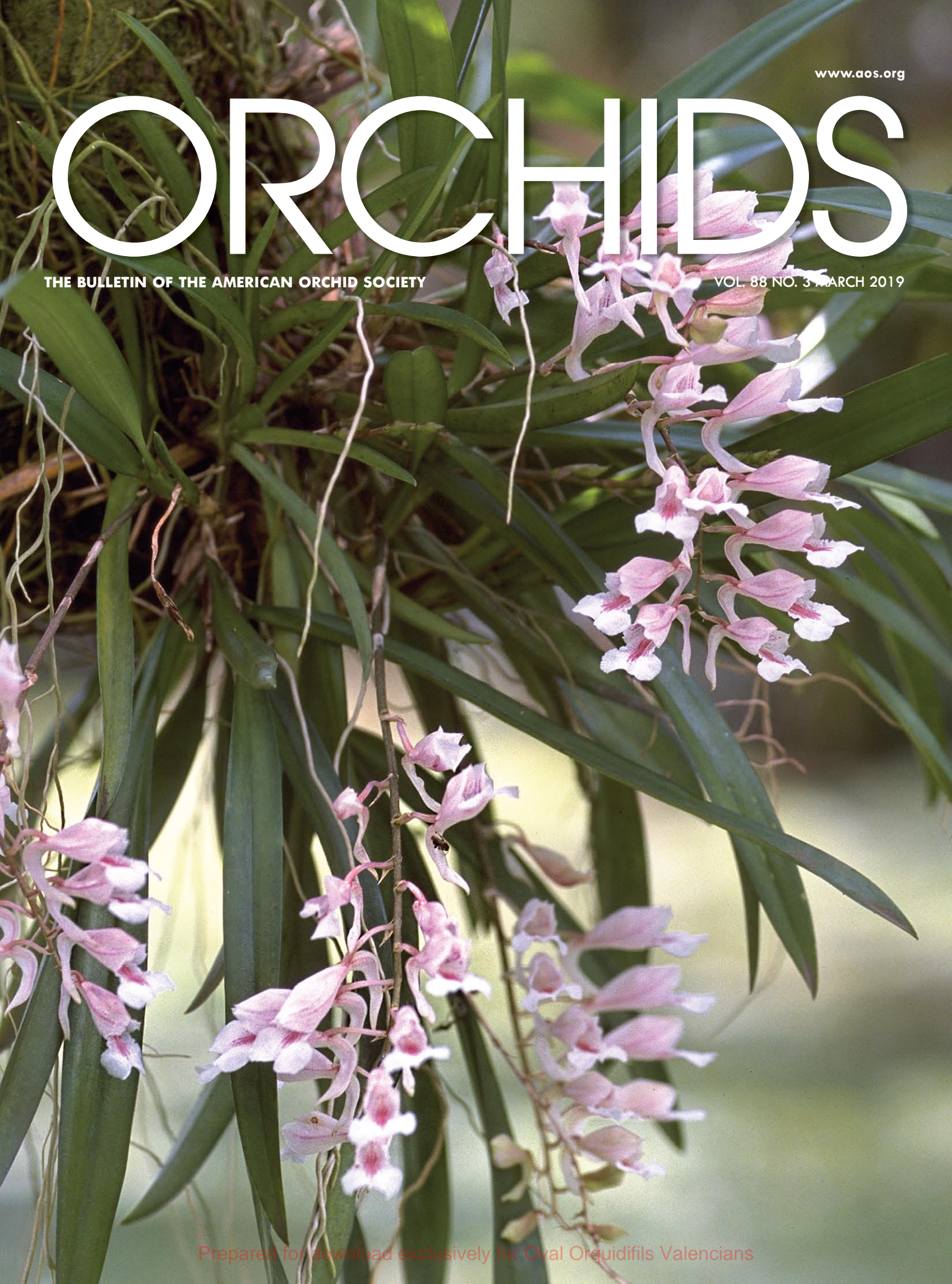


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# ORCHIDS

THE BULLETIN OF THE AMERICAN ORCHID SOCIETY

VOL. 88 NO. 3 MARCH 2019





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2019 American Orchid Society

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in conjunction with the  
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The Bulletin of the American Orchid Society

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*Rodriguezia batemanii* photographed by Greg Allikas in the Cauca Valley, Colombia

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The American Orchid Society provides leadership in orchids

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## PRONUNCIATION GUIDE

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

*andrettae* (an-DRET-tee)  
*Angraecum* (an-GRAY-kum)  
*anguloi* (an-gyew-LOH-ee)  
*Arachnis* (ah-RACK-niss)  
*Ascocenda* (as-koh-SEN-dah)  
*Ascozentrum* (as-koh-SEN-trum)  
*atropurpurea* (ah-troh-pur-PUR-ee-ah)  
*bahiensis* (bah-hee-EN-sis)  
*batemanii* (bate-MAN-ee-eye)  
*Batemanniana* (bate-man-ee-AY-na)  
*bella* (BELL-a)  
*besseae* (BESS-ee-eye)  
*birrimense* (beer-ih-MEN-see)  
*brachiata* (brak-ee-AY-tah)  
*bracteata* (brak-tee-AY-ta)  
*Burlingtonia* (bur-ling-TONE-ee-a)  
*cacao* (ka-KAY-oh)  
*calceolus* (kal-see-OH-luss)  
*Campylozentrum* (kamp-ee-loh-SEN-trum)  
*candida* (KAN-dee-dah)  
*Catasetum* (kat-a-SEE-tum)  
*citrina* (si-TRYE-na)  
*Citrus* (SIT-russ)  
*coccinea* (kok-SIN-ee-a)  
*coerulea* (see-ROO-lee-ah)  
*Coffea* (KOF-fay-a)  
*colleyi* (KOL-ee-eye)  
*Comparettia* (kom-pah-RET-ee-ah)  
*Crescentia* (kreh-SEN-tee-a)  
*curvifolia* (kur-vee-FOL-lee-a)  
*Cymbidium* (sim-BID-ee-um)  
*Cypripedium* (sip-rih-PEED-ee-um)  
*dalessandroi* (dal-ess-AN-droh-ee)  
*dearei* (DEER-eye)  
*decora* (deh-KORE-a)  
*dodsoniana* (dod-son-ee-AY-na)  
*eichlerianum* (eye-kler-ee-AY-um)  
*Epidendrum* (ep-ih-DEN-drum)  
*erectum* (ee-REK-tum)  
*erichmichellii* (air-ik-mye-KEL-ee-eye)  
*exiliens* (eks-ILL-ee-enz)  
*firthii* (FIRTH-ee-eye)  
*fischeri* (FISH-er-eye)  
*fragrans* (FRAY-granz)  
*Galabstia* (ga-LAB-stee-a)  
*Galearis* (gal-ee-AY-ris)  
*Galeottia* (gal-ee-OT-tee-a)  
*germinyanum* (ger-min-ee-AY-num)  
*grandiflora* (grand-ih-FLOR-a)  
*guajava* (gwa-HA-va)  
*Habenaria* (hab-ih-NARE-ee-a)  
*hookeriana* (hook-er-ee-AY-na)  
*imschootiana* (im-shoot-ee-AY-na)  
*infundibulare* (in-fun-dib-yew-LAIR-ee)  
*lonopsis* (eye-on-OP-sis)

*janellehayneana* (jan-ell-hayne-ee-AY-na)  
*kovachii* (koh-VAK-ee-eye)  
*leeana* (lee-AY-na)  
*luzonica* (loo-ZON-ee-ka)  
*Lycaste* (lye-KASS-tee)  
*makasin* (MAH-kah-sin)  
*manzurii* (man-ZUR-ee-eye)  
*Maxthompsonara* (maks-tomp-SON-are-a)  
*Metrosideros* (met-roh-SID-er-ohs)  
*Micropetalum* (mye-kroh-PET-a-lum)  
*monachica* (mone-AH-chee-ka)  
*montanum* (mon-TAN-um)  
*Neogardneria* (nee-oh-gard-NEER-ee-a)  
*Neostylis* (nee-oh-STYE-liss)  
*Nottara* (NOT-are-a)  
*Notylia* (noh-TEE-lee-a)  
*obtusifolia* (ob-toos-ih-FOL-lee-a)  
*Oncidiinae* (on-sih-DEE-ih-nee)  
*Oncidium* (on-SID-ee-um)  
*Pabstia* (PAB-stee-a)  
*Paphiopedilum* (paff-ee-oh-PED-ih-lum)  
*parviflorum* (par-vih-FLOR-um)  
*Phalaenopsis* (fail-en-OP-sis)  
*philippinensis* (fill-ip-in-EN-sis)  
*Phragmipedium* (frag-mih-PEED-ee-um)  
*planifolia* (plan-ih-FOL-lee-a)  
*polymorpha* (pol-ee-MORE-fa)  
*pompona* (pom-POH-na)  
*praetinctorum* (pree-tink-TORE-um)  
*Psidium* (SID-ee-um)  
*pubescens* (pew-BESS-senz)  
*pulcherrima* (pull-KER-rih-mah)  
*Renanthera* (ren-AN-ther-a)  
*rigida* (RIJ-id-ah)  
*Rodriguezia* (rod-rih-GUESS-ee-a)  
*rubescens* (roo-BESS-enz)  
*sanderiana* (san-der-ee-AY-na)  
*satipoana* (sa-tee-poh-AY-na)  
*Scelochilus* (skel-oh-KYE-luss)  
*schlimii* (SHLIM-ee-eye)  
*Sigmatorthos* (sig-mat-ORE-thos)  
*smithii* (SMITH-ee-eye)  
*spectabilis* (spek-TAB-ih-liss)  
*storiei* (STORE-ee-eye)  
*strobilii* (stroh-BEL-ee-eye)  
*Sutrina* (sue-TREE-na)  
*Theobroma* (thee-oh-BROH-ma)  
*Trichoglottis* (trik-oh-GLOT-tiss)  
*tricolor* (TRY-kuhl-er)  
*Vanda* (VAN-da)  
*Vanilla* (van-ILL-lah)  
*Vanillaea* (van-ILL-lee-a)  
*Vanilloideae* (van-ill-OY-dee-ee)  
*Zyogardmannia* (zye-goh-gard-MAN-ee-a)  
*Zyogopetalum* (zye-goh-PET-a-lum)

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# CALL FOR CONSERVATION GRANTS

IN ITS CONCERN for the protection of wild orchid species around the world, the AOS Conservation Committee announces that it is taking applications for conservation-project grants for 2019. Please note that as of last year, the AOS has decided to fund conservation projects separately from research projects, allowing for some different types of initiatives to be considered. Although conservation research will still fall under the purview of the Research Committee, conservation grants are intended to encourage a more practical, hands-on, grassroots approach. We are seeking a broad range of applicants engaging in projects that protect orchids and their natural habitats, including, but not limited to:

- Studies that enhance our knowledge of crucial ecological information
- Conservation assessments of specific orchids or regions
- Seed propagation of rare or threatened species
- Habitat restoration or reintroduction efforts
- Raising public awareness regarding orchid conservation and encouraging public participation
- Providing education or outreach to present and future members of the conservation community

The project ideas listed above are simply that. The committee is receptive to any additional ideas or concepts that can potentially protect orchid species. Indeed, any and all conservation-oriented projects, anywhere in the world, will be considered. An institutional affiliation is helpful, although it is not required. However, an accurate, estimated itemized budget is required. Although funds are limited, past grants have averaged about \$3,000.00. We REQUIRE annual project reports, and that an article featuring your project be submitted for publication in *Orchids* magazine within six months of the project's completion. Because of the nature of conservation projects, ongoing multiyear support is a possibility.

Grants are awarded for one or two years' duration, with funds distributed annually. For projects requiring more than two years, applicants will need to reapply for additional funding. At the discretion of the AOS Conservation Committee, project progress reports will likely be requested. Although we limit most grants to two years, longer-term projects will be considered on a case-by-case basis.

The application deadline is June 30, 2019. Please see the AOS website for application and requirements, or contact the AOS Conservation Committee at [conservation\\_committee@aos.org](mailto:conservation_committee@aos.org) for an application.

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

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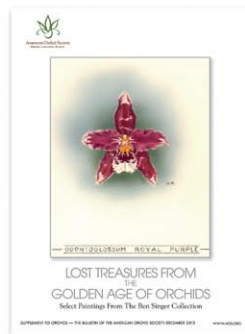
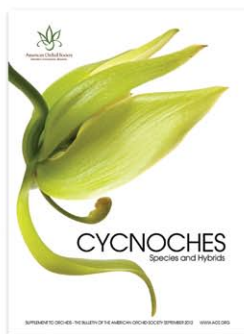
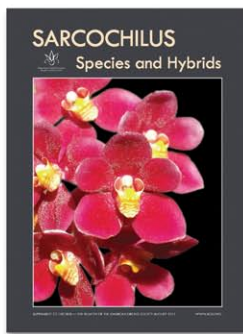
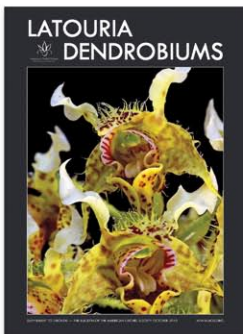
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## PRESIDENT'S MESSAGE

THE AMERICAN ORCHID Society is a 501(c)(3) organization registered in the state of New York, as many of you already know. As with any organization, you need a committee to make sure your group follows the rules for tax-exempt status with the IRS. The AOS Governance Committee has among its tasks a responsibility to assure that the Board of Trustees complies with not-for-profit laws both at the State and Federal levels. This committee is also very busy with a list of tasks assigned by the board, such as creation and maintenance of job descriptions for employees, officers of the organization and committee chairs, and our personnel handbook. This month you will be learning more about this committee from its chair, Jean Hollebhone. According to Hollebhone, "The Governance Committee is a small, yet important, committee that reports to the Board of Trustees. It is responsible for assisting the Board in establishing good governance practices such as clarifying roles and responsibilities of staff and volunteers, ensuring that needed bylaws, policies and procedures are developed to guide the operation of the organization, and offering opportunities for Board and staff development. After presentation to the Board for discussion and approval, these become the formal working procedures of the AOS, which the Committee also informally oversees for ongoing compliance.

