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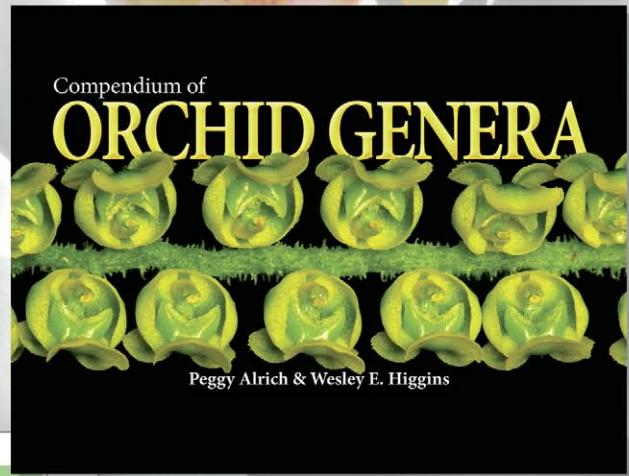
# ORCHIDS

THE BULLETIN OF THE AMERICAN ORCHID SOCIETY

VOL. 90 NO. 10 OCTOBER 2021



Presenting  
**The Compendium  
of Orchid Genera  
by Peggy Alrich  
and Wesley Higgins**



**Angraecum** Bory  
*Viv. Bot. Afrique, 1: 356, t. 19 (1865).*  
*Epistulae. Vandae. Angraecum*

**ETYMOLOGY:** From the Latinized form of the Malay word (*Angrak* or *Angrok*) for the epiphytic orchid that resembles *Aerolis* and *Tanaka* in habit. The name *Angraecum* originated with George Engelhard Rumphius (1628-1702), who coined it from the word *Angrak*, a name or title given by the Malays to a parasitical *Epistulae* plant, the meaning of which has not been discovered. From Engelhard Kämpfer (1651-1716) we learn that *Angrak* or *Angrok* is also the name used by the Javanese for these plants.

**GENETICS:** *Angraecum eburnaceum* Bory  
*(Illustration: Angraecum eburnaceum)*

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, Gabon to Zimbabwe 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 dichotomous 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 spurs 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 encloses the column, and it has a central callus. The flowers have a very short, foetal column with deeply divided lobes.

**Column:** 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.

**Angraecum superbum**  
*(Illustration: Angraecum superbum)*

**Angraecum humboldtii**  
*(Illustration: Angraecum humboldtii)*

**Valid Angraecum Synonyms**

**Aerobion** Kämpfer ex Sprengel  
*Syn. Vig. (Sprengel), ed. 16, 3: 679 & 716 (1826).*  
*Errores:* Greek for air and life, referring to the epiphytic habit of the plants.  
*LECTOTYPE:* *Aerobion superbum* (Thouars) Sprengel (*Angraecum superbum* Thouars) (*Angraecum* Cels. *non det.*, 30: 93 (1875)).

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** (Cadenot) Schachter, Mynik & Gorchacka  
*Biodivers. Res. Conservation, 20: 9 (2013).*

*Errores:* *Angraecum*, a genus of orchids, and Greek for likeness or form. Refers to a similarity to *Angraecum*.

**Two Seces:** *Angraecoides pingue* (Fragson) Schachter, Mynik & Gorchacka (*Angraecum pingue* Fragson)

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** (Schlachter) Schachter, Mynik & Gorchacka  
*Biodivers. Res. Conservation, 20: 11 (2013).*

*Errores:* Greek for spider and *Angraecum*, a genus of orchids. Refers to the long, spider-like segments.

**Two Seces:** *Arachnangraecum arachnoides* (Thouars) Schachter, Mynik & Gorchacka (*Angraecum arachnoides* Thouars)

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** Cadenot  
*Rev. Gén. Bot., 11: 416, pl. 10-11 (1899).*

*Errores:* In appreciation of Eugène Marie Gaston Bonnier (1853-1922), a French botanist, editor of *Revue Générale de Botanique* and publisher of *Cadenot's* notes on the orchids of Réunion.

**Two Seces:** 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** (Schlachter) Schachter, Mynik & Gorchacka  
*Biodivers. Res. Conservation, 29: 12 (2013).*

*Errores:* Named for Jean Baptiste Bory de Saint-Vincent (1778-1846) a French naturalist and author of *Voyage dans les Iles d'Asie*. And *Angraecum*, a genus of orchids.

**Two Seces:** *Boryangraecum pumilla* (Schlachter) Schachter, Mynik & Gorchacka (*Angraecum pumilla* Schlachter)

Now recognized as belonging to the genus *Angraecum*, *Boryangraecum* was previously considered to include thirteen epiphytes found in cool, mid elevation, hill scrub and montane forests in found in Madagascar, Mauritius and Réunion.



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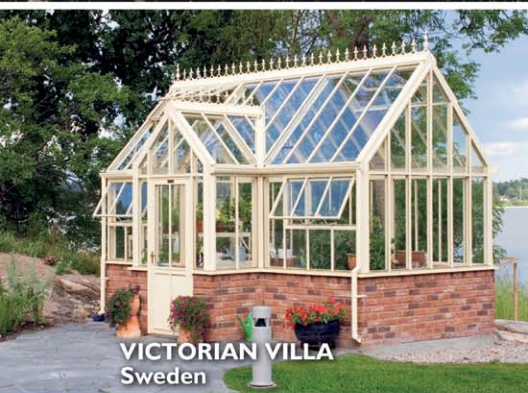
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Bill Bodei

## FRONT COVER

Good things often come in small packages and this month's feature article by Deb Boersma on the development of miniature paphiopedilums brings that home. One of the most recent tiny paph hybrids is this *Paph. Hanoi Fairy* (*rungsuriyanum* × *fairrieianum*) photographed by Michael Tibbs.

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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>.

<i>alexandrae</i> (al-lex-AN-dree)	<i>fragrans</i> (FRAY-granz)	<i>Rhyncholaeliocattleya</i> (rink-oh-lay-lee-oh-KAT-lee-a)
<i>amoriqensis</i> (a-more-ih-KEN-sis)	<i>Grastidium</i> (grass-TID-ee-um)	<i>Rhynchostele</i> (rink-oh-STEE-lee)
<i>Anacardium</i> (an-a-KAR-dee-um)	<i>Guarea</i> (GWAR-ee-a)	<i>Rhynchostylis</i> (rink-oh-STYE-liss)
<i>anosmum</i> (an-OSS-mum)	<i>Guarianthe</i> (gwar-ee-AN-thee)	<i>Rodriguezia</i> (ro-dri-GAY-see-a)
Apidae (AY-pih-dee)	<i>guidonia</i> (gwee-DOHN-ee-a)	<i>rousseauae</i> (rou-SOH-ee)
<i>aspasia</i> (as-PAY-see-a)	<i>hartii</i> (HART-ee-eye)	<i>ruckeri</i> (ROO-ke-rye)
<i>atroviolaceum</i> (at-roh-vye-oh-LAY-see-um)	<i>helenae</i> (HELL-en-ee)	<i>rungsuriyanum</i> (rung-suu-ree AY-num)
<i>barbigerum</i> (bar-BIJ-er-um)	<i>henryanum</i> (hen-ree-AY-num)	<i>Saccolabium</i> (sak-koh-LAY-bee-um)
<i>barclayi</i> (bar-KLAY-eye)	<i>Holcoglossum</i> (hole-koh-GLOSS-sum)	<i>saprophyticum</i> (sa-pro-FYE-tih-cum)
<i>biberianum</i> (bee-ber-ee-AY-num)	<i>insigne</i> (in-SIG-nee)	<i>seemannii</i> (see-MANN-ee-eye)
<i>bicolor</i> (BYE-kuhl-ur)	<i>interrupta</i> (in-ter-RUP-ta)	<i>silvana</i> (SIL-va-na)
<i>bifalce</i> (bye-FAL-kay)	<i>japonica</i> (ja-PON-ih-ka)	<i>Sorostylos</i> (sore-oh-STYE-los)
<i>bowringiana</i> (bow-ring-ee-AY-na)	<i>kimballianum</i> (kim-ball-ee-AY-num)	<i>Spatulata</i> (spat-yew-LAY-ta)
<i>Brachycentron</i> (brak-ee-SEN-tron)	<i>labiata</i> (la-bee-AY-ta)	<i>spectabile</i> (spek-TAB-ih-lee)
<i>Brachypetalum</i> (brak-ee-PET-a-lum)	<i>lackneri</i> (LAK-ner-eye)	<i>spicerianum</i> (spy-ser-ee-AY-num)
<i>Brassia</i> (BRASS-ee-a)	<i>Latouria</i> (la-TOUR-ee-a)	<i>Stanhopea</i> (stan-HOPE-a but most often mispronounced stan-HOPE-ee-a)
<i>Bratonia</i> (bra-TONE-ee-a)	<i>liturata</i> (lit-ur-AY-ta)	<i> trianae</i> (TREE-an-ee)
<i>Bulbophyllum</i> (bulb-oh-FILL-lum)	<i>Luehea</i> (LEW-ee-a)	<i>Trichocentrum</i> (trih-ko-SEN-trum)
<i>Cadetia</i> (ka-DET-ee-a)	<i>lunata</i> (lune-AY-ta)	<i>Trichosalpinx</i> (trih-ko-SAL-pinks)
<i>candida</i> (KAN-did-a)	<i>Lycaste</i> (lye-KAS-tee)	<i>tricolor</i> (TRY-kuhl-ur)
<i>carthagenense</i> (kar-ta-hane-YEN-see)	<i>macrophyllum</i> (mak-roh-FILL-lum)	<i>Trophianthus</i> (troh-fee-AN-thus)
<i>Cattleya</i> (KAT-lee-a)	<i>maculata</i> (mak-yew-LAY-ta)	<i>ulei</i> (YEW-lay)
<i>caucaensis</i> (kow-ka-EN-sis)	<i>madonnae</i> (mah-DON-na-ee)	<i>Vanda</i> (VAN-da)
<i>Centridini</i> (sen-trih-DEE-nee)	<i>Miltonia</i> (mil-TONE-ee-a)	<i>Vandoglossum</i> (van-doh-GLOSS-sum)
<i>charlesworthii</i> (charles-WORTH-ee-eye)	<i>Miltoniopsis</i> (mil-tone-ee-OP-sis)	<i>Vanilla</i> (van-ILL-la)
<i>chocoensis</i> (choh-koh-EN-sis)	<i>montanum</i> (mon-TAN-um)	<i>Vanilleae</i> (van-ILL-la-ee)
<i>Comparettia</i> (kom-par-ET-tee-a)	<i>niveum</i> (NEE-vee-um)	<i>Vanilloideae</i> (van-ill-OY-da-ee)
<i>concolor</i> (KON-kuhl-er)	<i>nobile</i> (NOH-bill-ee)	<i>variegata</i> (vair-ee-a-GAY-ta)
<i>Corallorrhiza</i> (kawr-uhl-loh-RYE-za)	<i>Odontoglossum</i> (oh-don-toh-GLOSS-sum)	<i>Wilhelmara</i> (will-helm-ARE-a or will-helm-ARE-a)
<i>Coryopetalum</i> (kore-ee-oh-PET-a-lum)	<i>odorata</i> (oh-dore-AY-ta)	<i>wilhelminae</i> (will-hell-MIN-ee or will-hell-MIN-ee)
<i>costaricensis</i> (cos-ta-ree-KEN-sis)	<i>omissa</i> (o-MISS-a)	<i>Xanata</i> (zan-AY-ta)
<i>Cryptarrhena</i> (krypt-are-RAY-na)	<i>Oncidium</i> (on-SID-ee-um)	<i>zonatus</i> (zone-AY-tus)
<i>Cymbidium</i> (sim-BID-ee-um)	<i>oroana</i> (ore-oh-AY-na)	
<i>Cypripedium</i> (sip-rih-PEED-ee-um)	<i>Paphiopedilum</i> (paff-ee-oh-PED-ih-lum)	
<i>Cyrtopodium</i> (sir-toh-POH-dee-um)	<i>papilionacea</i> (pap-ee-lee-oh-NAY-see-a)	
<i>Dendrobium</i> (den-DROH-bee-um)	<i>patula</i> (PAT-yew-la)	
<i>Diplocaulobium</i> (di-loh-kaw-LOH-bee-um)	<i>Phalaenopsis</i> (fail-en-OP-sis)	
ectozoochory (ek-toh-ZOO-kore-ee)	<i>philippinense</i> (fill-lip-pin-EN-see)	
<i>edwallii</i> (ed-WALL-ee-eye)	<i>Pinus</i> (PYE-nuss)	
endozoochory (en-doh-ZOO-kore-ee)	<i>planifolia</i> (plan-ih-FOL-lee-a)	
<i>Epicharis</i> (eh-pee-KARE-is)	<i>Pleurothallid</i> (plur-oh-THAL-lid)	
<i>epidendroides</i> (eh-pih-den-DROY-deez)	<i>pompon</i> (POM-poh-na)	
<i>Epidendrum</i> (eh-pih-DEN-drum)	<i>Ponera</i> (poh-NER-a)	
<i>Erythroxyllum</i> (eh-rith-roh-ZYE-lum)	<i>principissa</i> (prin-sih-PISS-sa)	
<i>Euglossa</i> (yew-GLOSS-sa)	<i>psittacina</i> (sit-ta-SEE-na)	
Euglossine (yew-GLOSS-eeen)	<i>pumilum</i> (PEW-mill-lum)	
<i>Eulaema</i> (yew-LEE-ma)	<i>punamense</i> (pun-a-MEN-see)	
<i>Exaerete</i> (eks-ee-RAY-tee)	<i>quadricolor</i> (kwad-REE-kuhl-ur)	
<i>excelsum</i> (ek-SEL-sum)	<i>quasipinifolium</i> (kwa-zee-pin-ee-FOL-lee-um)	
<i>fairrieanum</i> (fair-ee-AY-num)	<i>Renanthera</i> (ren-AN-ther-a)	
<i>finisterre</i> (fin-ih-STAIR-ree)	<i>rhodostictum</i> (roh-doh-STIK-tum)	

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When	October 05, 2021 8:30pm EDT Tuesday	October 21, 2021 8:30pm EDT Thursday	November 09, 2021 8:30pm EST Tuesday	November 17, 2021 8:30pm EST Wednesday
Topic	Greenhouse Chat (Orchid Q&A) <i>Send in your Questions!</i>	Black Orchids The Lure, The Lust and Licentiousness	Orchid Collection Tour The Huntington Botanical Gardens	Greenhouse Chat (Orchid Q&A) <i>Send in your Questions!</i>
Presenter	Ron McHatton Chief Education and Science Officer	Dr. Leslie Ee, ND Associate Judge, President of COC	Brandon Tam Orchid Collection Specialist, AOS Judge	Ron McHatton Chief Education and Science Officer

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

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## Vegetable Starter Trays for Orchid Seedlings

I USE SEEDLING starter trays with humidity domes in the fall and spring for my vegetables. It did not occur to me to use them in the greenhouse for my orchids but when I deflasked my first orchid seedlings a couple of months ago, I needed a place, protected from the elements, to put the fragile seedlings. I keep a small amount of water in the tray and the humidity dome on top with both vents open. It sits on a shelf in my Arizona greenhouse in the southeast corner. After the first month, my seedlings doubled in size (the seedlings are pictured in the larger containers). So, I decided to move a few of my more fragile orchid divisions into the tray to see if I could encourage strength and growth. After another month, I noticed new growth and better color on the leaves (the divisions are pictured in the smaller pots).

I feed them every other week with MSU high-potassium fertilizer. Once a week, I leave the lid off for several hours just to increase the airflow and prevent mold or fungi from growing. If you grow indoors, this would be a great place



for orchids needing higher humidity or those that are more fragile. We often get small divisions or purchase orchids in 2-inch (5-cm) pots because they are cheaper. This tray and dome will keep them protected as they grow. It fits well under a counter and you can even mount a grow light under the counter if you are growing in a more shaded environment. These seedling starter trays with humidity domes cost under \$10. Be sure to get the heavy weight tray so that it will not collapse when moved.

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

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## PRESIDENT'S MESSAGE

ONE THING ALL orchid hobbyists in the AOS have in common is that we are patient. We will wait months for that orchid to produce a new shoot, or a year for the other one to rebloom, and we will even wait multiple years for that hybrid seedling to produce its first flower. And, just when we thought we were going to celebrate the Centennial of the American Orchid Society this month, we have to be patient and wait until next April. This month, though, we will be enjoying the AOS fall Members' Meeting.

The American Orchid Society has been very vigilant about the coronavirus situation that is gripping the nation and, more specifically, Florida. Despite having so much of the country vaccinated, we have seen an increase in cases and Florida was a hot spot at one point. As a result, the decision was made to change the official Centennial Celebration to the spring Meeting of 2022. We will be talking more about this in the months to come. But for now, save the dates on your calendar, April 6–9, 2022.

Keeping this in mind, our focus is on this fall Members' Meeting. I am very excited to share with you some details of the meeting. It will be virtual, as we have done for the past few Members' Meetings, and by now, we have become very experienced in participating in virtual meetings. We must consider the safety of our members, first and foremost. AOS members have shown how resilient they have been throughout the whole pandemic, and how inventive too. Over the last year or so, AOS members have stepped up to the plate to share meetings, photos and videos, and to make sure the AOS was as active as ever.

As I mentioned earlier, it will be a virtual meeting, taking nothing away from what a wonderful time it will be. There will be an online auction with many delightful items from which to choose. There always seems to be something to whet everyone's appetite. Over time, we have seen how generous folks have been donating items for our auctions. To date, our online auctions have included a variety of items such as gift certificates, orchids, jewelry, books, and housewares. I am so grateful for all the donations.

Also on the agenda, we will be introducing the judges that have been promoted to a new level. This is one of the highlights of the day. These judges have worked so tirelessly, studying, researching and writing, and their hard work has paid off — the icing on the cake! I am very proud of their efforts and all the



Left to right: Cheryl Erins, AOS Secretary; Bob Fuchs, AOS President; Coniah Hanley and his mother, Mariah Hanley.

work they have done to get there. I hate to sound repetitious, but given the recent happenings in the world, it is no small feat they have accomplished.

Even though the Centennial Celebration has been moved to the 2022 AOS spring Members' Meeting, the excitement is still at an all-time high. During the fall Meeting this October, we will be giving everyone a sneak peek as to what to expect for the Centennial. In previous issues of *Orchids* magazine, I have mentioned many events of the Centennial, including the speakers, the auction, the dazzling entertainment and the over-the-top gala. It will be spectacular! During the event, the Biltmore Hotel will be taking every precaution to make sure everyone will feel comfortable and be safe from any COVID-19 infections.

On a separate note, I recently had the great fortune to attend the Ohio Valley Orchid Fest, which included the Mid-America Orchid Congress Auction, held in Dayton, Ohio. It was the first in-person judging event in conjunction with the AOS since COVID-19 shut everything down. It was very well attended, with an exciting raffle and auction for everyone to enjoy. I saw many friends there and made some new ones. I am always so delighted to attend judgments and at every one I attend, the folks there feel the same way.

During my visit there, I was invited to give a talk on the history of the AOS, taking into consideration that the centennial

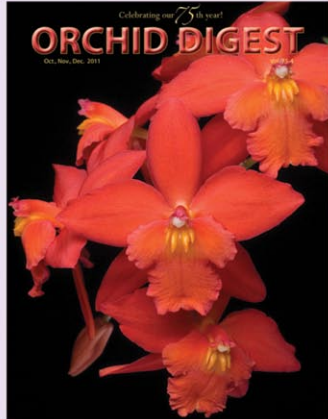
is coming up. The AOS is rich in history, evolving over time to what it is today. I am excited for the future of the AOS as well. We are progressing as an organization that is productive and unified to conserve the future of orchids for generations to come.

Part of the future of the AOS includes new members joining. I am very pleased to introduce to all of you the newest member of the American Orchid Society, Coniah M. Hanley. I met him at the Ohio Valley Orchid Fest, and he reminds me of me when I was that age. His mother tells me he eats, sleeps and breathes orchids. He will be a great addition to the AOS family.

As a final note, I cannot stress enough the importance of getting vaccinated against COVID-19. I understand many folks have underlying medical conditions that may prevent them from receiving the vaccination, but I urge you to speak with your doctors about it. If your doctor is comfortable with you receiving the vaccine, please do so. We know that the majority of new cases of the virus are those that are not vaccinated. So, get the jab and be safe.

That being said, I am looking forward to seeing (virtually) many of you at the fall Members' Meeting in just a few weeks. This is an exciting time for the AOS, its members and committees. There is lots happening. See you soon! — Bob Fuchs, President (email: bob@rforchids.com).

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# Fall 2021 Meeting of the Members & Town Hall

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# October: The Month of Partnership

By Thomas Miranda

SOMETIMES THE MACHINATIONS of our Earth are deeply profound, while at the same time shifting subtly, almost imperceptibly. They are both pervasive and ineffable to our daily grind. As our planet travels around the sun, causing the seasons we experience across the globe, I am reminded that everyone, everywhere experiences these gradual, incremental changes in their own specific way, as do the orchids that occur in very specific places. It is testament to their adaptability that we can successfully cultivate so many types of orchids in so many diverse places, far removed from the natural habitats in which they evolved. It is said that no two orchid growers do things exactly the same way. So, although advice is often appreciated, there is no one right way to approach orchid cultivation. Nor is there a place on the planet that is ideal for every orchid...though, happily, some growers come awfully close.



Thomas Miranda

Although we cannot predict what changes will happen on our spectacular planet with the prospects that face us, it is true that as engaged, passionate, sentient humans, we have the ability to combine our efforts and create partnerships. Orchidaceae is vast and diverse and, as much as we might like to, none of us can grow everything. So, it is our responsibility as stewards of the earth and its biodiversity to strive to learn as much as we can about these remarkable plants, for their sake as well as ours. I like to think our collective efforts of orchid cultivation are a partnership with them, and Mother Earth, in the interest of preserving these highly evolved creatures for generations to come, theirs and ours. Here are the basics for some of the most popular orchid genera.

**PHALAEOPSIS** After a summer of record warmth in parts of the world, it is a relief to find some cooler temperatures in the northern hemisphere this month. Such temperature shifts influence most phalaenopsis to initiate spikes. It is so exciting to see those upturned growths appear and start to elongate around now! It is instructive to understand that this spiking is the result of two environmental



THOMAS MIRENDA

Kim Takamoto (left) and Jarusha Aipia (right), nurses at the hospital in Hilo, Hawaii accepting an orchid arrangement from Island Sun Orchids to thank them and the other nursing staff for their heroic efforts saving the life of Hilo Orchid Society member Lori Aitchison.

factors: temperature and photoperiod. As temperatures naturally dip in the fall months, phalaenopsis are triggered to start their inflorescences. Do not miss out on this subtle trigger. If your plants are indoors and you keep your temperatures constant year-round, it is possible that your phalaenopsis may not get the signal to set a spike. Photoperiod also plays a role in blooming some phalaenopsis as days shorten and nights lengthen. These are signals by which plants can sense which season it is. If you cultivate your phalaenopsis under lights you might miss this subtle signal as well, especially if photoperiod is constant year-round or your plants are in rooms where lights are still on well past dusk.

**CYMBIDIUMS** These magnificent plants make amazing specimens over time and can put on a plentiful and long-lasting show of marvelous flowers. Heavy feeders, it is fun to watch these vigorous plants produce bigger and bigger bulbs each year. However, many growers do not understand the basics of their cultural needs. Most standard cymbidiums need cooler temperatures starting this time of year to set their spikes. Nighttime temperatures in the 40s F (4.4–9.4 C) are often necessary. Depending on where you live, this can be almost impossible

to achieve. South Florida and southern California climates can be problematic. Growers might miss this important factor even where appropriate cold temperatures occur outside, because they bring plants inside too early in the season. Let plants chill this month before protecting them from frost and you will see excellent spike initiation. Happily, even if you live in a climate that does not allow you to bloom these well, new, showy, warmth-tolerant cymbidiums have been (and continue to be) bred that will allow all of us to grow and bloom these outstanding orchids to perfection.

**CATTLEYAS** By this month, your cattleyas should have developed fine, plump, maturing pseudobulbs and each new growth should have a sheath from which their buds will emerge over the next six months. Fall-blooming types, such as *Cattleya labiata* and *Cattleya trianae* and their hybrids, as well as hybrids of *Guarianthe bowringiana*, should be swelling with buds and blooms already. Sometimes it is advisable to remove the sheaths gently and carefully to allow unfettered bud development. High light levels and air movement are still pretty important for these spectacular plants to bloom their best. A little less watering and fertilizing, as well as somewhat

cooler nighttime temperatures (55–65 F [12.8–18.3C]) are also helpful to initiate spikes. Make sure to not overcrowd them so they get excellent airflow. As with most orchids, pay attention to individual plants, with special attention to the undersides of their leaves. You want to search for and eliminate harmful infestations such as boisdual scale for the best results.

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

fine reward for a summer of hard work watering and feeding your orchids.

**PLEUROTHALLIDS AND BULBO-PHYLLUMS** With their unique, other-worldly forms and colors, these two groups of often-bizarre orchids, one of the New World and the other, while circumtropical, prominent in the Old World, are growing increasingly popular for their strange loveliness, and have caused many of us to reconsider what true beauty really is. Although these enormous groups have representatives from torrid lowlands up to temperate high tropical mountains, making it impossible to offer consistent cultural advice, I can offer only this: If you love and appreciate this kind of biodiversity, it is up to you to learn the best you can about their habitats so you can best replicate their environment in your artificial situation. Although it does not always work this way because of the impulsive nature of orchid collecting, try to be sure you can offer these species a reasonable facsimile of the conditions they need. Without doing this in advance, it is probable that your plant will struggle or perish before you figure things out. Plants speak to us with their vigor. Be sure to listen to them.

It is the first and most important lesson for any partnership.

— Tom 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).

### Yellow Sticky Cards for Bush Snails

Plagued by those tiny pesky snails that are nearly impossible to eradicate? Here's a little trick I learned a few years ago:

cut a piece of the yellow sticky cards sold in agricultural supply houses for trapping small flying insects and insert it into the pot. Wait a couple of days. If you have bush snails they will be attracted to the card and get stuck. You will not get them all but you will get an amazing number of them.

— Sara Johnson

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## QUESTIONS AND ANSWERS

### POTTING MEDIUM CHANGE



#### QUESTION

I have a *Wilhelmaria* Pinot Princess (*Rhynchostele* × *Bratonia*) that I bought in flower and then repotted into Orchiata™ bark and sphagnum moss. It had a new healthy growth and then the backbulb turned brown from the bottom up. I checked the roots and they were gone. I then repotted in an Orchiata™ bark and charcoal mix, topped with moss and have misted daily. This appears to be working, but how long do I continue this before returning to my normal watering routine?

#### ANSWER

There are multiple issues here. First when dealing with *Oncidium* Alliance plants, it is critical to repot them only when active new root growth occurs. Unlike many orchids that root with the flush of new growth, the *Oncidium* Alliance tends not to produce roots until the new growth is as much as a third to half completed. In the case of your plant, this delay in rooting is the reason that it appeared to take so long for new roots to form. Your plant had been grown in straight sphagnum moss which brings us to the second issue — existing roots adapted to the constantly moist and humid environment that moss produces. Repotting from moss directly into the drastically different environment provided by a bark mix, coupled with an inactive root system often causes the death of

all or much of the existing roots. These things together cause the plant to shed that back growth to conserve available moisture and nutrients for the developing new growth. Once the new growth starts to root, the missing roots will be rapidly replaced and the plant should ultimately grow out of the problems you see.

How do you manage drastic changes in potting medium? Going from bark to moss is fairly easy because the existing roots are adapted to the drier bark environment but if moss is watered properly and allowed to become nearly dry between waterings, the roots will adapt. Moss to bark is more difficult. One option is to wait until you are sure there is new root growth, move the plant to bark and accept the fact that much of the old root system will not survive. If there are new roots, they will rapidly replace the old system and the plant, although stressed, will handle the change. The other option, more time consuming, involves a step-wise transition from pure moss to whatever bark mix you finally grow in. For instance, you would move the plant first into a mix of perhaps half to two-thirds moss, after producing a growth in this mix, repot into a mix of less moss and more bark and allow another growth cycle. This continues until the final potting mix is achieved. This obviously takes longer but



the existing roots accommodate the step-wise transitions better with less stress to the plant.

### YELLOW SPOTS

#### QUESTION

Could you please tell me what could cause these yellow spots?

#### ANSWER

There are actually two different problems with these plants. Notice how round the yellow spots in the first photograph are and that each spot has a sharp dark pin point in the center? That dark spot corresponds to the entry point of the fungal or bacterial (I think likely bacterial) pathogen causing the spot. These leaf-spotting problems often start with water standing on the foliage or condensing on the leaves as temperatures cool in the evening. This standing water allows bacterial or fungal spores to germinate and once they enter the leaf, begin to cause the death of surrounding tissue. This can be especially prevalent in winter where warm air comes into contact with the cold glass (or plastic) greenhouse roof, where it then condenses and drips on the plants below and in hot humid summers when heavy dews form in the evening. One easy fix for roof drips is to spray diluted Palmolive® original dish soap diluted to about a tsp to two quarts of water on the greenhouse ceiling or skylights. It will cause the moisture to bead up and run down the wall rather than dripping on the plants below.

Phalaenopsis can be especially prone to this sort of spotting. Copper fungicides/bactericides such as Soluble Copper, Phyton 27 (or 35), or topical copper oxide products such as Kocide or Champ are often used prophylactically by commercial phalaenopsis growers most of the summer to fight these problems. Junction fungicide also has strong antibacterial properties and this particular preparation is a go-to standby for first response following severe trauma such as tropical storms, hurricanes and unexpected cold damage. Luckily, unlike *Erwinia* infections that spread like wildfire, the spots on your leaves are more of a slow progressing cosmetic problem..

The spots in your second photograph are an entirely different problem. Notice

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

their irregular shape with no central point of infection and how sunken they are? They also appear to be only on mature leaves and not the developing soft new leaves. These are the result of the death of internal tissue (mesophyll collapse) followed by the leaf surface sinking inward. The exact cause of this sort of damage in phalaenopsis is still a subject of debate but some of the causes appear to be shock from cold water (or cold rain), phalaenopsis mites or chlorotic spot virus infection. In the case of cold water or chlorotic spot virus, the spots appear suddenly and, in the case of the latter, often following some sort of significant stress. Mite damage typically occurs much more slowly and involves more of the leaf surface. Spots caused by chlorotic spot viruses usually appear on mature leaves not the newest growth but will appear in what was an otherwise healthy new leaf as that leaf reaches maturity. These viruses (potyvirus family) are not detected by the usual virus test kits for Cymbidium Mosaic and Odontoglossum Ringspot viruses and their presence is usually inferred from the behavior of the plants. At the present time, there is no reliable cure.

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COLLECTOR'S ITEM

# *Holcoglossum kimbalianum*

(Rchb. f.) Garay 1972

By Judith Rapacz-Hasler



*Holcoglossum kimbalianum* 'Silas' CCM/AOS; exhibitor: Walter E. Crawford;  
photographer: Scott Weber. Inset photograph by the author; grower: Dora Gerhard.

## RAPACZ-HASLER

**SYNONYMS** *Holcoglossum saprophyticum* (Gagnep.) Christenson 1987; *Vanda kimballiana* Rchb. f. 1889; *Vanda kimballiana* var. *lackneri* Kraenzl. 1894; *Vanda saprophytica* Gagnep. 1932.

The genus *Holcoglossum* today includes about 23 known species and was established as a monotypic genus in 1919 by the German botanist Rudolf Schlechter based on *Saccolabium quasipinifolium* (Hayata) Schlr. 1919. The range of the genus extends over southwest China, Laos, Vietnam, Thailand and Malaysia, originating from the tropical to subtropical climate zones of Asia. However, the majority of the species originate from Yunnan Province in the southwest of the People's Republic of China. This species and two others belong to subgenus *Brachycentron* X.H. Jin & S.C. Chen; six species to subgenus *Holcoglossum* section *Holcoglossum* Christenson and six species to subgenus *Holcoglossum* section *Sorotylos* X.H. Jin & S.C. Chen. The remaining eight species have not been so far assigned.

All species of this genus, quite different in color and shape, are perennial epiphytes or lithophytes and are characterized by a short monopodial shoot axis with petiolar or triangular leaves in cross-section. The upper surface forms a groove by up-folded leaf margins. Leaves taper to a point and are not notched at the leaf tip. The root tips of living roots show a reddish coloration in all species of the genus; furthermore, some species have red-spotted foliage. The flowering shoot arises laterally from the shoot axis and forms two to several flowers, and these are widely spaced and form a raceme or panicle.

The flowers are white and wide open. The lip is trilobed. The lateral lobes are erect and adaxially dotted. The central part is spread over a large area and is parallel to the gynostemium. The lip is shaped to allow potential pollinators to push down on the central lobe. The elongated spur characteristic of other subgenera is greatly reduced in the species of subgenus *Brachycentron*.

*Holcoglossum kimballianum*, unlike *Holcoglossum quasipinifolium* and *Holcoglossum pumilum*, the other two species in the subgenus endemic to Taiwan at higher altitudes between 3,900 and 10,800 ft (1,200–3,300 m) preferring a cool-to-cold habitat, is warm growing. This small, vanda-like epiphyte can be found in Myanmar, Thailand, Laos and southern China at elevations from 3,900 to 5,900 ft (1,200–1,800 m), mostly on rocks

in exposed locations, but occasionally on trees in partial shade. Plants consist of a short stem with long, thin, terete, sharply pointed leaves. The fragrant, long-lived flowers are produced in the fall from axillary, 8–18 inch (20–45 cm) long, loosely sparse to multiple-flowered, racemose inflorescences with elliptic, obtuse bracts. The species grows best mounted on cork or tree fern. An adaptable species, *Holc. kimballianum* will thrive under a broad range of temperatures from cool to warm conditions if given bright light and plenty of water while actively growing. Plants benefit from a short, dry rest in the winter.

There are a number of intergeneric hybrids with *Holcoglossum* and related genera such as *Renanthera*, *Vanda*, *Rhynchostylis* and *Phalaenopsis* (*Phalaenopsis japonica*). A hybrid with *Vanda tricolor* resulted in *Vandoglossum* Trikimball 'Whirling Galaxies' HCC/AOS.

**CULTURE** This species originates from the tropical-to-subtropical climate zones of Asia characterized by hot, humid summers, and cool-to-mild winters.

