Hagen, the second on Mt. Wilhelm. Both were growing in wet, shady, mossy places, under taller vegetation. *Corybas* have fantastic complex flowers but unfortunately neither of the two species we found were in flower at the time.



[8] *Bulbophyllum unicaudatum*

[9] *Ceratostylis* species

[10] The author admiring an unidentified *Dendrobium* species.

[11] *Epiblastis* species

[12] *Ceratostylis* species

[13] *Glossorhyncha fructicola*



## KASOMENAKIS

*Peristylus pachyneurus* — a small delicate terrestrial plant with little whorled, plicate leaves at the base, grows on rocks and embankments on Mt. Hagen. *Liparis altigena*, *Liparis brunescens* and *Liparis wernerii* are all plants of the dark, primary forest; the first species growing in wet, mossycushions, the other two epiphytically or semiepiphytically. Other fascinating jewels encountered included *Peristylus triarnus* — another true terrestrial, with long inflorescences of green flowers; *Calanthe micrantha* — a large, leafy forest floor plant, with small green flowers, quite unlike the Asiatic calanthes that usually have more showy flowers; *Crepidium* cf. *megalanthum* — long known as a species of *Malaxis*, grows as a forest-floor plant in very wet areas; *Platylepis zeuxinoides* — a small jewel orchid, with whorls of pretty foliage and tall spikes of brown flowers, peeking through the vegetation; *Caladenia papuana* grows in alpine grasslands and I suspect the plants we saw were cleistogamous (a form of self-fertilization that occurs in a permanently closed flower), as it was sunny, but no flowers were open; *Goodyera rubicunda* is another pretty terrestrial from this a widely distributed genus; several species of *Epiblastis*, most with arresting red, tubular flowers, most probably pollinated by birds; and *Agrostophyllum majus* — several species of this genus were observed on both mountains. The latter are usually large sedgelike plants with congested inflorescences of waxy white flowers. *Phreatia* was also one of the dominant genera in this area. All species observed had rat-tail inflorescences of white flowers. *Thelasis carinata* formed large, rambling plants with inflorescences of small, white flowers. Species of *Glomera*, another very diverse genus, include large plants with globose inflorescences as well as tiny plants that formed large, pillowlike masses. *Ceratostylis* species were easily recognized by their habit of blooming from the top of the stemlike pseudobulbs and their mostly white stellate flowers. *Mediocalcar subtreres*, an unusual *Mediocalcar* species in both flower color and habit, produces concolor yellow flowers that do not open very widely, and almost terete foliage. *Pholidota carnea* formed large, rambling plants with stemlike pseudobulbs and very showy red flowers.

Bulbophyllums were ubiquitous throughout the area. This enormous genus exhibits such variability in flower and plant forms it could be a separate survey of its own. *Bulbophyllum brachypus*,



- [14] *Glomera* species
- [15] *Glomera* species
- [16] *Liparis altigena*
- [17] *Liparis brunescens*

- [18] Tentatively identified as *Glossorhyncha monticuprina*.
- [19] *Octarrhena cordata*



# KASOMENAKIS

*Bulbophyllum* cf. *saccoglossum* and *Bulbophyllum takeuchi* all have unusual pouched flowers that look somewhat like odd little paphiopedilums. *Bulbophyllum antennatum*, a rather sinister looking flower, was easily overlooked in the dark forest. *Bulbophyllum spongiola* formed lanky, sprawling plants on Mt. Wilhelm. We found it growing by a stream in deep shade. *Bulbophyllum unicaudatum* grew as tiny little plants on a mossy tree trunk near a river we encountered. Because of its unusual red flowers, I suggested the name “red unicorn bulbo.” They were a lucky find, as we were running out of daylight on the last day in the field and red flowers are hard to spot in dimming light. *Bulbophyllum lepanthiflorum* and *Bulbophyllum linearilabium* were two very different plants growing on the same branch in good light. The first grows in a very unusual pendent habit producing round leaves and small white flowers near the base of the plant. If you were in South American and stumbled across the second species you might think it a *Barbosella*. Plants consist of narrow upright foliage on almost no pseudobulb and the upright inflorescences carry dark, elongated clamshell flowers with a long featherlike lip that flutters in the breeze!

*Octarrhena*, a very diverse genus of mostly small mat-forming plants, is yet another genus almost unseen outside of New Guinea. Three species we could identify were observed: *Octarrhena cordata*, *Octarrhena platyrachis* and *Octarrhena bilabrata*. You really need a magnifying glass to appreciate these tiny flowers. Speaking of tiny flowers, several species of *Oberonia* were encountered. These plants were easy to recognize, at least to genus, with their fans or chains of flattened leaves and spikes of tiny (really tiny) flowers. If you think *Oberonia* flowers are tiny, *Glossorhyncha fruticola* and *Glossorhyncha monticuprina* produce tiny succulent-leaved plants with even tinier flowers. While on Mt. Hagen, we encountered one of the strangest plants of our trip and we aren't even sure of the genus, although the flowers somewhat fit a *Bulbophyllum* species. These tiny plants, completely covered in glandular hairs — leaves, stems and flowers — were found growing in deep moss under wet conditions, and if anyone reading this article recognizes it, I would love to know its name.

I have to admit it was work preparing for this trip — vaccinations, long plane rides, jet-lag, considerable expense, and even a sudden attack of paranoia about



[20] *Liparis wernerii*

[21] *Oberonia* species

[22] *Octarrhena bilabrata*

[23] *Peristylus triarnus*

[24] Is this an even more bizarre *Bulbophyllum*?

[25] *Octarrhena platyrachis*





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poisonous snakes (Do not ask!). It was work on the trip itself — the long bumpy car rides over impossible roads, petty crime in the cities and the occasional illness, but it was worth it! Boy was it worth it! The orchids were otherworldly, the people friendly and generous. It was a once-in-a-lifetime trip.

The OCA will be going back in a few years. Well...maybe twice-in-a-lifetime?

— Spiro Kasomenakis has been growing orchids, and has been an AOS member, since the 1980s. His first orchid

was *Paphiopedilum callosum*, and he wishes that he still had it in his light garden. Travel always includes orchids, especially in their native habitats or at least in collections. The allure of these plants is undeniable, and once you commit to entering the “rabbit hole” you may never be the same again. 158-20 Powells Cove Boulevard, Beechurst, New York 11357 (email: [kasomenakis@aol.com](mailto:kasomenakis@aol.com)).

[26] Remnant forest tree colonized by an *Oberonia* species.

[27] *Pholidota carnea*

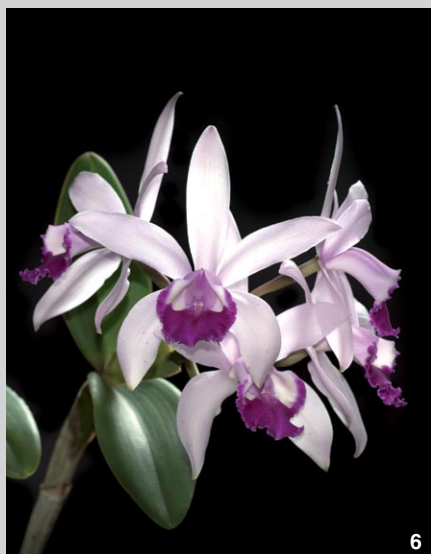
[28] Moss forest on Mount Wilhelm.