"Recent efforts have included the creation and establishment of a personnel handbook detailing obligations and benefits of employees as well as performance expectations. A corresponding performance appraisal system has been put in place and work goals are assessed and updated annually. The Governance Committee provides orientation for new Trustees, presenting each with a copy of the frequently updated Trustees Handbook, which is the working AOS rule book.

Another recent challenge for the Governance Committee was to strengthen and improve the process used by our nominating committees to select candidates for new board members. This new procedure was approved by the Board in August of 2018 and was successfully implemented during our fall 2018 trustee nominations. Feedback has been positive, and the Committee continues to examine other opportunities for improvement.

The AOS is well positioned to meet ongoing challenges and opportunities. Membership is consistently rising, and our 100th anniversary is fast approaching.

The Governance Committee is embarking on a strategic planning process with the Board to better clarify our upcoming priorities and propose necessary changes important to maintain and enhance AOS value and relevance to our members.

Our policies and procedures are posted on the website. We welcome your ideas and suggestions to enhance and improve offerings to our membership and the larger orchid community ([governance\\_committee@aos.org](mailto:governance_committee@aos.org)).

During the second week of this past January, I traveled to St. Augustine, Florida, to present the AOS Certificate of Meritorious Achievement in Orchid Education to Sue and Terry Bottom. They have been writing and illustrating very informative orchid articles for *Orchids* magazine for several years now. The following has been excerpted from their formal nomination:

"[O]rchid enthusiasts have waited eagerly for their next issue of *Orchids* magazine to arrive and have then turned the pages with great anticipation to find what is featured this month in the latest Sue Bottom article. Since April, 2014 Sue Bottom and her husband Terry have provided monthly dissertations on cultural topics, which have helped orchid growers across North America and indeed everywhere, to grow healthier orchids. Cleverly but clearly written, they contain information of use to both experienced and the novice growers. Sue writes straightforward, concise articles packed with advice and needed cultural information. Terry provides clear, diagnostic color photographs and graphs that illustrate the text.

This husband and wife team has helped many AOS growers solve a wide range of cultural problems, which enhances their enjoyment of these amazing plants. The articles have ranged broadly from practical cultural discussion, such as what clay pot to use or disease identification and control, to more complex subjects, such as cold tolerance in warm growing orchids, why orchids need a drop in nighttime temperature, what a species is, and even how to recover from a devastating hurricane...Because the writing is clear, straightforward and easy to understand and the practical advice works, they are great teaching aids. The accompanying photographs by Terry illustrate the points being made and provide visual examples and proof of the advice given.

The AOS sincerely thanks Sue and Terry Bottom for their practical help to



AOS President Susan Wedegaertner (center), presents the AOS Certificate of Meritorious Achievement in Orchid Education to Sue (right) and Terry (left) Bottom at the January meeting of the St. Augustine Orchid Society, St. Augustine, Florida.

orchid growers everywhere and wishes to recognize and honor their contribution with the AOS Certificate of Meritorious Achievement in Orchid Education."

I was honored to present this award and I thank the St. Augustine Orchid Society for such a warm welcome.

Our spring 2019 meeting will be in San Diego, California, March 20–24, at the Hilton San Diego Mission Valley. The customary Trustees' Planning Session will take place on Wednesday afternoon, March 20, 2019, followed by the Judges' Forum (do not let the name scare you off — anyone can attend) that evening. Our spring meeting is very important because it includes the election of trustees for 2019–2021. Mark your calendar now, so you do not miss our next Members' Meeting.

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

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# March: The Month of Vision

By Thomas Miranda

DURING THIS MONTH when much of the Northern Hemisphere is still barren and cold, many of us plan and yearn for spring and summer. Even though I currently live in a place where outdoor living is delightful pretty much year-round, I still can feel in my bones, the visceral remembrance of Northeast winters from my childhood and adolescence with a combination of fondness and dread. While I do not particularly miss dealing with frigid temperatures, snow and ice removal and treacherous driving conditions, I do sometimes ponder the way the change of the seasons affects our lives and moods. Indeed, the amount of time spent indoors with plants in winter has repeatedly been my salvation, getting me through post-holiday doldrums and depression much of my life.



Thomas Miranda

Now that March is here, with its lengthening days, we can see a way forward through that tunnel that is winter as we watch the rebirth of our gardens, the return of spring harbingers and new growths appearing on most of our orchids. Even though so many, particularly phalaenopsis, cymbidiums, paphiopedilums and lycastes, are still in glorious bloom, this month is particularly exciting as growth resumes on many right around now. The best orchid growers understand that it is **now** that you need to have a vision for the future.

**BE PREPARED** Although it may still seem a bit early to get down and dirty with your collection, there is no question that by next month you will need to commence repotting in earnest. Now, before the garden centers start getting overrun with plant novices and enthusiasts, pick up or order some fresh supplies, such as potting mixes or ingredients to make your own. Avoid reusing old pots for fear of disease transmittal and purchase new ones in the various sizes you feel you will need. Getting everything in place now will allow for focused, productive and uninterrupted repotting sessions as spring progresses.

**SELF-ASSESSMENTS** Ask yourself which orchids thrived and which did not this past winter and where improvement is needed. Hopefully all your plants made it through the inclement season

unscathed. But seriously, there are always problem areas where plants were too crowded, or outbreaks of parasites or rot occurred in the winter greenhouse, light room or windowsill. Even the greatest orchid growers know there is always some room for improvement. Do not be afraid to be critical of yourself. It is all about the love you have for your plants. Just like anything else you care about and nurture, you want to give your precious orchids the best you can provide.

**PERILS OF THE EAGER** As we see plants resuming their growth this month, it is very tempting to step up watering and fertilizing. Indeed, I generally have to hold myself back a bit this time of year. So many orchids are just finishing blooming and are somewhat weary from the energetic expenses of anthesis. Even though it seems logical to feed and water them well right now, most new growths are still small and often without enough roots to take mass quantities of moisture and nutrients. Overdoing it now can lead to dampening-off of those tender new growths; especially in their developing crowns. Some plants, particularly catasetums, will not re-establish well if watered this month. Even though growths and roots are developing, a little restraint until the roots are a couple of inches (about 5 cm) long will yield better results in the end.

**BE EXTRAORDINARY** While self-criticism is a necessary ingredient to orchid growing success, so is a modicum of pride and magnanimity in your orchid growing. As you get better and better results each year (from reading this column), do not be afraid to share what you have learned



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With roots only an inch (2.5 cm) long, it is still too soon to begin watering this catasetum.

and show off your achievements. You may think it is braggadocious to bring glorious, superbly grown plants to show tables and exhibitions. Perhaps so, but in my mind it is inspirational. I may get jealous of my fellow orchidists' triumphs from time to time, but in the end, we then learn so much from each other and apply that gained knowledge towards reaching cultural perfection; a vision for the future for these plants we all love so dearly.

— Tom Miranda has been working professionally with orchids for over three decades. He is an AOS accredited judge and is the chairman of the American Orchid Society's Conservation Committee. He recently coauthored *The Book of Orchids: A life-size guide to 600 species from around the world* (email: [biophilialk@gmail.com](mailto:biophilialk@gmail.com)).

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**March 26, 2019** at 8:30 pm EDT — Greenhouse Chat (Orchid Q&A) with Ron McHatton, AOS Chief Education and Science Officer.

**April 9, 2019** at 8:30 pm EDT — Greenhouse Chat (Orchid Q&A) with Ron McHatton, AOS Chief Education and Science Officer.

**April 18, 2019** at 8:30 pm EDT — The Culture of Habenarias with James Heilig, PhD, AOS Trustee and accredited judge.

**May 16, 2019** at 8:30 pm EDT — Asian Cymbidiums with George Hatfield, Hatfield Orchids.

For webinar announcements and login information check [www.aos.org/orchids/webinars.aspx](http://www.aos.org/orchids/webinars.aspx). Webinar announcements are posted to Facebook, Instagram and in the AOS Corner of your affiliated society's newsletter.

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**Sylvia Strigari**

*Phragmipedium schlimii* f. *manzurii*

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

Subfamily Cypripedioideae  
Genus PHRAGMIPEDIUM Rolfe

***Phragmipedium schlimii* f. *manzurii*** (W.E.Higgins and P.Viveros) Braem and Tesón, *Richardiana* 16:305. 2016. *Phragmipedium manzurii* W.E.Higgins and P.Viveros, *Lankesteriana* 8(3):89. 2008. *Phragmipedium schlimii* var. *manzurii* (W.E.Higgins and P.Viveros) P.J.Cribb, *Slipper Orchids Trop. Amer.* 129. 2017. Type: Colombia. Santander: *ex hort.* D. A. Manzur, June 2008, *D. A. Manzur 1501* (holotype, FAUC).

A terrestrial *plant* up to 35 cm tall. *Leaves* linear, acute, 8.5–25.0 × 1.5–3.0 cm, midgreen. *Inflorescence* erect, 8.8–19.5 cm long, branched, successively flowered; peduncle dark purple, finely pubescent, with an ovate, acute, conduplicate bract, 2.1–3.8 × 2.0–2.5 cm, green with a dark red base. *Floral bracts* conduplicate, ovate, acute, 2.5–3.0 × 1.4–1.8 cm, green with a dark red base and margins. *Flowers* with white to green sepals, white petals slightly suffused with pale rose on the base, and yellow staminode; lip white suffused with pink on the frontal part, dark pink stripes along the rim of the lip becoming pale rose on the abaxial surface through the veins, and stained with yellow at the back of the opening of the lip, spotted with purple on the adaxial surface. *Pedicel* and *ovary* 38–59 × 2.0–3.4 mm, green, covered with white, minute, pubescence. *Dorsal sepal* elliptic, obtuse, 22–27 × 14–17 mm, 9-veined, concave at the apex, finely pubescent on both surfaces. *Synsepal* broadly elliptic, obtuse, shorter than the lip, 18–22 × 19–21 mm, concave, 12-veined, the veins green, pubescent on both surfaces. *Petals* elliptic to subrhomboid, obtuse, 26–28 × 14–17 mm, fine white pubescence on both surfaces, densely pubescent on the base of the adaxial surface. *Lip* urceolate, subspherical, 17–24 × 16–23 mm, finely pubescent on the abaxial surface, densely pubescent on the base of the adaxial surface, provided with distinct, translucent, lateral windows toward the base, the rim dentate. *Column* 7 mm long; the staminode round to subquadrate, minutely bifid at apex, approximately 7.5 × 7.0 mm, finely pubescent; stigma approximately 6–3 mm long, hidden by the staminode, covered by small papillae, the base pubescent. *Anthers*

small, 1–2 mm long, bilocular. *Pollinia masses* granulose, 1–2 mm long.

For such a small genus as *Phragmipedium*, a plethora of infrageneric (subgenera, sections, and subsections) and infraspecific (subspecies, varieties, and forms) classifications have been proposed. Up to 45 species names have been described in the genus, although no more than 25 are now accepted. This phenomenon is particularly common in taxonomic groups with a high horticultural attractiveness. Even though taxonomic classifications are frequently created with the purpose of clarifying the understanding of an intricate group, the exaggeration of subdivisions in small groups usually does the opposite and the results are unnecessary, especially when the parameters that define each one of these subclassifications are not quite clear.

The International Code of Botanical Nomenclature indicates as infrageneric taxa in descending sequence the section and the series, and as infraspecific taxa the variety and the form, and all the intermediate taxa made by adding the prefix ‘*sub-*’ (Turland et al. 2018). However, the Code does not provide definitions for those taxa, and the application of each of those terms is highly variable and subjective within and out of the orchid family. Several attempts have been made to delimit how these terms should be used, particularly for the infraspecific ranks since the terms ‘variety’ and ‘form’ have been ambiguously used in the history of both in the botanical nomenclature as well as in the nomenclature of cultivated plants.