The large species of the subgenus *Brachycentron* and of section *Holcoglossum* can be cultivated in an upright position, but they are best suited for cultivation in baskets or mounts. If

regular watering is provided, these species are best cultivated in a basket without substrate. Any substrate used should be coarse in texture to allow good air circulation to the roots. The plants need a very bright but also cool location. They should be watered regularly, with drier periods during dormancy. In the wild, the plants are regularly exposed to hoarfrost during the flowering period, which they survive without problems. Cultivation often fails because conditions provided are much too uniformly warm or because the substrate used is too fine, and the roots die because of lack of air. Maximum daytime temperature may be from 75 to 95 F (24–35 C) in the summer, and nighttime lows can be 40–50 F (5–10 C). High humidity is important, as is watering throughout the year, except for somewhat less water in cooler winter weather.

### REFERENCES

Garay, L. A. 1972. On the Systematics of the Monopodial Orchids. *Botanical Museum Leaflets, Harvard University* 23(4):149–212.

Jin, X.-H. 2005. The Generic Delimitation and a New Infrageneric System of *Holcoglossum* (Orchidaceae). *Botanical Journal of the Linnean Society* 149(4):465–468.

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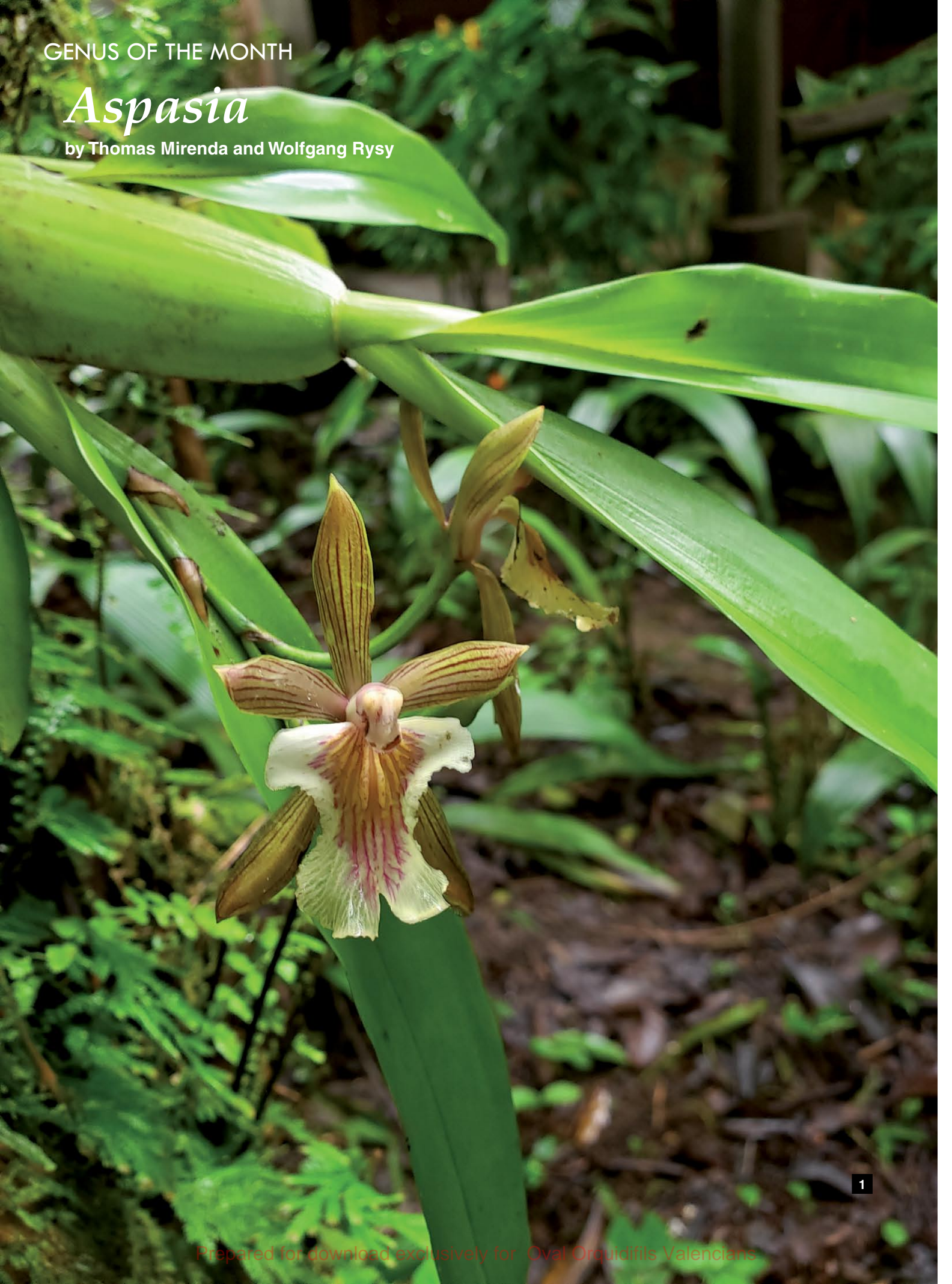
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GENUS OF THE MONTH

# *Aspasia*

by Thomas Mirenda and Wolfgang Rysy



ANCIENT TEXTS REVEAL that Aspasia was a fiercely intelligent, accomplished woman who was well-known for fostering ideas and organizing gatherings and illuminating discussions amongst the prominent thinkers and philosophers of her day, with the intention of spreading enlightenment among them. Notably, Socrates, as a young man, credits her with informing his ideas regarding love, truth, justice, knowledge and courage — these being the cornerstones for western philosophy. Later in life she was the consort of Pericles, one of the greatest leaders of ancient Greece, and is thought to have been the actual author of his influential orations. Therefore, her influence on society from antiquity to the present day is unquestionable.

Ironically named for one of the more poorly known, yet highly influential women of all time, this New World oncioid genus might, like its namesake, be easily overlooked and underappreciated, because of the modesty of its flowers. Nonetheless, the genus contains several extremely interesting, beautiful and easily grown species that deserve to be widely cultivated, enjoyed, and used in breeding. Most species are compact, vigorous and easily grown and bloomed. The plants have small, rounded pseudobulbs and branching rhizomes, allowing them to grow into wonderful specimens rather quickly and almost effortlessly.

Almost exclusively from lowland tropical forests, these warm- to hot-growing epiphytes are adaptable to most any growing regime, making them great beginner's plants for novice species enthusiasts. The fact that all the species are wonderfully fragrant is an added bonus for their human devotees, and adds credence to the belief that they are likely pollinated by fragrance-collecting male euglossine bees that require a complex cologne to attract picky females for mating purposes.

Closely related to brassias and miltonias, several species have been in cultivation for over a century and were used in many early hybrids, including pioneering efforts by Dr. Goodale Moir in Hawaii. Although those hybrids are lovely and still grown by many, a few species stand out for their desirability. In particular, *Aspasia epidendroides*, with a ubiquitous distribution throughout Central America, and *Aspasia lunata*, a widespread, lowland Brazilian species with a beautiful and colorful lip, are extremely vigorous and compelling subjects for cultivation. A personal favorite, *Aspasia*



*principissa*, from Costa Rica, Panama and northern Colombia, bears really lovely flowers larger and better formed than those previously mentioned.

If the genus has any perceived faults, they may be that the inflorescences are short and bear fewer flowers than their aforementioned sister genera, and colors tend to be subtle and earthy rather than vibrant and audacious. Like their namesake, these important orchids prefer being in the background rather than their more ostentatious cousins. Even so, they constitute one of the more didactic and illuminating of orchids for us to cultivate.

#### THE SPECIES

##### ***Aspasia epidendroides* Lindl. 1843**

SYNONYMS *Odontoglossum aspasia* Rchb.f. 1864; *Aspasia fragrans* Klotzsch 1853; *Aspasia barclayi* Rolfe 1892

ETYMOLOGY Derived from the genus *Epidendrum* and Greek *-oides* (similar) because the shape of the flower is similar to that of an *epidendrum* flower.

This medium-sized species has lanceolate-ovate and distinctly flattened (ancipitous, nearly two-edged) pseudobulbs with a length of 2.4–4 inches (6–10 cm) and a maximum width of 1.6 inches (4 cm). Pseudobulbs are bifoliate, closely spaced on the rhizome (0–1.2 inches [0–3 cm] apart) and at the base subtended two to three leaflike sheaths. Leaves are narrowly lanceolate, 5.9–11.8 inches (15–30 cm) long and 0.8–1.6 inches (2–4 cm) wide. From the basal sheathing bract arises the few-flowered inflorescence with a length of 4–8 inches (10–20 cm). The faintly cinnamon-scented flowers have a diameter of about 1.6 inches (4 cm). The dorsal sepal stands upright and is slightly



- [1] *Aspasia principissa* photographed in situ in Costa Rica by Thomas Mirenda.
- [2] *Aspasia epidendroides* 'Etelvina de Cierra' HCC/AOS; exhibitor: Etelvina de Cierra; photographer: Maria Teresa. This species can be found in a wide range of color forms from darkly colored specimens such as this awarded example to quite pale individuals (inset photograph by Eric Hunt) and even completely albino forms.
- [3] Botanical illustration of *Asp. epidendroides* from *Curtis's Botanical Magazine*.

helmet-shaped and turned forward at the top. The lateral sepals are directed downward and basally concealed by the lip. The petals are of similar shape as the dorsal sepal and pulled forward. The

## MIRENDA AND RYSY

nearly circular lip has small side lobes and the midlobe is bent backward at the tip. The sepals and petals are mainly brownish with greenish stripes in a more or less horizontal pattern. The lip is mainly white with more-or-less heavy purple markings for the central area to the apex.

**DISTRIBUTION** Central America to Colombia at elevations from sea up to 2,300 feet (700 m) in dry forests of the Pacific region.

**PHENOLOGY** Flowering occurs from the winter into spring (January–May).

### *Aspasia lunata* Lindl. 1836

**SYNONYMS** *Odontoglossum lunatum* (Lindl.) Rchb.f. 1864; *Trophianthus zonatus* Scheidw. 1844; *Miltonia odorata* Rchb.f. 1855; *Aspasia papilionacea* Rchb.f. 1876

**ETYMOLOGY** From the Latin *lunatus* = lunate, moon-shaped, referring to the central maculation of white lip (translation from Lindley's first description in Latin).

This medium-sized species has obovate, distinctly flattened and petiolate pseudobulbs 2–2.8 inches (5–7 cm) long and 0.4–0.7 inches (1–1.8 cm) wide carried about 0.4–0.8 inches (1–2 cm) apart on the rhizome. Pseudobulbs are bifoliate and the 3.1–5.9-inch (8–15 cm) -long, 0.6–0.8-inch (1.5–2 cm) -wide leaves are lanceolate. The short, approximately 2-inch (5 cm) inflorescence originates from the base of the pseudobulb, is carried upright and normally carries only a single flower of about 2-inch (5 cm) diameter. The narrow, lanceolate sepals and petals are arranged in the shape of a star and of the same greenish color with similar brown markings on the basal halves. The more-or-less violin-shaped lip, about 0.8 inch (2 cm) in diameter, has two small basal lobes fused to the column. The lip is pure white, except for the full-moon-shaped patch of faded violet to ruby coloration in the middle. The upright column is also white.

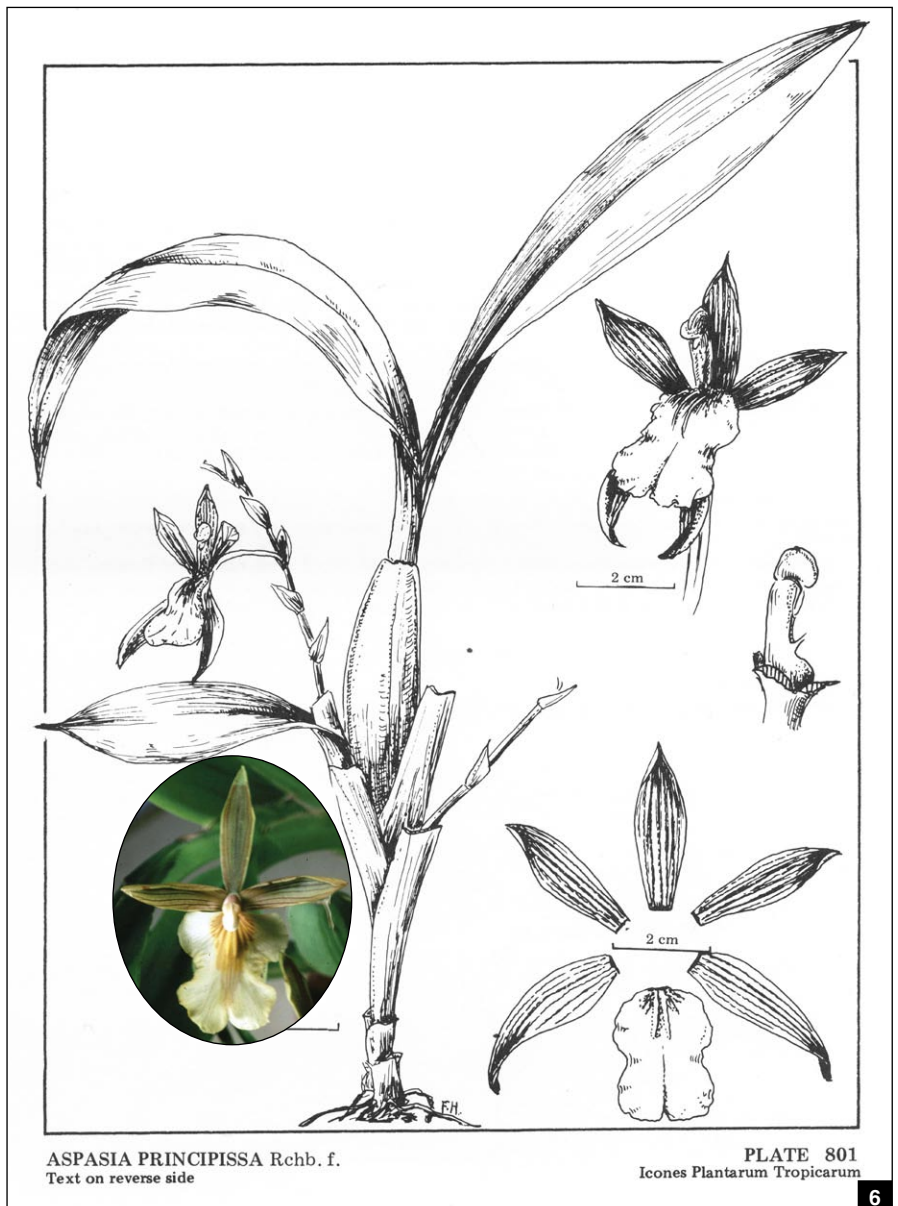
**DISTRIBUTION** Northeastern Bolivia to Brazil.

**PHENOLOGY** Flowering occurs from June to September.

### *Aspasia omissa* E.A.Christenson 2004

**ETYMOLOGY** From the Latin *omissus* = negligent, because the species was long confused with *Aspasia principissa* Rchb.f.

There is little literature regarding this species other than the original description by Christenson (2004) with a detailed description in French and one color photograph. His short diagnosis reads: "*Species haec A. principissa* Rchb.f. *similis sed labello ovato non pandurato, sepalis signatis transverse differt.*



Holotype: Colombie, plante cultivée ayant fleuri en Floride, 29 décembre 2003, E.A. Christenson 2066 (holotype:NY)."

Roughly translated meaning "Species similar to *A. principissa* Rchb.f., lip ovate not pandurate, sepal apices different."

***Aspasia principissa* Rchb.f. 1852**

SYNONYMS *Odontoglossum principissa* (Rchb.f.) Rchb.f. 1864; *Aspasia epidendroides* var. *principissa* (Rchb.f.) P.H.Allan 1949; *Aspasia biberiana* (Rchb.f.) Rchb.f. 1864; *Odontoglossum biberianum* (Rchb.f.) Rchb.f. 1864; *Aspasia rousseauae* Schltr. 1922.

ETYMOLOGY From the Latin *principissus* = very fashionable, elegant in reference to the large and elegant-looking flower.

Plants of this species are medium-sized with bifoliate, lanceolate-ovate and flattened pseudobulbs about 2 inches (5 cm) tall and up to 1.2 inches (3 cm) wide. The elliptic-lanceolate leaves are basally conduplicate, up to 7 inches (18 cm) long and to 1.4 inches (3.5 cm) wide. The upright inflorescence reaches a length of 9.8 inches (25 cm) and carries 4–6 delicate-smelling flowers of nearly 2.8-inch (7 cm) diameter. The stellate, narrowly elliptic sepals and petals are olive-colored with reddish-brown longitudinal stripes; the lateral sepals largely concealed by the lyre-shaped lip. The lip is basically whitish to yellowish, centrally marked in dark yellow to orange with red-brown longitudinal stripes nearly up to the tip of the lip. The 0.6-inch (1.5 cm) -long column is white.

DISTRIBUTION Central America to Colombia, Brazil (Pará), at elevations of 1,640–3,275 feet (500–1,000 m).

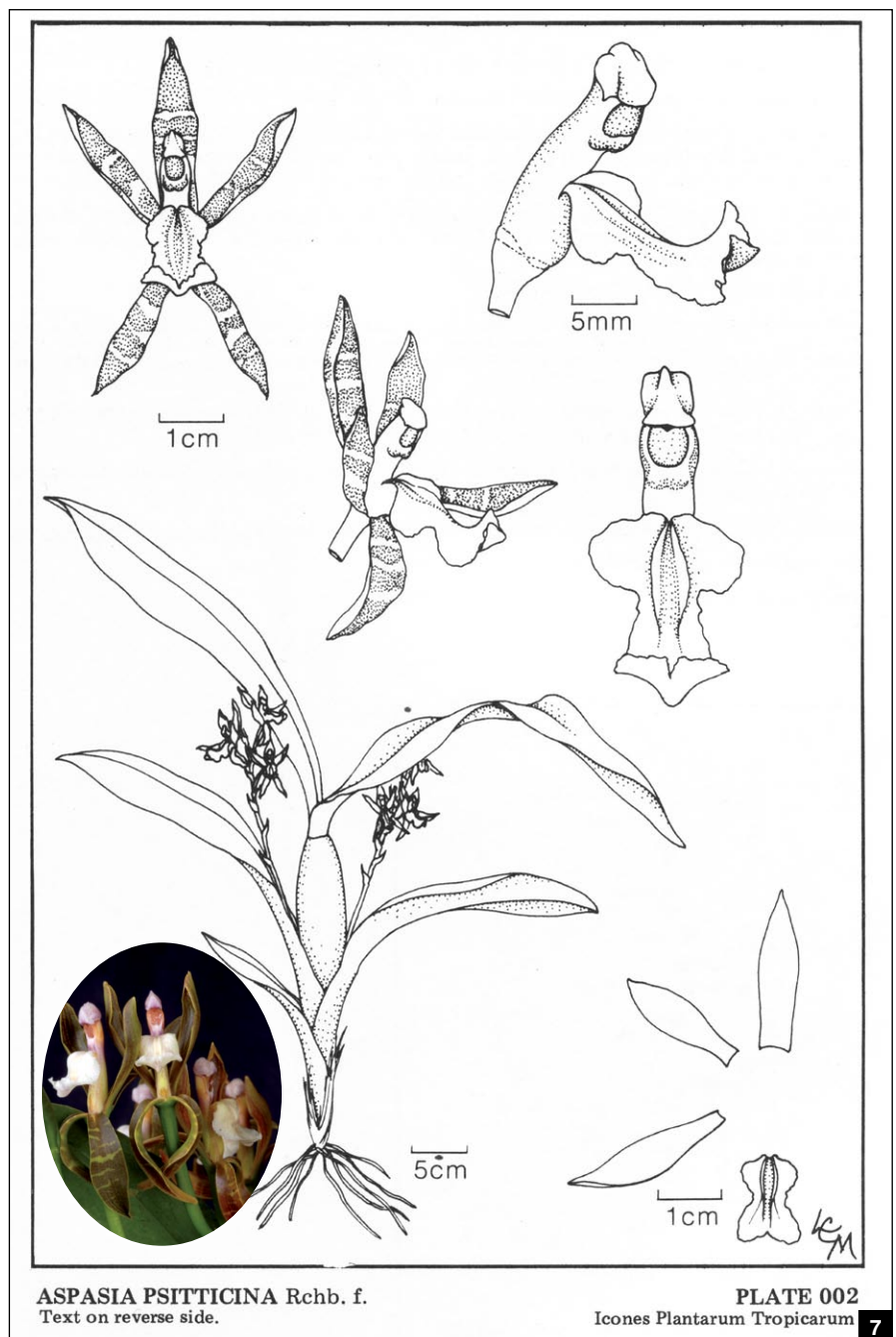
PHENOLOGY Flowering time extends from the winter to summer (February to July).

***Aspasia psittacina* (Rchb.f.) Rchb.f. 1878**

SYNONYM *Odontoglossum psittacinum* Rchb.f. 1864

ETYMOLOGY From the Latin *psittacinus* = like a parrot, many-colored; in reference to the flower color.

This large epiphyte has a stout rhizome from which the oblong-to-ellipsoid, strongly flattened pseudobulbs arise. The bifoliate pseudobulbs have 3–5 sheathlike basal bracts and reach up to 4.7 inches (12 cm) long and 1.8 inches (4.5 cm) wide. The linear-lanceolate, conduplicate leaves reach up to 19.7 inches (50 cm) long and 2 inches (5 cm) wide. The often-multiple inflorescences carry 3–8 flowers and arise from the base of the pseudobulb from between the sheathlike bracts. The nearly 2.4-inch (6 cm) -long flowers are strongly fragrant of cloves and open in succession.



**ASPASIA PSITTACINA** Rchb. f.  
Text on reverse side.

**PLATE 002**  
Icones Plantarum Tropicarum **7**

The sepals and petals are greenish yellow and barred red-brown, and the lip is white. The column is a flushed yellow and violet color.

DISTRIBUTION Colombia, Ecuador and Peru at elevations of about 100–1,640 feet (30–500 m) in moist and seasonally dry forests in areas with frequent nocturnal fog.

PHENOLOGY Flowering occurs in the late winter and spring (February–May).

***Aspasia silvana* F. Barros 1989**

SYNONYMS None.

ETYMOLOGY Named for the discoverer of the holotype in December of 1985 in Bahia: E.F. Silva.

The vigorous plants have a rhizome

[4] *Aspasia lunata* from the second author's collection.

[5] *Aspasia omissa* 'Magnifico' CHM/AOS; exhibitor: Mrs. Ralph Levy.

[6] *Aspasia principissa*. Botanical drawing, Plate 801, from the *Icones Plantarum Tropicarum*. Inset photograph is the cultivar 'Lil' CHM/AOS grown by Henry J. Severin.

[7] Botanical drawing of *Asp. psittacina*, Plate 002, *Icones Plantarum Tropicarum*. Inset photograph by Karl Siegler is the cultivar 'Karlene' CBR/AOS grown by Karlene Sanborn.

about 0.2 inches (0.6 cm) in diameter with bifoliate, petiolate pseudobulbs carried about 1.2–2 inches (3–5 cm) apart. The petiolate base of the pseudobulb is 1.2–1.6 inches (3–4 cm) long and 0.2–0.3 inches (0.6–0.8 cm) in diameter and covered in papery sheaths; the expanded part of the pseudobulb, enveloped at the base by three to four sheathlike, lanceolate bracts is obovate, distinctly laterally compressed and 3.5–4.7 inches (9–12 cm) long and 0.7–1 inches (1.8–2.5 cm) in diameter. The acute leaflike sheaths reach 5.5–7.9 inches (14–20 cm) long and 0.7–0.9 inches (1.8–2.2 cm) wide. The two true, acute, conduplicate leaves are lanceolate and reach up to 7.9 inches (20 cm) long and 1.6 inches (4 cm) wide. The single-flowered inflorescence arises from between the sheathlike leaves and reaches a length of 3.9–5.5 inches (10–14 cm) with a very showy flower with a shape comparable to *Aspasia lunata*, but much larger (about 3.5 inches [9 cm] long) and a trapezoidal lip. The shape and the color of the sepals and petals are nearly identical, but the white lip has a basal patch of deep yellow marked in faded violet.

**DISTRIBUTION** Brazil (Bahia, Espírito Santo) in mountainous rain forests or cloud forests in shaded, humid places at elevations of 200–700 m.

**PHENOLOGY** Flowering occurs during the summer months (June, July).

***Aspasia variegata* Lindl. 1836**

**SYNONYMS** *Odontoglossum variegatum* (Lindl.) Rchb.f. 1864; *Aspasia interrupta* Hoffmanns, 1844; *Aspasia liturata* Link ex Rchb.f. 1855.

**ETYMOLOGY** From the Latin *variegatus* = irregularly spotted, related to the coloration of the flower.

This medium-sized species grows as an epiphyte with a creeping, slender rhizome, on which the pseudobulbs are carried an inch or so (few centimeters) apart. The ellipsoid to oblong pseudobulbs are strongly laterally flattened (ancipitous), becoming sulcate with age. The bifoliate pseudobulbs reach a length up to 3.4 inches (8 cm) and a width up to 1.2 inches (3 cm). The conduplicate leaves are lanceolate and acute, and reach a length of up to 7.9 inches (20 cm) and a width of up to 0.8 inches (2 cm). The 3.1–5.9-inch (8–15 cm) -long inflorescence with one or two flowers arises at the base of the pseudobulb covered by a sheathlike, conduplicate leaf up to a length of 5.5 inches (14 cm). The very showy flower is nearly 2 inches (5 cm) in diameter and described by Lindley (1836) as “especially deliciously sweet in the morning.” The



WOLFGANG RYSY

narrow, lanceolate sepals are greenish with red-brown lines. The shorter and broader petals have a similar coloring but with a yellowish border. The roundish white lip has laterally spreading basal side lobes. The entire lip is marked with violet dots and the margin is notched.

**DISTRIBUTION** Trinidad to tropical South America; in moist forests at elevations of about 200 m.

**PHENOLOGY** Flowering occurs in the spring and summer.

**REFERENCES**

- Christenson, E.A. 2004. Une Nouvelle Espèce d'*Aspasia* de Colombie. *Richardiana* IV(2):84–87.
- Lindley, J. 1836. *Aspasia variegata*. *Edwards's Bot. Reg.* 22:t.1907.
- ADDITIONAL READING**
- Bechtel, H., P.H. Cribb, and E. Launert. 1980. *Orchideen-atlas* 59:169.
- Chase, M., M. Christenhusz, and T. Mirenda. 2017. *The Book of Orchids*. p. 272. University of Chicago Press, Chicago, IL.
- Moir, W.W.G. 1979. *Aspasia*. *American Orchid Society Bulletin* 48(3):252–256.
- Pridgeon, A., editor. 1992. *Aspasia*. *The Illustrated Encyclopedia of Orchids*. p. 35. Timber Press, Portland, OR.
- Rysy, W. 2007. *Aspasia* Lindl., *Ceratostylis* Bl., *Comparetita* Poepp. & Endl. *Die Orchidee* 58(4):426–429.
- Senghas, K. Hrsg. 2002. R. Schlechter. *Die Orchideen* I/C:2073–2076.
- Senghas, K. and L. Bockemühl. 1983. *Aspasia epidendroides* Lindl. 1834. *Die Orchidee* 34(2):281–282.
- Sheehan, T. and M. Sheehan. 1979. *Orchid Genera, Illustrated* – 68 – *Aspasia*. *American Orchid Society Bulletin* 48(3):248–249.
- Wolff, M. and O. Gruss. 2007. *Orchideenatlas* 41–42. Verlag Eugen Ulmer, Stuttgart, Germany.
- Zelenko, H. and P. Bermúdez. 2009. *Orchids, Species of Peru*. p. 28. Z A I Publications, Quito, Ecuador.

— Tom Mirenda has been working professionally with orchids for over three decades. He recently coauthored *The Book of Orchids: A Life-Size Guide to 600 Species From Around the World* (email: [biophil-iak@gmail.com](mailto:biophil-iak@gmail.com)).

— Wolfgang Rysy is a retired mechanical engineer and has been an orchid hobbyist for more than 45 years. He has been a member of the German Orchid Society since 1973 and of the AOS since 1975. He



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WOLFGANG RYSY

[8] *Aspasia silvana* from the second author's collection.

[9] Botanical drawing of *Aspasia variegata* from Curtis's Botanical Magazine.

[10] *Asp. variegata* from the second author's collection.

has visited many countries in Europe, the Americas, South Africa, Southeast Asia and Australia to study orchids in more detail in their native habitats and he maintains an orchid collection in a small greenhouse. The results of his orchid studies are published in books and more than 100 articles in national and international magazines. He is a national and international lecturer who speaks to orchid and general botanical societies. For 17 years he has been a member of the editorial staff of the German Orchid Society. His special interest is the Bulbophyllinae (email [Rysy-Erlangen@t-online.de](mailto:Rysy-Erlangen@t-online.de)).



# Virus Testing — Do You Really Want To Know?

Text by Sue Bottom/Photographs by Terry Bottom

APPROACHES TO VIRUS testing range from simply not wanting to know to wanting a virus-free collection. Whether or not to test your orchids is a very personal decision that each grower will ultimately have to make.

Most people simply do not want to know if their plant is virused. Denial is a temptress. We all want to believe that life is fair and only good things happen to good people. It is perfectly fine to assume all your orchids are virus and disease free, as long as you hedge your bets and act as if all your plants are virused, so you follow stringent sanitary practices when handling any of your plants. If you find plants that are potentially diseased or exhibit symptoms of virus infection you have to be brutal and simply discard any and all questionable plants.

At the other end of the spectrum are those that want a virus-free collection. This group might include orchid hybridizers, who do not want to transmit virus to their new hybrids. A virused plant should not be used as the pollen parent because the virus could be transmitted to the offspring, but a virused plant can be used as the capsule parent as long as the seed from the mature, dried capsule is properly sterilized. Of course, the hybridizer must know which, if any, of his plants are virused so the proper precautions are taken. Hobbyists may want a virus-free collection so they do not have to worry about virused plants infecting the rest of their collection or those of their friends. They are willing to go to the considerable expense of testing each and every plant and discarding any plant that is virused. Then, to maintain a virus-free collection, every new plant purchased must be tested.

My sainted mother told me to never ask a question to which I did not want to know the answer. Too bad my evil sister-in-law did not learn that lesson before asking what I thought of her. So it is with virus testing. If you decide to move forward with virus testing, think the whole process through in advance and be prepared for some heartbreak. My approach was to start testing the most at-risk plants, those that are in 8-inch (20-cm) pots and have been through the process of division multiple times, so they have the highest potential to be virused



from contaminated cutting tools and potting surfaces.

**EASY DECISIONS** Any plant that exhibits symptoms of virus is either simply discarded, or discarded after testing confirms the presence of virus. Plants with blotchy black necrotic spotting may have cymbidium mosaic virus (CyMV), and those with angular V-shaped markings may have odontoglossum ringspot virus (ORSV). Once the symptoms of virus are visible in the leaves, the plant is simply too ugly to keep in the greenhouse. Even worse are flowers that exhibit virus symptoms. ORSV causes color break. CyMV does not usually express itself in the flowers, but when it does, it causes blossom brown necrotic streak (some say a dual infection with CyMV and ORSV is

[1] Often cymbidium mosaic virus causes black blotches on the leaves that result in a really ugly plant, although there are other diseases that can result in black spotting besides virus.

[2] Sometimes odontoglossum ringspot virus causes circular to angular patterns on the leaves, with the discoloration ranging from yellowish to reddish to brownish in color.

required for the necrosis to occur). In any case, any plant that is obviously infected with a virus is discarded.

**DIFFICULT DECISIONS** The tough decisions arise when you decide to test your entire orchid collection for virus, even those that do not exhibit any symptoms.

You have a plant that is growing well, has no leaf discolorations, no flower blighting, but it tests positive for virus.

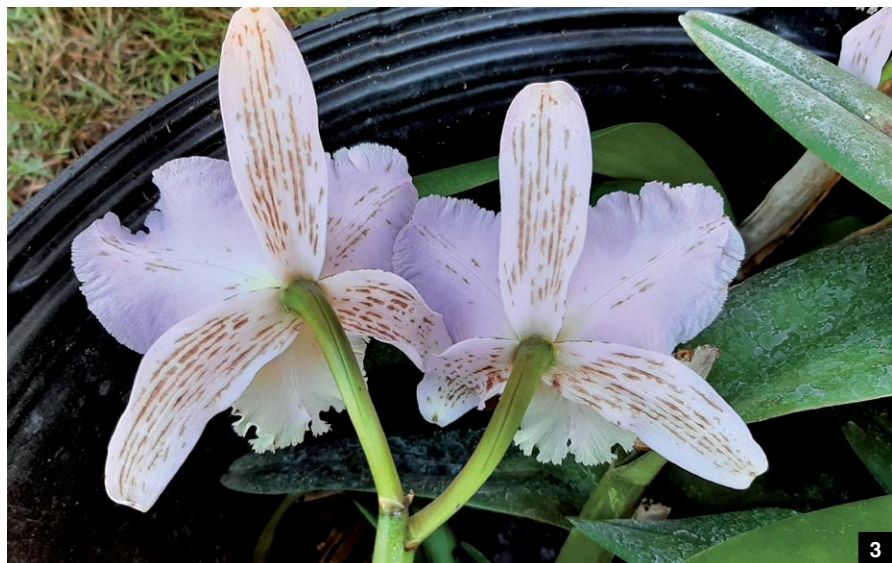
1. If vigor is compromised or the flower is nothing special, it is discarded, knowing there are many new seedlings growing up that will be glad to take its place.
2. If this asymptomatic plant tests positive for ORSV, it is discarded to avoid potentially spreading the disease to other plants. ORSV is the primary flower blighting virus, and to avoid spread to other plants, infected plants are discarded.
3. If it tests positive for CyMV, it is evaluated on the basis of its vigor and flower quality. Vigorously growing, otherwise healthy plants with drop dead gorgeous flowers are moved to a virused bench, to isolate them to some extent from other plants. Here, extraordinary sanitary precautions are taken to prevent spreading the disease.

We became familiar with the five stages of grief at Chez Bottom during virus testing:

1. Denying the existence of virus (we use strict hygiene procedures...but what about the early days?)
2. Being angry with the vendor (but the plant has been in my care for all these years)
3. Bargaining with the orchid gods (how can I get the plant to outgrow the virus?)
4. Being depressed (what a failure I am at orchid growing), and finally
5. Accepting facts as they are (guess this means I will have to buy lots of new plants and be more careful going forward).