[29] *Phreatia* species

[30] *Pterostylis papuana*

[31] *Platylepis zeuxinoides*









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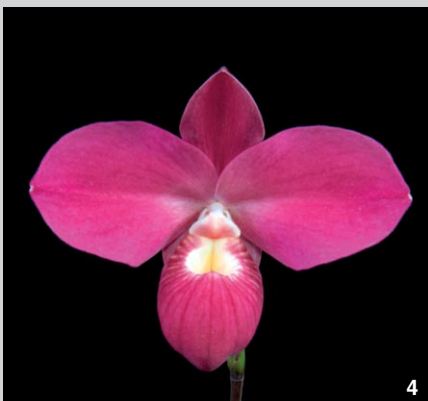
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- [1] *Phragmipedium* Vingtaine des Mathias 'George's Sweetheart' HCC/AOS (Sunset Glow x *kovachii*) 76 pts. Exhibitor: George A. Bogard; photographer: David Gould. Dallas Judging
- [2] *Paphiopedilum wenshanense* 'Wing-Dreams Ghost' HCC/AOS 77 pts. Exhibitor: Julio and Eileen Hector; photographer: Kay Clark. Florida North-Central Judging
- [3] *Cattleya schilleriana* 'Dark Knight' AM/AOS 80 pts. Exhibitor: Ben Oliveros and Orchid Eros; photographer: Glen Barfield. Hawaii Judging
- [4] *Paphiopedilum rothschildianum* 'Fantastic Four' AM/AOS 86 pts. Exhibitor: The OrchidFix Nursery Jurahame Leyva; photographer: Glen Barfield. Hawaii Judging
- [5] *Phragmipedium* Frank Smith 'Jenny Mae' AM/AOS (Grande x *kovachii*) 81 pts. Exhibitor: Darlene Thompson; photographer: Ed Cott. Great Lakes Judging
- [6] *Cattleya intermedia* (Orlata) 'Evangeline' HCC/AOS 76 pts. Exhibitor: David Gardner; photographer: Malcolm McCorquodale. Houston Judging
- [7] *Paphiopedilum* Johanna Burkhardt 'Ginnugagap' AM/AOS (*rothschildianum* x *adductum*) 81 pts. Exhibitor: The OrchidFix Nursery Jurahame Leyva; photographer: Glen Barfield. Hawaii Judging
- [8] *Tolumnia* Orchidom Happy Spots 'Windswept' AM/AOS (Orchidom Happy x Aleka) 80 pts. Exhibitor: Windswept in Time Orchids; photographer: Ed Cott. Great Lakes Judging
- [9] *Paphiopedilum* Macabre Flutter 'Slipper Zone Snook' HCC/AOS (Macabre Pops x Montera Moth) 75 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging
- [10] *Coelogyne buennemeyeri* 'OrchidFix's Falling Stars' CBR/AOS. Exhibitor: The OrchidFix Nursery Jurahame Leyva; photographer: Glen Barfield. Hawaii Judging
- [11] *Cattleya schilleriana* 'Vibrant' AM/AOS 81 pts. Exhibitor: Ben Oliveros and Orchid Eros; photographer: Glen Barfield. Hawaii Judging
- [12] *Dendrobium* Carly Hera 'Shogun Hawaii' CCM-HCC/AOS (*loddigesii* x *anosmum*) 84-76 pts. Exhibitor: Shogun Hawaii- Matthias Seelis; photographer: Glen Barfield. Hawaii Judging
- [13] *Cattleya schilleriana* 'Isabel' AM/AOS 82 pts. Exhibitor: Ben Oliveros and Orchid Eros; photographer: Glen Barfield. Hawaii Judging
- [14] *Encyclia randii* 'Sebastian Ferrell' AM/AOS 81 pts. Exhibitor: Ben Oliveros and Orchid Eros; photographer: Glen Barfield. Hawaii Judging
- [15] *Cymbidium* Cali Night 'Geysersland' AM/AOS (Black Forest x *devonianum*) 87 pts. Exhibitor: Dick and Carol Doran; photographer: Duane Erdmann. Mid-Atlantic Judging
- [16] *Cattleya warneri* 'Pink Perfection' HCC/AOS 78 pts. Exhibitor: Ben Oliveros and Orchid Eros; photographer: Glen Barfield. Hawaii Judging









- [1] *Mediocalcar decoratum* 'Mie' CCE/AOS 93 pts. Exhibitor: Chuck Briggs; photographer: Chuck Briggs. Hawaii Judging
- [2] *Cylindrolobus aporooides* 'Yellow Shower' CBR/AOS. Exhibitor: Andrew Okada; photographer: Michael Blietz. Hawaii Judging
- [3] *Myrmecocattleya* John's Passion 'Harriet's Smile' HCC/AOS (*Cattleya* Hybrida (1859) x *Myrmecophila tibicensis*) 76 pts. Exhibitor: Dennis Tomjack; photographer: Malcolm McCorquodale. Houston Judging
- [4] *Phragmipedium* Haley Decker 'Hutchins Pond' AM/AOS (*kovachii* x Saint Ouen) 81 pts. Exhibitor: Woodstream Orchids; photographer: Duane Erdmann. Mid-Atlantic Judging
- [5] *Dendrobium bracteosum* var. *album* 'Orange and Cream Parfait' CCE/AOS 90 pts. Exhibitor: Bryan Lee; photographer: Roy Andrade. Hawaii Judging
- [6] *Paphiopedilum* Midori World 'Relentless' AM/AOS (Hilo Midori x Hilo Green) 81 pts. Exhibitor: Doug George; photographer: Malcolm McCorquodale. Houston Judging
- [7] *Cattleya* Canhamiana 'Elegance' HCC/AOS (*mossiae* x *purpurata*) 79 pts. Exhibitor: David Rosenfeld; photographer: Bayard Saraduke. Mid-Atlantic Judging
- [8] *Paphiopedilum* Kiwi Charm 'Box of Crayons' HCC/AOS (Duguesclin x Kiwi Ingenuity) 76 pts. Exhibitor: Rick Hepler; photographer: Malcolm McCorquodale. Houston Judging
- [9] *Tolumnia* Golden Sunset 'Sun Dew' AM/AOS (Stanley Smith x Tiny Tim) 81 pts. Exhibitor: Derek Lowenstein; photographer: Malcolm McCorquodale. Houston Judging
- [10] *Paphiopedilum* Odette's Allure 'Memoria Gary Alexander' HCC/AOS (Odette Divine x Friedrich von Hayek) 76 pts. Exhibitor: Barbara Alexander; photographer: Julius Klehm. Houston Judging
- [11] *Phragmipedium* Don Wimber 'Spring Coulee Creek' HCC/AOS (Eric Young x *besseae*) 79 pts. Exhibitor: Woodstream Orchids; photographer: Duane Erdmann. Mid-Atlantic Judging
- [12] *Cymbidium* Sarah Jean 'Ice Cascade' CCM/AOS (*pumilum* x Sleeping Beauty) 86 pts. Exhibitor: Dick and Carol Doran; photographer: Duane Erdmann. Mid-Atlantic Judging
- [13] *Paphiopedilum haynaldianum* 'M&M Orchids' AM/AOS 83 pts. Exhibitor: Matt and Michelle Jaenke; photographer: Matthew Nutt. Mid-America Judging
- [14] *Cattleya* Life's Melody 'Peach Cobbler' AM/AOS (Circle of Life x Magic Melody) 87 pts. Exhibitor: David Rosenfeld; photographer: Bayard Saraduke. Mid-Atlantic Judging
- [15] *Dendrobium striolatum* 'Memoria Carl Phillips' CCM/AOS 88 pts. Exhibitor: Dick and Carol Doran; photographer: Duane Erdmann. Mid-Atlantic Judging
- [16] *Coelogyne incrassata* 'Copper Glory' CCE/AOS 92 pts. Exhibitor: Stephen Male and Fishing Creek Orchids; photographer: Duane Erdmann. Mid-Atlantic Judging



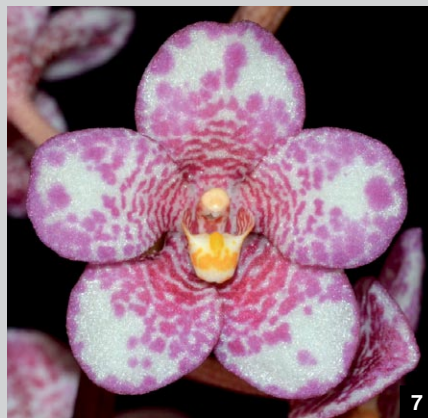






- [1] *Paphiopedilum* Rollie Wilson 'Judging Day' AM/AOS (*Hung Sheng Eagle* x *rothschildianum*) 82 pts. Exhibitor: Sergey Skoropad; photographer: Bayard Saraduke. Mid-Atlantic Judging
- [2] *Cymbidium* Marilyn Hatfield 'Cinnabar' AM/AOS (James Toya x Flaming Pepper) 80 pts. Exhibitor: Weegie Caughlan; photographer: Chaunie Langland. Pacific Central Judging
- [3] *Cymbidium* Hazel's Dragon 'Loyola' HCC/AOS (Hazel Tyers x Satin Dragon) 75 pts. Exhibitor: Weegie Caughlan; photographer: Chaunie Langland. Pacific Central Judging
- [4] *Sarcophilus* Kulnura Max 'Gracie' AM/AOS (*hartmanii* x Kulnura Sanctuary) 80 pts. Exhibitor: Amy and Ken Jacobsen; photographer: Chaunie Langland. Pacific Central Judging
- [5] *Paphiopedilum* Hilo Black Eagle 'Dark Knight' AM/AOS (Johanna Burkhardt x *rothschildianum*) 80 pts. Exhibitor: Sergey Skoropad; photographer: Bayard Saraduke. Mid-Atlantic Judging
- [6] *Jackfowleara* Appleblossom 'Barbara Latza' CCM/AOS (*Caulaelia* Snowflake x *Rhyncattleanthe* Orange Nuggett) 85 pts. Exhibitor: Mark Gaglioti; photographer: Maurice Garvey. Northeast Judging
- [7] *Laelia* x *crawshayana* 'Dogtown' HCC/AOS 78 pts. Exhibitor: Musia Stagg; photographer: Chaunie Langland. Pacific Central Judging
- [8] *Dendrobium velutinellabrum* 'Irene' CHM/AOS 83 pts. Exhibitor: Al and Irene Messina; photographer: Maurice Garvey. Northeast Judging
- [9] *Cattlianthe* Chocolate Drop 'Long Life' AM/AOS (*Cattleya guttata* x *Guarianthe aurantiaca*) 82 pts. Exhibitor: Waldor Orchids, Inc.; photographer: Bayard Saraduke. Mid-Atlantic Judging
- [10] *Paphiopedilum* Skelton 'Cleveland's' AM/AOS (*lowii* x *dianthum*) 83 pts. Exhibitor: Robert Cleveland; photographer: Robert Hesse. Northeast Judging
- [11] *Paphiopedilum lowii* 'Cleveland's' HCC/AOS 78 pts. Exhibitor: Robert Cleveland; photographer: Robert Hesse. Northeast Judging
- [12] *Bulbophyllum retusiusculum* 'Irene' CHM/AOS 82 pts. Exhibitor: Al and Irene Messina; photographer: Maurice Garvey. Northeast Judging
- [13] *Paphiopedilum* Voodoo Jewel 'Slipper Zone's Bob's Surprise' AM/AOS (Voodoo Crazy x Jewel Green) 82 pts. Exhibitor: Lehua Orchids; photographer: Robert Hesse. Northeast Judging
- [14] *Masdevallia* Geneva Spots 'Measles' HCC/AOS (*chaparensis* x White Swallow) 77 pts. Exhibitor: Liana Webb; photographer: Ross Leach. Pacific Northwest Judging
- [15] *Cymbidium* Funny Face 'San Bar Mine' CCM/AOS (*tigrinum* x *Doris Aurea*) 85 pts. Exhibitor: Carol Armendariz; photographer: Chaunie Langland. Pacific Central Judging
- [16] *Cymbidium* Snow Ball 'White Out' CCM/AOS (Sarah Jean x *insigne*) 86 pts. Exhibitor: Carol Armendariz; photographer: Chaunie Langland. Pacific Central Judging