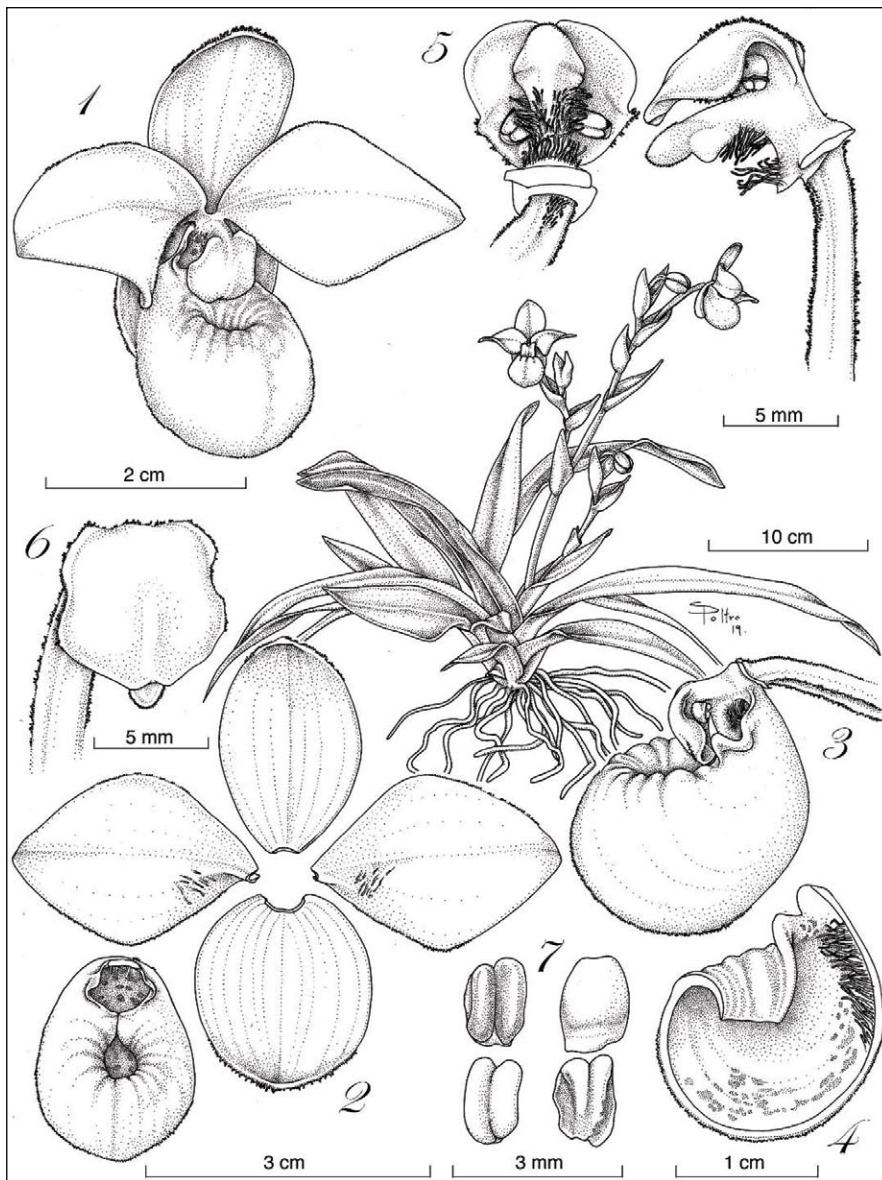
Some authors mostly delimit a subspecies on geographical basis, in this case, each subspecies is considered a population that has the capability of reproducing with each other but are limited by geographical barriers (van Steenis 1957, Kapadia 1963). The term variety, from the Latin *varietas*, has a long tradition in botany and could arguably be considered a good term to describe modifications caused by abiotic factors and expressed as minor changes in size, color, smell, etc. (Clausen 1941). Unfortunately, the term “variety” has been adopted by the International Union for the Protection of New Varieties of Plants Convention (UPOV) as a legal term to provide breeders with some protection

and rights as to their cultivated plants. This kind of “variety” not only will differ in status according to national law and the internal legislation of the UPOV signatory countries, but also differs from both the taxonomic rank of *varietas* (as regulated by the International Code of Nomenclature for algae, fungi, and plants), and the term “cultivar” (regulated by the International Code of Nomenclature for Cultivated Plants). Botanists have had at their disposal the terms subspecies and variety to define taxa that have some kind of integrity beyond the morphological (i.e. geographic, ecologic, or phylogenetic), and historically they have largely used both terms as equivalent. To avoid unnecessary confusion with the legal — and not equivalent — term “variety,” botanists have recently mostly abandoned the use of *varietas* (in favor of *subspecies*) to describe those aggregates of phenotypically similar populations that inhabit a given geographic range within the species distribution and differ from other populations of that species. *Formae* are then the next available taxonomic rank to define those changes that lack any extramorphological integrity, and it is in this sense that we favor here the use of *forma* to better designate the morphological deviation of f. *manzurii* within *Phragmipedium schlimii*, without suggesting that the individuals classified within this form are necessarily closely related. Nevertheless, examples where the same terms are not applied in this way are overabundant in the history of botany (Hamilton & Reichard 1992).

*Phragmipedium manzurii* was discovered by David Angel Manzur in Santander, Colombia. In 2008 Manzur, a retired professor of Agronomy, sent photographs of plants growing in his personal collection requesting further identification of what he thought could be a different variety or species from *Phrag. schlimii*. Paula Viveros traveled to Colombia to examine the plants. Subsequently, together with Wesley Higgins she described it as a new species and they named it after Prof. Manzur, distinguishing the new taxon by the color of the flowers, the rounded, shortly emarginate staminodal shield, provided with a central low ridge, and the lip with the apex turned up in front (Higgins and Viveros 2008).

They compared *Phrag. manzurii* with





to examine quite a large number of plants labeled as *Phrag. manzurii*, and we documented some of them. The features that have been used to distinguish *Phrag. manzurii* from *Phrag. schlimii* are quite feeble in practice, and we observed significant variation, both in the shape of the staminodal shield and in the color of the flowers. Strigari's watercolor, which depicts a specimen from the same strain grown at Ecuagenera, is visibly less "green" than the type flower, but quite a bit more green than others that we photographed in cultivation in Ecuador.

*Phragmipedium schlimii* f. *manzurii* naturally occurs in wet montane habitat as terrestrial plants; as in several species of the genus, it grows on steep slopes with abundant light at 1,300 to 2,000 meter elevation. Populations of *Phrag. schlimii* f. *manzurii* are exclusively known from the central Cordillera in Colombia, in the same regions where *Phrag. schlimii* also occurs. As with other phragmipediums, this species needs good air flow among the roots. It can be cultivated in a mix of pine or fir bark, perlite, and charcoal, that holds water and allows the roots to breath. Under the right conditions a plant can produce up to three successive flowers. Higgins (2009) reports the blooming season of *Phrag. schlimii* f. *manzurii* in early spring, although Cribb and Purver (2017) report it flowering in June.

#### References

- Braem, G. E. Tesón and S. L. Öhlund. 2018. *The genus Phragmipedium. A treatise on the conduplicate-leafed slipper orchids of Latin America*. Privately printed by the author, Atlanta-Belgium.
- Braem, G. J. and E. Tesón. 2016. A revision of the *Phragmipedium schlimii* complex (Orchidaceae: Cyripedioideae). *Richardiana* 16:293-321.
- Clausen R. T. 1941. On the use of the terms "subspecies" and "variety". *Rhodora* 43:157-167.
- Cribb, P. and C. Purver. 2017. *Slipper Orchids of the Tropical Americas*. Natural History Publications and The Orchid Digest in association with Royal Botanic Gardens, Kew.
- Hamilton, C. W. & S. H. Richard. 1992. Current practice in the use of subspecies, variety, and forma in the classification of wild plants. *Taxon* 41:485-498.
- Higgins, W. E. 2009. *Phragmipedium manzurii*. A new discovery in Colombia is officially described in the journal *Lankesteriana*. *Orchids* 78(3):174-175.
- Higgins, W. E. and P. Viveros. 2008. A new *Phragmipedium* (Orchidaceae) from Colombia. *Lankesteriana* 8(3):89-92.
- Kapadia, Z. J. 1963. Varietas and subspecies, a suggestion towards greatest uniformity. *Taxon* 12(7):257-259.
- Turland, N. J., J. H. Wiersema, F. R. Barrie, W. Greuter, D. L. Hawksworth, P. S. Herendeen, S. Knapp, W.-H. Kusber, D.-Z. Li, K. Marhold, T. W. May, J. McNeill, A. M. Monro, J. Prado, M. J. Price, and G. F. Smith (eds.). 2018. International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. *Regnum Vegetabile* 159. Glashütten: Koeltz Botanical Books. DOI <https://doi.org/10.12705/Code.2018>
- van Steenis, C. G. G. J. 1957. Specific and infraspecific delimitation. *Fl. Males. ser. I*, 5(3):167-234.

*Phragmipedium schlimii* var. *manzurii*. The plant.

1. flower;
2. dissected perianth;
3. column and lip, lateral view;
4. lip, longitudinal section;
5. column, ventral and lateral views;
6. staminodial shield;
7. anthers caps and pollen masses.

All drawn from ECUA-00020 (Ecuagenera) by Sara Poltronieri.

*Phragmipedium fischeri* and *Phrag. schlimii*, two species of section *Micropetalum*. According to Cribb and Purver (2017), seven species can be recognized in the section. The marvelous Peruvian species, *Phragmipedium kovachii*; the orange-red-flowered *Phragmipedium besseae* and *Phragmipedium dalessandroi*; and the four small, white to pink flowered, *Phragmipedium andreetae*, *Phragmipedium anguloi*, *Phrag. fischeri*, and *Phrag. schlimii*. The seven species share an Andean distribution, the elliptic petals, and the hairy, globose lip provided with translucent windows in the base. Currently, *Phrag. manzurii* is considered conspecific with *Phrag. schlimii* by most of the authors on the subject (Braem and Tesón 2016, Cribb and Purver 2017, Braem et al. 2018).

When studying *Phragmipedium* in the large living collections of Ecuagenera in Gualaceo, Ecuador, we had the opportunity

## Yellow Sticky Cards for Bush Snails

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

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

— Sara Johnson, Concord, California



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The OCA conserves orchids by funding habitat preservation. In 2018 we supported two reserves, Reserva Dracula in Ecuador and Reserva La Selva de Ventanas in Colombia. Our contributions were matched by the Rainforest Trust, enabling the purchase of 400 acres of highly diverse rainforest and protecting a number of extremely endangered as well as newly identified flora and fauna, with many orchids among them.



*Dracula gigas* (L), *D. trigonopetala* (R)  
Dracula Reserve, Ecuador

*Dracula lemurella* (L), *Lepanthes escifera* (R)  
La Selva de Ventanas Reserve, Colombia

We hope that you will join us in promoting this important work. We invite you to become a member of the OCA, to make a donation, to take a trip with us to see Orchids in the Wild®, and to purchase merchandise through our website. Since we have no paid staff, all proceeds go to support orchid conservation. The OCA is a 501(c)(3) corporation.

For more information: [www.orchidconservationalliance.org](http://www.orchidconservationalliance.org)

## Selected Botanical Terms

abaxial – lower surface  
acute – pointed  
adaxial – upper surface  
apex – tip or top  
apicule – small point  
apiculate – ending abruptly in a small point  
arcuate – bow-shaped, curved  
articulate – joint or clearly delineated separation point  
bifid – divided by a deep cleft or notch into two pieces  
biocular – two chambered  
caespitose -densely clumping  
carinate – having a keellike ridge  
concave – bowl-shaped  
conic – cone-shaped  
connate – fused  
conduplicate – folded lengthwise  
convex – curved like the exterior of a circle or sphere  
cucullate – hooded  
cuniculate – an elongate passage open at only one end  
dentate – toothed  
elliptic – oval

emarginate – having a notched margin  
flexuous – flexible, full of bends and curves  
granulose – covered in small grains or granules  
hyaline – glassy, translucent appearance  
incumbent – lying on the inner side  
incurved – curved inward  
infundibular – funnel-shaped  
isthmus – a narrow connection between two parts  
linear – straight and narrow like the leaves of a grass  
monodial – growing upward from a single point  
obovate – egg-shaped with the narrow end down  
obtuse – blunt or rounded  
ovate – egg-shaped with the narrow end up  
papillae – small fleshy projection  
pedicel – a stem carrying a single flower  
peduncle – the lower part of the inflorescence below the first bud

petiole - the stalk joining a leaf to a stem or pseudobulb  
phenotypic – relating to the observable form of an individual  
pubescent – covered in tiny fine hairs  
staminodal shield – in the Cypridioideae, the flat surface of the sterile anther or staminode  
staminode – sterile stamen  
subcoriaceous – almost leathery  
suborbicular – nearly round  
subrhombic – almost rhombic, having four parallel sides with no right angles  
subquadrate – nearly square; square but with rounded corners  
subspherical – almost a sphere  
synsepal – floral structure formed by the partial or total fusion of the lateral sepals  
taxon – a taxonomic group of any rank, such as a species  
urceolate – shaped like an urn or pitcher



# Repotting Orchids — Wet or Dry?

Text by Sue Bottom/Photographs by Terry Bottom

I HAVE ALWAYS used water during the repotting process. First, I soften the roots with water so they can more easily be removed from the pot. Next I water-blast the potting medium from around the roots, often with the hose-end nozzle set on flat or jet. Then the plants are cleaned up and get their Saturday night bath — removing the papery cataphylls from cattleyas, and mold or algae from leaves, etc. Then the plants get a good watering after they are situated in their new home. Of course, if there are any viral particles or pathogens on that plant, the water really spreads them around to the potting surfaces and your hands. Newspapers used as a protective barrier get soaked and become ineffective. Any cuts you made on the plant are open wounds



Sue Bottom

allowing easy access for pathogens directly into the plant. There are some points in the repotting process where water helps you achieve your goals, whereas some steps are better done dry to prevent unintended consequences.