**VIRUS TESTING** The test involves cutting a small sample of tissue from the plant, mashing it in a buffer solution and inserting the test strip to wait for the results to appear. If you decide to start a virus testing program, be exceedingly careful not spread the disease during the testing program. Put on fresh gloves to test each new plant, and use newspaper or butcher paper to provide a clean working surface, changing it between plants. Use single-use, double-edge razor blades to make your cuts.

Very little is written about exactly where to obtain the sample. Some like to sample an almost spent flower, some sample the roots, and others the leaves; but which leaves? I had always sampled the older symptomatic leaves under the assumption that these had the most time for the virus to replicate inside. The Good



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Doctor Hackney says he always tests a leaf from the youngest mature growth because that is where the virus will be most concentrated. Per Randalls and Ogle (1997): “When the virus reaches the vascular tissue, it is distributed rapidly through the plant via the phloem and becomes systemic. Viruses generally move first to the roots and top leaves before infecting the remaining leaves from the top of the plants downwards.”

The phloem, which transports sugars and carbohydrates throughout the plant and fuels the growth of newly developing tissue, also carries the viral particles, concentrating them in the new growths. It is possible for the virus present in the older parts to become dormant and test negative, even though the virus is present in the plant.

To get the best flowering, you need a vigorously growing plant that has enough energy in reserve to bloom to perfection. The corollary of this is that a poorly growing plant will never have that “wow” factor. It may grow poorly as a result of a disease from which it can recover, or from a virus from which it will ultimately fade away and possibly infect other plants along the way. In that the greenhouse is not a hospital for sick orchids, plants that have unexplained poor growth are simply discarded. If you find this too painful, keep a small inventory of test strips on hand so that you can test suspect plants and make an informed decision as to whether you want to discard the virused plant, isolate it, or try to nurse the nonvirused plant back to health. — Sue Bottom (email: sbottom15@gmail.com).

**REFERENCES AND ADDITIONAL READING**  
Randles, J. and H. Ogle. 1997. Viruses and Viroids as



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[3] Blossom brown necrotic streak from CyMV (generally thought to be in combination with ORSV) shows up 5–10 days after the flower opens, resulting in unsightly discoloration on the floral segments.

[4] Color break from ORSV is an irregular, nonsymmetrical marking on the flower. You might simply discard the plant with apparent color break, but thrips and chemicals can cause similar blemishes on the flower.

Agents of Plant Disease. p. 104–126. In: J.F. Brown and H.J. Ogle, editors. *Plant Pathogens and Plant Diseases*. Rockvale Publications, Armidale, Australia.

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

# Nominations for AOS Conservation Awards

By Charles Wilson

DO YOU KNOW someone, an agency or society who has done something notable in the interest of orchid conservation? You have an opportunity to nominate them for recognition for their efforts!

- The Philip E. Keenan Award was established to recognize and reward individuals, groups, or affiliated societies for outstanding work in the field of orchid conservation, restricted to North America.
- The AOS Conservation Recognition Award was similarly established to recognize and reward individuals, groups, or Affiliated Societies worldwide for outstanding work in the field of orchid conservation.

Two \$500.00 first-place awards and two \$250.00 second-place awards may be given in each category each year.

**The application period for both of these awards has been extended to December 1, 2021.**

Applications for these prestigious awards should include a nomination statement, a short biography of the proposed recipient when it concerns an individual's efforts, or a short history of the nominated group, organization or affiliated society. A concise description (no more than two pages) of the project or endeavor and its effectiveness must be submitted along with the nomination. Several photographs of the conservation work should be included, as well as no more than three letters of recommendation from individuals who are familiar with the work. It is hoped that we can feature these projects in regular articles in *Orchids* as a reward for the recipients' good work and to encourage conservation efforts. Nominations or questions should be sent to [conservation\\_committee@aos.org](mailto:conservation_committee@aos.org).

— Charles Wilson, AOS Conservation Committee Chair (email: [conservation\\_committee@aos.org](mailto:conservation_committee@aos.org)).



DR. ANDY HUBER



DR. ANDY HUBER

[1] *Corallorrhiza maculata* (summer coralroot) in eastern Oregon at GROWISER.  
 [2] *Cypripedium montanum* (mountain lady's slipper) at GROWISER

# Call for Grants!

Each year, the AOS offers grants for work in education, conservation and research. It is that time of year!

## EDUCATION

The AOS Education Committee will be accepting applications for education grants from November 1, 2021 through February 1, 2022. Applicants will be notified of status in May 2022.

Education grants support the development, implementation, maintenance or support for comprehensive educational programs and activities that embrace learners of any age level and promote passion for orchids through education. We are seeking applicants engaging in a wide range of projects.

Requirements include an article featuring the project submitted for publication in *Orchids* magazine following completion, and a webinar about the project to be used for educational purposes. Multiyear projects are funded on an annual basis upon submission of a report due by March 14 on work from the previous year.

Application forms are available with instructions on the AOS website at [aos.org](https://www.aos.org). Use the All About Orchids menu and click on Education Grant Program, or contact the AOS Education Committee directly at [education\\_committee@aos.org](mailto:education_committee@aos.org) for an application or to answer any questions regarding the grants. If the project is also suitable for conservation or research grants, those applications must be submitted separately to the respective committees.

Good luck! — *Phyllis S. Prestia, EdD, Chair, AOS Education Committee.*

## CONSERVATION

All conservation-oriented projects, anywhere in the world, will be considered. An institutional affiliation is required for administration of international grants. We are seeking applicants engaging in a wide range of projects that study, protect or restore orchids and their natural habitats. Conservation grants are intended to encourage a more practical, applied, hands-on approach. We require all projects to be reported on annually, and that an article featuring your project be submitted for publication in *Orchids* magazine within six months of completion. Multiyear projects are funded on an annual basis after a required satisfactory progress report has been submitted by March 14 on work

from the previous year. Applications must be submitted on the application form, which is available with instructions on the AOS website at <https://www.aos.org/about-us/orchid-conservation/grant-application.aspx>. Your grant may be more suited for either a research or education grant, which are also available, but those applications must be submitted separately to their respective committees. Please contact the Conservation Committee at [conservation\\_committee@aos.org](mailto:conservation_committee@aos.org) with any questions in advance of the February 1, 2022 deadline. All applicants will be notified of their acceptance status by May 1, 2022.

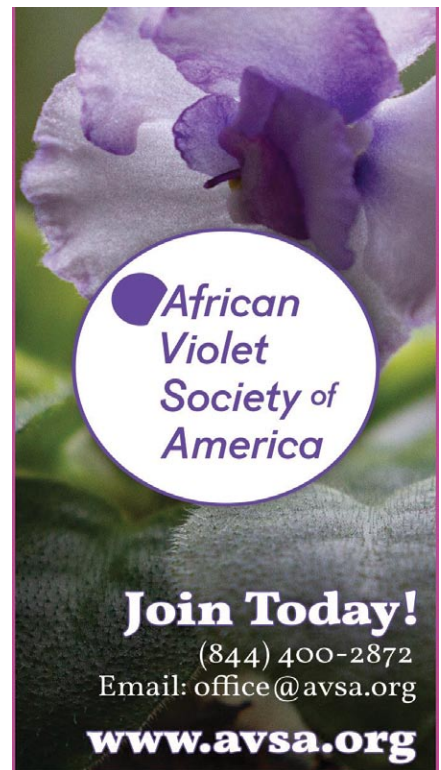
Good luck! — *Charles Wilson, Chair, AOS Conservation Committee.*

## RESEARCH

All orchid research projects, anywhere in the world, will be considered. An institutional affiliation is required for administration of international grants. We are seeking applicants engaging in a wide range of research projects with a focus on orchids, such as anatomy, biogeography, conservation science, development, ecology, evolution, genetics, horticulture, morphology, physiology, propagation, systematics and so on. We require all projects to be reported on annually, and that an article featuring your project be submitted for publication in *Orchids* magazine within six months of completion. Multiyear projects are funded on an annual basis when a satisfactory progress report on work from the previous year is submitted by March 14. Applications must be submitted on the application form, which is available with instructions

on the AOS website at <https://www.aos.org/about-us/orchid-research/application-guidelines.aspx>. Your grant may be more suited for a conservation or education grant, which are also available, but applications for these must be submitted separately to their respective committees. Please contact the Research Committee at [research\\_committee@aos.org](mailto:research_committee@aos.org) with any questions in advance of the February 1, 2022 deadline. All applicants will be notified of their acceptance status by May 1, 2022.

Good luck! — *Robert J. Griesbach, PhD, Chair, AOS Research Committee.*



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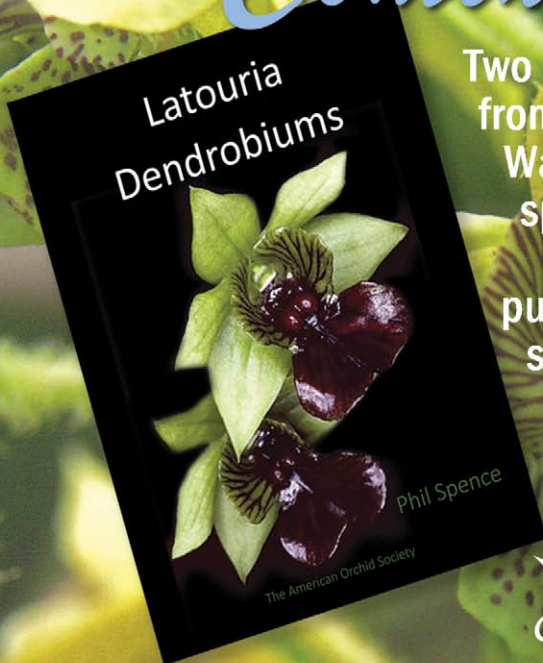


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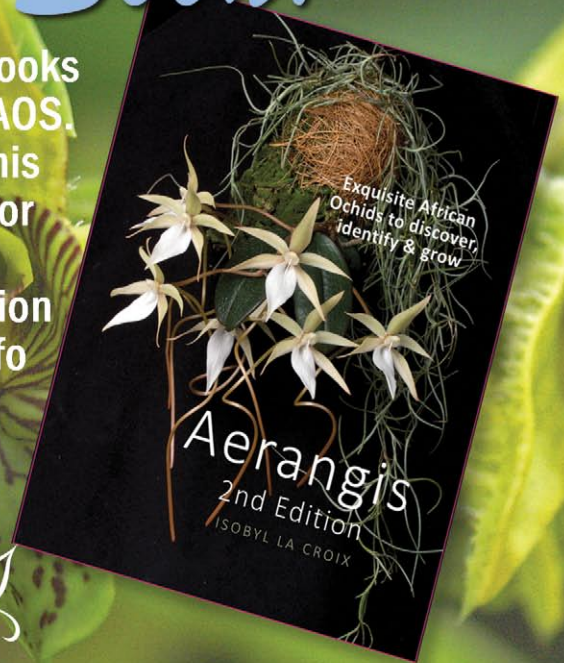
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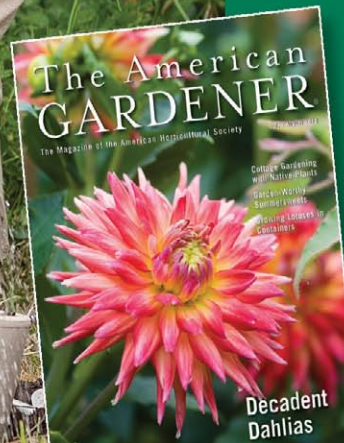
# Coming Soon!



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Sylvia Strigari

# *Vanilla costaricensis*

Text by Adam Karremans/Watercolor by Sylvia Strigari

Subfamily VANILLOIDEAE  
 Tribe VANILLEAE  
 Genus VANILLA Plum. ex Mill.

*Vanilla costaricensis* Soto Arenas, *Lankesteriana* 9:297. 2010. TYPE: Costa Rica. Alajuela: Llanura de San Carlos. Alt. 200 m., Feb. 20, 1966. Lip white, tepals same green as leaves; vine. Lowland rainforest between Los Chiles and Venecia. A. Molina R., L.O. Williams, W.C. Burger & B. Wallenta 17565 (holotype, CR-062310; isotype, MO-2367689).

An hemiepiphytic herb, leafy vine, up to several meters long. Stems branching, terete, fleshy; internodes 15.8–19.8 cm long. Aerial roots velamentous, semicylindric, one per internode emerging opposite the leaf. Leaves subsessile; blade elliptic, acuminate, membranaceous to chartaceous, 30–34 × 13–17 cm. Inflorescence lateral, similar to the vegetative shoot, axillary, erect, racemose, up to 25 cm long, with successive flowers, 1–3-opened simultaneously; rachis terete, internodes up to 4–5 cm long. Floral bracts similar to the leaves in shape, sessile, membranaceous, basal ones 13–14 × 6–7 cm, shorter apically. Ovary (plus pedicel) terete, 5–6 cm long, 6 mm in diameter, curved. Flowers with ovary dark green, sepals and petals pale green, lip white, elevated veins at the base yellow, turning salmon pink below the middle, apical callus yellow, column white; sepal and petal margins conspicuously reflexed and undulate, apically recurved. Dorsal sepal narrowly elliptic, acute, 4.3 × 1.4 cm. Lateral sepals narrowly elliptic to oblanceolate, acute, 3.9–4.1 × 1.4 cm. Petals narrowly elliptic, acute, 3.6–3.8 × 1.2 cm. Lip fused to the column base, slightly arcuate, forming a tube around the column; when spread out 3.1–3.2 × 2.8 cm; the blade quadrate-suborbicular, entire, inconspicuously trilobed apically, lobes overlapping into a more or less straight, truncate apex, base rounded, margins undulate above the middle; with a pair of large, elevated keels, born at the base and ending in the apical third, veins conspicuously branched and elevated at the base, with a central longitudinal

papillose callus born on the apical third, above the large keels. Column subterete, slightly bent, 1.9 cm, wider at the apex, clinandrium with undulate margins. Rostellum oblong. Anther subquadrate, attached to the clinandrium, and forming together with it, a couple of lateral horn-shaped projections. Pollinia two, soft, sticky granular masses. Fruit cylindric, attenuate at both ends, nonaromatic, dehiscent while on the vine, two halves becoming coiled and exposing the rounded black seeds.

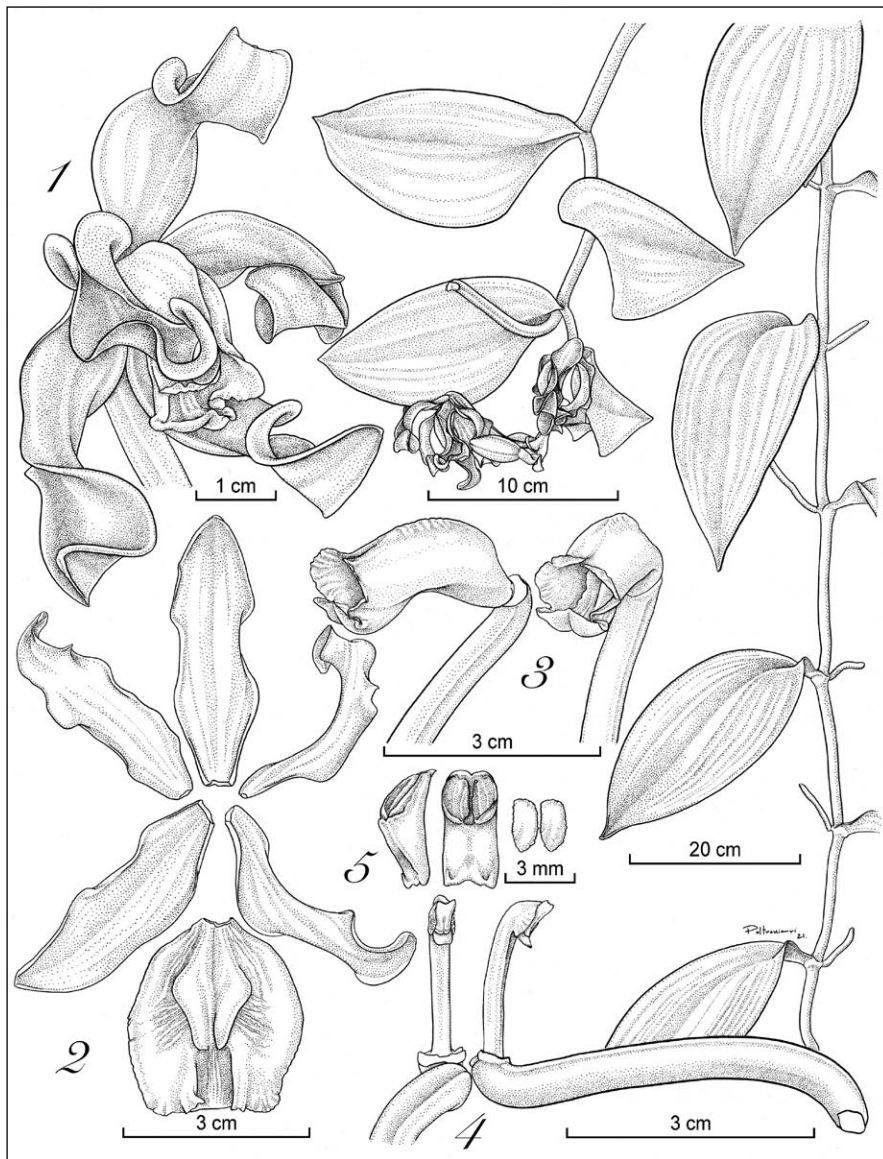
The pantropical genus *Vanilla* Plumier ex Miller is probably the most well-known and widely appreciated of all orchids thanks to the famous flavoring found in its fruits. Not all *Vanilla* species have fragrant fruits, in fact the precious compound vanillin, which gives them their characteristic aroma, is only present in certain Neotropical species native to tropical North America, Central America and South America, where they are mainly found in the extremely humid and warm lowlands. Today the genus includes about 118 species, 62 of those are Neotropical and 38 of those, the members of *Vanilla* sect. *Xanata* Soto Arenas & P.J.Cribb, bear fragrant fruits (Karremans et al. 2020). Among the non-fragrant *Vanilla* species in the Neotropics are the 18 species that have been classified in *Vanilla* subgen. *Vanilla*, and are commonly known as the so-called membranaceous group. Members of *Vanilla* subgen. *Vanilla* feature plants with large membranaceous leaves, flowers with undulate, green sepals and petals, and a white lip, the column is relatively short, bent to arcuate, and the lip lacks the prominent penicillate callus found in the fragrant species of *Vanilla* sect. *Xanata*.

There are four species of membranaceous *Vanilla* native to Costa Rica, and among them *Vi. costaricensis* is one of the least frequent. The species was first illustrated by Rafael Lucas Rodríguez in 1986, but remained nameless for more than two decades. Despite the large size of the plant, notable inflorescence and flowers, it escaped formal recognition until 2010 when it was described by Miguel

Soto Arenas on the basis of a couple of collections made in the San Carlos lowlands in the Northern plains of Costa Rica in the 1960s (Soto Arenas & Dressler 2010). Today we know of relatively large, healthy populations of *Vi. costaricensis* around the Laguna de Hule in Sarapiquí and La Alegría in Siquirres, both on the Caribbean lowlands.

One of the most unusual features of *Vi. costaricensis* is the elongate, slowly successive inflorescence which bears very large foliaceous bracts. The odd inflorescence resembles a stem and may in fact become very much branched (Karremans et al. 2020). Soto Arenas & Dressler (2010) compared *Vi. costaricensis* with the Ecuadorian endemic *Vanilla oroana* Dodson, another rare species. The inflorescence and flower morphology was said to be very similar, but *Vi. oroana* has a longer, relatively narrower, trilobed non-truncate lip, and the surface of the lateral, basal part is minute, and conspicuously more sculptured than in *Vi. costaricensis*. Another similar species is the recently described Peruvian endemic *Vanilla armoriquensis* Damian & Mitidieri. The latter shares the membranaceous leaves, foliaceous floral bracts, and general flower morphology, but is easily distinguished by the larger sepals and petals (5.2–5.5 × 1.0–1.3 cm vs. 3.5–4.1 × 0.9–1.1 cm), and especially the narrower lip callus and a well-developed triangular-acuminate keeled apex (vs. lip with a truncate apex). *Vanilla armoriquensis* is a cloud forest species growing at around 1,700 m in elevation. Membranaceous *Vanilla* species are very poorly understood, unlike other vanillas they are very difficult to reproduce vegetatively and do not do well in cultivation. There are only a handful of species with foliaceous bracts recognized today and they all have relatively restricted distributions, but many remain underrepresented and undetermined in herbaria and other collections.

Not much is known about the ecology of *Vi. costaricensis* and other members of *Vanilla* subgen. *Vanilla*. Pollination data is only available for one membranaceous



*Vanilla costaricensis*. The plant.

- [1] Flower.
- [2] Dissected perianth.
- [3] Apex of ovary and lip, lateral and three-quarters views.
- [4] Ovary and column, ventral and lateral views.
- [5] Anther cap and pollinia.

All drawn from A.P. Karremans et al. 7308 by Sara Poltronieri.

*Vanilla* species, *Vanilla edwallii* Hoehne from Brazil. Pansarin et al. (2014) showed that species to be pollinated by a bee of the genus *Epicharis* (Apidae: Centridini), possibly through food deception. The flowers of other members of *Vanilla* subgen. *Vanilla* are morphologically similar to those of *Vl. edwallii*, but it remains to be shown if they are pollinated in the same manner. The fragrant *Vanilla* species belonging to section *Xanata*, on the other hand, have been shown to be pollinated by Euglossine bees (Lubinsky et al. 2006; Householder et al. 2010; Soto Arenas & Dressler 2010; Pansarin & Pansarin 2014; Anjos et al. 2017). Exciting ongoing studies show for the first time that some species, including *Vanilla pompona* Schiede, are nectarless but offer floral fragrances that the male Euglossine bees collect (Watteyn et al. 2021), while others, such as *Vanilla hartii* Rolfe, provide copious amounts of nectar as reward (Watteyn et al. in

prep.).

Like other members of *Vanilla* subgen. *Vanilla*, the fruits of *Vl. costaricensis* are odorless to our nose. However, they are extremely long and thick, green and cylindrical until they become fully mature, at which point they will become longitudinally dehiscent, splitting into two coiling segments and exposing the black, rounded seeds. It is currently unknown how the seeds of this species disperse, but it is likely to be animal-mediated. Unpublished ongoing studies on *Vanilla odorata* C.Presl, *Vanilla planifolia* Andrews and *Vl. pompona* Schiede in Costa Rica show that bees and rodents are responsible for their natural seed dispersal through endozoochory and ectozoochory (Karremans 2019a, 2019b). Field observations of *Vanilla costaricensis* have unfortunately not been fruitful yet, and the dispersal of seeds of non-fragrant *Vanilla* species still remains a mystery.

#### References

- Anjos, A.M., F.F.V.A. Barberena and C.M. Pigozzo. 2017. Biología Reproductiva de *Vanilla bahiana* Hoehne (Orchidaceae). *Orquidario* 30(3/4):67–79.
- Damian, A. and N. Mitidieri. 2020. Living in the Clouds: A New High-Elevation Species of *Vanilla* (Orchidaceae, Vanilloideae) from Perú. *Phytotaxa* 451(2):154–160.
- Householder, E., J. Janovec, A. Balarezo Mozambique, J. Huinga Maceda, J. Wells and R. Valega. 2010. Diversity, Natural History, and Conservation of *Vanilla* (Orchidaceae) in Amazonian Wetlands of Madre de Dios, Perú. *Journal of the Botanical Research Institute of Texas* 4(1):227–243.
- Karremans, A.P. 2019a. Irresistiblemente fragante: la Misteriosa Ecología de *Vanilla*. Charla presentada el 8 de Agosto 2019 en el marco de la VI Conferencia Científica de Orquídeas Andinas, Medellín, Colombia.
- \_. 2019b. Irresistiblemente fragante: la misteriosa ecología de *Vanilla*. Charla presentada el 21 de Noviembre 2019 en el marco de el Quinto Encuentro Mexicano de Orquideología, Mérida, Yucatán, México.
- Karremans, A.P., I.F. Chinchilla, G. Rojas-Alvarado, M. Cedeño-Fonseca, A. Damián and G. Léotard. 2020. A Reappraisal of Neotropical *Vanilla* with a Note on Taxonomic Inflation and the Importance of Alpha Taxonomy in Biological Studies. *Lankesteriana* 20(3):395–497.
- Lubinsky, P., M. Van Dam and A. Van Dam. 2006. Pollination of *Vanilla* and Evolution in Orchidaceae. *Orchids* 75(12):926–929.
- Pansarin, E.R., J.M.R.B.V. Aguiar and L.M. Pansarin. 2013. Floral Biology and Histochemical Analysis of *Vanilla edwallii* Hoehne (Orchidaceae: Vanilloideae): an Orchid Pollinated by *Epicharis* (Apidae: Centridini). *Plant Species Biology* doi: 10.1111/1442-1984.12014.
- Pansarin, E.R. and L.M. Pansarin. 2014. Floral Biology of two Vanilloideae (Orchidaceae) Primarily Adapted to Pollination by Euglossine Bees. *Plant Biology* 16(6):1104–1113.
- Soto Arenas, M.A. and R.L. Dressler. 2010. A Revision of the Mexican and Central American Species of *Vanilla* Plumier ex Miller with a Characterization of Their ITS Region of the Nuclear Ribosomal DNA. *Lankesteriana* 9:285–354. <https://doi.org/10.15517/lank.v0i0.12065>
- Watteyn, C., D. Scaccabarozzi, B. Muys, N. van der Schueren, K. van Meerbeek, M.F. Guizar Amador, J.D. Ackerman, M. Cedeño Fonseca, I.F. Chinchilla, B. Reubens, R. Pilco Huaracaya, S. Cozzolino, and A.P. Karremans. 2021. Trick or Treat? Pollinator Attraction in *Vanilla pompona* (Orchidaceae) Based on Fragrance Reward and Food Deception. *BioRxiv* <http://doi.org/10.1101/2021.08.30.458254>



## Selected Botanical Terms

acuminate – tapering to a long point  
 acute – pointed  
 apical – at or from the top  
 arcuate – bow-shaped; curved  
 axillary – arising from the juncture of leaf and stem  
 attenuate – gradually tapered  
 bract – modified or specialized leaf  
 callus – thickened tissue on the lip  
 chartaceous – papery  
 clinandrium – cavity which houses the orchid's anther  
 dehiscent – spontaneous splitting open; as in the capsule of an orchid  
 dorsal surface – upper surface  
 ectozoochory – seed dispersal via the fur or skin of an animal  
 elliptic – oval  
 endozoochory – seed dispersal via the gut of an animal  
 epiphyte – a plant that uses another plant as a means of support  
 foliaceous – leaflike  
 hemiepiphyte – germinating as a terrestrial plant, climbing a suitable host and becoming epiphytic, often shedding the terrestrial root system  
 internode – section of rhizome or stem

between nodes  
 keel – thickened area(s) on the lip of an orchid  
 lanceolate – narrow oval tapering to a point at each end  
 membranaceous – thin; like a membrane  
 ob – prefix meaning inverted; for example obcordate is a heart-shaped structure with the pointed end of the heart uppermost.  
 obtuse – blunt  
 orbicular – round  
 pan – being found throughout; for example, pantropical means being found throughout the world's tropical zones  
 papillose – covered in small, nipple-like projections  
 pedicel – a stalk attaching the flower to the inflorescence  
 peduncle – the part of an inflorescence before the rachis or section to which the flowers are attached  
 penicillate – having tufts of fine hairs  
 petiole – stem joining leaf to stem; leafstalk  
 quadrate – four-sided

racemose – an inflorescence that continues to elongate producing flowers and does not terminate in a floral bud  
 rachis – the portion of the inflorescence to which the flowers are attached  
 recurved – bent or rolled backward along the axis  
 reflexed – bent or folded back  
 rostellum – the structure of an orchid that carries the glands to which pollinia are attached  
 semi – half; also as a prefix to mean more or less.  
 sessile – joined directly without a stalk  
 sub – somewhat less than; i.e., subspherical would refer to almost but not quite a sphere  
 subtend – beneath or close to as in subtended by a bract.  
 terete – cylindrical or pencil-shaped  
 trilobate – three-lobed  
 truncate – abruptly cut off or terminated  
 viscidium – sticky pad to which the pollinia are attached

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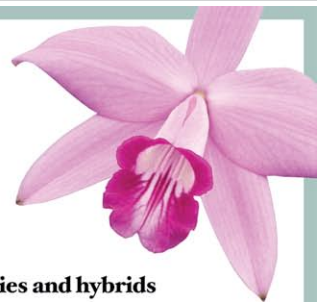


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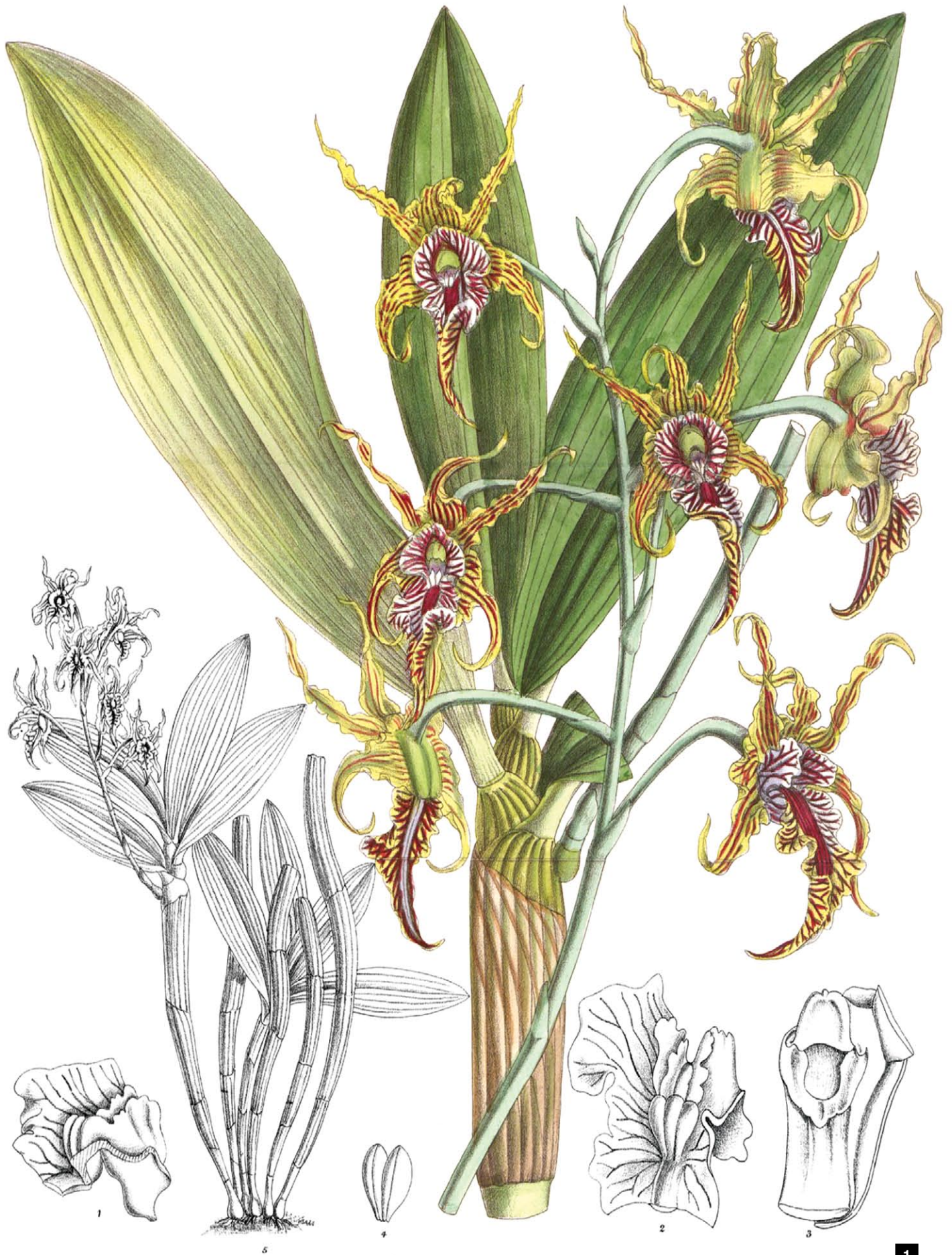


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# *Dendrobium* section *Latouria* by Wesley Higgins and Peggy Alrich

Australia



## SECTION LATOURIA

*DENDROBIUM* SECT. *LATOURIA* was proposed by Rudolf Schlechter in *Nachträge zur Flora der deutschen Schutzgebiete in der Südsee: mit Ausschluss Samoa's und der Karolinen*. Leipzig (1905). The section was based on Blume's illegitimate name *Latourea* (1849).

The 53 species in section *Latouria* are primarily found in New Guinea, although some species are found in the Philippines and Samoa. The plants are predominantly epiphytic in lowland and montane forest, but also terrestrial in subalpine grasslands. They grow from sea level to 6,390-foot (1,950-m) elevation, in areas of high, year-round rainfall. Plants range in size from very small to very large. The flowers are long lasting, usually white, yellow, or green with black or purple markings on the inner surfaces; they also range in size.

Section *Latouria* is characterized by the club-shaped pseudobulbs, some short, others elongated and slender. Leaves are carried toward the apex of the cane and do not have sheathing at their

bases. The nearly terminal, few-flowered inflorescences carry flowers that are somewhat fleshy and have a prominent three-lobed lip with a raised callus. Some species in this group have flowers where the back of the sepals and petals are better marked than their front surfaces.

**DESCRIPTION** Rhizome short. Pseudobulbs clustered, short to elongated, canelike or clavate to fusiform or almost spherical, with limited apical growth, not branching, often very narrow at the base; apical part 1–10 leaved. Leaves usually coriaceous, glabrous; leaf sheath absent. Inflorescences subterminal or lateral, mainly on the upper part of the stem, racemose, elongate, erect or arching, one to many flowered. Flowers long lived, fleshy, medium sized to large, resupinate, often showy, sometimes fragrant. Ovary sometimes hairy. Sepals not connate, sometimes hairy outside; mentum chinlike, short. Petals often broad. Lip mobile on the apex of the column foot, entire or trilobed, usually with high fleshy calli or keels.