13



14



15



16

- [1] *Sarcochilus hartmannii* 'Bee See' AM/AOS 82 pts. Exhibitor: Dick and Carol Doran; photographer: Maurice Garvey. Northeast Judging
- [2] *Cymbidium* Hazel's Dragon 'Princess Ziva' AM/AOS (Hazel Tyers x Satin Dragon) 82 pts. Exhibitor: Weegie Caughlan; photographer: Chaunie Langland. Pacific Central Judging
- [3] *Acineta antioquiiae* 'Arya' AM/AOS 85 pts. Exhibitor: William Jasen; photographer: Ross Leach. Pacific Northwest Judging
- [4] *Paphiopedilum* Robinianum 'Linda Ann' AM/AOS (*lowii* x *parishii*) 80 pts. Exhibitor: Mike Ayres; photographer: Tim Morton. Pacific Northwest Judging
- [5] *Microcoelia stolzii* 'Kathy Fenwick's Medusa' CCE/AOS 91 pts. Exhibitor: Terry and Margaret Boomer; photographer: Chaunie Langland. Pacific Central Judging
- [6] *Cattleya jongheana* 'Bentley' HCC/AOS 78 pts. Exhibitor: Amy and Ken Jacobsen; photographer: Chaunie Langland. Pacific Central Judging
- [7] *Sarcochilus* Kulnura Loyalty 'Sebastian' HCC/AOS (Kulnura Absolute x Kulnura Ballerina) 76 pts. Exhibitor: Kevin Hill; photographer: Chaunie Langland. Pacific Central Judging
- [8] *Paphiopedilum* Ho Chi Minh 'Liberty' AM/AOS (*delenatii* x *vietnamense*) 82 pts. Exhibitor: Zack Bray; photographer: Ross Leach. Pacific Northwest Judging
- [9] *Dendrobium* Remy Hartmann 'Leta Gay' AM/AOS (Mini Gem x *stratiotes*) 83 pts. Exhibitor: Jim Snyder; photographer: Ross Leach. Pacific Northwest Judging
- [10] *Paphiopedilum delenatii* f. *albinum* 'Sugaree' AM/AOS 82 pts. Exhibitor: Zack Bray; photographer: Ross Leach. Pacific Northwest Judging
- [11] *Phalaenopsis aphrodite* 'Huron' HCC/AOS 78 pts. Exhibitor: Jim Heilig; photographer: Chaunie Langland. Pacific Central Judging
- [12] *Lycaste* Pearl Dream 'Bell' Orchidea' AM/AOS (Pearl Line x Chita Dream) 80 pts. Exhibitor: Phyllis Prestia; photographer: Arthur Pinkers. Pacific South Judging
- [13] *Dendrobium* Nestor 'Laura' CCM/AOS (*parishii* x *anosmum*) 85 pts. Exhibitor: Charles and Susan Wilson; photographer: Ross Leach. Pacific Northwest Judging
- [14] *Chiloschista yunnanensis* 'Marisa's Chinese Ghost' CCM/AOS 84 pts. Exhibitor: Bill Nerison and Botanica Ltd.; photographer: Tim Morton. Pacific Northwest Judging
- [15] *Paphiopedilum* Oriental Aura 'Emerald City Green' AM/AOS (Oriental Jewel x Fred's Aura) 83 pts. Exhibitor: Emerald City Orchids; photographer: Sue Birnbaum. Pacific Northwest Judging
- [16] *Porroglossum josei* 'Cosmos' AM/AOS 82 pts. Exhibitor: Terry Thompson; photographer: Tim Morton. Pacific Northwest Judging









- [1] *Trichopilia tortilis* 'Paradox' AM/AOS 81 pts. Exhibitor: Paul and Ann Tuskes; photographer: Arnold Gum. Pacific South Judging
- [2] *Phalaenopsis* Peggy Tauscher 'Phoenix Sunrise' HCC/AOS (Sogo Lawrence x Tying Shin Forever Love) 77 pts. Exhibitor: Eric Goo/Phoenix Orchids; photographer: Eric Goo. Pacific South Judging
- [3] *Phalaenopsis* Peggy Tauscher 'Phoenix Red' HCC/AOS (Sogo Lawrence x Tying Shin Forever Love) 79 pts. Exhibitor: Eric Goo and Phoenix Orchids; photographer: Eric Goo. Pacific South Judging
- [4] *Paphiopedilum* Pinocchio 'Wilderness' CCM/AOS (*glaucophyllum* x *primulinum* var. *primulinum*) 83 pts. Exhibitor: Sue Birnbaum; photographer: Sue Birnbaum. Pacific Northwest Judging
- [5] *Brassocattleya* Hippodamia 'Amelia' HCC/AOS (*Brassavola nodosa* x *Cattleya aclandiae*) 77 pts. Exhibitor: Karla Velasco; photographer: Eric Goo. Pacific South Judging
- [6] *Paphiopedilum* Magical Peacock 'Slipper Zone Little Garry' AM/AOS (Presidential Magic x Petula's Peacock) 82 pts. Exhibitor: Lehua Orchids; photographer: Eric Goo. Pacific South Judging
- [7] *Paphiopedilum* Macabre Mothra 'Slipper Zone Stalwart' HCC/AOS (Montera Moth x Macabre Grace) 76 pts. Exhibitor: Lehua Orchids; photographer: Eric Goo. Pacific South Judging
- [8] *Phalaenopsis* Peggy Tauscher AQ/AOS (Sogo Lawrence 'F1982' AM/AOS x Tying Shin Forever Love 'Golden Beauty' FCC/AOS). Exhibitor: Eric Goo and Phoenix Orchids; photographer: Eric Goo. Pacific South Judging
- [9] *Phalaenopsis* AL Redsun Queen 'Caribbean Sunset' AM/AOS (Ba-Shi Redsun x LD's Bear Queen) 86 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [10] *Phalaenopsis* Jennifer Palermo 'Montclair' AM/AOS (*tetraspis* x *violacea*) 82 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [11] *Vanda garayi* 'Orange Pixie' HCC/AOS 76 pts. Exhibitor: Alfred Hockenmaier; photographer: Arthur Pinkers. Pacific South Judging
- [12] *Angraecum viguieri* 'Diamond Orchids' CCE/AOS 92 pts. Exhibitor: Peter T. Lin; photographer: Arthur Pinkers. Pacific South Judging
- [13] *Phalaenopsis* Phoenix Sunflower 'Yellow Beauty' AM/AOS (I-Hsin Sunflower x Hawaii Sun) 80 pts. Exhibitor: Eric Goo/Phoenix Orchids; photographer: Eric Goo. Pacific South Judging
- [14] *Cattleya coccinea* 'Tokyo Sun' AM/AOS 83 pts. Exhibitor: Peter T. Lin; photographer: Arthur Pinkers. Pacific South Judging
- [15] *Cattleya coccinea* 'Tokyo Crown' CCM-FCC/AOS 83-91 pts. Exhibitor: Peter T. Lin; photographer: Arthur Pinkers. Pacific South Judging
- [16] *Cymbidium goeringii* 'Yue Pei Su' AM/AOS 81 pts. Exhibitor: Jack Zhu; photographer: Arthur Pinkers. Pacific South Judging