**PREWATERING** Around an hour before you want to start repotting a plant, water it thoroughly and completely. This will give the roots a chance to soften and become pliable. If they have attached to the pot surface, they can be removed more easily. If they have to be untangled, they are more likely to bend than break. This final watering will have to sustain the plant until the next watering event after repotting.

**CLEANING** If the plant needs it, you can start cleaning the plant with the hose end sprayer set on flat. You can use the water pressure to wash the medium away from the roots, blast the dried papery sheaths away from the pseudobulbs, along with any scale or other pest that may be hiding there, and blast any algae or mold deposits from leaf surfaces. Once your plants are cleaned up, put the hose down and switch over to dry mode.

**PREPARATION** Cut away the old and tired parts of the plant and separate it into the pieces you want to repot. Remove dead and soggy roots, and give the roots a haircut so they will fit easily into the top third or half of their future



pot. Then set your cleaned-up plant on some newspaper or Kraft paper and allow it to dry for a bit.

**ROOT STIMULANTS** You can prepare multiple plants for repotting, keeping plants with tags, in assembly line style. This is a great opportunity to spray the plants with a root stimulant. Whether you choose seaweed/kelp or one of the

[1] Wet the roots an hour or so before repotting and the plant will be much easier to remove from the pot.

[2] Use water to blast the dried papery sheaths off and dislodge loose potting mix, but leave pieces if removal would damage the roots.





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- [3] Cut away the old tired pseudobulbs and separate pieces into three- to five-pseudobulb clumps that will fit easily in the pot.
- [4] Spray a root stimulator on the base of pseudobulbs and roots to encourage new root growth.
- [5] Let the plant dry and allow it to absorb the root stimulant prior to repotting. You can prepare multiple plants to repot.
- [6] Wash your hands with Lysol All Purpose Cleaner as you finish with each plant and before you start the next one.
- [7] Fill the bottom third of the pot with Styrofoam, lava rock, etc. to provide an airy reservoir into which roots will grow.
- [8] Situate the pieces with the oldest part of the plant flush against the edge of the pot and splay the roots over the mix.
- [9] Trimmed pieces can be situated together in the pot, allowing plenty of room to grow into a specimen, but this will preclude any AOS cultural awards.



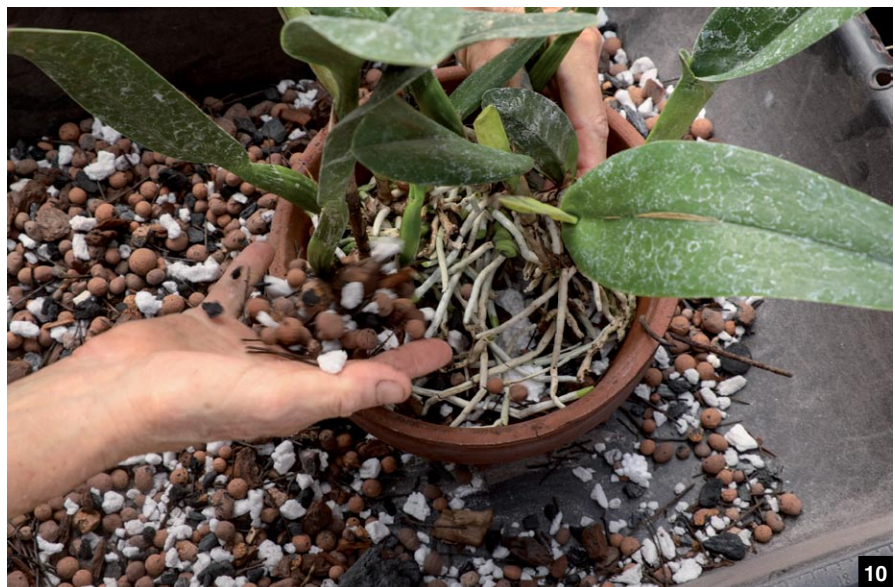
synthetic root stimulators such as Dip 'N Grow, you can mix up your concoction, put it in a spray bottle, and spray the bases of the plants and roots while they are on the drying paper.

**POTTING MIX** Some people advocate wetting the potting mix to prevent a dry mix from pulling moisture from the roots, desiccating the plant. Perhaps a bigger concern is all those open wounds on the roots that allow bacteria to enter the roots easily and cause problems. Keep the mix dry and allow the wounds to seal over. Sphagnum moss and cypress mulch are two exceptions to the keep-it-dry rule, they should be wetted first to allow proper packing around the roots. These two organic materials have an acidic pH that is less conducive to bacterial growth.

**REPOTTING** Your repotting regime probably follows the typical rules: Add a layer of porous drainage materials in the bottom third of the pot (Styrofoam, lava rock, etc.), add a little potting mix and then orient the plant in the pot, splaying the roots out, and backfill with mix. You may finish up by top dressing with sphagnum moss or cypress mulch and adding Purely Organic or a timed-release fertilizer. Date your plant tag and reinsert it into the pot (some even have the foresight to add a second tag in the bottom of the pot in case the main tag is lost).

**AFTER REPOTTING** To water or not to water, that is the question. Probably the best advice is not to water; allow time for the wounds to seal over and encourage the plant to grow new roots to seek out water. As a serial overwaterer, I have to fight the natural inclination to water the plant after repotting. I usually pour a Banrot solution through the pot as a protective fungicide. You can add root stimulants to the Banrot jug for some extra oomph. Then it is best to wait a few days to a week or two before resuming your normal watering practices. If you find yourself repotting during the hot humid months of July and August, restricting water is very important to avoid black rot from infecting your plants. As with any rule, there are always exceptions, and the restriction on watering after repotting can be ignored when potting in ProMix-based mixes, which often have biofungicides or mycorrhizae, and have an acidic pH similar to sphagnum moss and cypress mulch. I can usually force myself not to water for at least two or three days.

If you have a convenient staging area, you can enforce the restriction on watering more easily. Set up a series of sterilized flats sitting on benches in a



shady area away from water. Put your cleaned up and trimmed plants along with their plant tags into the trays for a week or two, misting occasionally with water and perhaps spraying with a root stimulant. You are waiting for the wounds to seal over and the plants to shift into the root-growing mode. Once you see the beginnings of new green root tips, you can finish the repotting process and water to your heart's content immediately after repotting.

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

[10] Backfill the pot with your dry potting mix of choice, keeping the rhizome about even with the top of the potting mix.

[11] Top dress with a little sphagnum moss and some timed-release or Purely Organic fertilizer in a tea bag.

[12] Pour some Banrot solution through the pot and then keep it on the dry side for a few days, or until you see new green root tips.



# Coming soon!

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FORM MEETS FUNCTION

# Vining Orchids!

## Those Provocative Climbers

by Thomas Mirenda





IN THE WORKPLACE, we often find individuals that will do anything to get ahead and climb the corporate or institutional ladder. They have given climbers a bad name in that their behavior usually seems rather self-serving. Sometimes, coworkers develop some antipathy when they feel they have been stepped on or overrun by their aggressive, uber-ambitious cohorts.

Many gardeners find climbers to be rather too aggressive for their orderly, manicured vision of what their garden should be. Just like those annoying, pushy office climbers, they can occasionally dominate and take over the whole place. Even so, I have always found vining plants to be utterly compelling in their exuberance. They just need to be planned for and controlled to some extent. If planted in the wrong situation, botanical climbers can be even more annoying than the social or

workplace types.

Climbing orchids are simply using other plants as scaffolding to reach adequate light levels in order to survive and bloom. Even though they may



Thomas Miranda

creep over other plants to get there, they are simply using an alternate strategy to meet their needs. Interestingly, many of these types of plants are considered both terrestrial and epiphytic (hemi-epiphytes) as they are often rooted in soil or detritus, and then use roots along their stems to attach to trees and shrubs as they ascend. Sometimes the ground roots are significantly different (thicker and more rhizomatous) than the epiphytic ones.

Indeed, there are several orchids that climb, some modestly and others boldly. Smaller climbing orchids are very fun to grow in a pot with a totem or tree branch for it to ascend. Some favorite subjects for this culture include the modest but colorfully bloomed *Trichoglottis smithii* from Borneo and Sumatra, which loves to attach the roots along its stem onto corrugated bark surfaces. In Hilo, my plant placed at the base of an Ohi'a tree (*Metrosideros polymorpha*), grew 6 inches (15 cm) each month, burying its roots as it climbed. Many of the smaller angraecoids such as *Angraecum erectum*, *Angraecum firthii*, *Angraecum germinyanum* and many campylocentrums do likewise and eventually need good sized mounts when grown in a greenhouse situation. When young, smaller renantheras such as *Renanthera citrina* and *Renanthera monachica* enjoy and bloom modestly



KARL SIEGLER

JAMES MCCULLOCH



DVANE ERDMANN

TOM KULIGOWSKI



BRYAN KUROVSKI

- [1] *Trichoglottis smithii* 'Erin' CBR/AOS photographed by James McCulloch. Inset: *Trichoglottis atropurpurea* 'Vin Mar' AM/AOS photographed by Butch Utery. This species has long been a source of nomenclatural confusion; at one time a varietal form of *Trgl. philippinensis* (as var. *brachiata*) and then later as *Trgl. brachiata*.
- [2] *Angraecum erectum* 'M&B' HCC/AOS
- [3] *Angraecum germinyanum* 'Highjack' CCM/AOS
- [4] *Campylocentrum robustum* 'Roger' CHM/AOS
- [5] *Renanthera citrina* 'Crownfox Lemonade' AM/AOS
- [6] *Angraecum birrimense* 'Swamprad' CHM/AOS



in a similar growing situation, though these too will eventually need larger accommodations as well.

Medium-sized climbers such as *Trichoglottis atropurpurea* (*brachiata*) and *Trichoglottis philippinensis* eventually need an extensive area to climb. These plants can produce outstanding displays when they are allowed to become large specimens in a tropical garden, but can also be impressive when grown mounted or allowed to climb a wall or larger branch. Certain midsize angraecoids are also wonderful to present this way; *Angraecum birrimense*, *Angraecum eichlerianum* and the incredible *Angraecum infundibulare* are fine examples. Medium-sized renantheras such as *Renanthera bella* and *Renanthera philippinensis* love a good size cork mount on which to climb.

If you have a tropical garden or a large conservatory, you might consider growing vanillas. While several of us grow small cuttings, particularly of some of the more diminutive, variegated forms, vanillas are eventually giant and rampant climbers. If you want these to bloom or make capsules for their delicious flavoring, you must be prepared for them to overtake any and every obstacle in their environment. When given the right conditions, they are irrepressible and truly remarkable.

Here on the Big Island, many of my friends have the luxury of giant trees and palms on which to attach truly mammoth-sized orchids. Larger renantheras such as *Renanthera imschootiana*, *Renanthera coccinea* and *Renanthera storei* require massive climbing opportunities. Among my new favorites are some of the related *Arachnis* species. *Arachnis hookeriana* climbs to over 25 feet (7.6 m) tall and blooms spectacularly in the gardens of Rick Kelley and Mary Beth Cohen of Kea'au Hawaii. How wonderful to have such extraordinary plants grace our gardens here in the Aloha State.

In the end, these are climbers I do not mind being around at all.

— Tom Mirenda has been working professionally with orchids for over three decades. He is an AOS accredited judge and is the chairman of the American Orchid Society's Conservation Committee. He recently coauthored *The Book of Orchids: A life-size guide to 600 species from around the world* (email: [biophiliak@gmail.com](mailto:biophiliak@gmail.com)).