Phylogenetically, sections *Spatulata*,

*Latouria*, *Grastidium*, *Diplocaulobium* and *Cadetia* form a polytomy. The presence of polytomies in these analyses provides firm evidence against forming additional genera. All these entities should be considered at the rank of sections. Nomenclatural stability is retained in continuing to use the long-held subgeneric sectional classification, including many of the sections of Schlechter, and infraspecific ranks of subspecies and varieties (Adams 2011).

**CULTURE** Provide high humidity, a minimum temperature of warm to intermediate to cool, depending on the species, and generally bright, filtered light. The plants should not be allowed to dry for long periods. *Latourias* prefer to be underpotted, in either a bark-based mix or New Zealand sphagnum moss. Coconut husk also works well.

### REFERENCE

Adams, P.B. 2011. Systematics of Dendrobiinae (Orchidaceae), with Special Reference to Australian Taxa. *Botanical Journal of the Linnean Society* 166(2):105–126.



Nr. 623. *Dendrobium spectabile*. (Bl.) Miq.

2



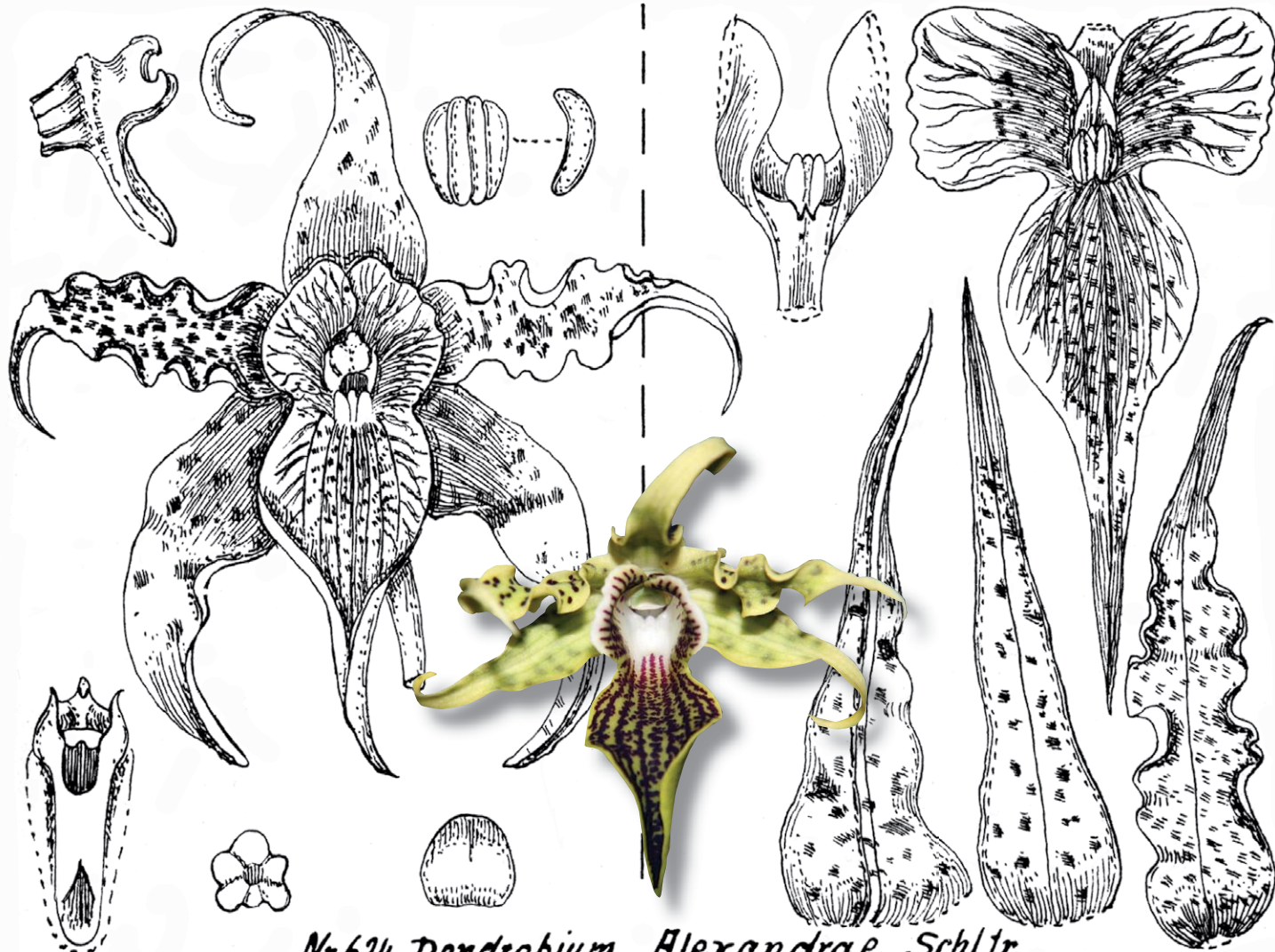
DENDROBIUM SPECTABILE, Miq.

# Dendrobium

## ANTIQUÉ PLATES

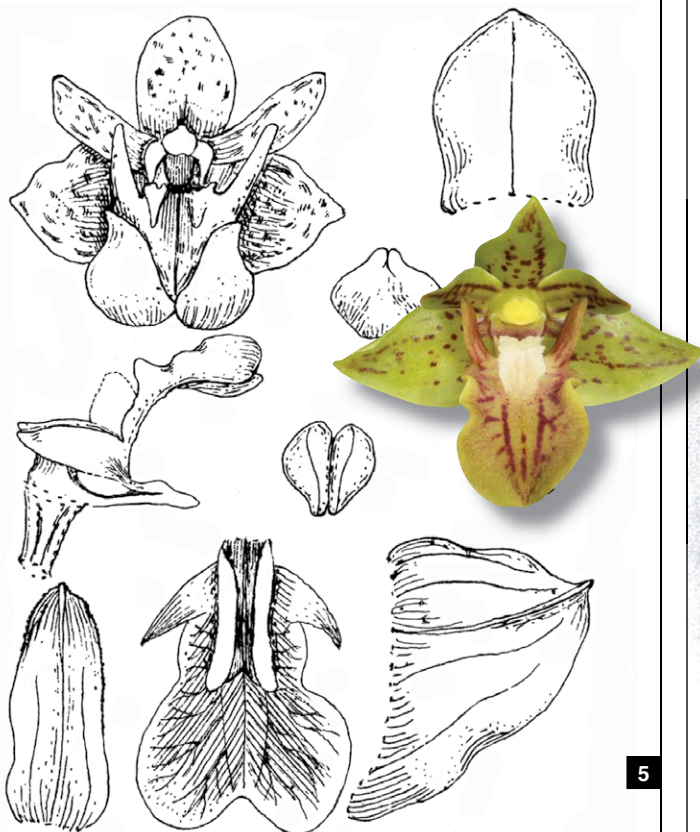
- [1] *Dendrobium spectabile*, *Botanical Magazine* 126: t.7747 (1900).
- [2] *Dendrobium spectabile*, *Orchidaceen von Deutsch-Neu-Guinea, Figuren-Atlas, Repertorium Specierum Novarum Regni Vegetabilis, Beihefte* 21: t.166, f.623 (1923).
- [3] *Dendrobium spectabile*, *Dictionnaire Iconographique des Orchidées* 5:t.22 (1900).
- [4] *Dendrobium alexandrae*, *Orchidaceen von Deutsch-Neu-Guinea, Figuren-Atlas, Repertorium Specierum Novarum Regni Vegetabilis, Beihefte* 21: t.168, f.624 (1923).
- [5] *Dendrobium bifalce*, *Orchidaceen von Deutsch-Neu-Guinea, Figuren-Atlas, Repertorium Specierum Novarum Regni Vegetabilis, Beihefte* 21: t.165, f.617 (1923).
- [6] *Dendrobium atrovioleaceum*, *Lindenia* 11: t.513 (1895).

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Nr. 624. *Dendrobium Alexandrae*. Schltr.

4

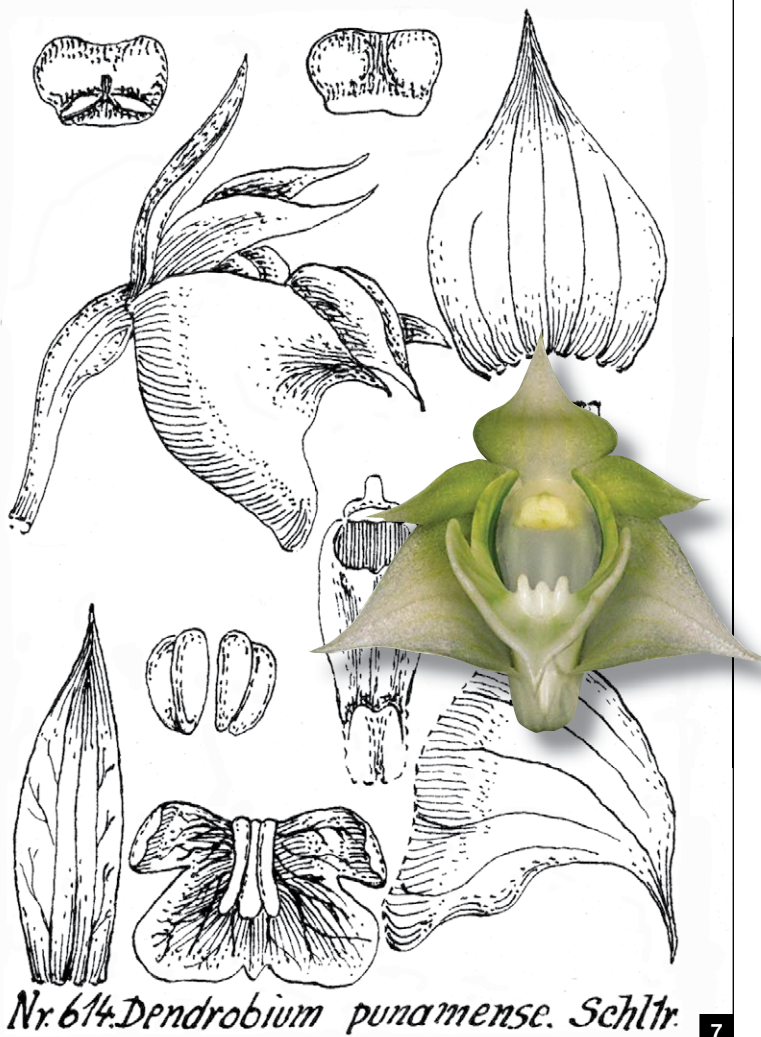


Nr. 611. *Dendrobium bifalce*. Ldl.

5

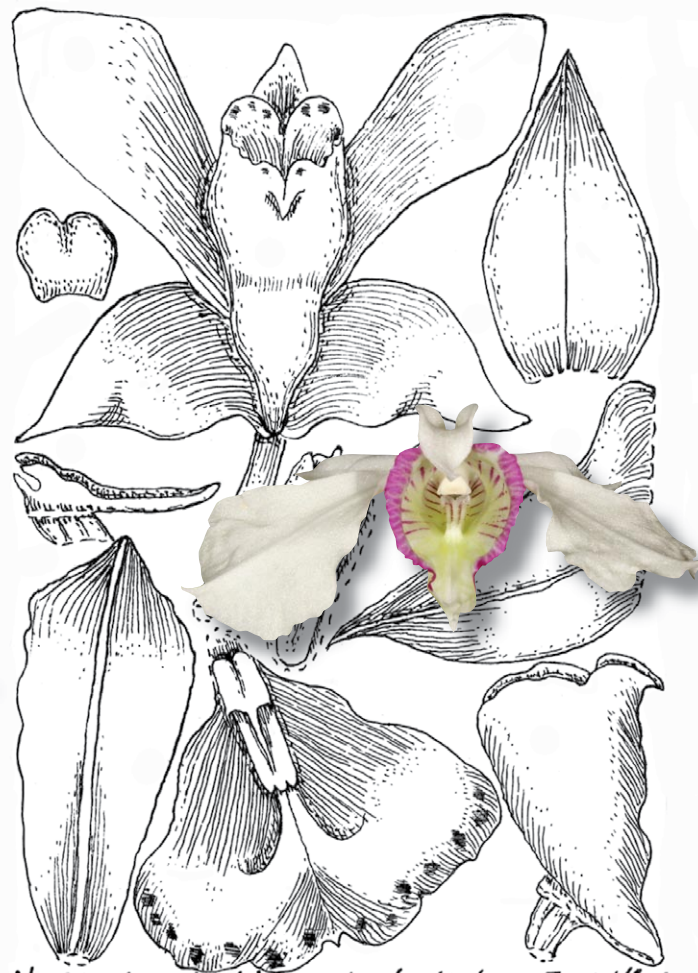


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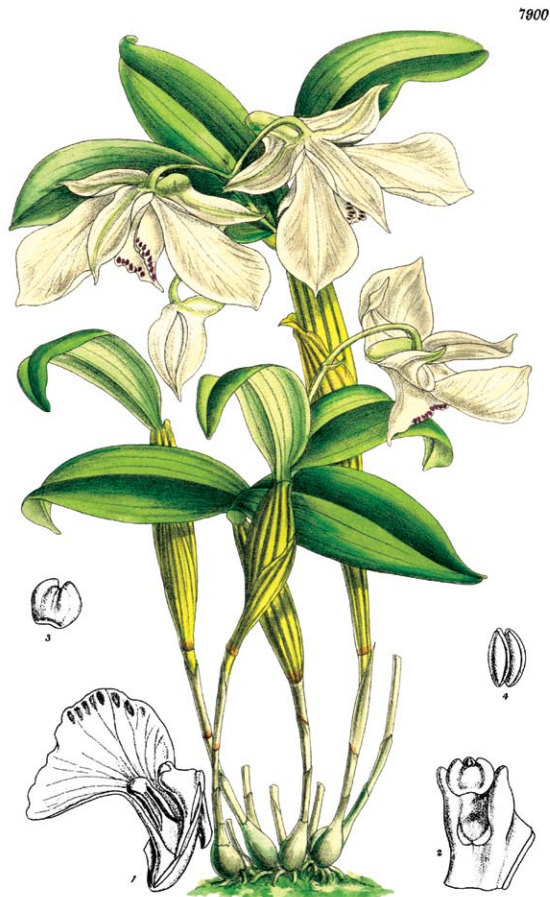
Nr. 614. *Dendrobium punamense*. Schltr.

7



Nr. 621. *Dendrobium rhodostictum*. F.v. Met. Kretz.

8



M.S. del. J.N. Pitsch lit.

Vincent Brooks, Day & Son Lith.

9

# Dendrobium

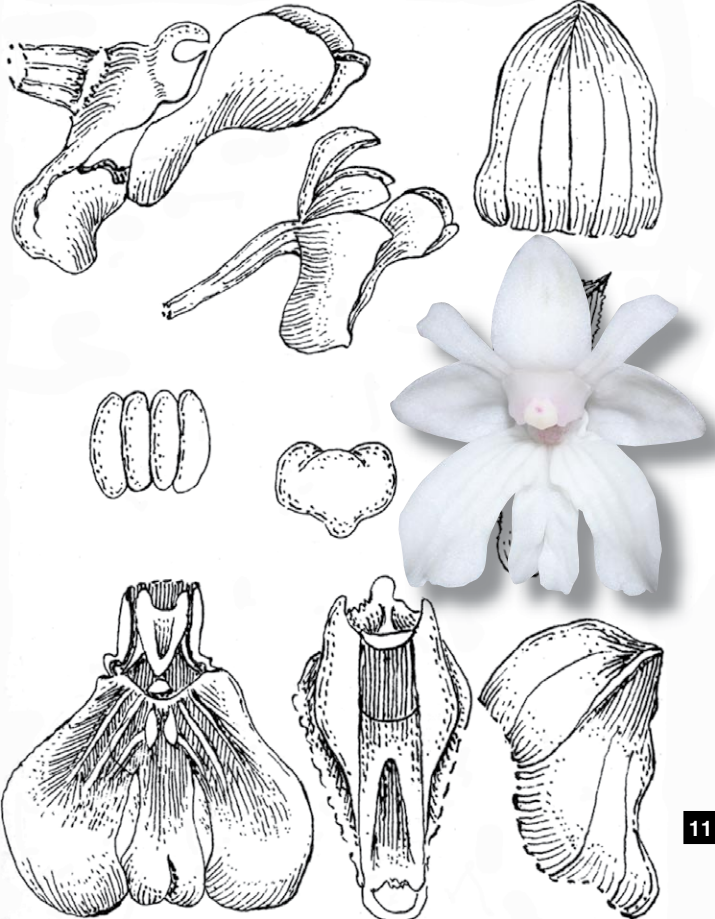
## ANTIQUE PLATES

- [7] *Dendrobium punamense*, Orchidaceen von Deutsch-Neu-Guinea, Figuren-Atlas, *Repertorium Specierum Novarum Regni Vegetabilis*, Beihefte 21: t. 164, f. 614 (1923).
- [8] *Dendrobium rhodostictum*, Orchidaceen von Deutsch-Neu-Guinea, Figuren-Atlas, *Repertorium Specierum Novarum Regni Vegetabilis*, Beihefte 21: t. 167, f. 621 (1923).
- [9] *Dendrobium rhodostictum* as *Dendrobium madonnae*, Botanical Magazine, 129: t. 7900 (1903).
- [10] *Dendrobium finisterre*, Orchidaceen von Deutsch-Neu-Guinea, Figuren-Atlas, *Repertorium Specierum Novarum Regni Vegetabilis*, Beihefte 21: t. 168, f. 626 (1923).
- [11] *Dendrobium aberrans*, Orchidaceen von Deutsch-Neu-Guinea, Figuren-Atlas, *Repertorium Specierum Novarum Regni Vegetabilis*, Beihefte 21: t. 163, f. 609 (1923).
- [12] *Dendrobium macrophyllum*, L'illustration Horticole, 35: t. 57 (1888).



Nr. 626. *Dendrobium Finisterrae*. Schltr.

10



Nr. 609 *Dendrobium aberrans*. Schltr.

11

L'ILLUSTRATION HORTICOLE

LXVII



12

DENDROBIUM MACROPHYLLUM A. RICH.

# Let There be Light

## Part 4: Setting up your LED Bar Lights — How High, How Far Apart and How Many You Need

TEXT AND PHOTOGRAPH BY KELLY MCCrackEN

THIS IS THE fourth in a five-part series of articles intended to be an introduction to growing orchids under artificial light. As discussed in my previous article “An Introduction to PAR, PPF, and Why You Should Forget Lumens,” artificial light can be deceptively bright (or dim) to our eyes. As it turns out, light fixtures do not provide an even level of light coverage to all areas they illuminate. This is not always a negative, as home growers tend to grow a hodgepodge of different plants, often with many different lighting requirements. Understanding these dimmer and brighter areas will allow you to make good use of the lighting microclimates produced by your fixtures.

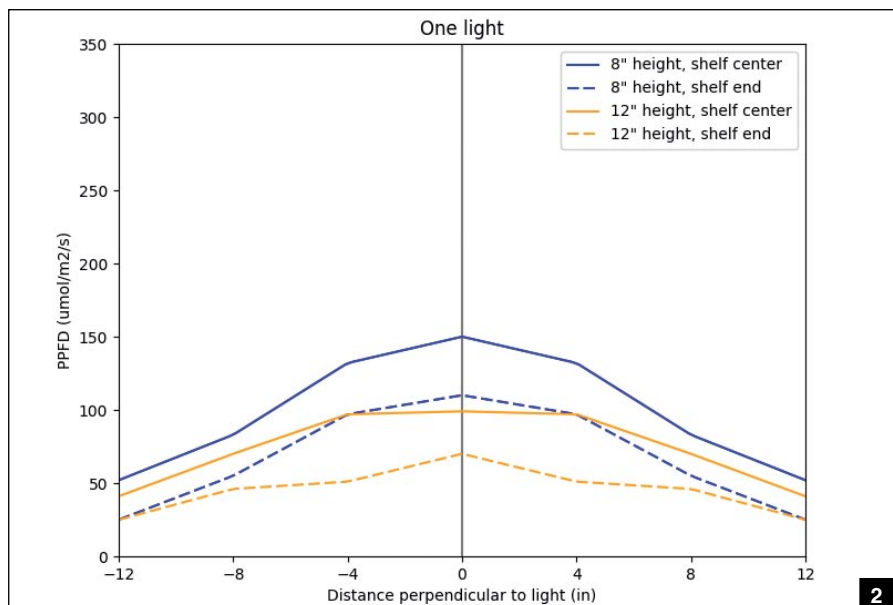
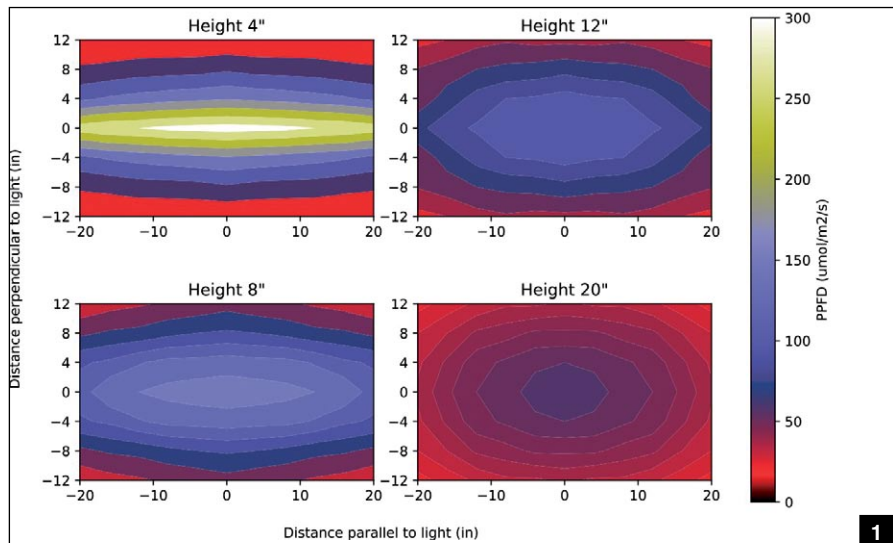
In this article, I will discuss how many lights you will need to properly illuminate a 4-foot (1.2-m) baker’s-rack-shelf growing space, how high above your plants to place the lights, and how far apart the lights should be, all based on the kinds of plants you want to grow.

For the purposes of this article, I looked at a bar LED lights. Many of my customers use them, and they are very easy to set up in a household environment. In particular, I tested the 4-foot (1.2-m), 42W Full-Spectrum V-Shape with Reflector Combo Light, manufactured by Barrina. They have good specs; they are full spectrum, affordable, have a reflector, and are about the brightness you would want to grow plants (i.e., they will not fry your houseplants like a cannabis grow light would). Barrina’s marketing materials also included a handy lighting diagram showing PPF at different distances from the light. This diagram can be viewed on their website, <https://barrina-led.com>.

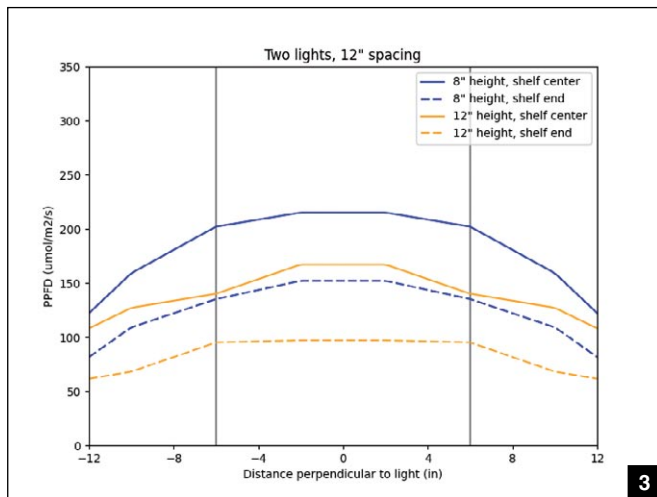
I had a few goals in mind when I started looking at these Barrina lights. First, I wanted to determine if the marketed PPF was accurate. Second, I wanted to map out the different brightness values produced by a single fixture. Lastly, I wanted to produce clear graphs plotting the brightness values at different distances and with different orientations and quantities of lights.

Distance from fixture (meter placed at center of the fixture, directly beneath: 0,0)	Measured PPF in $\mu\text{mol}/\text{m}^2/\text{s}$	Advertised PPF in $\mu\text{mol}/\text{m}^2/\text{s}$	Percent Difference
4 in (10 cm)	299	—	—
8 in (20 cm)	150	220	32
12 in (30 cm)	99	132.1	25
20 in (51 cm)	57	69.3	18

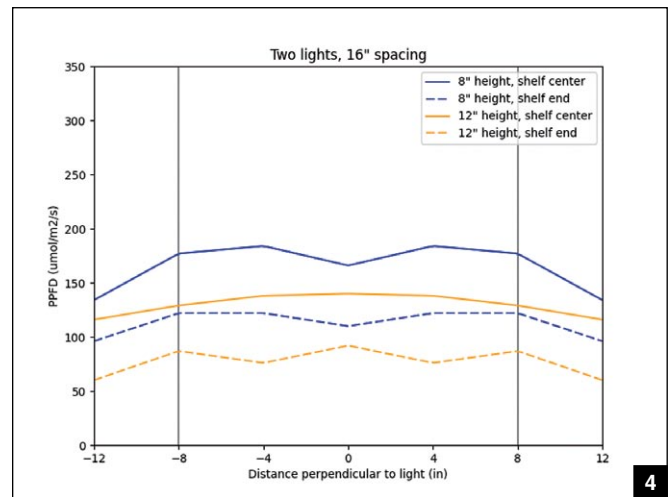
Table 1. Barrina lights measured at 0,0.







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Because my first goal was to determine whether the marketed PPF values were accurate, I set up an experiment to measure the brightness as it was illustrated by Barrina in their marketing materials. I set up my light exactly like Barrina's illustration: leveled at 20 inches (51 cm) above the ground. To facilitate accurate measurement, I put a 1-inch (2.5-cm) grid underneath and marked 0,0 with a sticker (illustrated by the blue dots in the illustration). Using my Apogee PAR meter, I took measurements every 4 inches (10.2 cm) going down the length of the fixture and perpendicular to the fixture. I then repeated the experiment at 12-inch (30.5 cm), 8-inch (20.3 cm) and 4-inch (10 cm) distances from the fixture.

My first goal was to determine if Barrina's marketing materials advertised PPF values were accurate. I found that the measured value varied from 18–32% less than the advertised value (Table 1). Unfortunately, but the results I got showed that there is still ample light to grow plants. (You can find a detailed guide to what I grow under what PPF in my article "Target PPF for Orchids and Houseplants.") I did email Barrina asking for an explanation as to why my results varied so much from theirs, and they simply stated that their experiment was done under laboratory conditions and offered no other explanation.

The second goal of the experiment was to determine the bright and dim spots produced by a single fixture. There were two significant findings after mapping out the light intensities. First, at a distance of 4 inches (10.2 cm) below the fixture, the light provided is intense for a narrow strip. Little light reaches outside of this strip. Second, no matter the distance, the intensity at the edges of the fixture was significantly less than

the intensity at the center of the fixture. The intensity peaked between 10,–10 at all distances.

My results favored using a distance of 8 inches (20.3 cm), or 12 inches (30.5 cm) for most even light distribution. Measurements taken at 4 inches (10.2 cm) showed that the light was too intense and narrow for growing plants, and at 20 inches (50.8 cm) there was too little light for growing most plants. Therefore, as I continued with my experiment, I looked only at the 8-inch (20.3-cm) and 12-inch (30.5-cm) distances.

Notice the slice plot of one light with 8-inch (20.3-cm) and 12-inch (30.5-cm) distances. The graph plots the light distribution of a single fixture as if you are looking down the length of the light. The solid lines are the measurements taken at the middle of the fixture, and the dotted lines are the measurements taken at the end of the fixture. The placements of the fixtures are marked with the gray line in all subsequent figures.

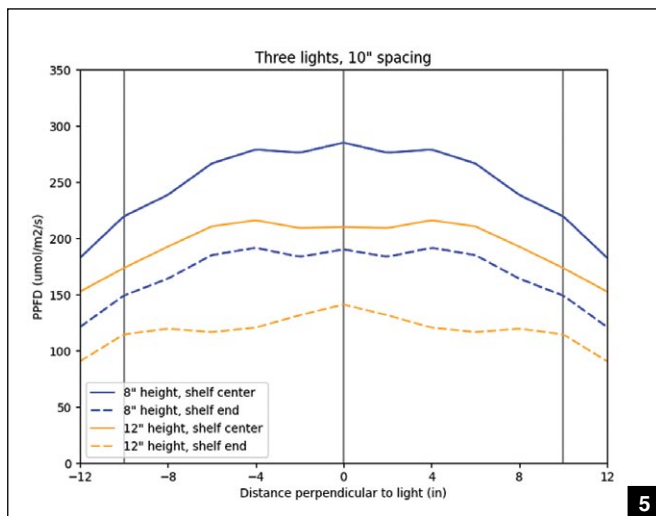
Looking at the light plotted like this gives us a new perspective — a perpendicular orientation. It clearly shows the sharp peak and subsequent drop-off of the light's brightness. With a 4-foot (1.2-m) Barrina LED light at 8 inch (20.3 cm) distance, you would have a space of approximately 6 × 20 inches (15.2 × 50.8 cm) of even light at about 140  $\mu\text{mol}/\text{m}^2/\text{s}$ . The 140  $\mu\text{mol}/\text{m}^2/\text{s}$  is enough light to grow some miniature cattleyas, some paphs, brighter-growing phalaenopsis and others. The space outside of this 6 × 20-inch 15.2 × 50.8-cm) area would be much darker, but the area would be suitable to growing *Maudia*-type paphiopedilums, phalaenopsis and other low-light plants. A home grower can definitely make a single-light setup work, but for more even lighting distribution, as

- [1] Barrina 4-ft (1.2-m) 42W Full-Spectrum V-Shape with Reflector Combo LED light intensity distribution.
- [2] Light intensity perpendicular to one bulb as a function of distance from the bulb.
- [3] Light intensity perpendicular to two bulbs placed 12 inches (30.5 cm) apart.
- [4] Light intensity perpendicular to two bulbs placed 16 inches (40.6 cm) apart.

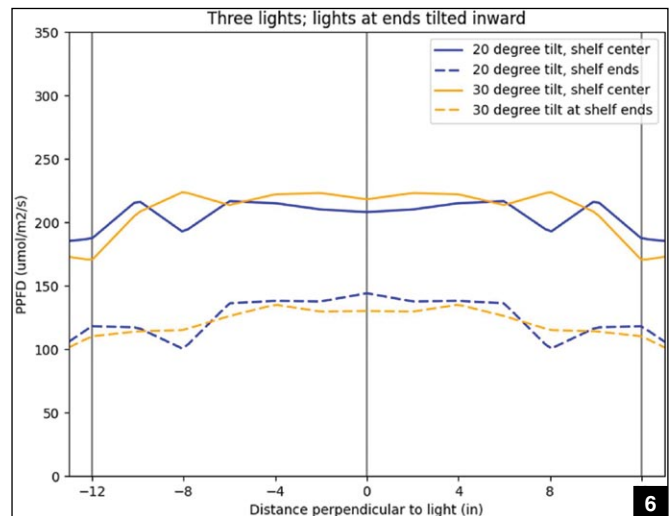
well as overall brighter light, more lights must be added.

The next example looks at what the lighting distribution would be if the lights were on a shelf, placed 12 inches (30.5 cm) apart. As you can see, this double-light configuration really increases the amount of evenly lighted, perpendicular space that a home grower can take advantage of. Whereas previously, we only had a few inches of the brightest light, we now have a width of 12 inches (30.5 cm), doubling that of a single-light setup. The overall brightness of the center region has also increased. At a distance of 8 inches (20.3 cm), the lights emit a total of 200  $\mu\text{mol}/\text{m}^2/\text{s}$ , allowing for brighter-growing plants. With these levels, you could grow strap-leaved paphiopedilums, some dendrobium species, miniature cattleyas, and many other medium-bright-growing plants.

The next example looks at two lights, 16 inches (40.6 cm) apart. At a distance of 8 inches (20.3 cm), this setup is not optimal, because there is a fairly big dip in the middle. At a 12-inch (30.5-cm) distance, you have a wonderfully even light distribution in the center and at the edges. At 115  $\mu\text{mol}/\text{m}^2/\text{s}$  (which is achieved at a distance of 12 inches [30.5 cm] from the fixture along the middle), you can grow brighter-growing paphiopedilums, maybe enough



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for phragmipediums, some smaller dendrobiums or miniature cattleyas. The light at the ends of the fixture would be enough for phalaenopsis, jewel orchids, Maudiae-type paphiopedilums, but not much else.

To grow bright-light plants such as cattleyas, ascocenda-type vandas, standard vandas and brassavolas (totally doable under artificial light), you will need to add a third light. The next example looks at just that.

At a distance of 8 inches (20.3 cm) from the fixture, we have the brightest light. Measuring around  $275 \mu\text{mol}/\text{m}^2/\text{s}$ , you can grow brighter-light loving plants such as standard cattleyas, vandas and brassavolas. But we are again limited in the amount of perpendicular space in which the light is brightest. At the edges, we get values of about  $175 \mu\text{mol}/\text{m}^2/\text{s}$ , plenty of light for brighter-growing paphiopedilums, dendrobiums, miniature cattleyas, many angraecoids and oncidium-intergeneric hybrids. A three-light setup is ideal if you are growing the brightest, but still not perfect.

I was still not happy with the lighting distribution. I wanted to see a flat line across the entire perpendicular space of the shelf. The solution turned out to be tilting the bulbs slightly inward. Figure 6 shows the results of tilting the two outer bulbs at 20 and 30 degrees. The center bulb is pointing straight down. Finally, there is a flat, mostly even line across the entire perpendicular plane.

**It should be noted that these distances are all measured from the top of your plant canopy, and not the distance from the bottom of your shelf.** A height of 8–12 inches (20.3–30.5 cm) above your plant canopy leaves plenty of room for spikes to grow but might not be enough for those very tall-spike-growing



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phragmipediums, paphiopedilums and the like.

— Kelly McCracken is the owner of High Desert Orchids in Albuquerque, New Mexico. She is an avid grower, breeder and seller of orchids. Currently, she is growing in a 3,000-square-foot high bay warehouse space all under artificial light. Kelly also does orchid society talks on lighting and other orchid-related topics. You can email her at [kelly@highdesertorchids.com](mailto:kelly@highdesertorchids.com), visit her website [highdesertorchids.com](http://highdesertorchids.com) or follow her on Instagram at [@hdorchids](https://www.instagram.com/hdorchids).