- [1] *Laeliocatanthe* Newberry Lava Burst 'Diamond Orchids' AM/AOS (*Cattlianthe* Rojo x *Laelia undulata*) 84 pts. Exhibitor: Peter T. Lin; photographer: Arthur Pinkers. Pacific South Judging
- [2] *Guarianthe skinneri* (Coerulea) 'Juan Jose Zúñiga' AM/AOS 81 pts. Exhibitor: Juan José Zúñiga; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging
- [3] *Cattleya* Leda (1900) 'Carlos Solís' AM/AOS (*dowiana* x *percivaliana*) 81 pts. Exhibitor: Carlos Solís; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging
- [4] *Cymbidium* Unemployed Pilot 'Canary' HCC/AOS (Fire Ernie x Memoria Amelia Earhart) 76 pts. Exhibitor: Cal-Orchid, Inc.; photographer: Larry Vierheilg. Pacific South Judging
- [5] *Leptotes bicolor* 'Whopper' AM/AOS 83 pts. Exhibitor: Peter T. Lin; photographer: Arthur Pinkers. Pacific South Judging
- [6] *Lepanthes guanacastensis* 'Rolando Ramirez' CHM/AOS 83 pts. Exhibitor: Jeannette Loria; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging
- [7] *Phalaenopsis tetraspis* f. *christiana* 'Montclair' AM/AOS 80 pts. Exhibitor: Norman's Orchids; photographer: Arthur Pinkers. Pacific South Judging
- [8] *Cattleya* Clarion 'Bluebird' HCC/AOS (*Eximia* x *mossiae*) 78 pts. Exhibitor: Outhay Viengkhou; photographer: Arthur Pinkers. Pacific South Judging
- [9] *Phalaenopsis* Liu's Star Dusts 'Arnie' HCC/AOS (Timothy Christopher x *minus*) 78 pts. Exhibitor: Arnold Gum; photographer: Arthur Pinkers. Pacific South Judging
- [10] *Guaricyclia* Silvester 'Nancy Uhlenhaut' HCC/AOS (*Guarianthe skinneri* x *Encyclia cordigera*) 77 pts. Exhibitor: Keith Uhlenhaut; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging
- [11] *Guarianthe skinneri* 'Celina Brenes' AM/AOS 84 pts. Exhibitor: Juan José Zúñiga; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging
- [12] *Cattleya* Milton Warne 'Dream Girl' AM/AOS (Hybrida (1859) x Suavior) 80 pts. Exhibitor: Carlos Solís; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging
- [13] *Paphiopedilum leucochilum* 'Susan Benavides' HCC/AOS 78 pts. Exhibitor: Jeannette Loria; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging
- [14] *Tolumnia* Jairak Flyer 'Margarita Chavarria' CCM-AM/AOS (Jairak Firm x Jairak Rainbow) 82-81 pts. Exhibitor: Keith Uhlenhaut; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging
- [15] *Paphiopedilum hookerae* var. *volonteanum* 'Purplelicious' HCC/AOS 78 pts. Exhibitor: Heidi Kirkpatrick; photographer: Larry Vierheilg. Pacific South Judging
- [16] *Guarianthe skinneri* (Albescens) 'Dr. Peña Chavarria' CCM/AOS 83 pts. Exhibitor: Keith Uhlenhaut; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging

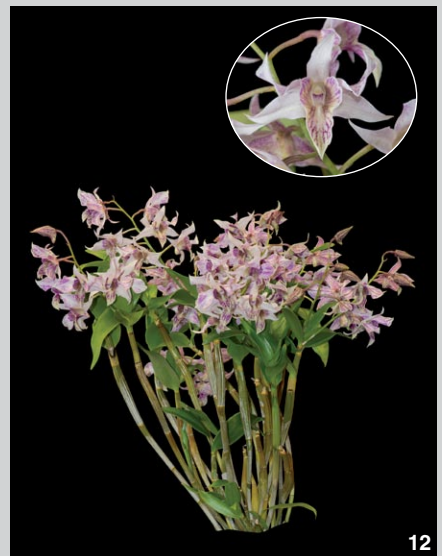
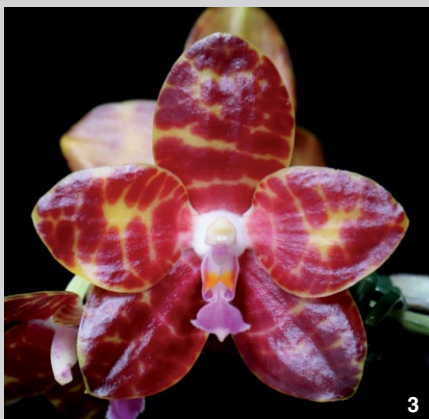
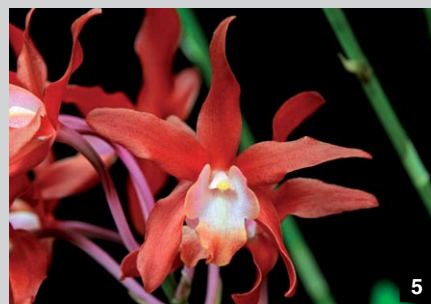
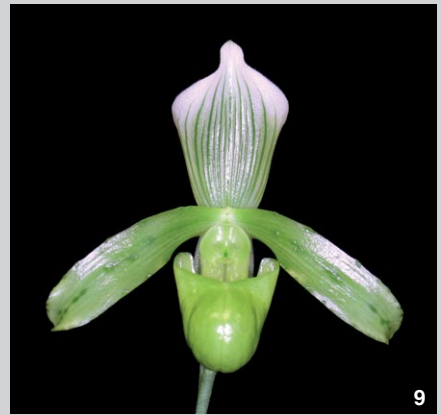
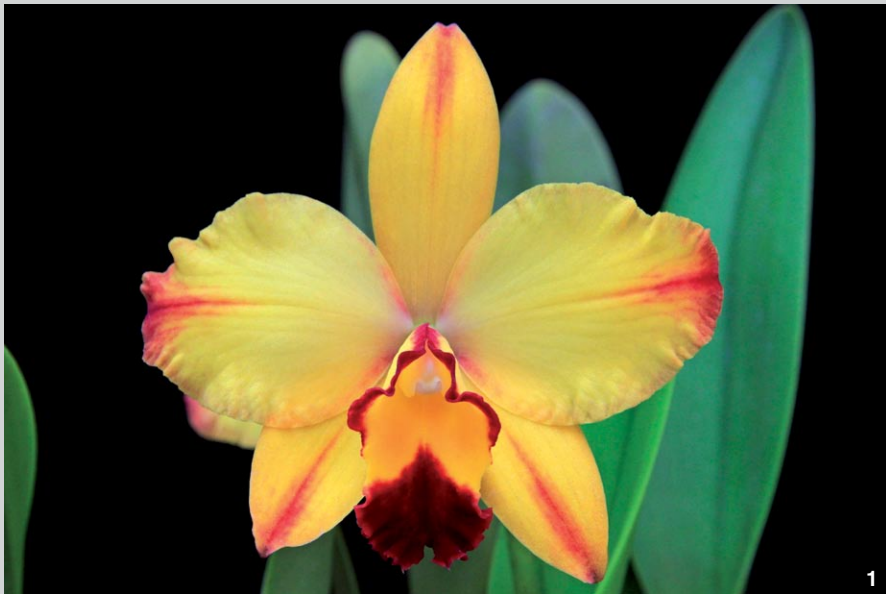