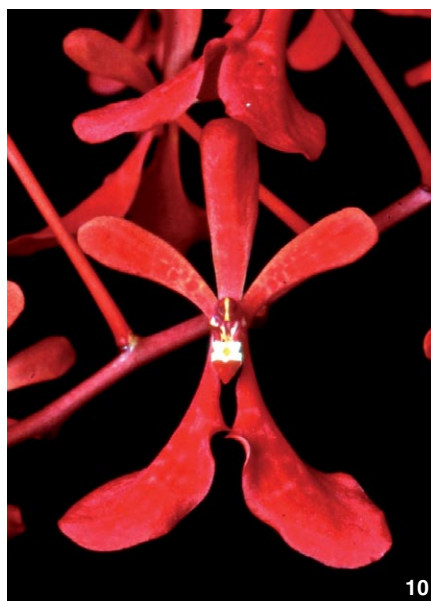
7  
TOM MIRENDA



8  
ARTHUR PINKERS



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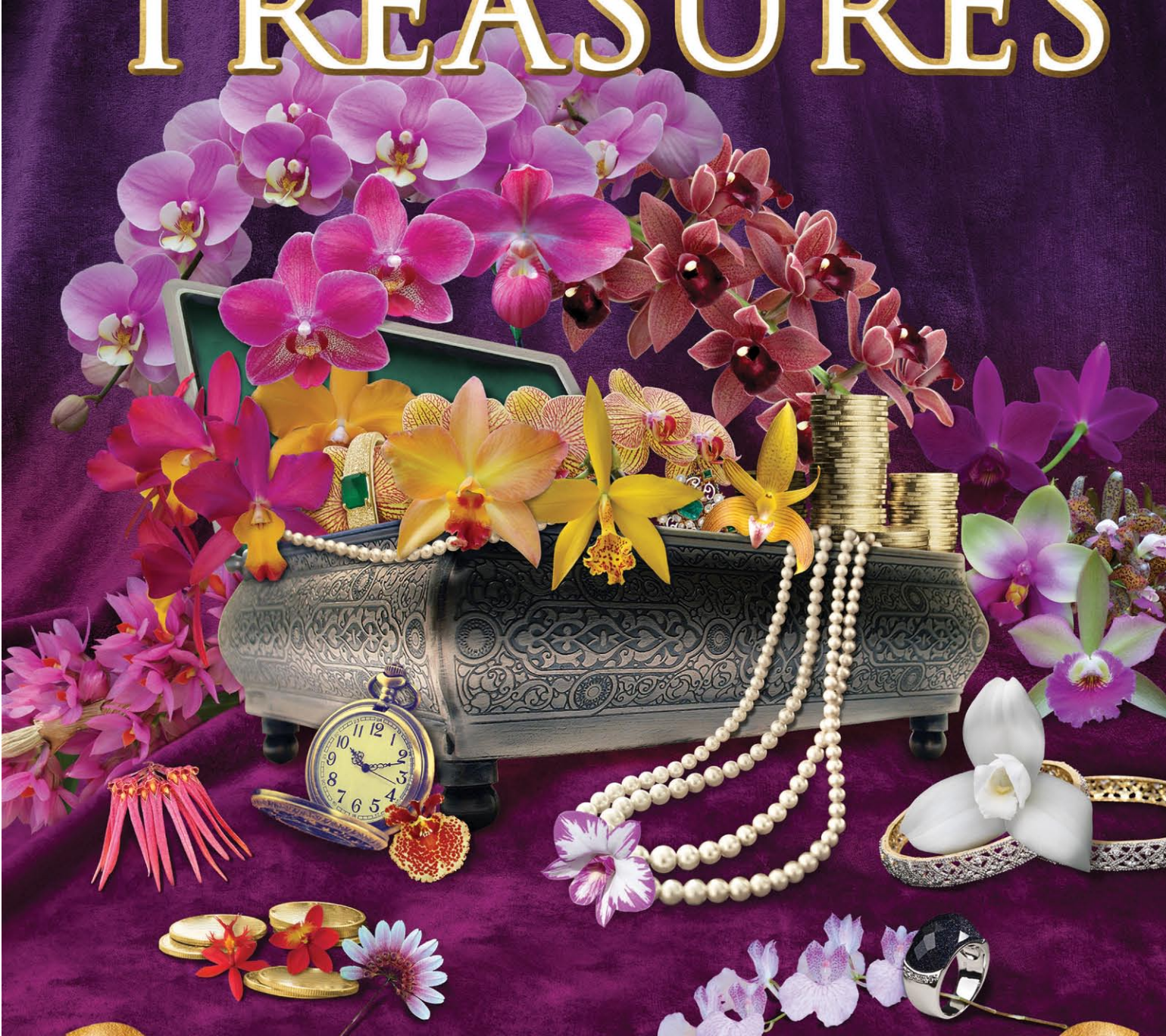


10  
MICHAEL PEARSON

- [7] Mary Beth Cohen poses next to an *Arachnis hookeriana* growing in her garden on Hawaii's Big Island.
- [8] *Angraecum infundibulare* 'Diamond Orchids' HCC/AOS
- [9] *Vanilla aphylla* 'Virginia Amelia Azizi' CCM/AOS; one of the many leafless *Vanilla* species.
- [10] *Renanthera philippinensis* 'Crimson Cascade' AM/AOS. The bright white or yellow lip side lobes are characteristic of this species.



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*Rodriguezia Batemani?*

Pöppig del.

# Rodriguezia

by Peggy Alrich and Wesley Higgins

A Tropical American Genus



# RODRIGUEZIA

THIS GENUS WAS first described by Ruiz and Pavón in 1794 in *Florae Peruvianae, et Chilensis Prodromas, sive novorum generum plantarum peruvianum, et chilensium descriptiones et icones*. Madrid (*Fl. Peruv. Prodr.*, 115, t.25).

**ETYMOLOGY** In commemoration of Antonio Manuel Rodríguez de Vera (1780–1846), a Spanish botanist, pharmacist at the royal court of Spain and contemporary of Hipólito Ruiz López and José Antonio Pavón.

**LECTOTYPE** *Rodriguezia lanceolata* Ruiz and Pavón, designated by Garay and H.R. Sweet, *J. Arnold Arbor.*, 53:527 (1972), and Pupulin, *Ana. Jard. Bot. Madrid*, 69(2):158 (2012).

There are 47 of these sympodial epiphytes (sometimes partially psygmoid) found in wet, low- to midelevation hill scrub, coffee–guava plantations and montane forests from Cuba to Trinidad, the Guianas, Venezuela, southern Mexico

to Bolivia and northeastern Argentina, with the greatest diversity found in Brazil

These clump-forming, twig-like plants have prominent, small, flattened pseudobulbs, clustered or borne at considerable intervals from each other, subtended by overlapping, leaf-bearing sheaths, each with one to two leathery leaves at the tip. The erect or arching, few- to numerous-flowered inflorescence, borne from the axils of the bracts at the base of the pseudobulb, has rather large to small, white or yellow to magenta or scarlet flowers. The oblong lateral sepals are fused along their inside margins forming a nectary spur. The white or creamy, deeply notched, simple lip, hinged to the slender, footless column base, has radiating veins, a ridged callus, a wavy margin, and is either lacking a spur or has a short spur. The column has a pair of forward-pointing arms and a basal horn that secretes nectar containing glucose

Pollination by *Eulaema* and *Exaerete* bees has been observed. Pollinia two, pear-shaped, waxy, attached by a narrow stipe to a small viscidium. Phylogenetic studies show *Rodriguezia* as a monophyletic genus closely related to *Compartmentia* Poepp.

**CULTURE** Mount on cork bark or a rough wooden slab and furnish abundant water throughout the year. Provide high humidity, intermediate to hot conditions, moderate shade and good air movement.

Thanks to the Selby Botanical Gardens Library, Missouri Botanical Garden, Biodiversity Heritage Library and Swiss Orchid Foundation for their help and as sources for illustrations.

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

— Wesley Higgins is an AOS accredited judge ([higgins@alumni.ufl.edu](mailto:higgins@alumni.ufl.edu)).





RODRIGUEZIA CALOPLECTRON RCHB. FIL.

2



L. Stroobant, del. & lith.

3



*Pleurothallis ? coccinea.*

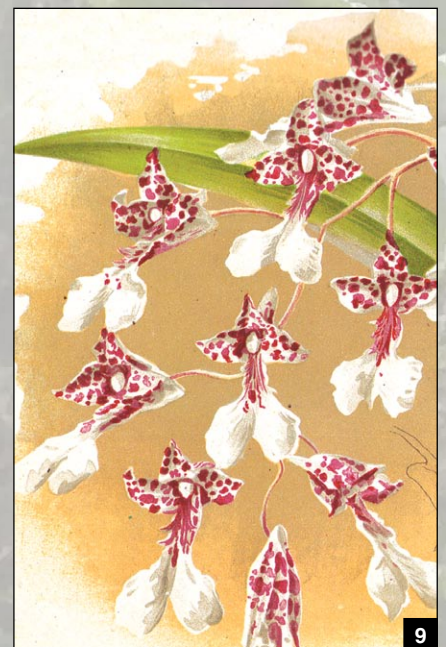
4





### Antique Plates — *Rodriguezia*

- [1] *Rodriguezia batemanii*, *Nova Genera ac Species Plantarum*, 1:t.70 (1835).
- [2] *Rodriguezia caloplectron* (*Rod. bracteata*), *Gartenflora*, 41:t.1372 (1892).
- [3] *Burlingtonia decora* (*Rod. decora*), *Flore des serres et des jardins de l'Europe*, 7:t.716 (1852).
- [4] *Pleurothallis coccinea* (*Rod. lanceolata*), *Exotic Flora*, 2:t.129 (1825).
- [5] *Rodriguezia secunda* (*Rod. lanceolata*), *Orchid Album*, 8:t.351 (1889).
- [6] *Rodriguezia secunda* (*Rod. lanceolata*), *Botanical Register*, 11:t.930 (1825).
- [7] *Rodriguezia secunda* (*Rod. lanceolata*), *Watercolours of Surinam*, unpublished, Universitätsbibliothek Frankfurt am Main, Germany, (1811–1824).
- [8] *Rodriguezia secunda* (*Rod. lanceolata*), *Botanical Magazine*, 63:t.3458 (1836).
- [9] *Rodriguezia decora*, *Dictionnaire Iconographique Orchidées, Rodriguezia*, t.1(1901).





# A Summer Place

## Building an Orchid Pergola

TEXT AND PHOTOGRAPHS BY NILE S. DUSDIEKER

MY WIFE AND I grow around a thousand orchids mostly in our insulated greenhouse that sits atop our third garage in North Liberty, Iowa. Nothing can match the joy of walking from our dining area into the tropical greenhouse when the winter weather outside is below zero F (-18 C). Our only problem, ironically, is the summer heat! The temperatures in the greenhouse can easily reach 100 F (37.8 C) in spite of open roof vents, exhaust fans, louvered side windows and a misting system. Clearly, we needed to find a special “summer place” for our orchids where they could enjoy the warm humid days of Iowa summers and still cool down at night. We built a 16 × 20 foot (4.9 × 6.1 m) outdoor pergola a few years ago and now all the greenhouse orchids live in the pergola from late May until late September. Cool-growing orchids go out early and stay outside longer. Warm growers, such as our vandas, go out in June and back inside late August. They all seem to love it and most grow vigorously. My annual concern is finding enough room for all of them back in the greenhouse come fall. This is how we built our pergola.

We considered three important factors in planning our pergola: location, structure and customized amenities. Location is the most important, because once the structure is built, one has to live with it long term. The arc of the summer sun should carefully be observed from its northernmost peak in June to near the equinox in September. Ideally, the pergola should have high light, especially during the cooler morning hours, then midday shade and perhaps some late-afternoon sunlight. The location should be somewhat protected from the elements but allow gentle breezes to flow through. Our pergola sits at the edge of the woods. We have large trees on the north and west sides with a clear open yard on the east. The pergola gets direct sunlight until about noon daily, and then some sunlight after 4 pm. The roof is covered with 40% shade cloth and each side has a roll-down



shade cloth, which helps in the fall when the sun angle is more southerly. I also use the roll-down material as a buffer against strong wind storms.

Ultimately, the most critical factor for location is proximity to where one houses the orchid collection the rest of the year. Our pergola is within 25 feet (7.6 m) of the greenhouse. This proximity allows

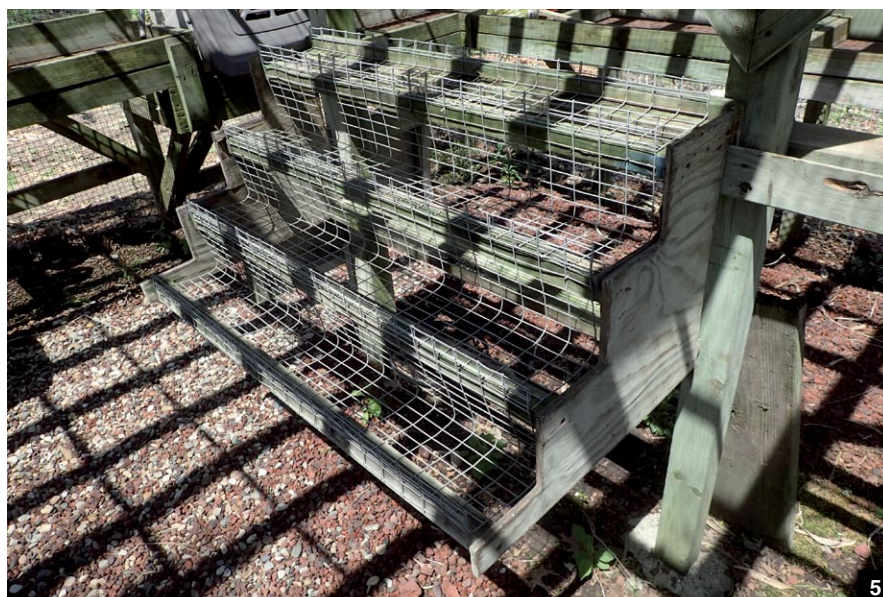
- [1] The author's pergola in early spring.
- [2] Side view.
- [3] Growing benches around the periphery.
- [4] Hanging pipes and misting system plumbing.
- [5] Portable stair-stepped bench.



me to transport plants in the spring at my leisure, inspect each one individually, repot if needed, add long-acting fertilizer, and spray for bugs. A few years ago, we had an early frost scare. My wife and I crammed all the plants back into the greenhouse in one day! They did not all make it back to their usual growing spots, but they survived, and some surprised us with new blooms.