[5] Light intensity perpendicular to three bulbs placed 10 inches (25.4 cm) apart.

[6] Light intensity perpendicular to three bulbs placed 10 inches (25.4 cm) apart as a function of bulb tilt.

[7] *Rhyncholaeliocattleya* Love Spirit bloomed under LED lights at  $250 \mu\text{mol}/\text{m}^2/\text{s}$  under a 12-hour photoperiod

# *Cattleya quadricolor*

## The Cattleya of the Dry Forest

TEXT AND PHOTOGRAPHS, UNLESS OTHERWISE CREDITED, BY SEBASTIAN AGUIRRE VALLEJO

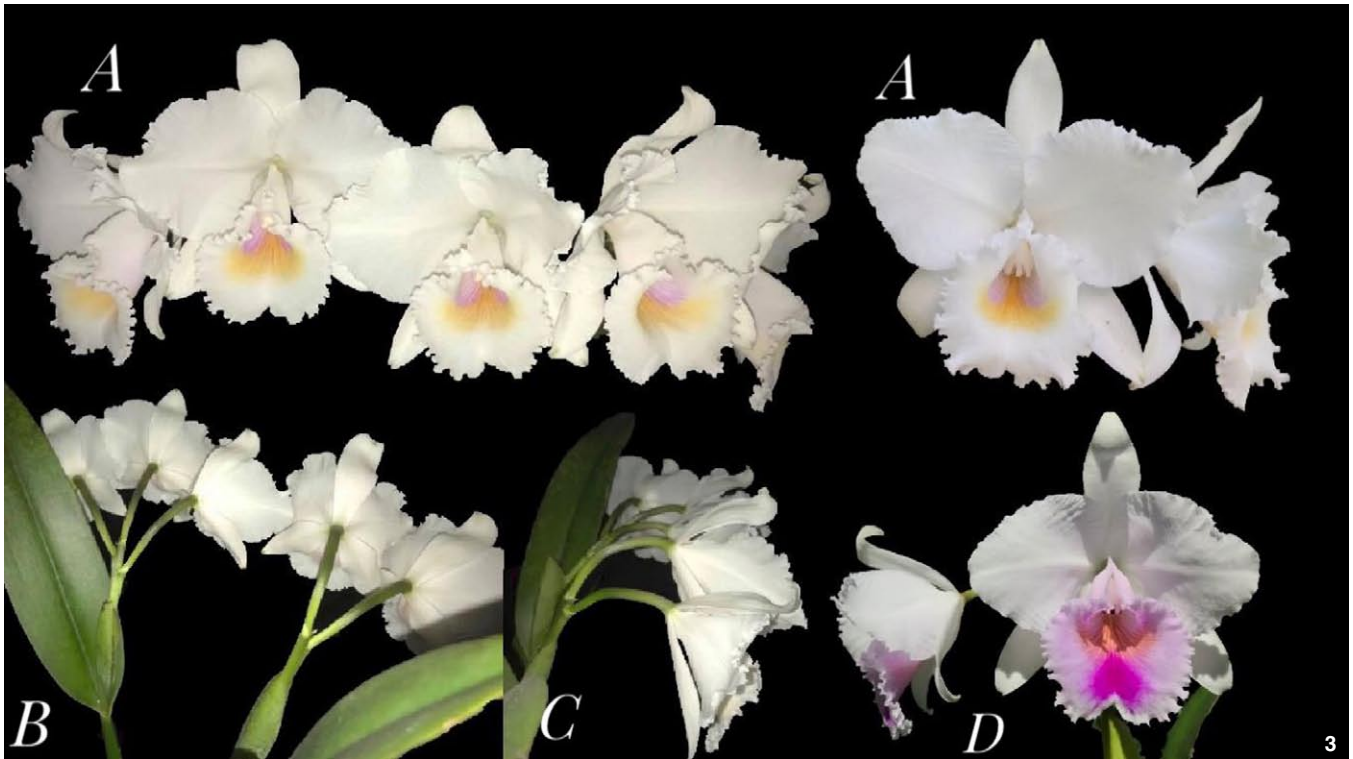
THIRTEEN YEARS AGO, when I was 12, my grandmother gave me her orchid collection. For the most part, they were *Cattleya* species and some unlabeled orange hybrids that completely dazzled me. During the flowering season, many of these plants had white flowers with a pleasant aroma. I used to give them to everyone who visited me because I considered them remarkable and there were so many in the nursery. One day she told me that these plants were called *Cattleya chocoensis* and that they grew naturally in the mountains nearby my city, Tuluá (Colombia). She also told me that very special colors and shapes could be found from time to time. It was at this moment that I became interested in them, and discovered that their correct name is *Cattleya quadricolor*. The magical qualities of this species completely captivated me. Today, it is my favorite species among all orchids.

**NOMENCLATURE** Although the International Code of Botanical Nomenclature provides clear rules on how to establish a correct and accepted name for a given group of plants, I quickly realized that the name of the plants I was beginning to be interested in was far from accepted by everyone, creating confusion among growers, collectors and scientists alike. Biologist Felipe Espinosa helped me discover and disentangle the confusing taxonomic history of my favorite species. This plant has been, at one time or another, been known by all the following: *Cymbidium candidum* Kunth (*Nov. Gen. Sp.* 1:342, 1816), *Cattleya quadricolor* B.S. Williams (*Orch.-Grow. Man.*, ed. 2:75, 1862), *Cattleya ruckeri* Linden (*Ann. Hort. Belge Etrangère* 15:102, 1865), *Cattleya chocoensis* Linden (*III. Hort.* 17:37, 1870), *Cattleya candida* (Kunth) F. Lehm. (*Gard. Chron. III*, 18:486, 1895) and *Cattleya caucaensis* Ballif (*Chron. Orchid.* 1901:329, 1901), among others. Although some authors have been interested in clarifying the valid name for this species, no general consensus has yet been reached (Roezl 1883; Rolfe 1898; Sauleda



2013, 2017; Seaton 2019). In this article and to avoid confusion, I will use the name *Cattleya quadricolor* B.S. Williams proposed as valid by the World Checklist

- [1] A white form of *Cattleya quadricolor*.  
[2] Plants of *Cattleya quadricolor* in situ in Zona Centro, Valle del Cauca.



of Selected Plant Families (WCSP 2020) of Kew Botanical Gardens, one of the leading scientific authorities in the nomenclature of Orchidaceae.

**DISTRIBUTION** The last wild populations of *C. quadricolor* are found only in the tropical dry forest of Colombia's upper Cauca River basin between Valle del Cauca, Quindío and Risaralda departments. Within this zone, the species can be found between approximately 3,100 ft and 4,900 ft (950–1,500 m). According to the definition proposed by the World Wildlife Fund (WWF), the tropical dry forest is characterized by a marked seasonality between periods of rain and dry periods of at least three months. Currently the country has only 8% of the original extent of these forests, positioning them in a critical state of fragmentation and degradation. The pressures to which the few preserved remnants of these forests are subjected put the species that inhabit there at great risk. Ecological preservation of interactions and balance in this rare extant habitat is indispensable for the survival of *C. quadricolor*.

The tropical dry forest remnants of this region of the Cauca River, home to *C. quadricolor*, are characterized by two periods of drought per year and two periods of rain, with a total annual precipitation of between 39.4 and 78.7 inches (100–200 cm) and an average annual temperature of 75.2 F (24 C; Salazar-Ramírez et al. 2002).



Unfortunately, the forested remnants of this region probably represent the most critical situation of degradation in the country, their main threats being their destruction because of the conversion of these lands to agriculture and livestock, as well as urban expansion and mining. For these reasons, as well as the illegal collecting of individuals for wildlife trafficking, it is likely that the population of *C. quadricolor* has been reduced by more than 80% in the last 100 years. Constantino et al. (2007) classify it as an endangered species within Colombia's

Red Plant Book. However, this species has been poorly studied and there is still very little information available about it and its wild populations.

The ECOrquideas research group led by Dr. Nicola Flanagan of the Pontificia Javeriana University of Cali (Colombia), advances studies of population demographics as well as isolation and identification of mycorrhizal fungi to develop conservation strategies suitable for this and other orchids in the region. In addition, at the Vallecaucana Association of Orchidology (AVO), located in the

city of Cali capital of the Valle del Cauca department (Colombia), are seriously committed to the care of nature and the conservation of orchids. Currently, we are carrying out different educational projects, supported by the Colombian Ministry of Culture, aimed at children and young people from the city of Cali in order to create environmental awareness. We also have a project led by biologist Paul Chavarriaga, with whom we are developing in vitro crops of *C. quadricolor* for conservation purposes.

**ECOLOGY** In the central area of the Valle del Cauca department, in some forests near rivers and ravines, I have been fortunate to observe plants of *C. quadricolor* growing naturally epiphytically between 23 and 82 ft (7–25 m) above the ground using large *Anacardium excelsum*, *Guarea guidonia* and *Luehea seemannii* trees as hosts. I have also been able to observe a few plants growing very close to the ground (3–6 ft [1–2 m]) on trees of *Erythroxylum ulei*. However, not many plants can be found at this point as they are easy to collect. In these same forests, and together with my friends Gabriela Torres, Gerardo Hernández and David Haelterman, I have been able to find about 30 other species of orchids belonging to the genera *Vanilla*, *Cyrtopodium*, *Trichocentrum*, *Trichosalpinx*, *Ponera*, *Stanhopea* and *Cryptarrhena*, among others.

In some coffee-producing farms, in the northern part of the same department, it is possible to find small plants of *C. quadricolor* in the company of some species of *Comparettia* and *Rodriguezia* growing on coffee trees (*Coffea* sp.). Surely, these plants are plucked and discarded by the harvesters because for them, any plant that grows on coffee trees is considered a possible “parasite” that can affect or diminish their production. In this area, it is also possible to find some young plants growing on the ground, on abundant shrubs or, more rarely, on rock walls.

One of the most interesting field outings I have done was a year ago, when my friend Tom Miranda visited Colombia for the Medellín Orchid Exhibition. On the recommendation of Andrea Niessen, we went to film *C. quadricolor* flowering plants in one of the few places where you can still see some in the wild. For this outing we were joined by Dr. Angel Vale and Maria del Rosario Malvey, the president of the AVO at the time. Prior to our arrival at the natural habitat, we could see how the inhabitants of the area



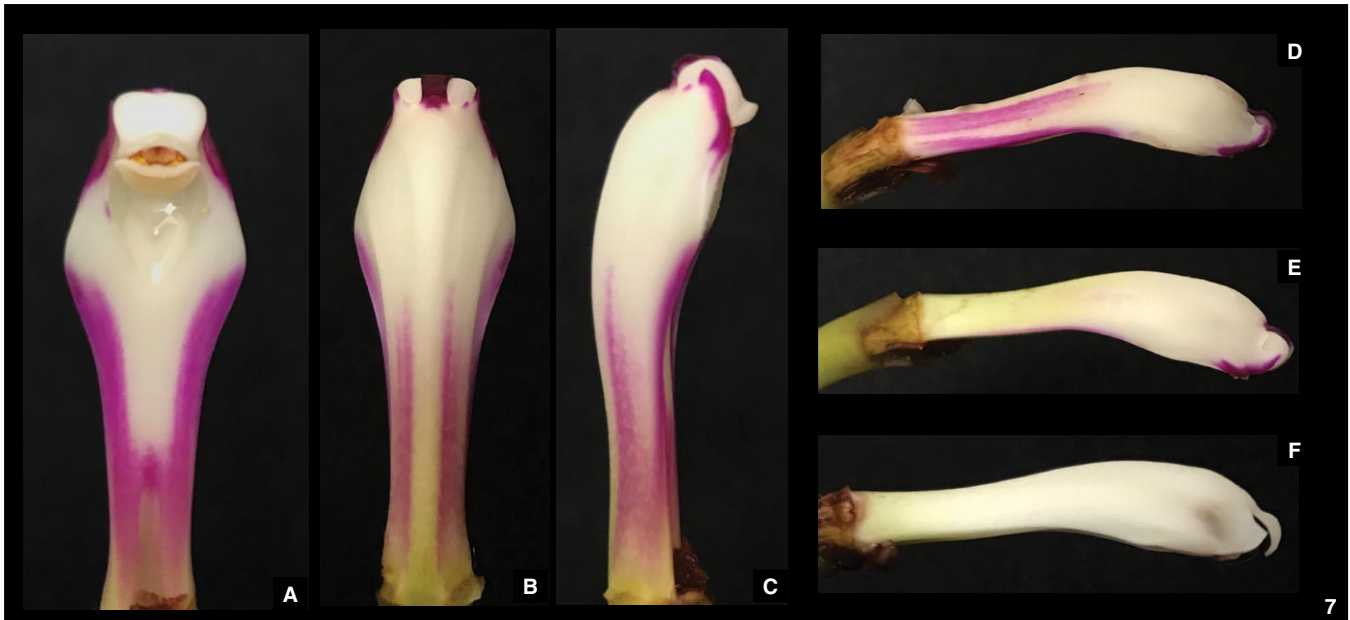
decorated their balconies and terraces of their houses with large baskets of *C. quadricolor* and *Trichocentrum carthagenense*. Upon arriving at the destination, my companions quickly realized that the conditions for access were inhospitable. I am sure this plays an important role in the conservation of this cattleya population. It was a very hot day in the middle of a drought, so we were able to walk through a waist-deep river that separated us from these plants. This would be almost impossible to do in the rainy seasons because of the strong currents that these rivers develop. After a couple of hours walking down the dry river bed, dodging large stones, fallen trees, and ravenous mosquitoes, we were finally able to observe a fine wild population of *C. quadricolor* in situ. We even found a large plant with about 200 pseudobulbs that had fallen from a tree. We took a few pseudobulbs to leave with the nearby botanical garden to preserve this plant that we christened *C. quadricolor* ‘Tom’.

The flowering season corresponds

[3] Images of some flowers of *Cattleya quadricolor* from various angles. Being two-dimensional, images in some cases do not allow a good appreciation of the depth of the flowers and can hide some important characteristics for the diagnosis of the species. (A) *C. quadricolor* ‘Elizabeth Canizales’ photographed from the front, apparently very flat flowers. (B), (C) *C. quadricolor* ‘Elizabeth Canizales’ photographed from behind and in profile, where one can see that its flowers have a slight downward inclination and the petals are directed toward the front. (D) *C. quadricolor* ‘María del Carmen’ where you see a very flat flower from the front and the true shape in profile.

[4] Expedition to photograph plants in their native habitat. Left to right: Tom Miranda, Ángel Vale and Sebastián Aguirre.

[5–6] Typical lip colors of *Cattleya quadricolor*. For these photographs, the lips have been flattened to adequately show the color distribution.



[7] Different patterns of lines and spots on the column of *Cattleya quadricolor*. (A)–(C) show photographs of the ventral, dorsal and lateral surfaces of the same column; (D)–(E) two columns of different plants; (F) column without a stripe pattern — found relatively frequently.

to the beginning of the rains in March, reaching a peak in September and October, when the rains are even more abundant. However, some plants bloom again in December and January. Perhaps it is these conditions that lead to the evolution of the species' characteristic bell-like form where the lip and column are better protected from rain and deterioration that torrential rain might cause.

**MORPHOLOGY** Plants usually have long, thin pseudobulbs from 7–9 inches (18–23 cm) from the base to the junction of the leaf. One of the best-known characteristics of this species is found in its leaves, as it appears that these can be bent or rolled without breaking (Pfahl 2020). Although this trick might be useful for identification of plants in cultivation, it is not universal. In fact, I have found that a good number of *C. quadricolor* plants do possess this feature, but every rule has its exception and several wild plants of the species have leaves that break at the slightest attempt at bending. At other times, I have observed in other *Cattleya* species that some individuals also have very flexible leaves, especially when they are a little dehydrated. Because of this, one must analyze more of the characteristics of the plant to be sure it is *C. quadricolor* one is looking at.

The inflorescences of *C. quadricolor* produce between one and four flowers, each with an average size of 6.7 inches (17 cm) wide and 6 inches (16 cm) high. These flowers are easily distinguished from other *Cattleya* species because the

sepals and petals only half open and the pedicel arches in such a way that it is oriented downward as if it were a bell. For this reason, I consider it the best *cattleya* to observe in situ as it seems that the flowers “look at us” from the top of the trees, showing us all their beauty. The characteristic of bell-shaped flowers is somewhat variable, and in some cases, it is possible to observe wild or cultivated plants with very special shapes, where the pedicel does not arch significantly and the petals open more fully, giving a classic shape to the flower that is considered almost “perfect” by growers. However, when these more “perfect” flowers are viewed in profile, you can still see how the petals are directed forward and you rarely ever find a flower that is completely flat; the petals always curve inward through the middle third and then open outward, giving that feeling of a flower with its segments open. Another important floral feature characteristic of the species is that its flowers are very round and there is almost always a degree of overlapping between the sepals and petals — again possibly an adaptation that protects the lip and column from rain. The aroma produced by *C. quadricolor* for me is very pleasant, sweet, strong and not cloying. It is possibly one of the most aromatic *cattleyas*, this being a vital feature for their identification.

Photographs of flowers can be deceiving, especially photographs of plants with more “open” form. In these cases, the photographs do not give us complete

certainty of what we are seeing because, many times, the depth of the flower is not captured, and the photographs give the impression of totally flat flowers. To remove that doubt, it is always better to observe the plant in person, in this way we will be able to observe the rest of the diagnostic characters that it may present. Generally, this species exhibits a range of colors characteristic of the varieties that we know as *semialba* in the rest of the *Cattleya* species of the *labiata* group. Usually, the lip has four well-defined colors: a white base with a purple patch or line at the distal tip of the lip and a yellow center in the shape of a disc or anchor that extends into the tube until it transitions to a very pale pink–lavender tone. However, this color pattern is not inviolate, adding confusion and sometimes uncertainty among growers trying to identify plants. I confess that I also had many doubts at first, until I observed lips with very dark colors in wild plants. Another feature that I find important to highlight in some flowers of *C. quadricolor*, is the presence of purple lines on the sides of the column that extend from the base to the middle or even into the distal third. In some cases, they can be found on the ventral and dorsal surfaces as well. Not all plants of this species exhibit this characteristic and you can even find some columns with very diffuse spots or lacking any color.

Finally, many collectors and growers believe all *C. quadricolor* of “good shape” are actually the hybrid *Cattleya* *Madonna* (*quadricolor* ×  *trianae*), but this is not

always the case. Although this hybrid is erroneously sold under the name of the species with which it has the most morphological affinity, the plants more resembling the *C. quadricolor* parent are difficult to identify. In some cases, the flowers of this hybrid have a very characteristic aroma that gives their hybrid ancestry away.

In conclusion, to identify this species accurately, different factors must be taken into account. First, it is essential to know the collection data and ascertain as much information as we can find for the plant: its origin, the characteristics of its pseudobulbs and its leaves, flowering season, shape and orientation of the flowers, fragrance and the color patterns, among other characteristics. Only with all these elements is it possible to make an adequate determination of the plant. In addition, it is essential to resort to specialized literature to find botanical descriptions and taxonomic keys, in addition to asking for the opinion of other people who have more experience with this species. The use of photo galleries to make comparisons can be misleading. Because photographs lack many of the nonfloral characters necessary to make a correct determination, photographs should never be the only resource. Secondly, the most important aid we have in identifying these plants is undoubtedly the experience we have accumulated with this species in collections and in the wild. It is also important to have experience with *C. trianae*, another species very close to *C. quadricolor*, and with which there is the hybrid discussed above.

My orchid collection is located within the natural range of *C. quadricolor*. During my days of confinement because of COVID-19 I set out to study the plants in my collection. Every day for a couple of weeks beginning at 6:00 am, I photographed all the insects that visited the flowers of *C. quadricolor* in my collection and the birds that feed in my garden. As I understand it, the natural pollinator of *C. quadricolor* is not known, so I staged all the plants with buds before they opened and I located my camera traps about 26 ft (8 m) away. Buds on my plants opened over the course of several days. At no point did I approach them during this experiment, the camera triggered remotely. I was able to record that visitors to the flowers belonged to different species of bees, mainly of the genus *Euglossa*, and that the hours of greatest activity were between 10:30 am and 12:00 noon, with decreasing frequency in the afternoon hours.



Color examples of *Cattleya quadricolor*. A proper study to document the diversity of lip colors has not yet been developed, so pictured here are only a few of the variations within the species, nonetheless representing some of the great diversity of the species. (a) Semialbas: the type color of the species. (b) Albescens: white flowers with disc or yellow anchor on the labellum and the tube has very light pink color, a very frequent variety. (c) Albas: white flowers with disc or yellow anchor on the labellum. These are also found relatively often. (d) Full Dawn: the only pure white example completely lacking yellow in all segments. It is the only specimen I know of and was a gift from Mr. Alejandro Pérez of the city of Cali. Francisco Villegas has a very similar plant in his collection although it has some very light yellow on the labellum. (e) Caerulean tones in the species are very rare. (f) Coerulescens. (g) The term *rubra* may be appropriate here, as it exhibits very intense colors throughout the flower. This is a very rare form. (h) Pink variations with very colorful lips. (i) A significant number of individuals exhibit solid color on the lip and (j) brushed or streaked forms.



**CULTIVATION** The cultivation of *C. quadricolor* is the same as that of other unifoliate *Cattleya* species. In my experience, this species responds well when grown on trunks of coffee trees (*Coffea* varieties) or in baskets with a substrate of coarse pine bark (1.5 in. [3 cm]) or other tree bark (in Colombia we mostly use bark of *Pinus patula*). Although in nature it is possible to find some plants directly exposed to the sun, this is not advisable in cultivation. Growth rate under optimal conditions for most *Cattleya* species can be very rapid, with some plants even flowering more than once a year. However, my results may be related to my being located in the area of origin of this species.

Some growers have lamented to me that, despite the great potential of the color variations of its flowers, *C. quadricolor* was, for a long time, an orchid that was overlooked for cultivation because of its “unfortunate” shape. However, thanks to the work that some national nurseries here in Colombia, such as Orquideas del Valle and others,



have been doing line breeding plants with excellent characteristics, surprising results have been achieved with very high quality flowers for collectors. These superior forms can represent a form of conservation through which, you can reach many growers who help to perpetuate the species in their collections, and saturate the market for this species, with very beautiful flowering plants and at a very affordable price, negating need



[8–10] Some flower visitors to *Cattleya quadricolor*: (8) three male bees of the genus *Euglossa* in the midst of collecting and storing floral aromas, inset photograph is a male *Eulaema* bee species collecting floral aromas; (9) Wasp species and (10) is a male bee of the genus *Exaerete*.





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for the collection of wild plants.

#### References

- Constantino, E., E. Calderón, and J. Farfán. 2007. *Cattleya quadricolor*. Lindl. ex Bateman.  
*In*: E. Calderón-Saénz, editor. *Libro Rojo de Plantas de Colombia. Volumen 6: Orquídeas, Primera Parte*. Instituto Alexander von Humboldt — Ministerio de Medio Ambiente, Vivienda y Desarrollo Territorial, Bogotá, Colombia. p. 95–98.
- Pfahl, J. 2020. Internet Orchid Species Photo Encyclopedia. Last modified September 26, 2020. <http://www.orchidspecies.com>.
- Roezl, J.B. 1883. *Cattleya chochoensis*. *L'Orchidophile Journal des Amateurs d'Orchidées* 23:571–573.
- Rolfé, R.A. 1898. *Cattleya quadricolor*. *The Orchid Review* 6(65):145–146.
- Salazar-Ramírez, M.I., N. Gómez-Hoyos, W.G. Vargas-Vargas, M. Reyes-Gutiérrez, L.S. Castillo-Crespo, and W. Bolívar-García. 2002. *Bosques Secos y muy Secos del Departamento del Valle del Cauca*. Corporación Autónoma Regional del Valle del Cauca–CVC, Santiago de Cali, Colombia. 72 p.
- Sauleda, R.P. 2013. The Proper Name for a Colombian *Cattleya* Lindl. *New World Orchidaceae — Nomenclatural Notes*. 6:1–3.
- Sauleda, R.P. 2017. El Nombre Correcto para una *Cattleya* Lindl. Colombiana. *Orquideología*. 24(2):20–26.
- Seaton, P. 2019. In Search of *Cattleya quadricolor*. *Orchids*. 88(7):508–513.
- World Checklist of Selected Plant Families. Kew. <http://wcp.science.kew.org>. Accessed September 23, 2020.

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- [11] Pollination. Although I have seen a male bee of the genus *Euglossa* with a pollinarium on its back, I had never observed the moment when these pollinia were removed from the flowers. For the first time, I had the opportunity to see the process as a male *Eulaema* bee managed to remove the pollinarium from one *Cattleya quadricolor* flower and subsequently deposit it on another flower.
- [12] Insects trapped. On two occasions, I managed to document in my nursery how European honey bees (*Apis* sp.) that are trapped by adhering to the viscous secretion of stigma, fail to break free and, in the end, end up dying in these flowers. This situation has also been reported by a Juan Esteban Ruíz from the city of Buga (Colombia).

# Discoverers of *Vanilla* Hand Pollination

BY JOSEPH ARDITTI

*VANILLA PLANIFOLIA*, ONE of the few vine orchids, has been called “the ice cream orchid” (Ecott 2004), but it is more than that. It is the “cookie orchid,” “pie orchid,” “cake orchid,” “perfume orchid,” “candy orchid,” and additional names. It is the only orchid grown as a plantation crop. Its fruits produce a substance, vanillin, which is extracted and consumed routinely by humans. The fruits are capsules (not beans), which are initially green. Their color turns yellow and then brown, and they develop the well-known aroma following curing or “sweating.” To produce fruits, *V. planifolia* flowers must be pollinated. Bees pollinate the flowers in their natural habitat in Mexico (Hagsater et al. 2005). When *Vanilla* plants were taken to other countries, they did not set fruits because their pollinators were not present. Large-scale cultivation of *Vanilla* became possible only after the discovery of hand pollination.

CHARLES MORREN *Vanilla* was first taken to Belgium by Parmentier d’Enghien (Morren 1838–1839). Its flowers were successfully hand-pollinated for the first time by Charles Morren (Morren 1838) at the Liège Botanical Gardens in 1836.

JOSEPH NEUMANN Neumann (1800–1858) reported that of 11 flowers produced (apparently in 1837) at the Muséum National d’Histoire Naturelle in Paris, three set fruit without pollination (Neumann 1838). The plants flowered again in 1838 and 1839. The flowers were hand pollinated by Neumann (or so he claims) at that time and produced fruits (Neumann 1838; for a review with numerous citations see Arditti et al. 2009). There are also reports that Neumann first pollinated *Vanilla* in France in 1830 (Delteil 1884). These reports have been questioned for two reasons (Busse 1899). First, this would have been a great discovery at the time. Neumann would not have waited eight years to publish it. Second, efforts were being made by the French to pollinate *Vanilla* in Réunion.

They would have taken such a major discovery to Réunion immediately, not 10 years later. Further, Neumann seems to have made a habit of claiming discoveries for himself made by others (for details and citations see Arditti 1984).

VAN DEN BOSCH, JOHANNES ELIAS TEIJSMAN AND SIMON BINNENDIJK *Vanilla* was first taken to Java in 1812 (de Vriese 1856) and for a second time in 1840 by a Dr. Pierot (Teijsman 1850, 1858). The plant flowered several years after being introduced but set no fruits. *Vanilla planifolia* flowers were hand-pollinated successfully in Indonesia on July 2, 1852 by Count Johannes van den Bosch (1780–1844; Anonymous 1852), Johannes Elias Teijsman (1798–1882) and Simon Binnendijk (1821–1883) in Buitenzorg (Bogor) and produced fruits on or after 1850 (Teijsman 1850, 1858; van Gorkom 1884; Busse 1899) and 1852 (van der Pant 1852). The hand-pollination method was not described. Therefore, it is not clear whether the three Dutchmen in Indonesia discovered hand-pollination on their own, or if they used Morren’s method or a different one. However, there is a report (de Candolle 1847) that M. Falk, the Dutch ambassador in Bruxelles, described the Belgian method when a naturalist from the Royal Museum in Leyden named Pierot left for Java in 1840 with the aim of introducing *Vanilla* there. No details are provided about him, but he could have been Jacques Pierot (1812–1841), who left for Java in 1840 with six cases of living plants from the Leyden Botanical Garden to introduce *Vanilla* to Indonesia (<https://plants.jstor.org/stable/history/10.5555/al.ap.person.bm000367798>). He could have introduced Morren’s method into Indonesia.

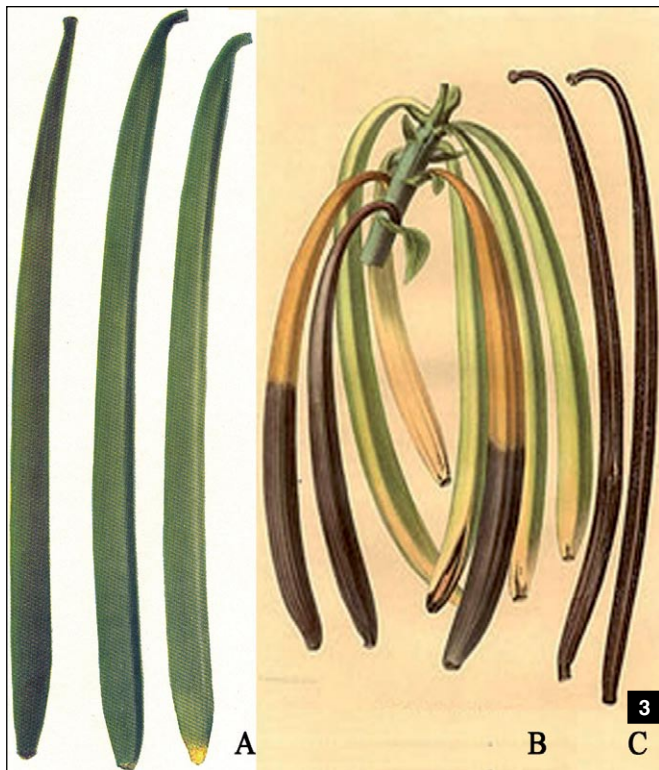
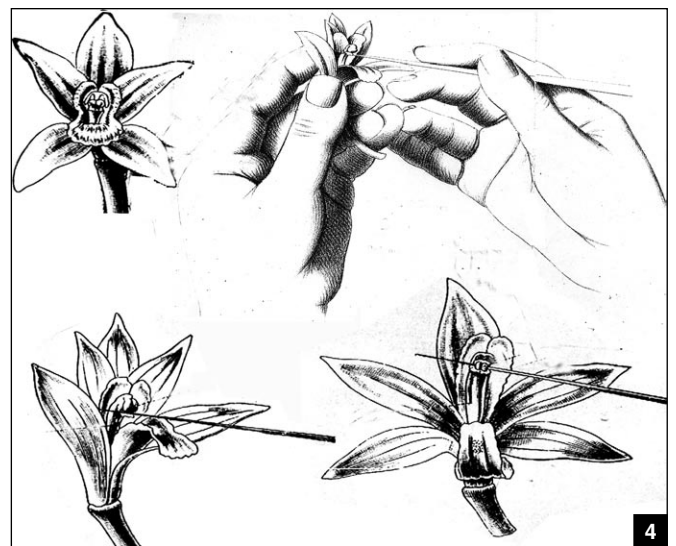
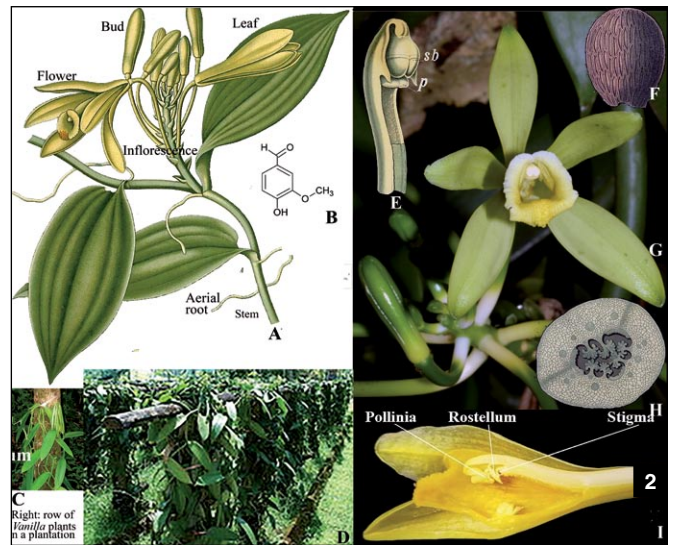
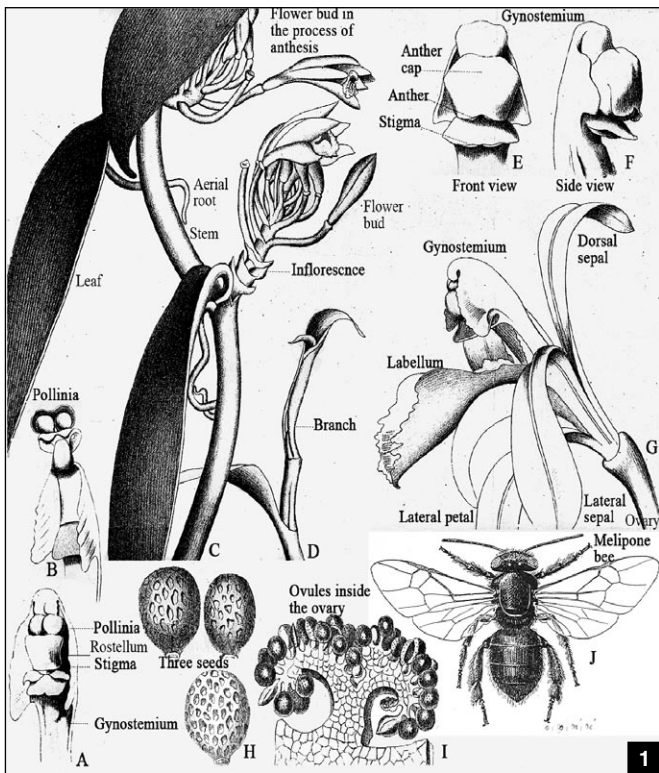
RÉUNION Pierre-Henri Philibert (1774–1824), captain of the *Le Rhône*, took *Vanilla* to Réunion (then known as the Ile de Bourbon) from the French colony Cayenne in French Guiana 1817, 1818 or 1819 (Delteil 1884). The plants

were probably *Vanilla pompona* (Ecott 2004). *Vanilla planifolia* plants that survived in Réunion were brought from the *Jardin des Plantes* in Paris in 1822.