- [1] *Cattleya mossiae* f. *semi-alba* 'Carlos Magdiel Arias' AM/AOS 85 pts. Exhibitor: Alejandro Rodríguez; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging
- [2] *Cattleya mossiae* f. *semi-alba* 'Alejandro Rodríguez' AM/AOS 86 pts. Exhibitor: Alejandro Rodríguez; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging
- [3] *Cattleya intermedia* 'Josué' AM/AOS 82 pts. Exhibitor: Erick Arce; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging
- [4] *Vanda falcata* 'Golden Viper' AM/AOS 89 pts. Exhibitor: Orchid Dynasty; photographer: Bruce Hugo. Rocky Mountain Judging
- [5] *Cattleya granulosa* 'Cecilia Castro' AM/AOS 83 pts. Exhibitor: Maribel Sandí; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging
- [6] *Cattleya* Brabantiae 'N O K' AM/AOS (*aclandiae* x *loddigesii*) 82 pts. Exhibitor: Noel Soler-Figueroa; photographer: Irma Saldaña. Puerto Rico Judging
- [7] *Cattlianthe* Dancing Fire 'Louisiana' HCC/AOS (*Rojo* x *Guarianthe skinneri*) 78 pts. Exhibitor: Al Taylor; photographer: Doug Stannard. Shreveport Judging
- [8] *Dendrobium thyrsoiflorum* 'Carmen Flores' CCM/AOS 82 pts. Exhibitor: Carmen Flores; photographer: Jorge Enrique Céspedes Trigueros. Puerto Rico Judging
- [9] *Dendrobium macrophyllum* 'Fco Mayra' AM/AOS 83 pts. Exhibitor: Francisco Martínez Rivera; photographer: Irma Saldaña. Puerto Rico Judging
- [10] *Eulophiella elisabethae* 'Palace' AM/AOS 80 pts. Exhibitor: Louisiana Orchid Connection John Nelson; photographer: Brandie Ferguson. Shreveport Judging
- [11] *Chysis limminghei* 'Benin' HCC/AOS 75 pts. Exhibitor: Mary Mancini; photographer: Brandie Ferguson. Shreveport Judging
- [12] *Aliceara* Pacific Nova 'Okika' AM/AOS (*Brassidium* Shooting Star x *Miltonia clowesii*) 82 pts. Exhibitor: José González Pérez; photographer: Irma Saldaña. Puerto Rico Judging
- [13] *Encyclia cordigera* var. *rosea* 'Elmer Gibson' HCC/AOS 75 pts. Exhibitor: Dennis Wollard; photographer: Brandie Ferguson. Shreveport Judging
- [14] *Vanda* White Crane 'Elizabeth McBurney' HCC/AOS (*sanderiana* x *falcata*) 77 pts. Exhibitor: David James Medus; photographer: Doug Stannard. Shreveport Judging
- [15] *Paphiopedilum* Hung Sheng Eagle 'Louisiana' HCC/AOS (*gigantifolium* x *rothschildianum*) 79 pts. Exhibitor: Al Taylor; photographer: Brandie Ferguson. Shreveport Judging
- [16] *Phragmipedium* Mini Grande 'Spider' AM/AOS (*humboldtii* var. *humboldtii* x *pearcei*) 84 pts. Exhibitor: Daniel Scher; photographer: Ed Cott. Toronto Judging







- [1] *Rhyncholaeliocattleya* Connie 'Hynson Bayou' AM/AOS (*Cattleya* Pole-Star x Bingham Vick) 81 pts. Exhibitor: Wilton Guillory; photographer: Doug Stannard. Shreveport Judging
- [2] *Phragmipedium* Moche 'Twister Traveler' HCC/AOS (*sargentianum* x *klotzscheanum*) 79 pts. Exhibitor: Mark Macfarlane; photographer: Ed Cott. Toronto Judging
- [3] *Phalaenopsis* Jong's Gigan Cherry 'Felicia' HCC/AOS (*gigantea* x Kung's Red Cherry) 78 pts. Exhibitor: Felicia Nicolaicine-Cheng; photographer: Ed Cott. Toronto Judging
- [4] *Catyclia* Orchidom Nancy's Rhyme 'Springwater' HCC/AOS (*Cattleya* Orchidom Cherry Lane x *Encyclia* Nursery Rhyme) 75 pts. Exhibitor: Springwater Orchids and Thanh Nguyen; photographer: Tom Kuligowski. West Palm Beach Judging
- [5] *Laeliocatanthe* Vera Lillian 'Epi-jim' AM/AOS (*Cattlianthe* Rojo x *Laelia* *elata*) 80 pts. Exhibitor: James Jeansonne; photographer: Doug Stannard. Shreveport Judging
- [6] *Paphiopedilum leucochilum* 'Black Beauty' JC/AOS. Exhibitor: Leslie Ee, N.D.; photographer: Patrick Boisvert. Toronto Judging
- [7] *Paphiopedilum* Glaucoliem 'Crystal Star' HCC/AOS (*glaucophyllum* x *liemianum*) 75 pts. Exhibitor: Crystal Star Orchids Ellen and Eric Lee; photographer: Patrick Boisvert. Toronto Judging
- [8] *Paphiopedilum bullenianum* 'Haley Suzanne' AM/AOS 82 pts. Exhibitor: Glen Decker; photographer: Patrick Boisvert. Toronto Judging
- [9] *Paphiopedilum tonsum* f. *alboboviride* 'Lime Light' HCC/AOS 78 pts. Exhibitor: Piping Rock Orchids; photographer: Ed Cott. Toronto Judging
- [10] *Paphiopedilum* Janet Kunkle 'Haley Suzanne' AM/AOS (Memoria Allegría Gutierrez x Maudiae) 83 pts. Exhibitor: Glen Decker; photographer: Patrick Boisvert. Toronto Judging
- [11] *Promenaea* Ben Berliner 'Synea' HCC/AOS (Limelight x Crawshayana) 77 pts. Exhibitor: Synea Tan; photographer: Patrick Boisvert. Toronto Judging
- [12] *Dendrobium* Lucky Charms 'Magic Toby' CCM/AOS (Peter Shen x Roy Tokunaga) 86 pts. Exhibitor: Wilson Ng; photographer: Patrick Boisvert. Toronto Judging
- [13] *Paphiopedilum* Robin in Purple 'Louisiana' HCC/AOS (*Robinianum* x *lowii*) 79 pts. Exhibitor: Al Taylor; photographer: Doug Stannard. Shreveport Judging
- [14] *Sarcochilus* Humming Bird 'Raspberry Ice Cream' HCC/AOS (Sweetheart x Fitzhart) 76 pts. Exhibitor: Jean Allenlkeson; photographer: Ed Cott. Toronto Judging
- [15] *Paphiopedilum* Carolyn Butcher 'Satin Slippers' HCC/AOS (*Fanaticum* x *delenatii*) 77 pts. Exhibitor: Stanley Luk; photographer: Ed Cott. Toronto Judging
- [16] *Rhynchostylis gigantea* 'Crystal Star' AM/AOS 86 pts. Exhibitor: Crystal Star Orchids Ellen and Eric Lee; photographer: Ed Cott. Toronto Judging

# Rare and Threatened Orchids

## Part 2

MURIELLE SIMO-DROISSART, TARIQ STÉVART, BONAVENTURE SONKÉ AND VINCENT DROISSART

PHOTOGRAPHS BY VINCENT DROISSART UNLESS OTHERWISE CREDITED

ATLANTIC CENTRAL AFRICA (ACA) has a rich orchid flora with more than 500 taxa so far described. Following the IUCN Red List Categories and Criteria, 131 (out of 177) orchid taxa endemic to Atlantic Central Africa are threatened with extinction. In an earlier paper published in *Orchids* in June 2020, we have shown that the major threats to the orchid habitats in Atlantic Central Africa are shifting agriculture, followed by selective logging and urbanization. Focusing on the methodology we used and explained to assess the risk of extinction of endemic orchids from ACA, we presented habitat threats and discussed IUCN Red List conservation status of seven threatened species. In the present contribution, we will explain (a) how we identified priority areas for conservation and (b) how we have implemented integrated conservation approaches in Central Africa to ensure preservation of the most threatened species.

About 90 percent of orchid specimens encountered in the field lack flowers, obscuring their accurate identification. To overcome this, an orchid shadehouse cultivation system was established in 1997, first in São Tomé Island and then expanded in Gabon, Cameroon, Rio Muni (the Continental Region of Equatorial Guinea), the Democratic Republic of the Congo and in Madagascar, to produce high-quality research material (Stévant et al. 2020). Orchid shadehouses have several purposes. Living plants cultivated there, each of known geographic provenance, are monitored until they flower, when we take photographs and collect specimens in alcohol which makes it possible to identify them accurately. These flowering specimens, combined with notes gathered from the field, provide data primarily for taxonomic, biogeographical, ecological, phenological and phylogenetic studies. Using information generated by our orchid research program, and thanks to the support from the American Orchid Society, we are conducting conservation assessments. The species' IUCN Red List categories, combined with species

distribution, enable identification of critical habitats and areas that host a high level of species diversity and endemism. Thanks to the unique collections of our orchid shadehouse network, we established in Cameroon the first non-agricultural seed bank in tropical Africa, to ensure maintaining species survival especially for those threatened with extinction.

### HOW DO WE IDENTIFY PRIORITY AREAS FOR CONSERVATION?

By using Geographic Information System (GIS) data, we generated a map with all occurrences of the 177 endemic taxa to ACA involved in the IUCN Red List assessments. By using data from the World Database on Protected Areas (<http://www.protectedplanet.net/>), we identified the occurrences within protected areas for each of those 177 endemics. Focusing on the 131 taxa identified as threatened with extinction (i.e., Critically Endangered, Endangered or Vulnerable), we compiled information on their distribution both within and outside protected areas network in Central Africa.

Distribution data for the 177 endemics to ACA (Figs. 1a) has shown that species richness is highest 1) in the Gulf of Guinea Islands, 2) along the Cameroon volcanic line and 3) along the Atlantic coast, in the mountainous area which stretches from the Ngovayang massif in Cameroon to the Mayombe in the Republic of the Congo. Eight protected areas (within four countries) harbor the greatest number of threatened taxa (Fig. 1b). These are the Obò National Park in São Tomé et Príncipe, the Réserve Scientifique de la Caldeira de San Carlos, the Pico Basile and the Monte Alén National Parks all three in Equatorial Guinea, the Monts de Cristal National Park in Gabon, and the Banyang Mbo Wildlife Sanctuary, the Mount Cameroon and the Campo Ma'an National Parks all three in Cameroon. The map resulting from the presence of the threatened taxa outside protected areas (Fig. 1c) points out two concerns: 1) protected areas such as the Obò National Park (in São Tomé) and the Mount Cameroon National Park

(Cameroon) should be expanded, and 2) protection is needed in Kupe Manenguba and Ngovayang massif areas, both located in the southern part of Cameroon.