The structure of our pergola is a simple “pole building.” Vertical 4 × 4-inch (10 × 10 cm) pressure treated (to resist rotting) posts were set in cement footings every 4 feet (1.2 m) around the periphery, with one row down the middle lengthwise as well. The structure was then framed in with 2 × 4-inch (5 × 10 cm) treated lumber. The roof has cross beams at 1-foot (30 cm) intervals, which allows one to walk on it if needed. The sides are open with just minimal connecting boards to ensure structural integrity. A decorative lattice caps the sides near the top. We used 1¼-inch (3.2 cm) galvanized chain-link-fence piping fastened to the underside of the roof for hanging plants. Pipes were placed on the front outside to hang plants for staging. Pipes also sit atop the pergola and hold the shade cloth in place. These pipes are lightweight, sturdy and come in 20-foot (6.1 m) lengths. The side rolls of shade cloth wrap around a pipe as well. The height of the structure is personal preference. I wanted to hang as many plants from the top pipes as possible and still have clearance to walk under them. The land under our structure slopes gently downward such that the pergola top varies from 9 to 10 feet (2.73 m) off the ground. Plant hangers 24 inches (61 cm) long are used on the higher side and 18-inch hangers (46 cm) on the other.

My carpenter was a stickler for detail and made sure the structure was square and level. He was extremely vexed that the planned width of 16 feet (4.9 m) had to be compromised by a large, immovable tree root where the corner post needed to be. Hence our structure’s width is only 15.75 feet (4.8 m). The outside of the entire pergola is covered with 1 × 1-inch or 1 × 2-inch (2.5 × 2.5 cm or 2.5 × 5.1 cm) galvanized-wire fencing material that keeps the critters out and provides additional hanging places for smaller plants on side pot hooks. We had aggressive squirrels that liked vanda roots and chewed the reedstemmed epidendrums down to the pot! The entrance is a double door made of the fencing material and the same galvanized pipes. The flooring is lava rock or river





rock atop normal ground. More detailed information is available on request via email.

At this point we had the location and the structure, and now we wanted to customize the pergola to meet our specialized needs. Space — one always needs more space! We built contiguous benches all the way around the inside of the pergola. These were 3 feet (91 cm) high with expanded metal bases and the exact width of standard bedding-plant trays. The benches have removable  $2 \times 4$ -inch ( $5 \times 10$  cm) boards around the rim, which protect trays and plants from falling off. My wife starts most of our bedding plants early in the spring and she acclimates the plants on these benches, much to the distress of my orchids. More plant space is provided on four removable, stair-step stands made of the same fencing material. These attach to the vertical central poles. In the winter they easily detach and move into the greenhouse for additional growing space. Because these stands are below the hanging plants, they offer lower light and cooler growing areas in the pergola. All plants in the pergola are at least 30 inches (76 cm) above the ground and, to date, we have not had a major problem with slugs, snails and rodents, although a couple of mouse nests exist in the orchid baskets. We did find a large corn snake enjoying the sun one afternoon during an orchid club gathering. A few screams later it slithered away!

Water and power — one must not forget these. We have a polyvinyl chloride (PVC) underground water line that surfaces near my outside hose faucet. The low spot in the line has a drainage valve to prevent freezing in winter. Inside the pergola I have a hose faucet to connect a watering wand and one to connect to my automatic misting system. We use well water. The misting system is quite simple. Placed between the metal overhead pipes used for hanging the plants, four PVC pipes with misting nozzles (24 total) spray a fine mist at rate of 1 gallon (3.8 L) per hour per nozzle. These lines are connected to the main line running to an automatic, battery-powered misting timer (for example, see [www.charleysgreenhouse.com](http://www.charleysgreenhouse.com) under accessories, then watering supplies). My routine is five minutes of misting early morning, noon and late afternoon. The system is easily shut off when we have a good rain. Inside the greenhouse, I use the same timer and similar piping system but with pure reverse-osmosis water. I considered this for the pergola, but with





the usual amount of cleansing natural rain in an Iowa summer, I rarely see much lime buildup on the leaves from our well water. The pergola is wired for electricity with ground-fault sockets. We have lights we rarely use, but the electrical sockets provide power for sprayers for chemicals and pumps for watering with rainwater collected from the greenhouse gutters.

Finally, one always needs a work area and storage. Two small, fold-down work benches are attached to the poles at each end of the center section. They have many uses, including repotting, inspecting plants for diseases and also as a temporary holding place for plants when moving them around. We have plenty of storage space under the benches along the sides. In front of the pergola a picnic table and a couple of outside chairs provide a larger, open work area that is ideal for large-scale cleaning, dividing, and repotting plants. After meeting the orchids' needs, we may have an afternoon libation. Our orchid club has had repotting sessions here; the outdoor setting allows for easy cleanup. All in all, our pergola is a really special summer place, not only for our orchids, but also for us.

**Acknowledgment**

Special thanks are due my friend and carpenter, Ed Ullrich of Coralville, Iowa who helped design and build our pergola.

— Nile Dusdieker, a retired physician and accredited AOS judge associated with the Chicago judging center grow, along with his wife Lois, around 900 orchids of varied genera in a greenhouse atop their third garage at their North Liberty, Iowa home. Nile enjoys giving presentations on a wide variety of orchid topics and has presented at international meetings (niledusdieker@gmail.com).



- [6] Central door allowing easy access.
- [7] Side benches and storage.
- [8] Cattleyas in their bright, airy spot.
- [9] Author with *Catasetum saccatum* hanging on the outside of the pergola.
- [10] The author's wife, Lois, admiring a *Stanhopea Assidensis* inside the pergola.
- [11] Because of its placement, the front end of the pergola provides bright light.
- [12] Pergola filling up nicely.
- [13] Collapsible work bench.
- [14] The author's empty pergola during an Iowa winter.



# Warming up to Some

## Two new hybrid genera in the Zygopetalum Alliance

TEXT BY FRED CLARKE

ZYGOPETALUMS ARE POPULAR with orchid growers in more temperate climates. They grow well in areas where they receive night temperatures averaging 45–55 F (7.2–12.8 C) for much of the fall, winter and spring. In coastal California, zygopetalums thrive outside, where the richly colored flowers and strong fragrance make them memorable for hobbyists. At Sunset Valley Orchids, we wondered how we could make these wonderful plants available to growers who live in warmer areas and those who grow plants indoors. A number of years ago, we embarked on a breeding program to produce warm-growing hybrids in the Zygopetalum alliance (also known as the Zygopetalinae), using species well suited for this endeavor. Two of the species playing a dominant role in this program are warm growing: *Batemannia colleyi* and *Galeottia grandiflora*. These species thrive in shady conditions with temperatures ranging from 63–88 F (17.2–31.1 C), and prefer consistently moist conditions, as rainfall is nearly constant year-round in their natural habitat.

The new hybrid genus (nothogenus) *Maxthompsonara* was named in honor of Max Thompson, a well-known and respected grower in Kansas. *Maxthompsonara* is comprised of three genera: *Batemannia*, *Galeottia*, and *Pabstia*. The grex *Maxthompsonara* Bryon Rinke, named for another respected grower in Kansas, is a cross between *Galabstia* Green Tyger and *Batemannia colleyi*.

A second new hybrid genus, *Nottara*, was named in honor of David Nott. *Nottara* is a combination of five genera: *Batemannia*, *Galeottia*, *Neogardneria*, *Pabstia*, and *Zygopetalum*. The grex *Nottara* Lucy's Sassafras is a cross between *Galabstia* Green Tyger and *Zygogardmannia* Dynamite Peru, named because David Nott's daughter likened the flower's fragrance to root beer.

These two warm-growing Zygopetalinae have opened new



BRYON RINKE



FRED CLARKE



LOREN BATCHMAN

opportunities for a wide range of hobbyists to enjoy their beautiful flowers. They have been bred specifically to do well under warm growing conditions with low light, such as those in the home or under lights. These hybrids have also performed well in the hot, humid conditions provided by growers who summer their plants outside. It is a bit surprising, but a testament to the heat tolerance of the species, that we have seen good results from plants grown outdoors in south Florida.

- [1] *Maxthompsonara* Bryon Rinke (*Galabstia* Green Tyger × *Batemannia colleyi*)
- [2] *Galabstia* Green Tyger 'H&R' AM/AOS
- [3] *Batemannia colleyi* 'Sunset Valley Orchids' HCC/AOS
- [4] *Nottara* Lucy's Sassafras (*Galabstia* Green Tyger × *Zygogardmannia* Dynamite Peru)
- [5] *Zygogardmannia* Dynamite Peru 'Sunset Valley Orchids' HCC/AOS



# Hot New Hybrids:

We have found that these hybrids grow well in the same conditions suitable for phalaenopsis and Maudiae paphiopedilums. Plants enjoy light levels ranging from 1,000 to 1,500 foot-candles and temperatures ranging from 60 to 65 F (15.6–18.3 C) at night and 70 to 85 F (21.1–29.4 C) during the day. These hybrids enjoy a freely draining potting medium that allows for frequent watering. We have found that a fine bark and perlite mix is well suited for these plants. The roots do not like to dry out between waterings, and irrigating 2–3 times a week in summer and once to twice a week in winter works out well. Fertilizing with ½ tsp (2.5 ml) of your favorite water-soluble fertilizer per US gallon (3.8 L) of water with each watering gives excellent results.

Even in this day and age, a new hybrid genus can still be created. Congratulations to Max Thompson and David Nott for being the first to flower these! Their names will forever be attached to these new hybrid genera.

#### ACKNOWLEDGMENTS

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

— Fred Clarke owns and operates *Sunset Valley Orchids*, located near San Diego, California. His interest in breeding orchids spans over 35 years. He is recognized as the foremost breeder in the *Catasetinae* and he is also actively developing new *cattleya*, *paphiopedilum* and *Australian dendrobium* hybrids. He travels extensively dedicating his time to the world-wide education of hobbyists (website: [www.sunsetvalleyorchids.com](http://www.sunsetvalleyorchids.com), email: [fred.clarke@att.net](mailto:fred.clarke@att.net)).



FRED CLARKE

4



ARNOLD GUM

5



# Conservation at Work

Biogeographic history and conservation of western North American

TEXT AND PHOTOGRAPHS BY TARA LUNA



*Cypripedium montanum* photographed in situ in Montana. Inset: the genetically distinct, albinistic color form *Cypripedium montanum* f. *praetertinctum*.





## *Cypripedium* species and their habitats

Western North American *Cypripedium* species exhibit a combination of life history traits that make them vulnerable to population loss or decline. Limiting traits include specific mutualisms with pollinators and mycorrhizal fungi, niche definitions within habitat, inbreeding depression in widely separated small populations, small population size and specific habitat requirements. Some life history traits, such as the ability to shift to self-pollination, clonal growth, phenotypic plasticity and positive response to small-scale disturbance have enabled these plants to persist and reproduce, adapt to new climates and survive past climate oscillations.



During maximum glaciation, colder climates and pollinator scarcity, isolation would enforce self-pollination in widely separated populations that survived in ice-free areas. Ice-free areas included Beringia (most of northern Alaska), portions of northern coastal islands, ice-free corridors and summits or slopes within the mountains and floodplains and mountain ranges south of the ice sheets. Because of periods of isolation and glaciation, isolated populations were self-pollinating to survive in situ and facilitate migration and site colonization during interglacial periods and following the end of the Pleistocene. Shifts in pollination strategy, pollen attachment site or pollination vectors would promote reproductive isolation, resulting in a range of morphological and genetic variability between populations and varieties.

During the Pleistocene, ice-free areas occurred in widely scattered locations. Both species were well adapted to survive unfavorable climate periods in situ at high latitudes in ice-free Beringia and in protected sea-level, ice-free sites subjected to slightly warmer and moist microclimates. South of the massive ice sheets, populations survived within mountainous ice-free areas and river floodplains beyond the region of ice advance. Ice-free areas occurred between ice sheets, on exposed ice-free plateaus, on mountain summits, or in protected sites behind lateral moraines radiating out of mountain valleys.

Following deglaciation, recolonization and genetic mixing between refugia populations occurred in some regions of North America. However, in western North America, refugia were widely separated by climate, geologic, physical, spatial and ecological barriers at the end of the Pleistocene.

For *Cypripedium parviflorum*, enforced isolation and adaptation resulted in the vicariant appearance of the distinct variety *exiliens*, adapted to cold, mountain environments at widely distant locations, ranging from Beringia to the northern Rocky Mountains and Black Hills. Notably, var. *exiliens* is found in similar glaciated landscape positions and similar low shrub or riparian-edge plant communities in the northern Rocky Mountains and interior Alaska.

Canadian and northern Rocky Mountain populations of variety *pubescens* recolonized developing wetland habitat and mesic forests during glacial retreat from a few populations that survived ice advance or from refugia south of



the ice sheets in the southern Rocky Mountains. Variety *makasin* in southern British Columbia remained well separated from the remainder of its range east of the Continental Divide, having survived in refugia in the vicinity of the Fraser Plateau.

*Cypripedium montanum* populations survived the Pleistocene along the western North American coast in ice-free refugia and south of the coastal ice sheet in southwestern and northern California. Populations found in the Great Basin mountain ranges most likely survived in situ during periods of colder climates, and populations in the northern Rocky Mountains survived such periods in ice-free refugia within mountain glaciers or south of the ice sheets. Populations may have occurred as far west as the Black Hills, Cypress Hills and western Colorado before or during interglacial periods of the Pleistocene.