A planter named Féréol Marie Bellier-Beaumont (1759–1831) had a 20-year-old *Vanilla* vine, which failed to bear fruit, on a plantation named Bellevue near the city of Sainte-Suzanne (Ecott 2004). He also owned a young black slave named Edmond. His sister, Elvira, gave the few-years-old Edmond (1829–1880) to Féréol Bellier-Beaumont. Féréol became attached to the young boy and took him along while studying plants and horticulture in his plantation and elsewhere. He taught young Edmond about plants, fruits, vegetables and flowers, including his *Vanilla* plant, and how to pollinate watermelon blossoms (<https://medium.com/galleys/the-child-slave-changed-the-world-3493b5ab1ba8>, <https://www.laphamsquarterly.org/roundtable/marriage-vanilla>). Edmond became interested in plants, started to tinker with *Vanilla* flowers and eventually found a way to pollinate them.

Early one morning in 1841, when Bellier-Beaumont was walking in his plantation with Edmond (who was later given the surname Albius), he saw two fruits on his *Vanilla* vine. Edmond told his master that he pollinated the flowers. Bellier-Beaumont found it hard to believe Edmond at first. When a second flower showed signs of being pollinated, and Edmond again claimed to have done the pollinating, Bellier-Beaumont asked to be shown how it was done. Edmond did (Delteil 1874; Busse 1899; Arditti 1971, 1984). His technique consists of lifting the rostellum and smothering the pollen on the stigma.

There is a report (Delteil 1874; Busse 1899) that a Mr. Perrottet (probably George Samuel Perrottet 1793–1870) arrived in Réunion in 1839 and described Morren’s pollination method, which was published in Belgium in 1837 (Morren



- [1] Drawings of a part of *Vanilla* plant, aerial roots, buds, inflorescences and flowers. Except for the *Melipona* bee, the drawings are from about the time period covered by the text. Text was added. **A, B.** Upper part of gynostemium (column), front view. **C, D.** Parts of stems with leaves, aerial roots, inflorescences, buds and flowers. **E, F.** Tip of gynostemium, front and side views (rostellum, between pollinia and stigma, is not shown well). **G.** Flower. **H.** Three seeds. **I.** Unfertilized ovules inside ovary. **J.** A natural pollinator, Mexican *Melipona* bee (sources: A–D, G, Delteil 1897; E, F, Delteil 1874; H, I, deVriese 1856).
- [2] Photographs and paintings of *Vanilla* plants, flowers, seeds and ovary, and vanillin formula. **A.** Part of a vanilla plant with flowers and buds. **B.** Vanillin formula. **C.** *Vanilla* plant climbing on a tree. **D.** *Vanilla* plantation. **E.** Gynostemium (column): sb, pollinia; p, stigma. **F.** Seed. **G.** Flower. **H.** Cross section of ovary. **I.** Cross section of flower (sources A–D, Wikipedia; E, F, H, *Ausländische Kulturpflanzen in farbigen Wandtafeln*, 1896; G, courtesy Dr. Tim Wing Yam; I, <https://www.growables.org/information/TropicalFruit/Vanilla.htm>).
- [3] *Vanilla* fruits. **A.** Immature (green) fruits. **B.** Stages of fruit of ripening: yellow and brown. **C.** Brown, mature fruits (computer generated after Bouriquet 1954).
- [4] Hand pollination of *Vanilla* (source: Delteil 1874).

1837a) and in Paris in 1837 (Morren 1837b) and 1838 (Morren 1838). According to this suggestion, Edmond somehow learned the Morren method and applied it. This is highly unlikely or even impossible for several reasons.

- If Perrottet described Morren’s method in 1839, several people could have learned it and used it to pollinate *Vanilla* flowers. There are no reports of *Vanilla* hand-pollination or fruits in Réunion before 1841.
- As a 10-year-old slave boy, Edmond either did not have

a chance to attend Perrottet's presentation, or, if he attended, he came with Féréol Bellier-Beaumont. If so, both he and Féréol Bellier-Beaumont would have learned the method and used it to pollinate the flowers on his *Vanilla* plant. He did not.

- Had Edmond attended a Perrottet presentation by himself as a 10-year-old boy and learned the pollination method, he would have pollinated Féréol Bellier-Beaumont's plants in 1839 or 1840, not 1841.

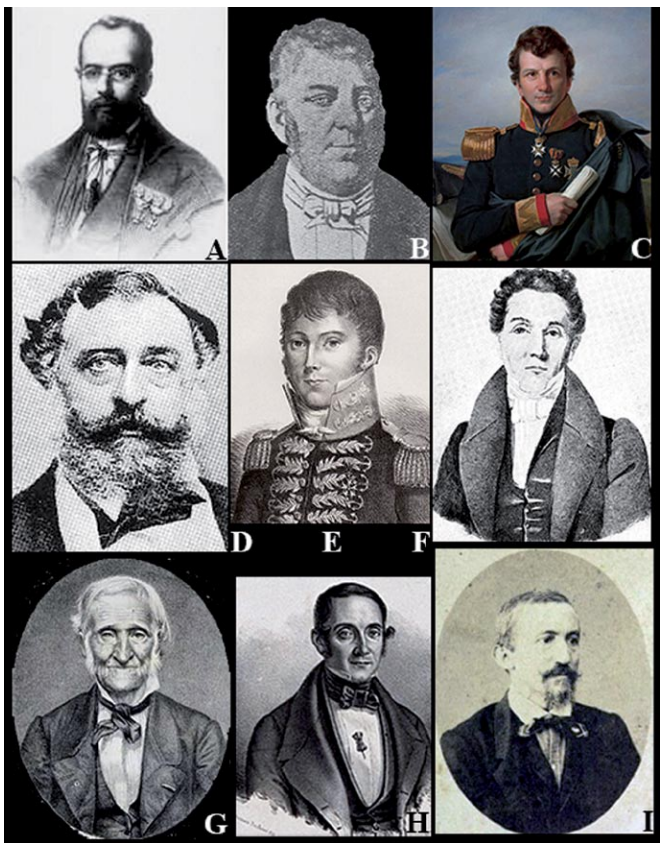
A British journalist, Tim Ecott, devoted considerable time and effort to tracing Edmond's origins and history. He unearthed many details, which lay forgotten in the island's *Archives Départementales*, and reported them in his excellent book on *Vanilla* (Ecott 2004). The only logical conclusion that can be drawn from his findings is that at the age of 12, Edmond Albius discovered *Vanilla* pollination independently and on his own. By doing that, Edmond made possible the *Vanilla* industry in Réunion and elsewhere.

Questions about whether Edmond discovered hand-pollination probably arose because of the period; local attitudes; place; and Edmond's age, race and status. Some of the people who accepted slavery for a race, as was the case for plantation owners in Réunion in the 1840s, must have found it difficult to believe that a 12-year-old black slave was capable of a major discovery. That such an aptitude cannot be justified probably did not enter their minds. This is an historical, even if repugnant, fact. Féréol Bellier-Beaumont asked for proof, but to his credit, he accepted what Edmond showed him and became his friend, defender and protector. Not long after the discovery, he freed Edmond. Others may have been less kind and took longer to become convinced that the 12-year-old boy told the truth, but they too came to believe Edmond and became his admirers, friends and defenders. All proved their sincerity when a need arose.

A noted botanist and plant collector at the time, Jean Michel Claude Richard (1787–1868), was the director of the *Jardin du Roy* (now *Jardin de l'Etat*) on Réunion at the time. In 1841, after Edmond made his discovery, Richard (he must not be confused with five other botanists and naturalists in roughly 1754–1900 who had the same last name) claimed that he discovered the process four years earlier. His claim was patently untrue but created doubts for a short time ([https://en.wiki/Jean\\_Michel\\_Claude\\_Richard](https://en.wiki/Jean_Michel_Claude_Richard)). Féréol Bellier-Beaumont immediately wrote a strong letter in defense of Edmond and suggested, "Let us leave [Richard] to his fantasies" (<https://www.clevelandcivilwarroundtable.com/a-life-flavored-with-sweet-vanilla-and-bitter-injustice/>). Naturalist Volcy Focard (1818–1901) and others also came to Edmond's defense. Richard's claim was discounted and his reputation marred. It is generally agreed now that Edmond discovered a method for hand-pollination of *Vanilla* on Réunion. A statue was erected in his honor.

Scientists are skeptical. They demand proof and confirmation for statements and discoveries. And, after they get proof and confirmation, they demand additional proofs and confirmations. Therefore, it is not surprising that: (a) Féréol Bellier-Beaumont believed Edmond only after he saw how the 12-year-old pollinated a flower, (b) several scientists checked and double checked what they read or were told, and (c) Tim Ecott traveled to far-off Réunion to dig through old archives. At the end all agreed and still agree that Edmond discovered how to hand-pollinate *Vanilla* in Réunion all on his own.

Still, a writer who was not and is not an orchid or a *Vanilla* expert wrote that, "The reluctance of some experts to concede that lesser mortals were capable of research and hybridisation



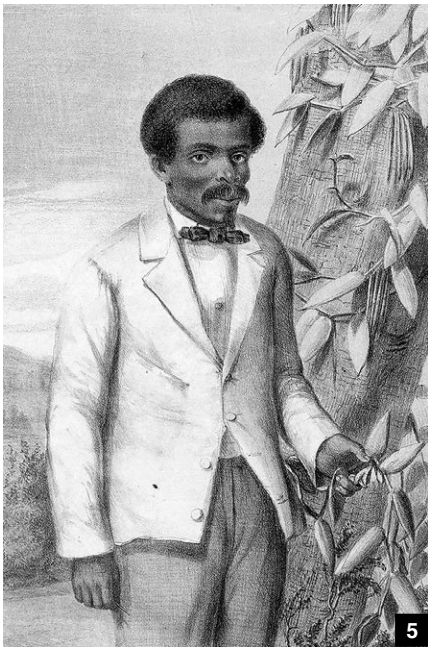
Persons associated with *Vanilla* in the 1800s. **A.** Charles Morren (1807–1858). **B.** Joseph Neumann (1800–1858). **C.** Johannes van den Bosch (1780–1844). **D.** Johannes Elias Teijsman (1808–1882). **E.** Pierre-Henri Philibert (1774–1824). **F.** George Samuel Perottet (1793–1870). **G.** Jean Michel Claude Richard (1787–1868). **H.** Roberto de Visiani (1800–1878). **I.** Giuseppe Clementi (1812–1873) (sources: downloaded in 2006 and 2021 from the World Wide Web, mostly Wikipedia).

[sic] is not new. When Edmond Albion [sic], a black slave on Reunion [sic] Island, developed his simple but very effective way of pollinating the *Vanilla* [sic] orchid in 1841, the experts were incredulous ..." (Wright 2000). This statement, made to bolster an agenda that has nothing to do with science or *Vanilla*, is incorrect, misleading, unnecessary and disturbing.

ROBERTO DE VISIANI, GIUSEPPE CLEMENTI AND CARLO CASLINI A *Vanilla* plant flowered for the first time at the Padua Botanical Garden in Italy in 1833. The plant continued to flower for several years. A flower was pollinated, and a mature fruit was obtained in 1842 by Professor Roberto de Visiani (1800–1878), Dr. Giuseppe Clementi (1812–1873) and Chief Gardener (1852–1866) Carlo Caslini (Busse 1899; De Visiani 1845). This pollination method did not attract attention and was not used.

DUPOIS A pharmacist named Dupois (initials and image not available) discovered a method of *Vanilla* hand pollination on the French island of Guadeloupe (Delteil 1884, 1902). His method used scissors to make a cut, which dropped the pollinia into the stigma. Dupois reported his method to the president of the Agricultural Chamber in Réunion. This method was cumbersome and without practical value (Delteil 1884, 1902).

CONCLUDING THOUGHTS Several people in different parts of the world discovered hand pollination of *Vanilla* independently of each other. Regardless, there can be no



question that Albius's method made the *Vanilla* industry possible in Réunion and other French dependencies such as Madagascar, Seychelles and Tahiti (all still important sources of vanilla). Despite several efforts, vanilla production never became important in British dependencies and colonies.

#### REFERENCES

- Anonymous. 1852. Kungsmatige Bevfruchting de Vanille te Buitenzorg. *Natuurkundig Tijdschrift voor Nederland-sch Indie* 3:484–485.
- Arditti, J. 1971. Vanilla: An Historical Vignette. *American Orchid Society Bulletin* 40:610–613.
- 1984. An History of Orchid Hybridization, Seed Germination and Tissue Culture. *Botanical Journal of the Linnean Society* 89:359–381.
- Arditti, A., N. Rao, and H. Nair. 2009. Hand Pollination of *Vanilla*: How Many Discoverers? p. 233–249. In: T. Kull, J. Arditti, and S. K. Wong, editors. *Orchid Biology, Reviews and Perspectives*. X. Springer Science + Business Media B.V., The Netherlands.
- Bouriquet, G., editors. 1954. *Le Vanillier et la Vanille dans le Monde*. Editions Paul Lechevalier, Paris.
- Busse, W. 1899. Vanille. *Arbeiten aus dem Kaiserlichen Gesundheitsamte*. 15:1–113.
- Delteil, A. 1874. *Étude sur la vanille*. Challamel Ainé, Librairie-Éditeur, Paris.
- 1884. *La vanille, sa culture et sa préparation*. Challamel Ainé, Librairie Algérienne et Coloniale, Paris.
- 1897. *La vanille, sa culture & sa préparation*, 4th ed. Augustin Challamel, Librairie Maritime et Coloniale, Paris.
- 1902. *La vanille, sa culture & sa préparation*, 5th ed. Augustin Challamel, Librairie Maritime et Coloniale, Paris.
- de Candolle, A. 1847. Sur le Musée Botanique de M. Benjamin Deleseert de Paris, et Surlé Martyreloge Contemporaine de la Botanique et de l'Horticulture. *Annales de la Société Royale de Agriculture et Botanique de Gand, Journal du Horticulture et Sciences Accessories* 3:141–151.
- De Visiani, R. 1845. Del Metodo e Delle Avvertenz che si Usano nell'orto Botanico di Padova per la Cultura, Fecondazione e Fruttificazione della Vaniglia. *Memorie dell' I. R. Istituto Veneto di Scienze, Lettere ed Arti* 2:3–18.
- De Vriese, W. H. 1856. *De vanielje*. A. W. Sythoff, Leyden, Netherlands.
- Ecott, T. 2004. *Travels in Search of the Ice Cream Orchid*



- Vanilla. Grove Press, New York.
- Hagsater, E., M. Soto, G. Salazar, R. Jiménez, M. López, and R. Dressler. 2005. Mexico City: Productos Farmacéuticos, S. A. De CV, 18 Lago Tangañica, 11520 ([www.chonoin.com.mx](http://www.chonoin.com.mx)).
- Morren [no initials given]. 1837a. Notice sur la vanille indigine et al fructification. *Bulletin de la Academie des Sciences, des Lettres et des Beaux-Arts de Belgique*. 4:225–237.
- Morren, C. 1837b. Note sur la première fructification du vanillier en Europe. *Annales de la Société Royale d'Horticulture de Paris* 20:331–334.
- 1838. Sur la fructification de la vanille obtenue au moyen de la fécondation artificielle. *Comptes Rendus Hebdomadaires Academie des Sciences, Paris* 6:489–492.
- 1838–1839. Fructification de la vanille obtenue au moyen de la fécondation artificielle. *Agric. Pratique Ser I* 2:114–116.
- Neumann [No initials]. 1838. Vanille. *Annales de Flore et de Pomone* 6:316–320.
- Teijsman, J. E. 1850. Lands Plantentuin te Buitenzorg. *Natuurkundig Tijdschrift vor Neerlandsche Indie* 1:431–440.
- 1858. *Verslag ontent den staat vant's Lands Plantentuin in het Jaar 1850. Verslag van het beheer en den Staat der Nederlandsche besittingen en kolonien in Oest and West Indie enter kust von Guinea over 1850*. Bejlage A. Verschenen, Utrecht. p. 93–97.
- van der Pant, F. D. S. 1852. Kungsmatige bevruchting der vanille te Buitenzorg. *Natuurkundig Tijdschrift voor Nederlandsch Indie* 3:486–487.
- van Gorkom, K. W. 1884. *De Oost-Indische cultures, in betrekking tot handel en nijverhed*. J. H. De Bussy, Amsterdam.
- Wright, N. H. 2000. The origins of *Vanda* Miss Joaquim. *Malayan Orchid Review*. 34:70–73.

— Dr. Joseph Arditti earned his doctorate at the University of Southern California in Los Angeles in 1965. He is now Professor of Biology Emeritus at the University of California, Irvine. From 1966 until 2001 Professor Arditti carried out research on orchids and wrote about them, some during visits to Indonesia, Malaysia and Singapore. He continues to write after his retirement. In addition to researching orchid physiology and development, he also studied orchid history, including unusual episodes. This article is dedicated



- [5] Edmond Albius (1829–1880) at 42, one year after describing how he hand pollinated *Vanilla* flowers (*Album de la Réunion*, 1863, downloaded in July 2021).
- [6] Edmond Albius (1829–1880) at 18. (Daguerreotype first published by Ecott 2004. It was downloaded in 2006 and 2021.)
- [7] Statue of Edmond Albius (1829–1880; source: <https://www.portail-esclavage-reunion.fr/en/lieux-de-memoire/the-slave-mario-and-the-black-madonna/>, downloaded in July 2021)

by Dr. Arditti to his friends and caregivers, Mr. Jorge Delgado and his wife Mrs. Edna Delgado, because they took excellent care of him during a prolonged period of health problems. They continue to care for him now, after his recovery.

# Tiny Slippers

a.k.a. Miniature Paphiopedilums

BY DEB BOERSMA



THERE IS A dizzying variety of names referring to diminutive paphiopedilum plants. They have been referred to as pygmy, teacup, pocket-sized, micro and dwarf paphiopedilums, but the name that seems to have taken hold is miniature paphiopedilums. Regardless of their title, diminutive paphiopedilums are characterized by plants with flower size, inflorescence length, leaves, and plant size all in proportion; they will flower in a 2-inch (5-cm) pot and have multigrowths in a 3-inch (7.5-cm) pot. Ideally flowers should have a full, round, flat form and bold colors, those traits that judges look for in an awardable plant. This begs the question: why breed for small plants? They are charming and beautiful, and they tend to bloom faster than standard size plants, and, best of all, they take up less space, so there is always room for one more plant!

Deliberate breeding for miniature paphiopedilums is a more recent trend that appears to have exploded into a passion among many in the hybridizing community. Historically, these diminutive plants were undesirables, plucked from collections and discarded, but today there is an increasing appreciation for their charm and elegance. However, the process of achieving the perfect miniature plant is not easy. Hybridizers are challenged with creating diminutive plants with the same ideal form and bold colors displayed in the standard complex hybrids.

One approach that seemed quite feasible in reaching these goals was to utilize old, small complex hybrids in a breeding program, but given that these were usually discarded or difficult to maintain in culture, this proved to be more challenging than expected. A second idea was to use small species as parents to produce primary and secondary hybrids of small stature. Many gorgeous, tiny hybrids were created; however, the ideal round, flat, full form that judges look for was rather elusive. Not all was lost in this approach, as these hybrids could then be used as stepping stones in subsequent breeding programs. The ideal approach was found to be the pairing of small species and their hybrids to reduce the plant size with complex standard hybrids to improve the flower form and incorporate bold colors.

The small species most commonly used for miniaturizing plant size are in the *insigne* alliance, as using species outside this group tends to result in sterility issues (Koopowitz 2014). The species typically used are *Paphiopedilum*



WOODSTREAM ORCHIDS

*charlesworthii*, *Paphiopedilum henryanum*, *Paphiopedilum fairrieianum*, *Paphiopedilum barbigerum*, *Paphiopedilum spicerianum* and *Paphiopedilum helenae*. Hybridizing for miniatures is not limited to the *insigne* group, however, as *Brachypetalum* species such as *Paphiopedilum niveum* and *Paphiopedilum concolor* play a role in widening the petals of progeny. If diminutive multifloral paphiopedilums are desired, then coryopetalums such as *Paphiopedilum wilhelminae* and *Paphiopedilum philippinense* are good candidates in a breeding program. However, the grexes featured in this article are mainly those of the *insigne* group breeding.

Certain traits of each of these *insigne* species are dominant and expressed in the progeny. *Paphiopedilum charlesworthii* passes on that very distinct wide dorsal and a white staminode, and is desirable for its ability to form offshoots readily (Koopowitz 2006). Dorsal sepal spotting and pink pouches are dominant in *Paph. henryanum* hybrids. The progeny of *Paph. fairrieianum* typically inherit an elegant petal shape and dark-red to pink coloration. *Paphiopedilum barbigerum* is one of the smallest species in the genus and really aids in size reduction. A white dorsal and curly-edged petals are earmarks if *Paph. spicerianum* is in the parentage of a plant. *Paphiopedilum helenae*, a species just recently introduced for legal trade in North America, is great for passing on a vibrant yellow color and is also an important species in miniaturizing offspring. Hybridizers select the plants that have the best form and smallest stature to incorporate into a miniaturizing breeding program.

**OLD COMPLEX MINIATURES** There is no need to recreate the wheel, right? If available, why not utilize some of those old, complex miniature hybrids as a starting point in a breeding program? This would presumably be a great approach to



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ROSS HELLA

- [1] *Paph. Nathaniel's Clarity* (*niveum* × *thaiantum*); grown and photographed by Fred Clarke.
- [2] *Paph. Garibaldi* grown by Woodstream Orchids.
- [3] *Paph. URG1 'Deerwood'*, HCC/AOS; grower: Ross Hella.
- [4] *Paph. Garibaldi's Gem*; grower: Ross Hella.

create a variety of new hybrids with both desired size and desired form. Attempts were made using several of these, including a very old grex, *Paphiopedilum Garibaldi* (Bronzino × Earl of Tankerville), registered in 1918. It did produce minis when paired with the appropriate parent (Koopowitz 2006). It is not known what is in the background that contributes to the small flowers, as the parentage of *Paph. Bronzino* is unspecified. There are 21 registered offspring with three notable miniature crosses registered as *Paphiopedilum Norvin Olivas* (× *charlesworthii*), *Paphiopedilum URG1* (× *fairrieianum*), and *Paphiopedilum Garibaldi's Gem* (In-Charm Topaz ×).

*Paphiopedilum Dalla* (Luna × The Gurka), an old cross registered by Cooke in 1943, is an interesting hybrid, having a nice green dorsal with dark-brown markings and good shape, although the petals are a little narrow. The *Paph. Luna* parent is part *Paphiopedilum insigne* and part unknown. The second parent, *Paph. The Gurka*, has *Paph. insigne* as the grandparent and then three generations

of backcrossing to *Paph. spicerianum* (Koopowitz 2006). Its small size likely comes from the *Paph. spicerianum*. It is quite prolific, with 39 offspring, but it was soon determined that the small stature was not dominant in its progeny.

In 1978, Day registered *Paphiopedilum* Ali Taba, a cross between *Paphiopedilum* Paeony 'Regency' AM/AOS and *Paph. fairrieianum* 'Red' AM/AOS. This was the perfect mating between the small species giving the miniature stature and the complex hybrid parent *Paph. Paeony* imparting the deep color and full, round form. The *Brachypetalum* in the background of the *Paph. Paeony* parent is evident in the broad petals and full, round form of *Paph. Ali Taba*. The form and deep-plum color are outstanding, and this would make a great parent in further breeding for miniatures. Unfortunately, it was difficult to maintain in culture, and many attempts to recreate the cross failed (Koopowitz 2006). It produced no offspring; however, its form is the benchmark for miniature paphiopedilum hybrids.

There was some speculation that *Paphiopedilum* Plumfairie 'Little Plum' AM/AOS, registered in 1982 by Rod McLellan Co., would be a great parent for this line of breeding. It had good form, albeit not as good as *Paph. Ali Taba*, nonetheless it had outstanding color with deeply saturated plum tones that was passed on by the grandparent *Paphiopedilum* Orchilla. The parentage is *Paphiopedilum* Plumly, a complex hybrid mated with *Paph. fairrieianum* to reduce size; unfortunately it was not a vigorous grower and did not produce offspring. Because the use of the old, miniature complex hybrids was not as successful as anticipated, a new approach was necessary. What about using primary hybrids created with small species?

**MINIATURE PRIMARY HYBRIDS** The second approach was to create primary hybrids using the small species as parents to ensure the diminutive plant stature, but would the ideal form be present? Using this approach, Koopowitz crossed *Paph. charlesworthii* × *Paph. henryanum*, not knowing H. Doll made the same cross and had registered the grex as *Paphiopedilum* Doll's Kobold in 1992 (Koopowitz 2014). Regardless, this was the beginning of his quest for miniature paphiopedilums with great form, good color and the holy grail: a solid-pink dorsal sepal. *Paphiopedilum* Doll's Kobold was and still is a popular hybrid and has been remade many times. It has received six quality awards to date. It is a charming flower in which the



AWARD ARCHIVES



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LARRY LIVINGSTON



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dorsal sepal is usually white with varying amounts of pink and pink spotting, brown petals, and a pinkish pouch (Koopowitz 2006). The pink pouch and dorsal spotting are dominant from the *Paph. henryanum* parent and it has inherited the wide dorsal from *Paph. charlesworthii* (Koopowitz 2006). It has a total of six American Orchid Society (AOS) awards, including four Highly Commended Certificates (HCC) and two Awards of Merit (AM). Although appealing, it lacked the ideal form; in particular it lacked the wide petals that are so desired in hybrids. It was useful in further breeding, producing 10 offspring including *Paphiopedilum* Little By Little, *Paphiopedilum* Baby Boo Boo and *Paphiopedilum* King Goldemar.

Another popular primary hybrid was *Paphiopedilum* Tyke registered in 1995 by Paphanatics, which incorporated the

- [5] *Paph. Dalla* 'Cerritos' HCC/AOS; grower: Clark Day, Jr., Orchids.
- [6] *Paph. Ali Taba* 'Elite' HCC/AOS; grower: Unicorn Orchids.
- [7] *Paph. Plumfairie* 'Little Plum' AM/AOS; grower: Paphanatics, unLtd.
- [8] *Paph. Doll's Kobold* 'Memoria John Stewart' AM/AOS; grower: Marion Allen.
- [9] *Paph Little by Little*
- [10] *Paph. King Goldemar* 'Deerwood' AM/AOS; grower: Ross Hella.
- [11] *Paph. Tyke*
- [12] *Paph. Wössner Ministar* 'Lisa' HCC/AOS; grower: Alawaena Orchids.
- [13] *Paph. Tiny Charlie* 'Cherub' HCC/AOS; grower: Prof. Harold Koopowitz.



species *Paph. barbigerum* and *Paph. henryanum*. The result was spotted little flowers with pink pouches and spots on dorsal because of the *Paph. henryanum* parent with the form of the dorsal from the *Paph. barbigerum* parent. Once again, the ideal form was not achieved, as petals were narrow, but it was awarded an HCC/AOS, utilized in subsequent miniature breeding, and spawned four hybrids including *Paphiopedilum* Tiny Charlie, *Paph.* Little by Little and *Paphiopedilum* Mary Zdilla.

A stunning little primary hybrid was registered in 2001 by F. Glanz as *Paphiopedilum* Wössner Ministar using *Paph. henryanum* and *Paph. helenae* as parents. It has gorgeous flowers with a bright-pink pouch on green or yellow flowers — a beautiful spectrum of color and a pretty color combination. It is tiny because of the *Paph. helenae* influence, and the spotting on the dorsal sepal and the pink pouch are inherited from the *Paph. henryanum* parent. It has received two quality awards and has just one registered offspring. The cultivar 'Lisa' received an HCC with a tiny flower with a natural spread of 2.1 inch (5.4 cm) horizontally and 1.9 inch (4.8 cm) vertically. As vibrant and stunning as this hybrid is, it still lacks that ideal form, as is the case with so many other primary hybrids within the insigne group. This lack of form does not preclude primary hybrids from receiving awards, as AOS judges must consider the species in the background and the attributes of the parents.

Another primary hybrid, *Paphiopedilum* Nathaniel's Clarity (*niveum* × *thaiantum*), is a charming, tiny flower; the petals are broad and the form is almost ideal. This cross demonstrates the ability to improve the form by utilizing species within the *Brachypetalum* section, but the disadvantage is that there are limitations in the color potential in these hybrids. More work had to be done. Would complex miniature hybrids help shift to wider petals and better form?

**MINIATURE COMPLEX HYBRIDS** In 2005, Paphanatics crossed two primary hybrids, *Paph.* Doll's Kobold and *Paph.* Tyke, and created a charming little flower named *Paph.* Little by Little, with a predominantly white or green dorsal sepal, which is brushed or spotted pink, and pink pouches. In the same year, Harold Koopowitz registered *Paph.* Tiny Charlie (Tyke × *charlesworthii*), a small hybrid with pretty flowers in shades of pink with a beautifully wide dorsal sepal.



ANNE KOLOWSKI



ED COTT



GLEN BARFIELD



LOREN BATCHMAN

The cultivar 'Cherub' HCC/AOS really highlights the traits of the parentage with a wide dorsal sepal and narrow petals from the *Paph. charlesworthii* parent and the spotting on the dorsal dominant from the *Paph. henryanum* parent. Although not the ideal form, as one might expect from hybrids so near to the ancestral species, they are aesthetically pleasing and both hybrids have been awarded.

The owner of Deerwood Orchids, Ross Hella, is another hybridizer spellbound by miniature paphiopedilums; he registered *Paphiopedilum* Mary's Little Leopard (Mary Zdilla × Little by Little) in 2011. *Paphiopedilum* Mary Zdilla is a small plant with nice spotting on the dorsal sepal and a pink pouch from *Paph. henryanum* in its background (Hella, pers. comm.). The offspring have striking little flowers that present nice wide dorsals from the *Paph. charlesworthii* parent, and a green and white dorsal with dark spots and a pink pouch — evidence of the *Paph. henryanum* parent. It inherited the best traits from both parents, and the cultivar 'Honey Bear' was awarded an AM in 2018.

Hella has continued his quest for the "perfect" miniature and registered *Paphiopedilum* King Goldemar (Doll's Kobold × Little by Little) in 2020. It has about 50% *Paph. henryanum*, 37.5% *Paph. charlesworthii* and 12.5% *Paph. barbigerum* in its theoretical genetic makeup, with each species contributing desirable traits to the 2020 awarded cultivar 'Deerwood' AM/AOS. It is an impressive little flower with great color and patterns, bold spotting on the dorsal coalesced into stripes, a pink pouch and a pink picotee on the wide dorsal. The flower is small, with a natural spread of 2.8 inches (7.2 cm) horizontally and 2.7 inches (6.8 cm) vertically. Even though the form is not ideal, as the petals are not quite broad enough, it is a treasure. Who would not want this in their collection?

Beautiful, stunning, charming, spectacular and desirable all describe the miniature hybrids, but those broad petals and ideal form so sought after were still elusive to hybridizers. Would the third approach yield success? Will utilizing the standard complex hybrids in a miniature breeding program garner success?

**THE STANDARD COMPLEX HYBRIDS** The third approach is the marriage of the standard complex hybrids with the small species and their hybrids. Adding in the standard complex hybrid genes helps to widen the petals and improve the form. Many modern large



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JULIE ROTRAMEL



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ROSS HELLA



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standard complex hybrids have species from the *Brachypetalum* section in their background to give the desired broad petals and when crossed with mini species, and their hybrids will help to decrease the size, hopefully, as there is no guarantee that the plants will be miniature in stature or have good form.

*Paphiopedilum* Garibaldi, one of the earlier-registered complex hybrids that had small stature, produced miniature offspring when crossed with insigne group species. *Paphiopedilum* Norvin Olivas (× *charlesworthii*) is a nice little flower with a spotted wide dorsal and a tessellated pattern on the petals, but the petals are too narrow and so it has garnered no awards to date. *Paphiopedilum* URG1 (× *fairrieianum*) cultivar 'Deerwood' was awarded an HCC in 2013. This cultivar, owned by Ross Hella, has downswept petals characteristic of the *Paph. fairrieianum* parent, a small plant. "Deerwood" flowers have a natural spread of 3.1 (7.9 cm) horizontal by 2.6 (6.7 cm) vertical. The spectacular pattern on the dorsal sepal and the petals are attributes that likely contributed to it having been awarded. *Paphiopedilum* Garibaldi's Gem (In-Charm Topaz ×) is a recent hybrid registered in 2018 by Ross Hella. *Paphiopedilum* In-Charm Topaz is a complex hybrid and is small in stature because of the *Paph. helenae* in its background. This breeding resulted in a plant with nice color and patterns; the dorsal is green with a white picotee and attractive spots, the pouch is red bronze and the petals have a great, tessellated pattern. It has many desirable

traits, but the petals are too narrow and disproportionately long, like dragonfly wings; broader, shorter petals would improve the form. There have been no awards to date for *Paph. Garibaldi's Gem*. So, it would appear that *Paph. Garibaldi* hybrids did not have significantly widened petals and did not produce progeny with ideal form.

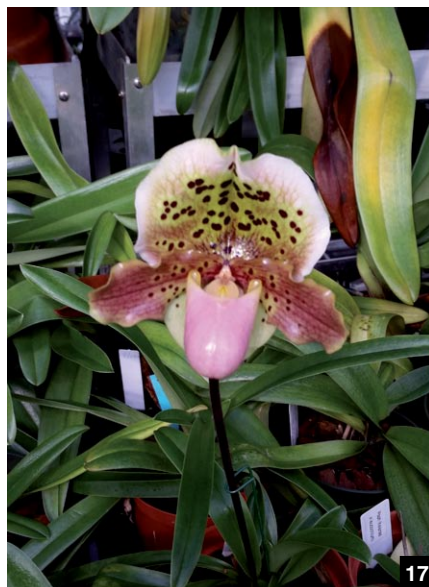
*Paphiopedilum* Hellas is a well-known standard complex breeder and, when crossed with *Paph. barbigerum*, produced a miniature plant registered as *Paphiopedilum* Barb Hella. It has improved form, and the petals were wider, but still narrower than preferred. It has a nice yellow coloration and a wide dorsal; however, the dorsal and petals inherited a little too much undulation from the *Paph. barbigerum* parent. This was a milestone in miniature hybridization, as it indicated that minis could be obtained even though one parent was a large standard complex slipper (Koopowitz 2014). *Paphiopedilum* Barb Hella (× Gege Hughes) generated *Paphiopedilum* Barbi's Moon, which has a good flat, full form, wide dorsal and petals, and yellow color with a tessellated pattern on the dorsal and petals. The ideal full, flat, round form is now starting to appear in these complex hybrids. *Paphiopedilum* Micah's Moon is another recent Ross Hella hybrid, again using *Paphiopedilum* Gege Hughes as one of the parents and *Paph. helenae* as the second parent. The result is brightly colored flower, green on the dorsal with a white picotee, pink blushing on the pouch, and a good-sized synsepal, but again lacking in petal width.