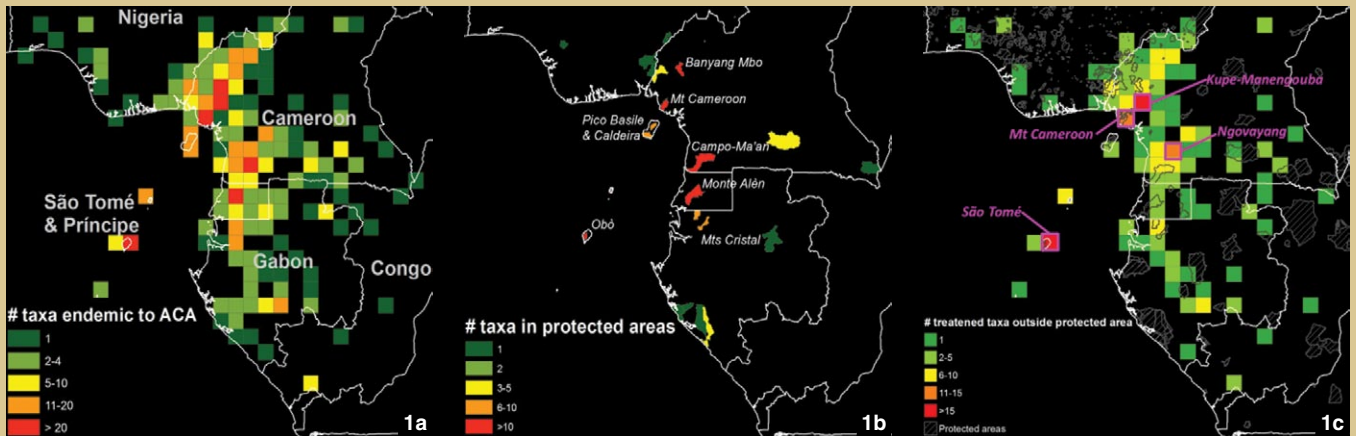
### HOW DO WE ENSURE SUSTAINABLE CONSERVATION OF ORCHID DIVERSITY FROM CENTRAL AFRICA?

Tropical rainforests of Central Africa are disappearing at an alarming rate; no longer an open secret. As more species' habitats and wild populations are threatened by changes in land usage, over-collection and climate change, the need for effective ex situ conservation strategies to be developed and communicated internationally has become increasingly urgent. Coordinated by the Royal Botanic Gardens, Kew, the Millennium Seed Bank Project (MSBP) currently represents the largest ex situ plant conservation program in the world. The project was initiated nearly a quarter of a century ago, and its purpose is to provide an "insurance policy" against the extinction of plants in the wild by storing seeds for future uses; the seeds being conserved outside their native habitat. One of the main aims of the MSBP is to collect the seeds from 75,000 plant species by 2020, representing 25 percent of the world-known flora. Despite over a hundred partnerships worldwide, the MSBP is not currently able to provide an adequate level of ex situ conservation for many plants in tropical Africa, which makes it necessary for us to develop a regional seed bank. Thus, we took advantage of the large number of plants currently growing in the Yaoundé shadehouse (~ 7,000 orchid specimens brought into cultivation, representing ca. 300 species), the largest in Continental Africa, to initiate in Cameroon an orchid comparative seed biology project to underpin the first noncommercial seed bank in tropical Africa. This project was financially supported by the AOS from 2015–2019 and by the National Geographic Society from August of 2015, for a 12-month period.

Our objective aims to document seeds' morphology and viability, and to bank the seeds of 25 percent (~ 150 species)



# of Central Africa



of taxa described to date from Central Africa, focusing as much as possible on the most threatened taxa. To achieve this, we monitor living specimens until they produce flowers, which are then hand-pollinated to obtain fruits. We made a particular effort to obtain fruits from controlled crosses using individuals from different localities to ensure maintaining genetic diversity. We performed controlled pollinations on 979 individuals (representing 165 different orchid taxa), directly in the shadehouse for plants with large flowers, or using a binocular scope for those with tiny flowers. We obtained mature fruits from 691 individuals (fruit set rate of 70 percent), belonging to 138 taxa, seeds of these taxa are currently banked in Yaoundé and stored in the freezer (-20 C) for long-term conservation, with duplicates sent to the Missouri Botanical Garden (USA) and the MSBP. Despite several pollination experiments, we failed to obtain fruits for about 17 percent of taxa involved. By initiating this tropical African orchid seed bank in Cameroon (currently expanded to Madagascar) shadehouses have proven to be highly useful for ex situ conservation of epiphytic orchids.

Of the 131 taxa threatened with extinction, only 13 are represented in our seed bank collection. We explain the low representation of threatened taxa by the fact that these rare taxa mostly occur in mountainous areas, and living plants from these areas are difficult to keep in cultivation in shadehouses. We are trying to compensate for our inability to obtain fruits from some species by implementing an approach involving monitoring and ecological surveys in the field. This method



has proven to be successful in reproductive biology studies carried out on some Central African *Cyrtorchis* taxa, by Laura Azandi (a Cameroonian PhD student supported by the AOS). Monitoring in the field was also successful for *Calyptrochilum aurantiacum* (presented in part 1), for which we have struggled to obtain fruits in the Yaoundé shadehouse. Indeed, specific surveys and a dedicated conservation program including rope climbing methods to reach subpopulations enabled us to discover new habitat sites, among which the canopy of a cocoa tree. We thus performed transplantation of 45 individuals on three cocoa trees (15 on each) in a village located in the Southwest Region of Cameroon. If these tests prove successful, then the next step will be to ensure that the

[1] Distribution of the 177 endemic orchids of Atlantic Central Africa.

[2] *Gastrodia africana* individual flower close-up.

[3] *Gastrodia africana* inflorescence.

pollinator will also survive in this human transformed-habitat.

Time now to present characteristics and main threats, and to discuss the Red List conservation status for eight additional endemics to ACA, all assessed as Endangered.

## GASTRODIA AFRICANA

*Gastrodia* consists of about 60 achlorophyllous orchid species, i.e., they lack chlorophyll and are incapable of photosynthesis. Thus, they totally rely on a fungus to ensure their food supply.

In Asia, some edible species, such as *Gastrodia elata*, are also used in traditional medicine. *Gastrodia africana* appears to be the westernmost species of the genus. It was described in 1900 by the German botanist Friedrich W. L. Kraenzlin (1847–1934), from a specimen collected on Mt Cameroon (Kraenzlin 1901). Then, three additional localities were discovered; two near Yaoundé (in the Centre Region), the capital of Cameroon, in 1969 and 1975, and the third in the Southwest Region, in 1988. Due to poor material, these three historical collections were considered doubtful and, until now, the species was still considered Critically Endangered on the IUCN Red List. Thanks to our extensive field surveys in the southern part of Cameroon, we recently collected the species in the Ngovayang massif area where its habitat is threatened by iron mining. After detailed examination of herbarium material, we have concluded that the species is currently known from five distinct collecting sites in Cameroon. *Gastrodia africana* is a mycoheterotrophic terrestrial herb in submontane forest with *Allanblackia gabonensis*, *Carapa grandiflora* and *Cola* sp., and occurs at an elevation of 3,608–3,937 feet (1,100–1,200 m), where habitat destruction is considerable in extent. The habitat of *G. africana* is also currently impacted from urbanization due to close proximity of one subpopulation with the city Yaoundé. The projected ongoing loss of its habitat leads us to predict a continuous decline in mature individuals of the species. Considering all these facts, *Gastrodia africana* is assigned a Red List conservation status of Endangered.

#### HABENARIA PHANTASMA

*Habenaria phantasma* was described from the Republic of the Congo in 1993 by the African orchids' expert Isobyl F. la Croix, based on a specimen she collected three years before in a beautiful mountainous area of the Mayombe (la Croix 1993). The specific epithet was chosen in allusion to the ghostly white appearance of the flowers in the shaded forest understorey where it grows. While describing the species, la Croix was obviously unaware of another specimen (*Moutsambe 300*) collected in the same area eight years before her field trip in the Mayombe. In May 2007, we collected three additional specimens in the southern part of Cameroon, allowing us to report in 2009 the species for the first time in Cameroon (Droissart et al. 2009a). While examining historical herbarium collections, we were greatly surprised to discover that the species was already collected in the same Cameroonian locality by Boss in



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1970, 20 years before its discovery by la Croix. *Habenaria phantasma* is currently known from two distinct collecting sites, one in Cameroon and the other in the Republic of the Congo. The species is a terrestrial herb growing in mid- to very deep shade in evergreen forest, and occurs at an elevation of 164–1,640 feet (50–500 m). In Cameroon, the locality where it was collected is subject to increasing threat mainly by selective logging and industrial plantations of rubber and oil palm. In the Republic of the Congo, the species' habitat does not appear under threat. However, the projected ongoing loss of its habitat in Cameroon leads us to predict a continuous decline in mature individuals of the species. We thus assigned a Red List conservation status of Endangered to

[4] *Habenaria phantasma* flower.