Both *Cyp. montanum* and *Cyp. parviflorum* and its varieties were examined in the Pacific Northwest to determine habitats and morphological and genetic traits among and between populations and to determine locations of potential Pleistocene refugia in western North America. Because both species are adapted to limestone-derived soils, bedrock or aquifers, distribution patterns and migration distance beyond refugia are limited and discontinuous. Existing populations appear to be closely tied to locations of ice-free Pleistocene-aged refugia.

For *Cyp. montanum*, preliminary DNA results from the North American Orchid Conservation Center (NAOCC) (McCormick-

- [1] *Cypripedium parviflorum* var. *exiliens* in Montana.
- [2] *Cypripedium parviflorum* var. *pubescens* in northwestern Montana.
- [3] *Cypripedium parviflorum* var. *pubescens* in a spruce hummock.
- [4] Fen edge with *Cypripedium parviflorum* and *Cypripedium* × *columbianum* in adjacent upland forest edge.

Smithsonian) show greatest levels of genetic diversity within and among populations from northern California and southern Oregon in the North Coast, Klamath and Siskiyou mountain ranges, which were important refugia during the Pleistocene. A population in southern



Alaska also showed high levels of genetic diversity, indicating an ice-free refugium in southern interior Alaska. DNA results also show genetic distinctiveness of the color form *praetertinctum* that exhibited low genetic variation among samples but high genetic variation and distinctiveness when compared with other color forms. *Cypripedium montanum* populations survived in refugia at widely separated locations along the western North American coast from southern Alaska to California.

*Cypripedium montanum* f. *praetertinctum* is genetically and morphologically distinct and contains high levels of genetic diversity comparable to those found in refugia of northern California and southern Oregon. This form has large, pure white lips and lip openings and may be pollinated by bumblebees where it is found in open mountain meadows and open forests adjacent to fens. Because of its genetic, morphological and ecological distinctiveness, f. *praetertinctum* should be elevated to a varietal or subspecies taxonomic rank.

For *Cypripedium parviflorum* var. *pubescens*, DNA results show a general trend for greatest genetic variation in southern and northern refugia, when compared to populations found in the inland Pacific Northwest and the northern and Canadian Rocky Mountains. Of all regions and varieties sampled, the highest genetic diversity (within and among) was found in var. *pubescens* from refugia in coastal Alaska, supporting the existence of ice-free areas in some islands during the Pleistocene. Variety *pubescens* is the most genetically homogeneous variety found in the Inland Pacific Northwest and Canadian Rocky Mountains, where a single or multiple small refugia of closely related populations recolonized this area following decay of the ice sheets, mountain glaciers and Lake Missoula floods.

DNA results also indicate that these populations were likely self-pollinating during periods of ice advance and isolation, a morphological feature that is still seen today in some populations in northwestern Montana. Variety *makasin* from southern interior British Columbia exhibited high within-region genetic diversity. Results support recognition of this taxonomic variety in British Columbia as distinct from var. *pubescens*, where it is disjunct from its range east of the Continental Divide.

However, *Cyp. parviflorum* var. *exiliens* from the northern Rocky Mountains



exhibited the greatest genetic variability within and among populations of all varieties sampled. As a result, var. *exiliens* must be conserved where it is found to preserve the distinct variety, its high genetic diversity and its distinct mountain upland and riparian habitats effectively. It may be pollinated by insects entering or exiting the lip opening or by syrphid flies, or it is mostly self-pollinating. Self-pollination is a favorable reproductive strategy in arctic, boreal, and mountain environments.

Self-fertilization may be facilitated by wind during later stages of anthesis where plants are found in open, exposed habitats at higher elevations in the northern Rocky Mountains and at high latitudes in Alaska. Variety *exiliens* (Sheviak 2010) is appropriately named, meaning “springing forth”; it emerged during periods of isolation, glaciation and climate shifts at widely separated locations. Throughout its range, it is extremely rare and represents a distinct conservation entity.

Because these orchids possess a long evolutionary history and have specialized relationships with other organisms, and are restricted to habitats influenced by specific geology or aquifers, they can serve as the focal species for land conservation goals and as the model species for pollinator conservation efforts. Target conservation areas containing rare orchid populations serve to conserve other co-occurring orchids, symbiotic organisms, pollinators, other rare and endemic species, and community-level, species-rich concentrations of plants restricted to rare habitat types such as groundwater-fed wetlands and limestone species-rich areas. Conserving existing populations

is crucial because total seed-bank life is limited and total genetic diversity is found in living plants. Existing populations serve as contemporary refugia under current climate change.

Conservation of genetic diversity can be viewed at both range-wide and within-population scales, where genetic diversity is greatest at the leading range edge of the population (Lesica and Allendorf 1995), within the leading edge of an isolated population and where population edges meet boundaries between different habitats. In the Rocky Mountains, diverse gradients of elevation, climate, and geology define the leading population edge in higher-elevation habitats.

In groundwater-fed wetlands, similar gradients occur across the site; variations in hydroperiod and microtopography exhibit fine-scale differences in water chemistry, diatoms and mycorrhizal floras, temperatures, pH, nutrient availability and organic matter. In wetlands, orchid populations tend to be restricted to microsites that exhibit specific environmental conditions required by the species and where symbiotic organisms are found.

Habitat variation directs vegetation composition and structure and constricts populations to sites and habitat boundary edges that contain the physical, chemical and biological requirements for growth and recruitment. Edge populations found on boundaries between habitats are genetically diverse where the species is actively adapting and expanding into new habitats. This illustrates the importance of conserving buffer habitats around habitats containing rare orchid populations in order to preserve the full



breadth of genetic diversity, evolutionary processes and future adaptation potential under a changing climate.

These marginal populations provide the stimulus for speciation, resulting in protospecies, new species or distinct varieties or forms capable of occupying different habitats. Edge populations preserve the genetic diversity and adaptation potential for future migration events within the site, within the local region and at the species leading range margin. Such populations are invaluable, as they contain contemporary genes that are preadapted to new environments.

Recent orchid studies strongly suggest that both mountain and high-latitude refugia contain the greatest levels of genetic diversity (Kennedy and Walker 2007; Brzosko et al. 2008, 2009; Fay et al. 2009; Stone et al. 2012). In Europe, widely separated populations of *Cypripedium calceolus* represent distinct genetic conservation units (Taniguchi et al. 2001, Filopov and Androva 2010), and range-margin island populations in northern Japan should be treated as an endangered species (Taniguchi et al. 2001).

Many of the habitats that contain *Cyp. parviflorum* populations in the Pacific Northwest are species rich and contain rare plant communities that are globally or regionally rare in the Pacific Northwest. Rare plant communities are representative of habitats that were once more broadly distributed and are contemporary refugia for rare plant species.

Refugia provide the dynamic evolutionary setting necessary for rapid evolutionary changes, adaptation and future speciation events. For orchids, these processes can occur in relatively short periods of time. Policy and management procedures need to be revised to protect existing refugia populations and habitat, and must include adequate buffer zones that will preserve genetic diversity found in population boundaries and gradients, as well as the ecological and environmental functions of the adjacent habitat.

Small *Cypripedium* populations are more sensitive to environmental changes than larger populations (Ackerman 1998, Nicole et al. 2005) and loss of genetic diversity occurs more at the population level rather than at the species level. Conservation planning efforts must include smaller populations to preserve genetic diversity and adaptation potential, particularly for those populations that are range margin, widely disjunct, isolated or found on habitat margins.

Temperate orchid species-rich areas



are frequently ignored for conservation purposes, because many taxa have broad distributions and are currently considered secure in portions of their range. Where diverse orchid floras and their symbiotic organisms are found, they have persisted over time as long as environmental conditions have remained stable. Conserving the phylogenetic diversity, evolutionary history and adaptation potential of these plants and other rare and species-rich floras and rare plant communities should be considered in local conservation and land-use policy decisions.

[5] Open fen community dominated by sedges, rushes and bulrushes-northwestern Montana.

[6] Northern paper birch-wild sarsaparilla (*Betula papyrifera*-*Aralia nudicaulis*) habitat.

In the Rocky Mountains, orchid-rich sites containing rare and common species are often found in regions or aquifers influenced by limestone bedrock that support rich and diverse floras, including rare species, endemics, range-margin populations and diverse plant



communities. Habitats include vertical limestone cliffs, moist and wet ledges, headwater streams, springs, talus and scree slopes, moist slopes and meadows, canyon walls, swales, alluvial floodplains and diverse wetlands. These environments provide maximum opportunity for local migration into new habitats, where mountain climate, reliable groundwater and geology drive species migration and distribution patterns into new habitats.

Increased levels of effort will be required to abate population losses on both local and regional scales, caused by factors such as climatic warming, wetland loss, drought, increasing severity and intensity of wildfires and pollinator declines. This presents an enormous challenge in addition to other threats such as habitat and plant population loss, invasive species and pollution.

Temperate orchid decline in Europe has been shown to be greatest in limestone-rich grasslands and woodlands. Overall range reduction is greatest in species found in drier soils and more open habitats (Kull and Hutchings 2006). High-latitude boreal and subarctic orchids in humid and mesic climates that are becoming increasingly drier and warmer are also vulnerable to loss (Blinova 2006). Similar challenges are found in orchid-rich sites in Asia (Liu et al. 2010), where plants are unable to migrate outside these areas or to higher elevations, as many species are already found on the highest mountain summits.

In western North America, substantial increases in annual temperatures and decreases in annual precipitation have resulted in increased wildfire severity and extension of the wildfire season. This may result in overall decreasing population trends in *Cyp. montanum* and other orchid taxa found in drier and warmer habitats. Decreased snowpack in high-elevation mountain habitats and drying, decreasing hydroperiods in wetland habitats or wetland loss will impact *Cyp. parviflorum* and other orchid taxa found in mesic and wetland habitats.

Several of the rarest western North American orchids, including *Cyp. parviflorum* and its western varieties, are found in mesic or temporally inundated wetlands, isolated wetlands or in groundwater-fed wetlands. Decreased groundwater availability or shortened hydroperiods will cause reduce wetland size and changes in surface water and substrate chemistry that result in accelerated, impaired fine-scale ecological functions and loss of biological organisms

necessary for orchid seedling recruitment and population maintenance. Conserving the entire of range of wet-land habitats found in western North America is crucial for preserving overall water storage, wetland function and the range of biological diversity dependent on these habitats.

Patterns and periods of extensive glaciation, warmer interglacial periods, flooding, volcanism, and shifting climates and geology shaped the distribution of western North American *Cypripedium* and its varieties. Both species represent an ancient lineage that appeared on the North American continent during the Miocene and possess life history traits that make them vulnerable and adaptable to changing climatic conditions.

Yet these species tenaciously persisted through severe climatic changes of the Pleistocene and during more recent warming periods of the Holocene, where they survived in refugia that provide the necessary biological and environmental requirements. In order to preserve the full breadth of phylogenetic diversity and the evolutionary potential of these remarkable species and their recognized varieties effectively, conservation efforts must focus on existing populations found in both contemporary and historical refugia, as well as populations found at their geographic and ecological range margins.

#### REFERENCES

- Ackerman, J.D. 1998. Evolutionary Potential in Orchids: Patterns and Strategies for Conservation. *Selbyana* 19:8–14.
- Blinova, I. 2006. Orchid Populations at Their Northern Limit of Distribution (Murmansk Oblast): Effect of Climate. *Russian Journal of Ecology* 39(1):26–33.
- Brzosko, E., A. Wroblewska, and M. Ratkiewicz. 2008. Spatial Genetic Structure and Clonal Diversity of Island Populations of Yellow Lady Slipper Orchid (*Cypripedium calceolus*) from Briebrza National Park, Northeast Poland. *Molecular Ecology* 11:2499–2509.
- Brzosko, E., A. Wroblewska, M. Ratkiewicz, I. Till-Bottraud, F. Nicole, and U. Baranowska. 2009. Genetic Diversity of *Cypripedium calceolus* at the Edge and Center of Its Range in Europe. *Annals Botany Fennici* 46:201–214.
- Fay, M.F., R. Bone, P. Cook, I. Kahandawala, J. Green-smith, S. Harris, H.E. Pederson, et al. 2009. Genetic Diversity of *Cypripedium calceolus* (Orchidaceae) with a Focus on Northwestern Europe, as Revealed through Plastid DNA Polymorphisms. *Annals of Botany* 104:517–525.
- Filippov, E.G. and E. Andronova. 2011. Genetic Differentiation in Plants of the Genus *Cypripedium* from Russia Inferred from Allozyme Data. *Russian Journal of Genetics* 47(5):538–545.
- Kennedy, A.H. and G.L. Walker. 2007. The Population Genetics Structure of the Showy Lady Slipper Orchid (*Cypripedium reginae* Walker) in Its Glaciated and Unglaciated Ranges. *Castanea* 72(4):248–261.
- Kull, T. and M.J. Hutchings. 2006. A Comparative Analysis of Decline in the Distribution Ranges of Orchid Species in Estonia and the United Kingdom. *Biological Conservation* 129:31–39.
- Lesica, P. and F.W. Allendorf. 1995. When are Peripheral



Populations Valuable for Conservation? *Conservation Biology* 9:753–760.