*Paphiopedilum henryanum* is dom-

inant for the pink pouch and spots on the dorsal, and when crossed with standard complex hybrids the expectation is progeny with good form, spotted dorsal sepals and pink pouches. Hella recently registered several stunning hybrids in this line of breeding. *Paphiopedilum* Henry's Kaleidoscope (× Memoria Flora Edith Alexander), in which both parents are small in stature, produced progeny that are tiny plants with a wide dorsal influenced by the *Paph. charlesworthii* grandparent. It has fantastic spotting and patterns on both the petals and the dorsal and a pink pouch from the *Paph. henryanum* parent. The petals did not quite hit the mark, but the color and patterns are fabulous and it does look awardable; however, there are no awards to date.

*Paphiopedilum* Harbur is an older spotted complex hybrid that was registered in 1958. The cultivar 'Perfection' was awarded an HCC in 1969. Ross used this awarded cultivar and crossed it with *Paph. henryanum* and registered the grex as *Paphiopedilum* Little Cove. The idea with this cross was to maintain spots and improve the form while reducing the size using *Paph. henryanum* (Hella, pers. comm.). This hybrid was a step closer to the ideal form, with a pretty little flower and spotting on the dorsal, broader petals with great color, dark-pink color on the pouch and overall vibrant colors. This hybrid was registered in 2020 and has no awards to date but it has award potential. Also in 2020, Hella registered *Paphiopedilum* Henry the Red, another hybrid using *Paph. henryanum*, as the miniaturizing parent. The complex hybrid parent was *Paphiopedilum* Sioux with the ideal full, flat, round form. *Paphiopedilum* Henry the Red has good form, the petals are wider, although a little porrect, but there is no fenestration, giving a fuller look to the flower. The color is great, the dorsal spotting and pink pouch is from the *Paph. henryanum* parent and it inherited good form from *Paph. Sioux*. This is another grex with award potential!

Harold Koopowitz also implemented this third approach using *Paphiopedilum* Coconut Candy (Elfstone × *charlesworthii*), a green, compact complex hybrid, in a breeding line for minis. *Paphiopedilum* Baby Boo Boo (Doll's Kobold ×) cultivars have quite a variation in color, but the petals were narrow and the form was not ideal. Having a complex hybrid in the genealogy does not guarantee broad petals or good form, and they are held to a higher standard when being judged, as it is expected that the form and color



ROSS HELLA



ROSS HELLA



ROSS HELLA



ARTHUR PINKERS

- [14] *Paph. Mary's Little Leopard* 'Honey Bear' AM/AOS; grower: Joel Graham.
- [15] *Paph. Barbi's Moon* '12-20'; grower: Ross Hella.
- [16] *Paph. Barb Hella* 'Sun's Glow' AM/AOS; grower: Ross Hella.
- [17] *Paph. Henry's Kaleidoscope*; grower: Ross Hella.
- [18] *Paph. Little Cove*; grower: Ross Hella.
- [19] *Paph. Henry the Red* (Henry × Sioux); grower: Ross Hella, Deerwood Orchids.
- [20] *Paph. Whimsical Baby* 'Pink Petals' AM/AOS; grower: Harold Koopowitz, Paph Factory.

have been improved through breeding. To date, it has not been awarded, but it was used in further breeding to produce five offspring.

The best of *Paph. Baby Boo Boos'* babies is *Paphiopedilum* Whimsical Baby (Whimsical ×) registered by Koopowitz in 2005. It is an impressive miniature plant with pink and white coloration, slight spotting on the dorsal, and

excellent form. The cultivar 'Pink Petals' was awarded an AM in 2016. The ideal form traits of the complex hybrid *Paph. Whimsical* with *Brachypetalum* species in the background have carried forward, significantly improving the flower form of *Paphiopedilum* Whimsical Baby. This is a real charmer!

Following this line of breeding with *Paph. Coconut Candy*, in 2013 Koopowitz

registered *Paphiopedilum* Small Wonder. He used *Paphiopedilum* Little Candy for the miniature stature and crossed with *Paph.* Whimsical for improved form. Small Wonder has *Paph.* Coconut Candy as a grandparent and has the *Brachypetalum* species in the background. Here the influence of the complex hybrid genes is evident; the ideal form can be seen in the aptly named cultivar 'Perfection'. An AM was awarded to the cultivar 'Deerwood Koop Connection', a tiny flower with a natural spread of 3.5 inches (9.0 cm) horizontally by 3.1 inches (8.0 cm) vertically with great form and color.

Another Koopowitz hybrid within this line of breeding is an unregistered grex, crossing *Paphiopedilum* Little Henry (Marguerite Knox × *henryanum*) with *Paph.* Coconut Candy. It was anticipated that the offspring would have the wide petals and good form from the *Brachypetalum* genealogy and that the *Paph.* *henryanum* would pass on the pink pouch and dorsal spotting. Well, if only predicting the traits of hybrids could be this easy — the result is a tiny, cute plant but the pouch is not pink and the petals are not wide, although there is spotting on the dorsal and petals. Ross Hella (pers. comm.) stated, "hybridizing orchids is like wood carving with a shotgun." One can never precisely predict the result of hybridizing, and such is the case here. Koopowitz is calling this a "micro" paphiopedilum. As hybridizers create even smaller flowers, the judging ideology of "bigger is better" becomes a conundrum.

What about red minis? Koopowitz (pers. comm.) commented, "Although there is red in *Paph.* *charlesworthii*, getting it expressed as deep red is difficult. One way to get reds is to mate vinicolored *maudiae* types with *Paph.* *charlesworthii* or *Paph.* *henryanum*." He coined the term "mini vinis" for miniature red paphiopedilums. In the quest for mini vinis, Koopowitz crossed *Paphiopedilum* Peacock Stars with *Paph.* *charlesworthii*. This cross has not yet been registered. The cultivar 'Red Baron' has boldly saturated color, but narrow petals, and the first generation are quite dark, but not small enough (Koopowitz, pers. comm.). He found that the second-generation offspring were smaller, but it was difficult to obtain solid red colors, and mini vinis are an ongoing hybridizing quest.

Dave Sorokowsky, owner of Paph Paradise, is also breeding for mini paphiopedilums, and he has produced some extraordinary hybrids. He used *Paph.* Doll's Kobold in a cross with *Paphiopedilum*



21 HAROLD KOPOWITZ



22 BILL JOHNSON



23 DAVID SOROKOWSKY



24 KATHY BARRETT

Happy Shamrock, a complex hybrid with good form, to produce *Paphiopedilum* Lucky Charms, just registered in 2020. The insigne species *Paph.* *henryanum* and *Paph.* *charlesworthii* in its genealogy carry forward their typical traits into this grex. The *Paph.* *henryanum* influence is evident, with bold spots on dorsal and pink pouch, and the *Paph.* *charlesworthii* contributes the wide dorsal and the brown petals with a tessellated pattern — *Paph.* Happy Shamrock improved the form. The cultivar 'Grenache' is an incredible little flower with great color, patterns and form.

In 2019, Sorokowsky hit the mark in miniature hybridizing for both form and color with *Paphiopedilum* Paradise Gem. He crossed two yellow, complex hybrids — *Paph.* In-Charm Topaz and *Paphiopedilum* Pacific Rainbow — to produce *Paphiopedilum* Paradise Gem. The *Paph.* In-Charm Topaz parent imparts the small size, and *Paph.* Pacific Rainbow was used for its bright-green color. The cultivar 'Prosecco' was awarded an AM in 2020. It is an absolute gem with a round, flat, full flower, a nicely spotted pattern on the dorsal, a little pink blush on the pouch and good clear color; the flower is held nicely above the foliage.

Fred Clarke of Sunset Valley Orchids



25 HAROLD KOPOWITZ



26 JASON R. MILLS

registered *Paphiopedilum* Nancy Depauw in 2017. He crossed *Paphiopedilum* Barbie's Candy (Coconut Candy × *barbigerum*) with *Paph. fairrieianum* and generated an elegant little flower. It has a veined light green on white dorsal, apple green petals and pouch, a nice striped pattern on the petals and veining on the pouch. The petals have a downswept stance passed on from *Paph. fairrieianum*, giving a real elegance to the flower form. To date, it has received two awards, an HCC and an AM.

What has been discussed so far is the tip of the iceberg, as there are a number of other miniature paphiopedilum hybridizers in North America, Asia and Europe working to achieve great miniatures. The sheer number of hybridizers and the number of unregistered crosses presently in the works would suggest that these are not a fad and more incredible miniature hybrids are just around the corner. So, what does the future hold?

Hybridizers are still challenged with obtaining solid pinks, better reds, soft whites and bold colors. The ideal form is always a challenge, but now there are quite a number of compact and small complex hybrids in the gene pool to incorporate into breeding programs to achieve great form. Miniature multifloral paphiopedilums are still rather elusive, and some hybridizers are pursuing this line of breeding, so hopefully these will appear sometime in the near future. Hybridizers always face the challenge of genetic incompatibility between paphiopedilum groups, resulting in failure to produce fertile seed pods or progeny, which is a frustrating result after years of hard work! And as new species are discovered and become available for cultivation, they are often used in hybridizing programs, as they lend new genetics into breeding programs.

One such plant is the recently discovered tiny species, *Paphiopedilum rungsuriyanum*, which have an elongated pouch and rich-plum color. Michael Tibbs crossed this with *Paph. fairrieianum* — the resultant hybrid *Paphiopedilum* Hanoi Fairy (see front cover) has some appeal. It was just registered in May of this year. The pouch is still elongated, but it has great color. Of course, this species is not legal for trade in North America, but perhaps will be in the future. *Paphiopedilum rungsuriyanum* has a rather awkward form, which is not at all the ideal form like so many other species, but it has that deep color that could be useful in hybridizing. It appears that in this



OLAF GRUSS

cross, the color is dominant. It would be interesting to see the results of crossing this with *Paphiopedilum thaianum* or *Paph. niveum* with the broad petals to see the resultant form and color variations. Perhaps this will be a new breeding line in the future.

Whatever the future holds, let us hope that it is a world full of wonderful... Tiny Slippers.

#### Acknowledgments

It is great to have so many extremely knowledgeable people that are willing and eager to share a wealth of information and, without them, I could not have accomplished writing this article. Special thanks to Harold Koopowitz and Ross Hella for their photos and never-ending assistance. Dave Sorokowsky, Fred Clarke, Olaf Gruss, Michael Tibbs and Bill Goldner provided advice and photos. I appreciate having two great student mentors, Ed Cott and Dave Miller of the Great Lakes Judging Center and thanks to Jean Allen-Ikeson from the Toronto Judging Center for her editing assistance, advice and encouragement.

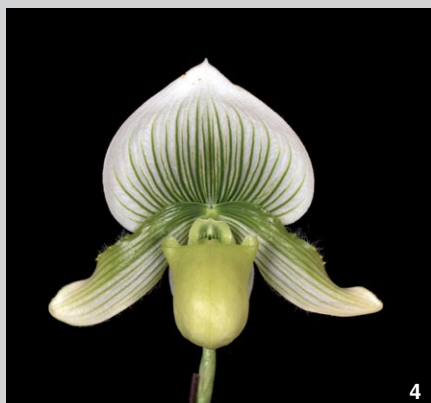
#### References

- American Orchid Society. OrchidPro database. Accessed May 2021.  
 Kew World Checklist of Selected Plant Families. <http://theplantlist.org>. Accessed April 17, 2021.  
 Koopowitz, H. 2006. New Miniature Paphiopedilums: The Next Big Thing in Slippers? *Orchid Digest* 70(1):8–14.  
 Koopowitz, H. 2008. *Tropical Slipper Orchids*. Timber Press, Portland, Oregon. p. 281–291.  
 Koopowitz, H. 2014. Miniature Paphiopedilums—An

- [21] *Paph. Small Wonder* 'Perfection'; grower: Harold Koopowitz.  
 [22] *Paph. Small Wonder* 'Deerwood Koop Connection' AM/AOS; grower: Ross Hella.  
 [23] *Paph. Lucky Charms* 'Grenache'; grower: Dave Sorokowsky, Paph Paradise.  
 [24] *Paph. Paradise Gem* 'Prosecco' AM/AOS; grower: Dave Sorokowsky, Paph Paradise.  
 [25] *Paph. (Peacock Stars x charlesworthii)* 'Red Baron'; grower: Harold Koopowitz.  
 [26] *Paph. Nancy Depauw* 'Sweet Little Thing' AM/AOS; exhibitor: Barbara Barnett.  
 [27] *Paph. rungsuriyanum*, photograph by Olaf Gruss. Inset photograph by Michael Tibbs of *Paph. Hanoi Fairy (rungsuriyanum x fairrieianum)*; see also front cover.

Update. *Orchid Digest* 7(4):226–233.  
 OrchidWiz Encyclopedia. v. X7.2. Louisville, Colorado. Accessed May, June 2021.  
 Schwarz, G. 2016. Part IV. Miniature and Intermediate Hybrids and New Directions. *The Slipper Alliance Newsletter* 17(3):7–12.

— Deb Boersma is a recently retired chemistry teacher from St. Clair College. She has been growing orchids for over 30 years and recently built a greenhouse to house her orchid collection of *Cattleya*, *Tolumnia*, *Sobralia* and other miscellaneous orchid genera. She is now an AOS student judge at the Great Lakes Judging Center (email: [debul8ter@outlook.com](mailto:debul8ter@outlook.com)).





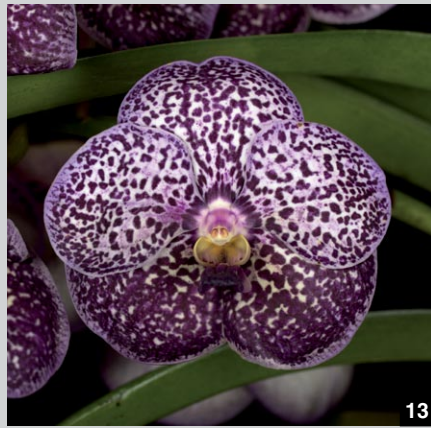
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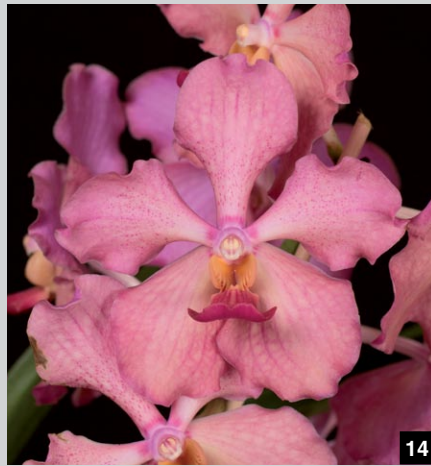
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- [1] *Paphiopedilum Rolfei* 'Crystelle' AM/AOS (*bellatulum* x *rothschildianum*) 83 pts. Exhibitor: Krull-Smith; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [2] *Paphiopedilum Fajen's Fair Wench* 'Springwater' AM/AOS (*fairrianum* x *wenshanense*) 81 pts. Exhibitor: Springwater Orchids & Thanh Nguyen; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [3] *Paphiopedilum Raingreen's Gem* 'Chrysalis Yami Delgado' AM/AOS (*Raingreen's Honey* x *concolor*) 82 pts. Exhibitor: Christine Morales and Alex Rodriguez; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [4] *Paphiopedilum Doya Green Prince* 'Crystelle' AM/AOS (*Hsinying Citron* x *In-Charm Silver Bell*) 83 pts. Exhibitor: Krull-Smith; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [5] *Cattleya Trudy's Apricot* 'Fred's Lack of Vision' AM/AOS (*California Apricot* x *Trudy Marsh*) 84 pts. Exhibitor: New Vision Orchids; Photographer: Mei Ling Clemens. Great Lakes Judging
- [6] *Oncidium Drummer Harry* 'Red Explosion' HCC/AOS (*Harry Baldwin* x *Drummer Boy*) 78 pts. Exhibitor: New Vision Orchids; Photographer: Mei Ling Clemens. Great Lakes Judging
- [7] *Angraecum elephantinum* 'M & B' AM/AOS 80 pts. Exhibitor: Max Thompson & Bryon Rinke; Photographer: Bryon K Rinke. Great Plains Judging
- [8] *Cattleya trianae* 'A.C Burrage' CCE/AOS 94 pts. Exhibitor: Yife Tien; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [9] *Cattleya Melody Fair* 'Lady Stella' CCE/AOS (*Stephen Oliver Fouraker* x *Horace*) 90 pts. Exhibitor: Yife Tien; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [10] *Vanda lamellata* var. *remediosa* 'Villa' CCM/AOS 84 pts. Exhibitor: Wayne T. Green; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [11] *Phragmipedium besseae* f. *flavum* 'Littlefrog Caroline' AM/AOS 81 pts. Exhibitor: Littlefrog Farm; Photographer: Mei Ling Clemens. Great Lakes Judging
- [12] *Acianthera zumbae* 'Bryon' CBR/AOS. Exhibitor: Bryon K. Rinke; Photographer: Bryon K Rinke. Great Plains Judging
- [13] *Vanda Kulwadee* Fragrance 'Alexander' AM/AOS (*Gordon Dillon* x *Guo Chia Long*) 84 pts. Exhibitor: Wayne T. Green; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [14] *Papilionanda Alphonsus Pang Chong Soon* 'Olga' HCC/AOS (*Josephine van Brero* x *Vanda Pat Delight*) 77 pts. Exhibitor: Wayne T. Green; Photographer: Carmen Johnston. Florida-Caribbean Judging
- [15] *Phragmipedium Manzur la Aldea* 'Littlefrog Fallen Down' AM/AOS (*schlimii* var. *manzurii* x *besseae*) 81 pts. Exhibitor: Littlefrog Farm; Photographer: Mei Ling Clemens. Great Lakes Judging
- [16] *Rhyncholaeliocattleya Ishpeming* 'Syzygy' CCM-AM/AOS (*Little Toshie* x *Cattleya California Apricot*) 82-80 pts. Exhibitor: Peter Ostlund; Photographer: Mei Ling Clemens. Great Lakes Judging







- [1] *Restrepia mohrii* 'Bryon' CCM/AOS 85 pts. Exhibitor: Bryon K. Rinke; Photographer: Bryon K Rinke. Great Plains Judging
- [2] *Renanthera* Wynn McPheeters 'Aloha Aina' AM/AOS (*bella* x *monachica*) 84 pts. Exhibitor: Aloha Aina Orchids; Photographer: Michael Blietz. Hawaii Judging
- [3] *Cattlianthe* Charles Wilson 'Lorraine A. Billeaud' AM/AOS (*Cattleya* Circle Spirit x *Orchidglade*) 80 pts. Exhibitor: Dennis Wollard; Photographer: Linda Medine. Houston Judging
- [4] *Dendrochilum wenzelii* 'Makawao Gold' CCE/AOS 90 pts. Exhibitor: Andrew Okada; Photographer: Michael Blietz. Hawaii Judging
- [5] *Schoenorchis paniculata* 'Bryon' CCM/AOS 87 pts. Exhibitor: Bryon K. Rinke; Photographer: Bryon K Rinke. Great Plains Judging
- [6] *Rhyncattaleia* Susan McKnight 'M & B' AM/AOS (Pamela x *Cattleya* Aristocrat (1945)) 80 pts. Exhibitor: Max Thompson and Bryon Rinke; Photographer: Bryon K Rinke. Great Plains Judging
- [7] *Clowesetum* Joy Prout 'Nancy's Notion' AM/AOS (*Clowesia* Rebecca Northen x *Catasetum semicirculatum*) 82 pts. Exhibitor: James Morrison; Photographer: Linda Medine. Houston Judging
- [8] *Cattleya* Hawaiian Message 'Carmela' AM/AOS (*Horace* x *walkeriana*) 80 pts. Exhibitor: James Jeansonne; Photographer: Linda Medine. Houston Judging
- [9] *Ghillanyara* Haleahi 'Memoria Palace' HCC/AOS (*Brassanthe* Maikai x *Collierara* Snow Ballet) 75 pts. Exhibitor: Louisiana Orchid Connection John Nelson; Photographer: Linda Medine. Houston Judging
- [10] *Epidendrum baumannianum* 'Memoria Palace' HCC/AOS 76 pts. Exhibitor: Louisiana Orchid Connection, John Nelson; Photographer: Linda Medine. Houston Judging
- [11] *Cattleya walkeriana* (Alba) 'Mauna Kea' HCC/AOS 77 pts. Exhibitor: Ben Oliveros and Orchid Eros; Photographer: Glen Barfield. Hawaii Judging
- [12] *Angraecum* Memoria Mark Aldridge 'Memoria Palace' AM/AOS (*sesquipedale* x *superbum*) 84 pts. Exhibitor: Louisiana Orchid Connection John Nelson; Photographer: Linda Medine. Houston Judging
- [13] *Eulophia euglossa* 'Theresia Hirsch' HCC/AOS 78 pts. Exhibitor: Meta Flanagan; Photographer: Linda Medine. Houston Judging
- [14] *Eulophia euglossa* 'Memoria Palace' HCC/AOS 77 pts. Exhibitor: Louisiana Orchid Connection John Nelson; Photographer: Linda Medine. Houston Judging
- [15] *Fredclarkeara* Desert Tenor 'Stephen Moffitt' HCC/AOS (*Mormodia* Painted Desert x *Catasetum tenebrosum*) 78 pts. Exhibitor: Steve Moffitt; Photographer: Malcolm McCorquodale. Houston Judging
- [16] *Paphiopedilum* Yosemite Green 'Green Bay' AM/AOS (*Miaohua* Curet x *Hsinying* Yosemite) 81 pts. Exhibitor: Sergey Skoropad; Photographer: David Oldham. Mid-Atlantic Judging





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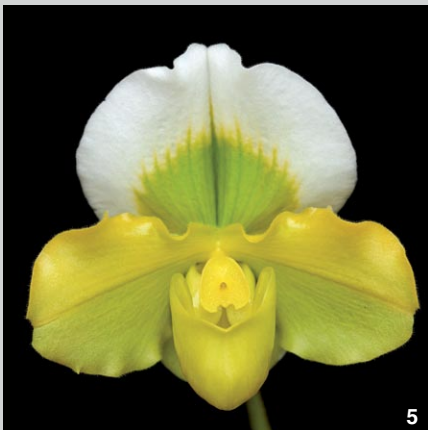


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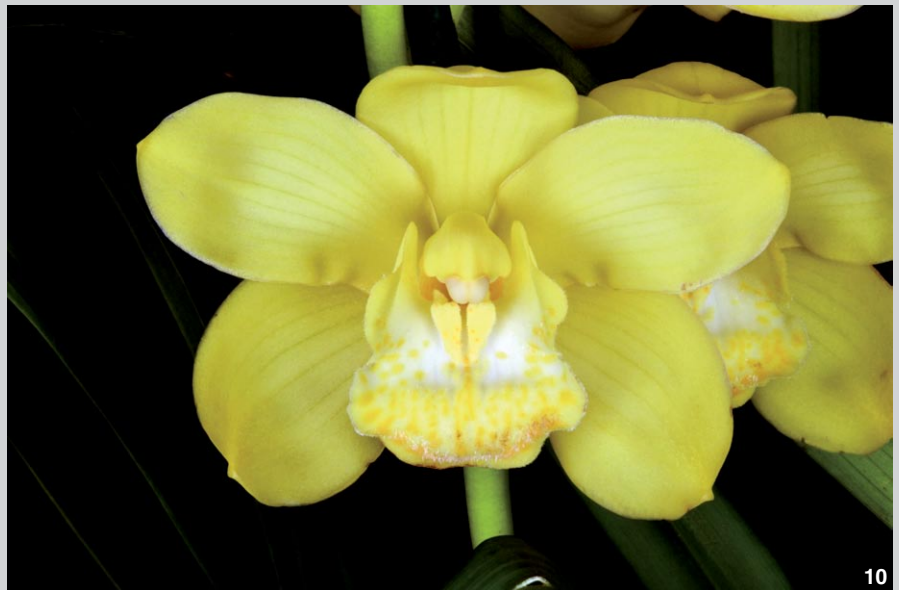
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- [1] *Cattlianthe* Hope Adair 'Nellie 3D' HCC/AOS (*Cattleya intermedia* x Cluster Fire) 77 pts. Exhibitor: Dennis Tomjack; Photographer: Malcolm McCorquodale. Houston Judging
- [2] *Phragmipedium* Acker's Royalty 'Elaine' HCC/AOS (Twilight x *fischeri*) 77 pts. Exhibitor: Derek Lowenstein; Photographer: Malcolm McCorquodale. Houston Judging
- [3] *Paphiopedilum* Jersey Girl 'Dottie' HCC/AOS (Hilo Girl x Stone Lovely) 79 pts. Exhibitor: Sergey Skoropad; Photographer: David Oldham. Mid-Atlantic Judging
- [4] *Cymbidium tortisepalum* var. *longibracteatum* 'Dark Mountain' HCC/AOS 79 pts. Exhibitor: John Dunkelberger; Photographer: Bryan Ramsay. National Capital Judging
- [5] *Cattleya walkeriana* (Coerulea) 'Dr. Chelsea' AM/AOS 83 pts. Exhibitor: Ken Reynolds; Photographer: David Oldham. Mid-Atlantic Judging
- [6] *Cattleya walkeriana* 'Big Rich' HCC/AOS 78 pts. Exhibitor: Ken Reynolds; Photographer: David Oldham. Mid-Atlantic Judging
- [7] *Cyrtocidium* Nittany Ruby 'Blood Orange Marmalade' HCC/AOS (Golden Ruffles x *Oncidium* Lois Posey) 76 pts. Exhibitor: Shawn Wood; Photographer: Bryan Ramsay. National Capital Judging
- [8] *Cattleya walkeriana* (Flamea) 'Pacific Dream' AM/AOS 88 pts. Exhibitor: Ken Reynolds; Photographer: David Oldham. Mid-Atlantic Judging
- [9] *Phragmipedium* Seven Mountains 'Tussey Mountain' HCC/AOS (Augres x Saint Ouen) 78 pts. Exhibitor: Woodstream Orchids; Photographer: Bryan Ramsay. National Capital Judging
- [10] *Oncidium* Cotton Candy 'Pink Passion' HCC/AOS (Fading Rose x *roseoides*) 79 pts. Exhibitor: John Dunkelberger; Photographer: Bryan Ramsay. National Capital Judging
- [11] *Cymbidium* Shirley Dunkelberger 'Holiday Greetings' AM/AOS (*tracyanum* x *seidenfadenii*) 81 pts. Exhibitor: John Dunkelberger; Photographer: Bryan Ramsay. National Capital Judging
- [12] *Phragmipedium* Jason Fischer 'Black Canyon' AM/AOS (Memoria Dick Clements x *besseae*) 88 pts. Exhibitor: Woodstream Orchids; Photographer: Bryan Ramsay. National Capital Judging
- [13] *Phragmipedium* Long Lake 'Rullands Coulee Creek' AM/AOS (Hanne Popow x *boissierianum*) 82 pts. Exhibitor: Woodstream Orchids; Photographer: Bryan Ramsay. National Capital Judging
- [14] *Phalaenopsis* amabilis 'Little Brook' JC/AOS. Exhibitor: Little Brook Orchids; Photographer: Julie Rotramel. National Capital Judging
- [15] *Phragmipedium* Jason Fischer 'Jersey' JC/AOS (Memoria Dick Clements x *besseae*). Exhibitor: Woodstream Orchids; Photographer: Bryan Ramsay. National Capital Judging
- [16] *Brassia pascoensis* 'Irene' CHM/AOS 82 pts. Exhibitor: Al and Irene Messina; Photographer: Maurice Garvey. Northeast Judging



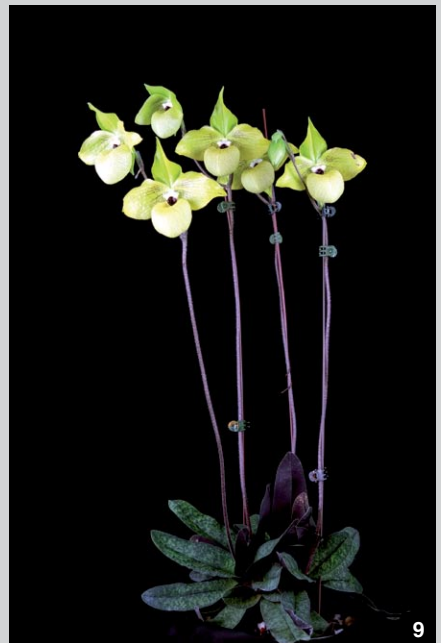


- [1] *Paphiopedilum* Hawaiian Aloha 'Slipper Zone Pink Pleasantly' HCC/AOS (Hawaiian Illusion x Memoria Jeffrey Ma) 77 pts. Exhibitor: Lehua Orchids; Photographer: Bryan Ramsay. National Capital Judging
- [2] *Paphiopedilum* Calvert Sunrise 'Jocelyn Marie' AM/AOS (*spicerianum* x *victoriamariae*) 82 pts. Exhibitor: Marc Kiriou; Photographer: Bryan Ramsay. National Capital Judging
- [3] *Paphiopedilum* Titan's Dream 'True Love' AM/AOS (Alex Szabo x Titan's Gold) 80 pts. Exhibitor: Marriott Orchids; Photographer: Bryan Ramsay. National Capital Judging
- [4] *Paphiopedilum* Irish Lullaby 'Charming' AM/AOS (Scarborough Faire x Coastal Gold) 80 pts. Exhibitor: Marriott Orchids; Photographer: Bryan Ramsay. National Capital Judging
- [5] *Paphiopedilum* Titan's Dream 'Golden Emperor' HCC/AOS (Alex Szabo x Titan's Gold) 79 pts. Exhibitor: Marriott Orchids; Photographer: Bryan Ramsay. National Capital Judging
- [6] *Paphiopedilum* Pink Queen 'Queen Mother' AM/AOS (White Queen x Amandahill) 83 pts. Exhibitor: Marriott Orchids; Photographer: Bryan Ramsay. National Capital Judging
- [7] *Dendrobium roslii* 'Carol' AM/AOS 80 pts. Exhibitor: Maurice Garvey; Photographer: Maurice Garvey. Northeast Judging
- [8] *Paphiopedilum delenatii* 'Deborah's Delight (3N)' HCC/AOS 79 pts. Exhibitor: Deborah Fox; Photographer: Bryan Ramsay. National Capital Judging
- [9] *Phragmipedium* Cardinale 'schlimii Wilcox' CCM/AOS (Sedenii x *schlimii*) 85 pts. Exhibitor: Jeff Morris; Photographer: Bryan Ramsay. National Capital Judging
- [10] *Cattleya walkeriana* 'Pacific Passion' AM/AOS 84 pts. Exhibitor: Ken Reynolds; Photographer: Bryan Ramsay. National Capital Judging
- [11] *Clowesetum* Diane Drisch 'Bonnie Marie' HCC/AOS (*Clowesia* Grace Dunn x *Catasetum tigrinum*) 78 pts. Exhibitor: Carol Butcher; Photographer: Bryan Ramsay. National Capital Judging
- [12] *Brassavola nodosa* 'Little Brook' CCM/AOS 85 pts. Exhibitor: Little Brook Orchids; Photographer: Julie Rotramel. National Capital Judging
- [13] *Rhyncattleanthe* Laszlo's Spark 'Denise' AM/AOS (*Cattleya* Memoria Trudi Marsh x Sunrise Fantasy) 82 pts. Exhibitor: Stephen Male & Fishing Creek Orchids; Photographer: Julie Rotramel. National Capital Judging
- [14] *Rhyncholaeliocattleya* Fantasy Circle 'Molly' HCC/AOS (Golden Circle x *Cattleya* Angel's Fantasy) 76 pts. Exhibitor: Stephen Male & Fishing Creek Orchids; Photographer: Julie Rotramel. National Capital Judging
- [15] *Rhyncholaeliocattleya* Memoria Cristina Montero 'Save for Sarah' AM/AOS (Hisako Jewel x *Cattleya* Cosmic Delite) 84 pts. Exhibitor: Sarah Hurdell; Photographer: Julie Rotramel. National Capital Judging
- [16] *Dendrobium toressae* 'Fishing Creek' CCE/AOS 92 pts. Exhibitor: Stephen Male and Fishing Creek Orchids; Photographer: Julie Rotramel. National Capital Judging