[5] *Habenaria phantasma* inflorescence.

[6] *Habenaria phantasma* flowering plant.

[7] *Polystachya lejolyana* flower close-up.

[8] *Polystachya lejolyana*, entire flowering plant indicating scale.

#### *Habenaria phantasma*.

#### POLYSTACHYA LEJOLYANA

*Polystachya lejolyana* is characterized by very attractive flowers maculated with deep-red spots. We described that lovely species in 2004 based on a unique collection made two years before in the Monts de Cristal National Park in the northwestern part of Gabon (Stévant and Nguema 2004). At that time, *P. lejolyana* was considered as endemic to that area. We collected the species twice in the



South Region of Cameroon; in 2014 within the Campo Ma'an National Park and the following year in the Ngovayang massif area. It has also been recently reported from the Mayombe area, in the southern part of Gabon. *Polystachya lejolyana* is thus currently known from four distinct collecting sites in Cameroon and Gabon. The species, usually found at an elevation of 1,968–3,543 feet (600–1,080 m), occurs particularly in humid and mist submontane habitats that prevail in the lower montane forest bordering the ACA coast. Two of the four known collecting sites occur within two protected areas, the first in Cameroon and the second in Gabon, where the species habitat does not appear under threat. However, in the southern part of Cameroon, the habitat of *P. lejolyana* is threatened by forest clearance for small-scale shifting agriculture. In addition, the Ngovayang massif area is currently covered by three exploration permits for iron and magnetite ores. Thus, the species habitat in the forest patches involved will be highly threatened in the future. These activities will lead to a continuous decline in mature individuals. Considering all these facts, *Polystachya lejolyana* is assigned a Red List conservation status of Endangered.

#### *RHIPIDOGLOSSUM THOMENSE*

More commonly known as *Cribbia thomensis*, *Rhipidoglossum thomense* is endemic to São Tomé Island. The species was described in 1997 by the English botanists Isobyl F. la Croix and Phillip J. Cribb (Cribb and la Croix 1997), based on two specimens that flowered in cultivation, out of their natural habitat: one in the Royal Botanic Gardens, Kew (United Kingdom), and the second in the Wageningen University (Netherlands). The entire genus *Cribbia* was recently transferred to the genus *Rhipidoglossum* after we highlighted their close affinities using new molecular data (Farminhão et al. 2018). Among this group (i.e., the ex-*Cribbia*), *Rhipidoglossum thomense* bears a short stem, distichous inflorescences and erect, pure-white flowers with crystalline and diaphanous appearance and a contrasting green anther cap. It was collected in montane forests of the northern part of São Tomé island and occurs at an elevation of 4,429–6,889 feet (1,350–2,100 m). The species is recorded from two locations: inside the Obò National Park, where its habitat is not under threat, and at Bom Successo where its subpopulation is easily accessible by local residents. The main threats to the species habitat are illegal logging and forest clearance for small-scale shifting agriculture and other farming



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activities. The ongoing loss of the species habitat will lead to a continuing decline in mature individuals. For these reasons, we have assigned to *Rhipidoglossum thomense* a Red List conservation status of Endangered.

**PORPAX REPENS VAR. CLEISTOGAMA**

*Porpax repens* var. *cleistogama* is better known under the genus *Stolzia*. The species is recorded only from Cameroon where the English botanist William W. Sanford collected it for the first time in 1968 in the Centre Region. With two additional collecting sites, we described that variety in 2009 while providing a synopsis of the genus *Stolzia* in Central Africa (Droissart et al. 2009b). The same year, the variety was recorded twice in the western part of Cameroon, slightly extending its distribution range. *Porpax repens* var. *cleistogama* possesses yellow-green flowers that turn completely red with age. The species is characterized by flowers with fused floral segments, which explains why they remain almost closed until they fade. This peculiarity led us to hypothesize that the non-opening flowers are self-pollinated or cleistogamous. As with other species described under *Stolzia*, it counts as a triumph to spot *Porpax repens* var. *cleistogama* in its natural habitat; and with good reason:

the species has an incredibly small size with tiny flowers no more than 1/5 inch (5 mm) long! *Porpax repens* var. *cleistogama* is usually found in lower montane, humid forests, at an elevation of 2,119–3,772 feet (645–1,150 m). The species is currently known from five localities, two of which are located inside protected areas in Cameroon: the Campo Ma'an and the Mount Cameroon National Parks. However, the species habitat in Mount Cameroon is situated at a lower elevation where there is no official protection. The species was also recorded from small hills, no more than 19 miles (30 km) from Yaoundé. This proximity is enough to warrant an inferred or suspected threat from urbanization and land conversion for agricultural expansion, and to predict a continuous decline in its mature individuals. Considering all these facts, *Porpax repens* var. *cleistogama* is assigned a Red List conservation status of Endangered.

**TRIDACTYLE MURICULATA**

*Tridactyle muriculata* was described in 1913 by the English botanist Alfred B. Rendle (1865-1938), from a specimen collected in 1911 in the forested southeastern part of Nigeria (Rendle 1913). Over nearly a century, no record of the species has been made. During extensive orchid surveys in the Southwest



[9] *Rhipidoglossum thomense* inflorescence.

Photograph by Tariq Stévert.

[10] Plants photographed in situ.

[11] The tiny plants and flowers of *Porpax repens* var. *cleistogama* cover a mossy tree branch.

[12] *Tridactyle muriculata*. Photographs by Murielle Simo-Droissart.



Region of Cameroon in 2004, we collected a living plant of *Tridactyle* without flowers that we could not assign to a described species. That living plant was brought into cultivation in the Yaoundé shadehouse and flowered for the first time in 2005, exhibiting an incredibly long spur for the genus (approximately 1.2 inch [3 cm] long); a feature that allowed us to assign this specimen to *T. muriculata*. The living plant collected in 2004 is still in cultivation at Yaoundé and has yielded more than ten fertile specimens now deposited in the main herbarium collections of the world. With the subpopulation from Nigeria, the species is currently known from two locations. *Tridactyle muriculata* is characterized by a one-flowered and very short (approximately 2/5 inch [10 mm] long inflorescence, and possesses the second longest spur of the genus (*T. nalaensis* has a spur of 1.6 inch [4 cm] long). The species is an epiphyte in lowland humid forest, and occurs at an elevation of 492–2,296 feet (150–700 m). Both subpopulations of *T. muriculata* have been collected in unprotected sites, and their habitat is currently impacted by human disturbance since it is accessible to local people. The main threats to the species are shifting agriculture, small-holder farming and plantations, and selective logging for domestic uses and these threats will continue in the future. This situation leads us to predict a continuous decline in mature individuals of the species. Considering all these facts, *Tridactyle muriculata* is assigned a Red List conservation status of Endangered.

#### VANILLA OCHYRAE

The first collection of *Vanilla ochyrae* was made in July 1939 by the French botanist Henri Jacques-Felix (1907-2008) at Bertoua, East Region of Cameroon. While describing the species in 1998 in the first volume of the *Flore du Cameroun*, Dariusz L. Szlachetko and Tomasz S. Olszewski mentioned a second specimen collected in 1960 in the Centre Region (Szlachetko and Olszewski 1998). Since then, we discovered in the East Region two new subpopulations of the species: the first in the surroundings of the Dja Faunal Reserve in 2002 and near the boundaries of the Nki National Park in 2015. Endemic to Cameroon, the species is currently known from four locations. *Vanilla ochyrae* is characterized by a long inflorescence up to 6 inches (15 cm) long bearing about 50 yellow flowers striated with deep purple veins. We monitored the living plants in the Yaoundé shadehouse for five years before the species' first flowering occurred; the plant was around 33 feet









(10 m) long. *Vanilla ochyrae* is a liana-forming epiphyte in lowland evergreen and semideciduous marshy forest. The species occurs at an elevation of 1,640–2,362 feet (500–720 m). All known subpopulations of *Vanilla ochyrae* occur in unprotected areas where their habitat is impacted by human activities. Indeed, lowland forests in the eastern part of Cameroon are subject to forest clearance by logging. The ongoing and projected loss of its habitat leads us to predict a continuous decline in mature individuals of the species. *Vanilla ochyrae* is thus assigned a Red List conservation status of Endangered.

#### VEYRETELLA HETAERIOIDES

Based on two specimens collected by the French botanist Georges Le Testu in July 1917 and March 1931, the English botanist Victor S. Summerhayes described *Veyretella hetaerioides* in 1938 (Summerhayes 1938). The genus *Veyretella* comprises two species; both endemic to Gabon. This inconspicuous species was not found again until 2012, when two new subpopulations were discovered nearby a proposed mining site. The species is a terrestrial herb occurring in low valley bottoms and on muddy sand, where it was collected at an elevation of 98–393 feet (30–120 m). One subpopulation of *V. hetaerioides* occurs within the Mont de Cristal National Park, a well-managed protected area. The other subpopulations are threatened by forest clearance for shifting agriculture, logging, and mining activities. We project that this degradation will continue in the future and we predict a continuous decline in the species mature individuals. We therefore assign to *Veyretella hetaerioides* a Red List conservation status of Endangered.

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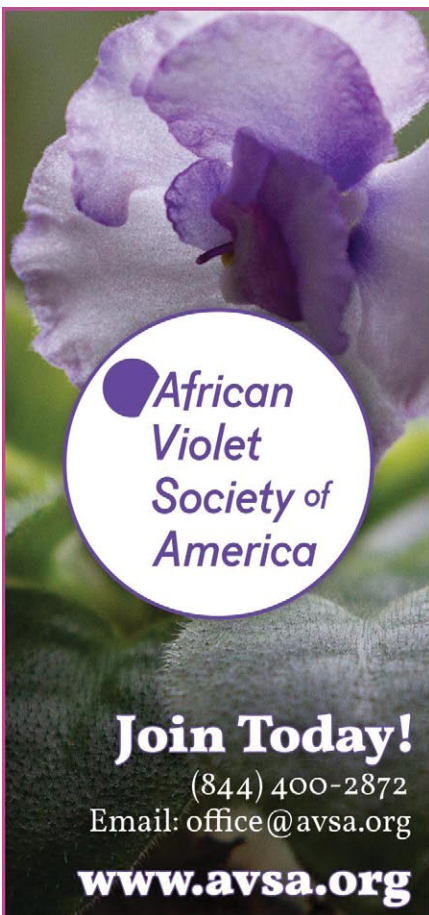
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[13] *Vanilla ochyrae*. This spectacular beauty was photographed by Vincent Droissart.

[14] *Veyretella hetaerioides*. Even out of flower, the emerald green rosettes of this species provide a lovely sight on the shady forest flower. Although small, the flowers in and of themselves are quite beautiful. Photographs by Ehoarn Bidault of the Missouri Botanical Garden.

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

Pictures and scientific activities related to African orchids are disseminated through the web-based portal [www.orchid-africa.net](http://www.orchid-africa.net) and through Tropicos, the Missouri Botanical Garden online database.



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## Fertilizer Baskets



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

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

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### Submission of articles for

### *ORCHIDS* magazine

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

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

**For Advertising Information,  
Contact: Kevin Hall,  
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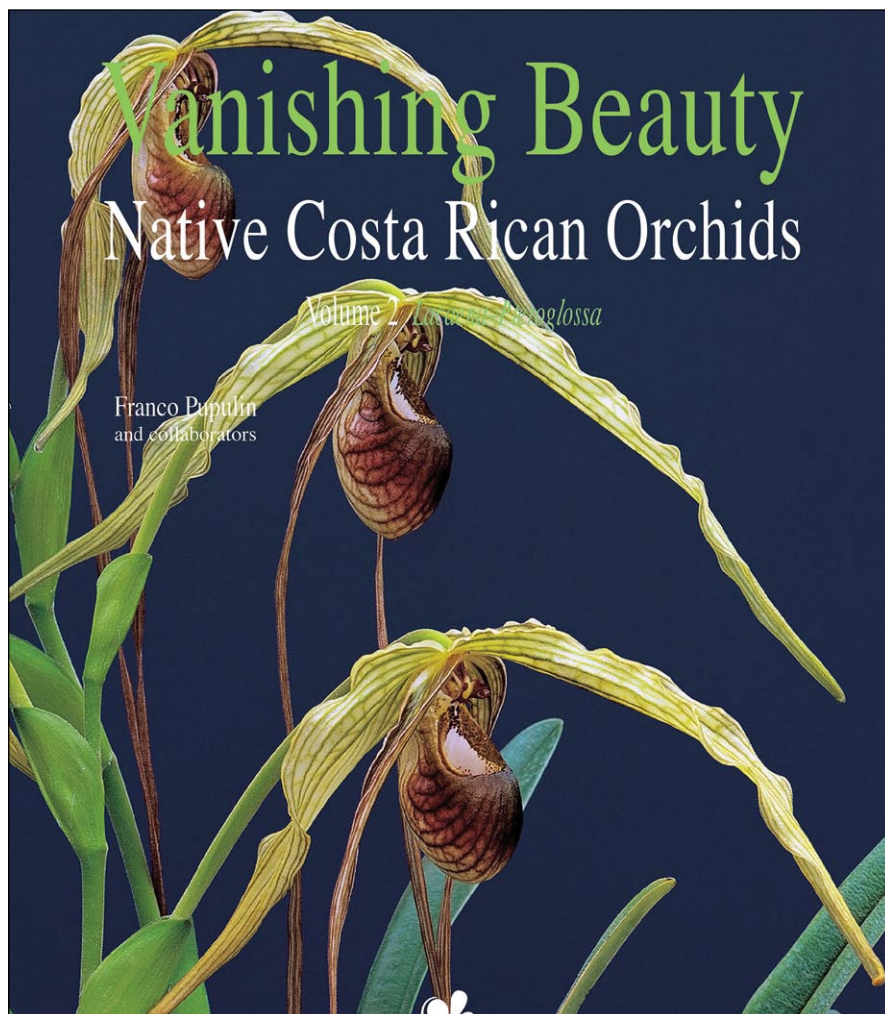
# Vanishing Beauty: Native Costa Rican Orchids, Vol. 2: *Laceana–Pteroglossa*

Franco Pupulin and collaborators. Oberreifenberg, Germany, Koeltz Botanical Books, 2020. ISBN 978-3-946583-12-7. Large volume in quarto (25.5 × 33.0 cm), 578 pages, 590 color photographs, one watercolor and six line drawings. Hardbound with dust jacket. \$320.00 US.

IN JULY 2005 Franco Pupulin, with a number of collaborators, released the first volume of a trilogy of books entitled *Vanishing Beauty: Native Costa Rican Orchids, Acianthera–Kegeliella*, to rave reviews. Now, in 2020, the long-awaited second volume has been issued. It was worth the wait. To start with, it is a beautiful book! The quality of the paper makes the images stand out. Fifty-seven genera are represented, with fantastic photographs of most of the species within each genus. For example, under the genus *Lepanthes* the author states, “In Costa Rica, more than 100 species of *Lepanthes* are known, 60 percent of which are endemic...” There are 104 photographs of these, large enough to be diagnostic, including three newly described species, descriptions of which are provided in the text (new species are described in the text for other genera as well). My only regret, and this is egotistical on my part, is that although it is mentioned in the text, no image of *Lepanthes glicensteinii* was shown.

The history of each genus is fully described in a scholarly, yet completely readable and understandable, fashion. For those who like orchid history it is a must-read. The text also includes information about the species in the genus, and in some cases discusses DNA work that has been done within the genus.

The nomenclature is completely up to date, which poses some problems for those of us who had a previous name attached to a species. Examples include the species I used to know as *Oncidium cabagre* (now *Oncidium dichromaticum*) and what I knew as *Oncidium pittieri* (now *Oncidium luteum*); however, Dr. Pupulin once told me when I complained about all the name changes, “They are synonyms, you can still use them.” I am glad to get the updates, but, and again this is personal, I wish there were a listing of the name changes so we old-timers can keep up. While I am talking for myself, I would also like to have some keys to the species, even though all the pictures in the tome are useful for diagnostic purposes. I know these pictures will help me identify a number of orchids that I photographed



when I lived in Costa Rica but for which I could not find names. Perhaps these will appear at the end of Volume 3. However, I know that this will not be important to many people, and the book stands on its own merits without these details.

The forward is by Dr. Phillip J. Cribb, formerly of the Royal Botanic Gardens, Kew. The text is by Dr. Franco Pupulin and a number of collaborators, such as Diego Bogarín and Mario A. Blanco, to name only two of many younger people (no disrespect to the others) doing active work in Costa Rica, searching out and describing new orchid species to add to the approximately 1,600 species known at present. In total there were 17 collaborators with expertise in orchidology and an ability to write well.

The name of the book, *Vanishing Beauty*, is also prophetic — as new species are being discovered many are also being lost through habitat destruction and climate change.

As I began, it is a beautiful book — besides being a scholarly scientific study, it is also a “coffee table” book, one to peruse many times. Although expensive, its value will only increase with time. It is a great research tool, and if possible, one should really obtain both Volumes 1 and 2 (and the third volume when it is available). I personally cannot wait for Volume 3 to come out, and perhaps there will be a supplement too. It will be worth the wait.

— Leon Glicenstein, PhD ([glicenstein33@msn.com](mailto:glicenstein33@msn.com))





# American Orchid Society

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# ANNIVERSARY 1921-2021



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