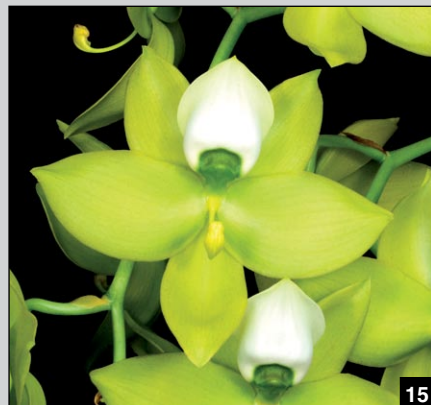




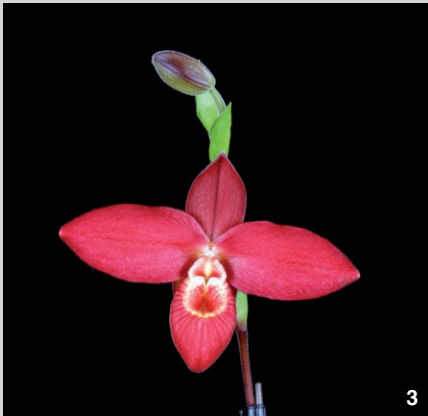
- [1] *Maxthompsonara* Bryon Rinke 'Winter Magic' AM/AOS (*Galabstia* Green Tyger x *Batemannia colley*) 82 pts. Exhibitor: Sergey Skoropad; Photographer: Maurice Garvey. Northeast Judging
- [2] *Phalaenopsis* AL Sun Hannover 'RED' AM/AOS (Mituo Sun x Hannover Passion) 84 pts. Photographer: Maurice Garvey. Northeast Judging
- [3] *Coelogyne usitata* 'Saba Dan' AM/AOS 89 pts. Exhibitor: Roey Shaviv; Photographer: Chaunie Langland. Pacific Central Judging
- [4] *Lepanthes menatoi* 'Cosmos' CCM/AOS 85 pts. Exhibitor: Terry Thompson; Photographer: Tim Morton. Pacific Northwest Judging
- [5] *Bulbophyllum gibbosum* 'Tory's Bouquet' CCE/AOS 94 pts. Exhibitor: Carol Baum; Photographer: Maurice Garvey. Northeast Judging
- [6] *Platystele scopulifera* 'Timothy Henry' CHM/AOS 83 pts. Exhibitor: Carrie Buchman; Photographer: Maurice Garvey. Northeast Judging
- [7] *Masdevallia concinna* 'Laval' CCM/AOS 83 pts. Exhibitor: Chuck and Sue Andersen; Photographer: Russ Price. Northeast Judging
- [8] *Paphiopedilum* Nikolay 'Eulachon Moon' AM/AOS (Misty Lantern x *armeniicum*) 80 pts. Exhibitor: John McCallen; Photographer: Chaunie Langland. Pacific Central Judging
- [9] *Dendrobium milaniae* 'New Jersey Surprise' CBR/AOS. Exhibitor: New World Orchids; Photographer: Maurice Garvey. Northeast Judging
- [10] *Cymbidium* Predawn Dream 'Windermere' HCC/AOS (Dream Therapy x Colonial Dawn) 78 pts. Exhibitor: Pierre Pujol; Photographer: Chaunie Langland. Pacific Central Judging
- [11] *Dendrobium* Snowman 'Mt. Airy' CCM/AOS (Gillian Leaney x Aussie Sandy) 84 pts. Exhibitor: Waldor Orchids, Inc.; Photographer: Russ Price. Northeast Judging
- [12] *Laelia autumnalis* 'Winston' HCC/AOS 77 pts. Exhibitor: Amy and Ken Jacobsen; Photographer: Chaunie Langland. Pacific Central Judging
- [13] *Paphiopedilum* Olympic Emerald 'Trifecta' HCC/AOS (Olympic Mountains x Limerick) 78 pts. Exhibitor: Hillside Orchids; Photographer: Ross Leach. Pacific Northwest Judging
- [14] *Paphiopedilum* Lex Luthor 'Kryptonite' AM/AOS (Luther Pass x Blockbuster) 81 pts. Exhibitor: Hillside Orchids; Photographer: Ross Leach. Pacific Northwest Judging
- [15] *Cymbidium goeringii* 'Taiwan Gem' AM/AOS 83 pts. Exhibitor: Amy and Ken Jacobsen; Photographer: Chaunie Langland. Pacific Central Judging
- [16] *Cymbidium tortisepalum* 'Xingyi 456' AM/AOS 85 pts. Exhibitor: Amy and Ken Jacobsen; Photographer: Chaunie Langland. Pacific Central Judging







- [1] *Laelia anceps* f. *lineata* 'Eleanor' CCM/AOS 81 pts. Exhibitor: Jim Pearce; Photographer: Ross Leach. Pacific Northwest Judging
- [2] *Masdevallia* Red Dawn 'Phil Webb' AM/AOS (Mary Staal x Redshine) 80 pts. Exhibitor: Liana Webb; Photographer: Tim Morton. Pacific Northwest Judging
- [3] *Paphiopedilum* Frank Zettle 'Shane' AM/AOS (*hirsutissimum* x *henryanum*) 83 pts. Exhibitor: Deborah Halliday; Photographer: Arnold Gum. Pacific South Judging
- [4] *Paphiopedilum venustum* 'Arnie' AM/AOS 83 pts. Exhibitor: Arnold Gum; Photographer: Arnold Gum. Pacific South Judging
- [5] *Cattleya trianae* 'Geneva's Holiday Surprise' HCC/AOS 77 pts. Exhibitor: Thornton Conservatory; Photographer: Arthur Pinkers. Pacific South Judging
- [6] *Paphiopedilum* Luther Pass 'Dolce' HCC/AOS (*Winston Churchill* x *Spotglen*) 77 pts. Exhibitor: Hillside Orchids; Photographer: Ross Leach. Pacific Northwest Judging
- [7] *Lepanthes menatoi* 'Cosmos' CCM/AOS 85 pts. Exhibitor: Terry Thompson; Photographer: Tim Morton. Pacific Northwest Judging
- [8] *Mormodes* Aftermath 'SVO Neon Blaster' AM/AOS (*Midnight Hooker* x *Mark Mills*) 86 pts. Exhibitor: Fred Clarke; Photographer: Arnold Gum. Pacific South Judging
- [9] *Paphiopedilum* Nori's Song 'MikeAl' CCM/AOS (*Norito Hasegawa* x *mali-poense*) 86 pts. Exhibitor: Michael Curtin; Photographer: Tim Morton. Pacific Northwest Judging
- [10] *Paphiopedilum* Star Scream 'Chapman Woods' AM/AOS (*Hagrid* x *Pacific Challenger*) 81 pts. Exhibitor: Fred Capriccio; Photographer: Arthur Pinkers. Pacific South Judging
- [11] *Paphiopedilum* King's Forest 'Gold Field' HCC/AOS (*Gege Hughes* x *Alex Szabo*) 76 pts. Exhibitor: Fred Capriccio; Photographer: Arthur Pinkers. Pacific South Judging
- [12] *Dendrobium* Anita Spencer 'Rainbow Valley' AM/AOS (*Tosca Starburst* x *Hilda Poxon*) 82 pts. Exhibitor: Jerry and Anita Spencer; Photographer: Arnold Gum. Pacific South Judging
- [13] *Cattleya coccinea* 'Paradox Ann' AM/AOS 84 pts. Exhibitor: Paul and Ann Tuskes; Photographer: Arnold Gum. Pacific South Judging
- [14] *Paphiopedilum* Voodoo Fred 'Slipper Zone Only Just Spots' HCC/AOS (*Voodoo Shadow* x *Fred in Pink*) 78 pts. Exhibitor: Lehua Orchids; Photographer: Arthur Pinkers. Pacific South Judging
- [15] *Cycnoches warszewiczii* 'SVO Jumbo Super' AM/AOS 83 pts. Exhibitor: Fred Clarke; Photographer: Arnold Gum. Pacific South Judging
- [16] *Paphiopedilum* Toni Semple 'Arnie' HCC/AOS (*haynaldianum* x *lowii*) 76 pts. Exhibitor: Arnold Gum; Photographer: Arnold Gum. Pacific South Judging





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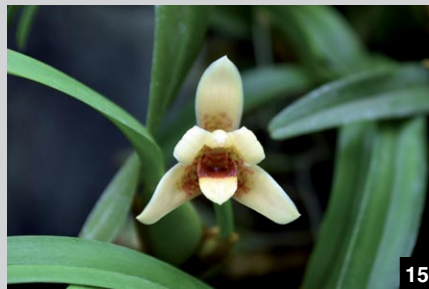
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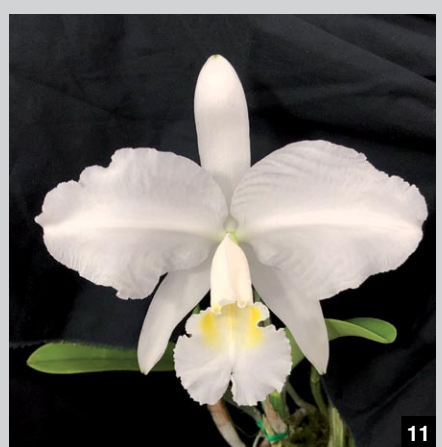
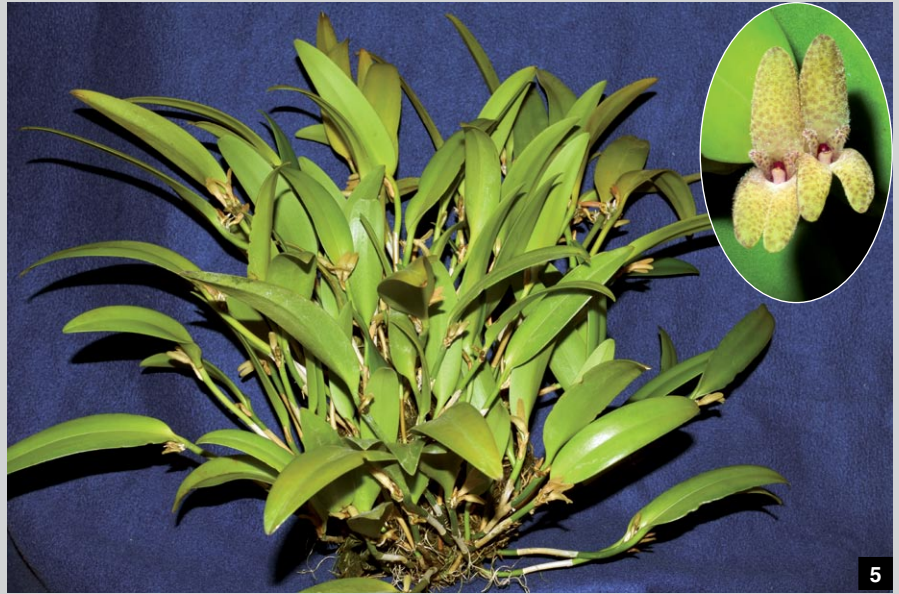


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- [1] *Paphiopedilum* Voodoo Fred 'Slipper Zone Dorsal Diva' HCC/AOS (Voodoo Shadow x Fred in Pink) 76 pts. Exhibitor: Lehua Orchids; Photographer: Arthur Pinkers. Pacific South Judging
- [2] *Paphiopedilum* Hawaiian Peacock 'Que' AM/AOS (Hawaiian Illusion x Petula's Peacock) 82 pts. Exhibitor: Bryce Augustine; Photographer: Arthur Pinkers. Pacific South Judging
- [3] *Phragmipedium* Jason Fischer 'Janet's Patience' AM/AOS (Memoria Dick Clements x *besseae*) 84 pts. Exhibitor: James Roberts; Photographer: Arthur Pinkers. Pacific South Judging
- [4] *Bulbophyllum* Taiwan Cicad 'Sheri Humphereys' AM/AOS (*arfakianum* x *burfordiense*) 83 pts. Exhibitor: Dennis Wollard; Photographer: Doug Stannard. Shreveport Judging
- [5] *Dendrobium sanderae* (Luzonicum) 'Geneva's Sugar Crystals' HCC/AOS 78 pts. Exhibitor: Thornton Conservatory; Photographer: Arthur Pinkers. Pacific South Judging
- [6] *Rhyncholaelocattleya* Montana Spirit 'Big Sky' HCC/AOS (William Farrell x *Cattleya loddigesii*) 76 pts. Exhibitor: Eron Borne; Photographer: Doug Stannard. Shreveport Judging
- [7] *Phragmipedium* Fritz Schomburg 'Synea' AM/AOS (*kovachii* x *besseae*) 85 pts. Exhibitor: Synea Tan; Photographer: Ed Cott. Toronto Judging
- [8] *Clowesetum* Diane Drisch 'Louisiana' AM/AOS (*Clowesia* Grace Dunn x *Catasetum tigrinum*) 81 pts. Exhibitor: Alan Taylor; Photographer: Doug Stannard. Shreveport Judging
- [9] *Dendrobium* Oma's Delight 'Petra F. Flanagan' HCC/AOS (Aussie Parade x *fleckeri*) 76 pts. Exhibitor: Meta Flanagan; Photographer: Doug Stannard. Shreveport Judging
- [10] *Bulbophyllum* Wilbur Chang 'Doctor Nieves' AM/AOS (*echinolabium* x *amplebracteatum* subsp. *carunculatum*) 82 pts. Exhibitor: Dr. José Nieves; Photographer: José A. González Pérez. Puerto Rico Judging
- [11] *Laelia* Rocky Clough 'J.A.R.R.' AM-CCE/AOS (*undulata* x *gloriosa*) 83-90 pts. Exhibitor: José Román; Photographer: José A. González Pérez. Puerto Rico Judging
- [12] *Paphiopedilum* Cocoa Kiku 'Magic Toby' AM/AOS (In-Charm Circle x Yi-Ying Fireworks) 80 pts. Exhibitor: Wilson Ng; Photographer: Ed Cott. Toronto Judging
- [13] *Dracula* Swamp Fox 'Anna Claire' JC/AOS (*cordobae* x *bella*). Exhibitor: Eron Borne; Photographer: Doug Stannard. Shreveport Judging
- [14] *Fredclarkeara* Desert Bordeaux 'Louisiana' HCC/AOS (*Mormodia* Painted Desert x *Catasetum* Alexa) 79 pts. Exhibitor: Alan Taylor; Photographer: Doug Stannard. Shreveport Judging
- [15] *Maxillaria variabilis* 'Jardin botanique de Montréal' JC/AOS. Exhibitor: Jardin botanique de Montréal; Photographer: Thang Dam. Toronto Judging
- [16] *Phalaenopsis* Lioulin R Lip 'Snookie' JC/AOS (Tying Shin Unicorn x Lioulin Pretty Lip). Exhibitor: Mary Mancini; Photographer: Doug Stannard. Shreveport Judging





- [1] *Rhyncattleanthe* Krull's Mini-Sunburst 'Eileen Hector' AM/AOS (Jack Crawford x *Cattleya* Seagulls Mini-Cat Heaven) 83 pts. Exhibitor: Krull-Smith; Photographer: Wes Newton. Florida North-Central Judging
- [2] *Cattleya* Cheuck Sun 'New Kid' HCC/AOS (Jungle Jewel x Beau's Apricot Gem) 78 pts. Exhibitor: Daniel Kwok; Photographer: Judith Higham. Western Canada Judging
- [3] *Vandachostylis* Blue Foo 'Garrett's Lavender Lady' AM/AOS (Blue Kahili x *Vanda* Peggy Foo) 83 pts. Exhibitor: Sharon and David Garrett; Photographer: Wes Newton. Florida North-Central Judging
- [4] *Rhyncattleanthe* Zul 'Boon Bryson' AM/AOS (*Guarianthe* *skinneri* x Orange Nuggett) 82 pts. Exhibitor: Krull-Smith; Photographer: Wes Newton. Florida North-Central Judging
- [5] *Restrepiella* *ophiocephala* 'Jardin botanique de Montréal' CCM/AOS 80 pts. Exhibitor: Jardin botanique de Montréal; Photographer: Thang Dam. Toronto Judging
- [6] *Vanda* Pitpreecha Sakura 'Crystelle' AM/AOS (Somsri Gold x Bitz's Hearthrob) 86 pts. Exhibitor: Krull-Smith; Photographer: Wes Newton. Florida North-Central Judging
- [7] *Vanda* No Fooling 'Garrett's Fuchsia' AM/AOS (Nopawan x Peggy Foo) 83 pts. Exhibitor: Sharon and David Garrett; Photographer: Wes Newton. Florida North-Central Judging
- [8] *Cattleya* *violacea* 'Lea' AM/AOS 84 pts. Exhibitor: Palmer Orchids; Photographer: Wes Newton. Florida North-Central Judging
- [9] *Dendrobium* *macrophyllum* 'Jardin botanique de Montréal' AM/AOS 83 pts. Exhibitor: Jardin botanique de Montréal; Photographer: Thang Dam. Toronto Judging
- [10] *Dendrobium* Nora Tokunaga 'Paramount's Valerie & Gabychat' HCC/AOS (*atroviolaceum* x *rhodostictum*) 76 pts. Exhibitor: Paramount Orchids; Photographer: Judith Higham. Western Canada Judging
- [11] *Cattleya* *lueddemanniana* f. *alba* 'Crystelle's Love' AM/AOS 86 pts. Exhibitor: Krull-Smith; Photographer: Wes Newton. Florida North-Central Judging
- [12] *Angraecum* Crestwood 'Tomorrow Star' CCM/AOS (*Veitchii* x *sesquipedale*) 83 pts. Exhibitor: Krull-Smith; Photographer: Wes Newton. Florida North-Central Judging
- [13] *Cattleya* *lueddemanniana* 'Krull's Blue Heaven' AM/AOS 83 pts. Exhibitor: Krull-Smith; Photographer: Wes Newton. Florida North-Central Judging
- [14] *Rhyncholaeliocattleya* Kathryn Hendron 'Odom's Orchid' HCC/AOS (Samantha Duncan x Bingham Vick) 76 pts. Exhibitor: Odom's Orchids, Inc.; Photographer: Wes Newton. Florida North-Central Judging
- [15] *Bulbophyllum* *lemniscatoides* 'Whisper Swinging Six Sporrán' HCC/AOS 78 pts. Exhibitor: Laura and Wes Newton; Photographer: Kay Clark. Florida North-Central Judging
- [16] *Masdevallia* *wendlandiana* 'Thanks Chuck...' CCM/AOS 82 pts. Exhibitor: Alexey Tretyakov; Photographer: Judith Higham. Western Canada Judging

**OCTOBER**

**1–3—Miami Orchid Society’s “Tamiami International Orchid Festival,”** Redland Fruit and Spice Park, 18701 SW 248 St, Homestead, FL; Contact: Martin Motes, 305-282-7520; martinmotes@gmail.com

**2–3—Oklahoma Orchid Society’s “Bewitched by Orchids” OOS/SWROGA Show & Sale,** Will Rogers Gardens Exhibition Center, 3400 NW 36th Street, Oklahoma City, OK; Contact: Douglas Needham, 610-563-8988; oos\_showchair@okorchidsociety.org

**2–3—The 2021 Morongo Basin Orchid Festival,** Gubler Orchids, 2200 Belfield Blvd, Landers, CA; Contact: Ronald Lang, 951-663-5237; rflangx25@gmail.com

**2–3—Northwest Orchid Society Fall Show and Sale,** Volunteer Park Conservatory, 1400 East Galer Street, Seattle, WA; Contact: Susan Burgess, 206-365-6406; fosterpierce@comcast.net

**6–17—Central California Orchid Society’s “The Big Fresno Fair,”** Fresno Home and Garden Show, Fresno Fairgrounds, Garden Pavilion, 1121 South Chance Ave, Fresno, CA; Contact: Gordon Wolf, 209-999-0181; gwsangca@yahoo.com

**9–10—Illinois Orchid Society’s “All You Need Is Orchids,”** Chicago Botanic Garden, Regenstein Center, 1000 Lake Cook Rd, Glencoe, IL; Contact: David Kirk, 847-563-0212; david.kirk.a@gmail.com

**9—\*Deep Cut Orchid Society Annual Orchid Auction,** Belford Engine Fire Company, 739 Main Street, Belford, NJ. Contact: Joan Mesander, 732-778-0922; jmesand22@gmail.com

**22–24—Massachusetts Orchid Society’s “World of Orchids – Caribbean,”** Sons of Italy, 117 Swanton St, Winchester, MA; Contact: Brigitte Fortin, 617-838-8682; bfortin425@msn.com

**22–24—New Mexico Orchid Guild’s “Paint with Orchids,”** Albuquerque Garden Center, 10120 Lomas Blvd NE, Albuquerque, NM; Contact: Keith Mead, 505-379-6786; orchidsinabq@gmail.com

**23–24—Ridge Orchid Society 59th Show “The Sound of Orchids,”** WH Stuart Center, 1702 US Hwy 17 S, Bartow, FL; Contact: Keith Emig, 863-412-4762; dkemig@gmail.com

**23–24—Gainesville Orchid Society’s “Orchids in the Garden,”** Kanapaha Botanical Gardens, 4700 SW 58th Dr, Gainesville, FL; Contact: Joan MacLeod, 352-665-2640; nealmacleod@bellsouth.net

**23–24—Eastern Iowa Orchid Society’s “Orchids are a Scream Returns,”** Elk Lodge Hall, 801 33rd Ave SW, Cedar Rapids, IA; Contact: Andy Coghill-Behrends, 319-512-8076; mistercoghill@hotmail.com

**28–31—East Everglades Orchid Society’s “Fall in Love with Orchids” Show & Sale,** R.F. Orchids, 28100 SW 182 Ave., Homestead, FL; Contact: Tere Camacho, 305-245-4570; tere@rforchids.com

**NOVEMBER**

**5–7—1st International Vanda & Slipper Orchid Symposium,** Highland Manor, 604 E. Main, Apopka, FL; Contact: Julio Hector, 813-765-9271; j.hector@verizon.net

**6–7—Kansas Orchid Society Fall Show and Sale,** Botanica, the Wichita Gardens, 701 Amidon St, Wichita, KS; Contact: Sarah Pratt, 316-655-0572; svcsjp@gmail.com

**13–14—Deerfield Beach Orchid Society’s “Orchid Obsession,”** Safe Schools Institute, 1790 Spanish River Blvd, Boca Raton, FL; Contact: Cheryl Babcock, 954-464-8996; babcockc@nova.edu

**13–14—Fort Pierce Orchid Society Show and Sale,** Botanica, the Wichita Gardens, 701 Amidon St, Wichita, KS; Contact: Sarah Pratt, 316-655-0572; svcsjp@gmail.com

**13–14—Niagara Frontier Orchid Society’s “Orchids Under the Dome,”** Buffalo & Erie Co. Botanical Gardens, 2655 South Park Ave, Buffalo, NY; Contact: Donna Lipowicz, 716-479-7698, ladysliper@roadrunner.com

**19–21—Atlanta Orchid Society Show and Sale,** Atlanta Botanic Garden, 1345 Piedmont Ave NE, Atlanta, GA; Contact: Danny Lentz, 770-362-0575; dblgongora@bellsouth.net

**JANUARY 2022**

**8–9—Sarasota Orchid Society’s, “Orchids in Paradise,”** Sarasota Municipal Auditorium, 801 N Tamiami Trail, Sarasota, FL; Contact: Larry Desiano, 941-724-6683; larrydesiano@gmail.com

**22–23—Cape and Islands Orchid Society Show,** Resort and Conference Center, 35 Scudder Ave, Hyannis, MA; Contact: Tina Balog, 508-540-5006; tina@plaid.whoie.edu

**28–30—Gulf Coast Orchid Society Show and Sale,** Gautier Convention Center, 2012 Library Lane, Gautier, MS; Contact: Jo Ann Vaz, 601-530-8778; joannvaz@bellsouth.net

**29–30—Florida West Coast Orchid Society’s “Orchids Unmasked,”** City of Seminole Recreation Center, 9100 113th Street North, Seminole, FL; Contact: Bill Nunez, 727-239-2700; biddison22@aol.com

**29–30—Orchid Society of Minnesota’s “Winter Carnival Orchid Show,”** Marjorie McNeely Conservatory, 1225 Estabrook Park, St. Paul, MN; Contact: Michael Dyda, 612-223-4059; michael1027us@yahoo.com

**29–30—Peninsula Orchid Society Show & Sale,** Community Activities Building, 1400 Roosevelt Ave, Redwood City, CA; Contact: Chaunie Langland, 510-364-2274; chaunieaos@gmail.com

**FEBRUARY 2022**

**4–6—Susquehanna Orchid Society’s “For the Love of Orchids,”** Milton and Catherine Hershey Conservatory at Hershey Gardens, 170 Hotel Road, Hershey, PA; Contact: Lorna Deibert, 717-825-7827; lornadeibert@aol.com

**5–6—Orchid Growers Guild’s “Orchid Quest,”** Olbrich Botanical Gardens, 3330 Atwood Ave, Madison, WI; Contact: Terri

Jozwiak, 608-592-7906; lodijoz@charter.net

**5–6—Venice Area Orchid Society Show & Sale,** Venice Community Center, 326 S Nokomis Ave, Venice, FL; Contact: Carol Wood & Judy Loeffler, 941-497-4995; showchair@vaos.org

**12–13—Boca Raton Orchid Society’s “In Love With...Orchids,”** Safe Schools Institute, 1790 NW Spanish River Blvd, Boca Raton, FL; Contact: Kathy Kersey, 954-802-3575; kathykbros@gmail.com

**12–13—Port St. Lucie Orchid Society’s “Orchid Village,”** Port St. Lucie Botanical Gardens, 2410 SE Westmoreland Blvd, Port St. Lucie, FL; Contact: Andrea Heitfeld, 772-528-1955; tazzette55@gmail.com

**19–20—Batavia Orchid Society Show,** DuPage County Fairgrounds, 2015 Manchester Rd, Wheaton, IL; Contact: Larry Sexton, 630-406-8460; orkiddoc@aol.com

**26–27—Greater Lansing Orchid Society Orchid Show,** Michigan State University Plant and Soil Sciences Bldg, 1066 Bogue St, E Lansing, MI; Contact: Ioana Sonea, 517-614-9120; ioanamsonea@gmail.com

**MARCH 2022**

**4–5—Englewood Area Orchid Society’s “Orchids to the Rescue,”** Tringali Gym, 3460 N Access Rd, Englewood, FL; Contact: Mary Anne DiGrazia, 941-697-9237; tommaryanne@centurylink.net

**4–6—Virginia Orchid Society Show,** Lewis Ginter Botanical Garden, 1800 Lakeside Ave, Henrico, VA; Contact: Donna Poland, 757-846-0981; in2gifted@gmail.com

**5–6—Tampa Bay Orchid Society’s “Orchids by the Bay,”** Tampa Scottish Rite, 5500 Memorial Hwy, Tampa, FL; Contact: Pat Solakian, 203-214-7042; psolakian@gmail.com

**19–20—Nature Coast Orchid Society Spring Show 2022,** VFW Post 8681, 18940 Drayton Street, Spring Hill, FL; Contact: Steve Mattana, 218-556-1895; stevemattana123@gmail.com

**25–27—Calcasieu Orchid Society’s “ORCHIDS Go To The Movies – Cinematic Spectacles,”** Historic City Hall, 1001 Ryan Street, Lake Charles, LA; Contact: R. Keith Joiner, 318-614-3516; kjoiner2000@yahoo.com

**25–27—New Hampshire Orchid Society’s “A Bounty of Orchids,”** The Event Center at the Courtyard Marriott, 2200 Southwood Drive, Nashua, NH; Contact: Brenda Campbell, 603-540-8195; Bbcampbell139@comcast.net

**26–27—The Central Pennsylvania Orchid Society’s 55th Annual Orchid Show,** Penn State University, Ag Arena, University Park, PA; Contact: Wade Hollenbach, 570-837-9157; wadeh@ptd.net

**APRIL 2022**

**23–24—West Shore Orchid Society Spring Show,** Strongsville Recreation Center, 18100 Royalton Rd, Strongsville, OH;

Contact: Chester Kieliszek, 330-467-3731; kieliszec@aol.com  
**30-1—Kansas Orchid Society's Spring 2022 Show and Sale** (Hosting SWROGA), The Wichita Gardens, 701 Amidon St, Wichita, KS; Contact: Sarah Pratt, 316-655-0572; svcsjp@gmail.com

**MAY 2022**  
**7-8—Volusia County Orchid Society's "Orchcademy Awards,"** Volusia County Fairgrounds, Townsend Arena, 3150 East New York Ave, Deland, FL; Contact: Jennifer Reinoso, 386-822-3178; jenorchid@bellsouth.net

**JUNE 2022**  
**3-5—New Orleans Orchid Society's Show and Sale,** Lakeside Mall, 3301 Veterans Memorial Blvd, Metairie, LA; Contact: Marian Prigmore, 504-810-9832; woodenbox@bellsouth.net

**IX International Conference on Orchid Conservation "Soroa 2022"**

**NEW DATES**

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

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



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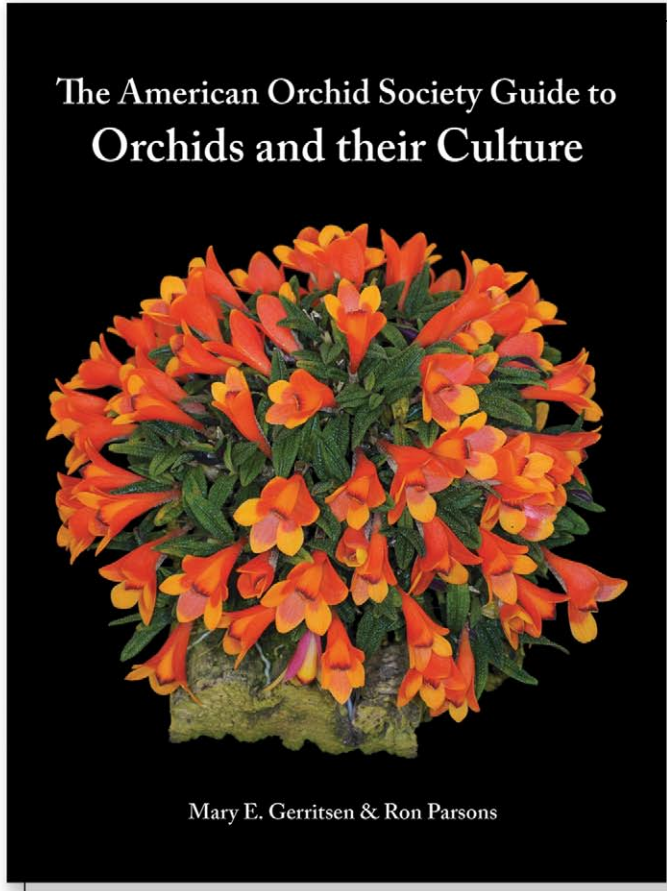
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Classified ads are \$55 for five lines (45 characters/spaces per line) and \$15 for each additional line. \$25 for first three words in red. \$25 to include logo. The first three words can be in all caps, if requested.

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## 2021 Dillon/Peterson Essay Prize

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

Membership in the American Orchid Society is not necessary to enter the contest.

**The deadline is November 30, 2021.** The winning entry, if any, will be published in the June issue of the following year. For complete contest rules see <http://www.aos.org/about-us/article-submissions/essay-contest-winners.aspx>

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

### 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,  
[khall@allenpress.com](mailto:khall@allenpress.com)**

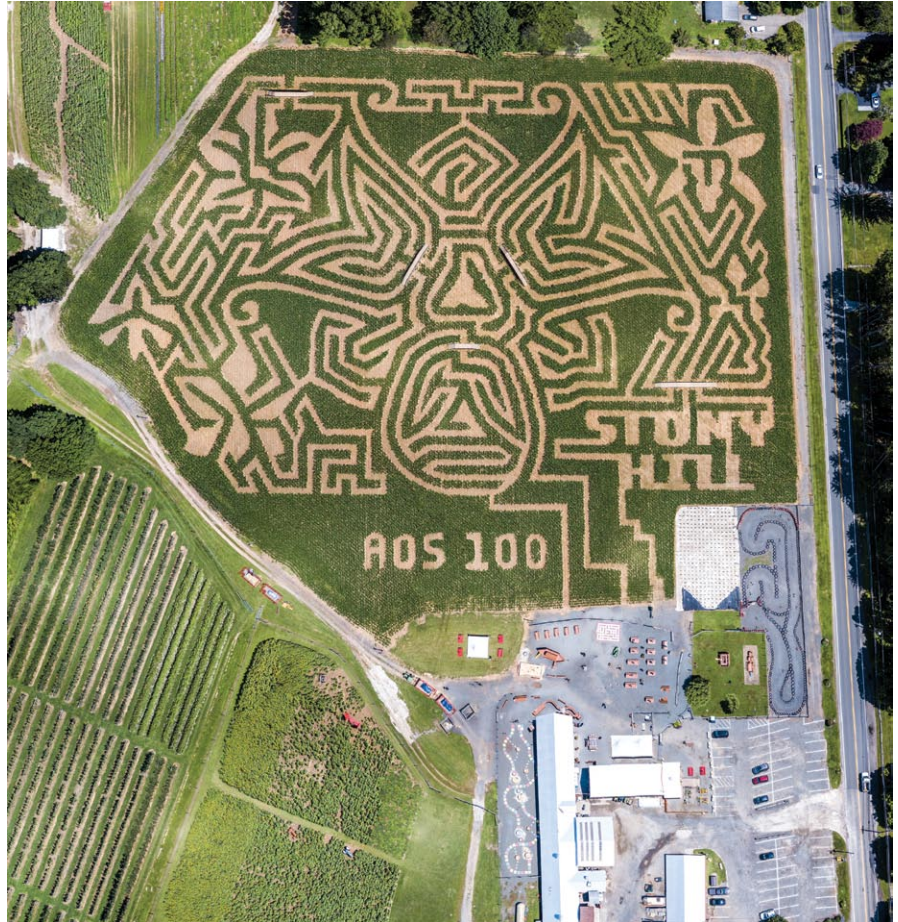
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# New Jersey Corn Maze Honors AOS Centennial

Stony Hill Farms in New Jersey has been growing orchids for over 30 years. Over the years, they have expanded operations from 40 to 500 acres (16.2 to 202.3 ha), now also growing fruits and vegetables, but they still love and appreciate the delicate beauties that got them started — ORCHIDS!

This year, they are celebrating the 100th anniversary of the American Orchid Society.

Bring the kids and learn all about orchids with a hidden picture find game and word jumble puzzle. Then stop by the Gardens to enjoy their extensive collection of orchids. The maze is open daily through November 7, 2021.



2021 Corn Maze “Orchid Adventure”

Stony Hill is an AOS Orchid Marketplace™ partner and offers discounts on orchids to all active AOS members. Tickets to the orchid adventure corn maze are available for purchase in advance online at the Stony Hill website, [www.stonyhillfarms.com](http://www.stonyhillfarms.com).



#### MAZE SEASON AND HOURS

The Maze Fun Park is open every fall during select dates and hours.

#### 2021 Season:

September 4 – November 7  
Open Daily (See Calendar and Hours)

#### CONTACT INFO

Phone: (908) 879-2908

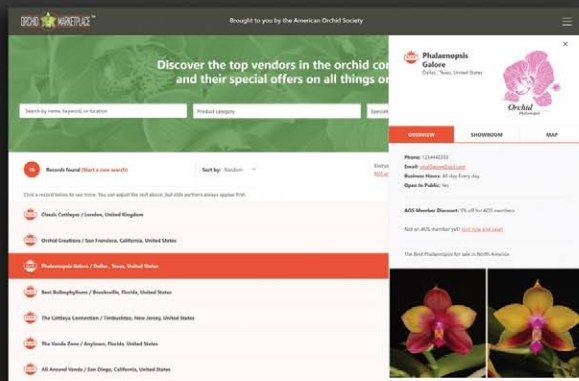
Email: [stonyhillgardens@gmail.com](mailto:stonyhillgardens@gmail.com)


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