- Liu, H., C-L Feng, Y-B Luo, B-S Chen, and S-W Zhong. 2010. Potential Challenges of Climate Change to Orchid Conservation in a Wild Orchid Hotspot in Southwestern China. *Botanical Review* 76:174–192.
- Nicole, F., E. Brzosko, and I. Till-Bottraud. 2005. Population Viability Analysis of *Cypripedium calceolus* in a Protected Area: Longevity, Stability and Persistence. *Journal of Ecology* 93(4):716–726.
- Sheviak, C. 2010. *Cypripedium parviflorum* in the Northwest, with the Description of a New Variety. *The Native Orchid Conference Journal* 7(2):1–15.
- Stone, J.L., P.A. Crystal, E.F. Devlin, R.H.L. Downer, and D.S. Cameron. 2012. Highest Genetic Diversity of Northern Range Limit of the Rare Orchid *Isotria medeoloides*. *Heredity* 109:215–221.
- Taniguchi, H., T. Nakamura, H. Mitzukumi, S. Kawano, H. Sano, and M. Katsumi. 2001. Identity of *Cypripedium calceolus* from Rebuton Island: Comparative Analysis of Related Species. *Genes and Genetic Systematics* 76:181–188.

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# Orchids in Watercolor

## *Galearis spectabilis*

By Marcia Whitmore

*Galearis spectabilis* is a native North American orchid and is commonly known as the showy orchid. It is found throughout the Midwest and eastern United States in deciduous forests. The beautiful, small rose-pink flowers are fragrant and emerge on a stout, somewhat succulent stem. The leaves are paired and shiny. Often several plants can be found in the same area, but do not appear as prevalent the following spring. The plants can be found in April through June before the canopy is fully leafed out. The leaves of this native orchid persist throughout the summer. It often appears in one place, and if marked with a cage or stake might appear again the following spring, but often does not. Occasionally, a pure-white clone is found.

I made sketches at a local forest preserve, took pictures and returned home to work on the drawing and painting. All native orchids are protected, so having the actual plant in my studio was not possible; they do not grow well as pot plants! This painting was done on 300-lb Arches paper. The painting of this plant can also be found in the Gallery section of the American Society of Botanical Artists (<https://asba-art.org/member-gallery/marcia-whitmore>)

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







# *Vanilla planifolia*

Not Just Another Pretty Flower

TEXT AND PHOTOGRAPHS, UNLESS OTHERWISE CREDITED,  
BY BARBARA SCHMIDT

*Vanilla planifolia* flower. Photograph by Naya Marcano.



I WAS RECENTLY asked to host a booth at an educational, family-oriented event at the Cornell University Arboretum. The theme of the event was “Plants Have Families, Too,” and I was to teach about Orchidaceae. I was told to include information about any food products produced from orchids. Of course, the first thing I thought of was vanilla extract. This is what led me to research the genus, and what I found was amazing. This is a truly ancient and fascinating genus.

The story of vanilla starts over 100 million years ago (MYA) in the mid-Cretaceous period. The current theory on the evolution of orchids states that the last common ancestor of the Orchidaceae appeared about 112 MYA, which is when orchids diverged from the Asparagales (Poinar and Rasmussen 2017). Apostasioideae was the first subfamily in Orchidaceae to diverge from all other orchids, about 90 MYA. This divergence was closely followed, on an evolutionary timescale, by the Vanilloideae subfamily, which originated about 84 MYA, making it the second oldest extant subfamily of orchids. The Vanilleae came into existence around 78 MYA (Givnish et al. 2015). Putting this in perspective, Vanilleae emerged in the late Cretaceous period about 12 million years *before* the Cretaceous–Paleogene (K-Pg) extinction event, which eliminated about 75% of life on Earth. To say the genus *Vanilla* is “old” would be an understatement.

With the exception of Australia, the genus is found in tropical areas between the 27th North and South parallels. However, the genus is most diverse in the Americas (Rodolphe et al. 2011). Since 1954, scientists have been hypothesizing where the genus originated. It was originally thought to have been in the Indo-Malaysia area (Portères 1954). However, with the creation of phylogenetic studies and molecular clock dating, it was determined in 2010 that the genus actually originated in tropical Mesoamerica. It is hypothesized that three separate transoceanic dispersion events carried it to tropical areas near Asia, Africa, and New Guinea (Bouetard et al. 2010).

The saga of how vanilla ended up in your ice cream dish is just as fascinating. Fast forward 78 million years to eastern Mexico. Indigenous people of this region, called the Totonacs, are credited with first cultivating and using vanilla extract. The Totonacs were invaded by the Aztecs, who also began cultivating vanilla orchids because they decided that vanilla made a



[1] Small cutting of *Vanilla planifolia*.

[2] Artistic drawing of the species.

great additive to their famous *chocolatl* drink. The Aztecs were subsequently invaded by the Spaniard Hernán Cortés. In the 1520s, Cortez was given credit for introducing Europeans to both chocolate and vanilla. However, in Europe vanilla was originally only used in the same way the Aztecs used it — as an additive for chocolate (Zeeman 2018). Most Europeans of the time actually did not like the taste of chocolate, and they felt the addition of vanilla made chocolate more palatable.

It was not until the early 17th century that the first all-vanilla treat was created. An apothecary in the employ of Queen Elizabeth I, named Hugh Morgan, was its inventor. The Queen loved the taste, and within the next century, vanilla became an ice cream flavor. Thomas Jefferson discovered vanilla ice cream in the 1780s while living in Paris as the American Minister to France. He was so taken by the taste that he copied the recipe and brought it to America. His original recipe can still be found in the Library of Congress (Zeeman 2018).

The genus *Vanilla* was first named in 1754 from the Spanish word *vaina*, meaning “little pod” (Katzer 2003). There are actually about 110 species, but only *Vanilla planifolia* and *Vanilla pompona* are

cultivated to produce vanilla extract. All members of the genus are tropical plants with monopodial, vinelike growth habits. Some *Vanilla* species are vines with thick, dark green, almost succulentlike leaves. Other species appear to have no leaves at all and are simply photosynthesizing vines. An interesting trivia fact about the genus *Vanilla* is that it is the only orchid that produces an edible fruit (Missouri Botanical Garden 2018).

About 95% of all of the vanilla extract production in the world comes from *Vanilla planifolia* (Kew Science 2018), which is native to Mexico and parts of Central America. *Vanilla planifolia* is unique because it is classified as both a terrestrial and epiphytic orchid (called a hemiepiphyte). It begins life as a terrestrial vine and maintains its terrestrial roots throughout its life. When mature, however, the vine can get enough water and nutrients through its long aerial roots. It can be easily propagated by planting a shoot once the vine reaches its mature height of 10–20 feet (3–6.1 m).

*Vanilla planifolia* is a tropical orchid that prefers a hot, humid environment



and organically rich soil to start out. In nature, the vine is found growing up tree trunks, so it never sees direct sunlight. It likes bright light and can tolerate direct early morning sun. This orchid prefers 80–85 F (26.7–29.4 C) daytime temperatures and 60–65 F (15.6–18.3 C) nighttime temperatures. It also requires a consistently moist, but not soggy, medium (Missouri Botanical Garden 2018).

The species produces a fleshy stem that can grow to 100 feet (30.5 m) long in nature, with alternating leaves. Each node produces one leaf, which is succulent and can be up to 5 inches (12.7 cm) long, and a strong aerial root, which is used to hold the vine in place and take up water and nutrients. The leaves are flat, giving this species its name as the flat-leaved vanilla (Missouri Botanical Garden 2018). Because it is monopodial, new stem and leaf growth appears from the top. However, this growth does not appear the same as other familiar monopodial orchids. Orchids such as phalaenopsis, neostylis and vandas produce a new leaf from the top of the stem. It is very interesting to watch as the new leaves appear in vanillas. They unfold from around the outside of the top of the stem.

Once the vine reaches maturity, it will begin to produce flowers. *Vanilla planifolia* has an axillary inflorescence, which means the bud clusters arise from a leaf axil where the leaf stalk connects to the stem. Clusters of buds, sometimes 15 or more, are produced at one time, with those nearest the stem opening first (Missouri Botanical Garden). These buds will open one at a time in the morning, and each flower only stays open for one day.

Each bud will eventually open into a beautiful, fragrant, greenish-yellow flower. The sepals and petals of this flower are similar in size and shape, and the trumpet-shaped labellum has a ruffled edge similar to a cattleya. The natural pollinator of *Vanilla planifolia* is a small, stingless bee, called *Melipona beecheii*. This bee is only native to Mexico and Central America, where *Vanilla planifolia* is indigenous. Because of the shape of the flower, this bee species is the only insect capable of pollinating it. Unfortunately, this bee is currently facing extinction (VanillaPura 2018). In its native range, there is only a 1% chance that any given flower will be pollinated (Rodolphe et al. 2011).

This was a problem until the mid-1800s, as any *Vanilla planifolia* plant grown outside of its native range had to be hand-pollinated, which was not very



successful in most cases. Finally, in 1841, a young boy on Reunion Island figured out how to complete the pollination process. Today, approximately 75% of all natural vanilla extract produced comes from *Vanilla planifolia* plants grown outside of its native range around Mexico (Missouri Botanical Garden 2018).

Once the flower is fertilized, like other orchids, the ovary will swell, and a thin fruit capsule will develop. In vanillas, this is called a bean, and it is 6–10 inches (15.2–25.4 cm) long. It will take about 6–9 months for this vanilla bean to mature. At first it is green and looks more like a seed capsule than the vanilla bean we are all familiar with. Once picked from the vine, it will take another three months of

[3] Monopodial growth habit in *Phalaenopsis*. Note the internode space between each leaf is so short as to give the impression of virtually no central stem.

[4–5] Monopodial growth habit in *Vanilla*. Here the internode spacing is much greater creating a vine-like central stem.

processing to create the aromatic black bean that produces vanilla extract (Gavin 2016, Lantz 2018).

Vanilla extract currently ranks as the second most expensive spice, behind saffron. Natural vanilla extract is produced from a phenolic aldehyde called vanillin (National Center for Biotechnology Information 2018). Vanillin is primarily



found in the beans and seeds of vanillas, with *Vanilla planifolia* having the highest concentrations of vanillin. One of the unwanted side effects of vanillin is that it can cause contact dermatitis. People working with *Vanilla planifolia* have to be careful to avoid skin contact with the sap from the vine.

To conclude, I was so fascinated by this orchid that I bought one. It came as a tiny shoot in a 2-inch (5 cm) pot. I am thrilled with my new little *Vanilla planifolia*, although I do not expect to be harvesting vanilla beans any time soon. I am still trying to figure out what I am going to wrap this vine around to keep it a manageable size for my house over the winter. As I write this, it is outside and just loving the hot, humid summer here in southeastern Pennsylvania. This orchid would make a great addition to any orchid collection. How many other plants can you grow that were alive with the dinosaurs!

#### REFERENCES

Bouetard, A., P. Lefeuvre, R. Gigant, S. Bory, M. Pignal, P. Besse, and M. Grisoni. 2010. Evidence of Transoceanic Dispersion of the Genus *Vanilla* Based on Plastid DNA Phylogenetic Analysis. *Molecular Phylogenetics and Evolution* 55:621–630.

Gavin, S. 2016. *The World's Most Valuable Bean: The History of Vanilla Beans*. [www.slofoodgroup.com/blogs/blog/the-worlds-most-valuable-bean-another-side-of-the-story-of-vanilla-beans](http://www.slofoodgroup.com/blogs/blog/the-worlds-most-valuable-bean-another-side-of-the-story-of-vanilla-beans).

Givnish T.J. et al. 2015. Orchid Phylogenomics and Multiple Drivers of Their Extraordinary Diversification. *Proc. R. Soc. London B* 282:20151553. <http://dx.doi.org/10.1098/rspb.2015.1553>

Katzer, G. 2003. *Spice Pages: Vanilla* (*Vanilla planifolia* Andrews). [http://www.uni-graz.at/~katzer/engl/Vani\\_pla.html](http://www.uni-graz.at/~katzer/engl/Vani_pla.html). Accessed March 16, 2009.

Kew Science. 2018. *Vanilla Planifolia* Andrews. In: Plants of the World Online. [powo.science.kew.org/taxon/urn:lsid:ipni.org:names:262578-2](http://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:262578-2).

Lantz, K. 2018. *Understanding the Difference in Grades of Vanilla Beans*. [www.slofoodgroup.com/blogs/blog/understanding-the-difference-in-grades-of-vanilla-beans](http://www.slofoodgroup.com/blogs/blog/understanding-the-difference-in-grades-of-vanilla-beans).

Missouri Botanical Garden. 2018. *Vanilla planifolia*—*Plant Finder*. [www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=283438](http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=283438).

National Center for Biotechnology Information. 2018. *Vanillin*. PubChem Compound Database, U.S. National Library of Medicine. [pubchem.ncbi.nlm.nih.gov/compound/vanillin](http://pubchem.ncbi.nlm.nih.gov/compound/vanillin).

Poinar, G. and F.N. Rasmussen. 2017. Orchids from the Past, with a New Species in Baltic Amber. *Botanical Journal of the Linnean Society* 183(3):327–333

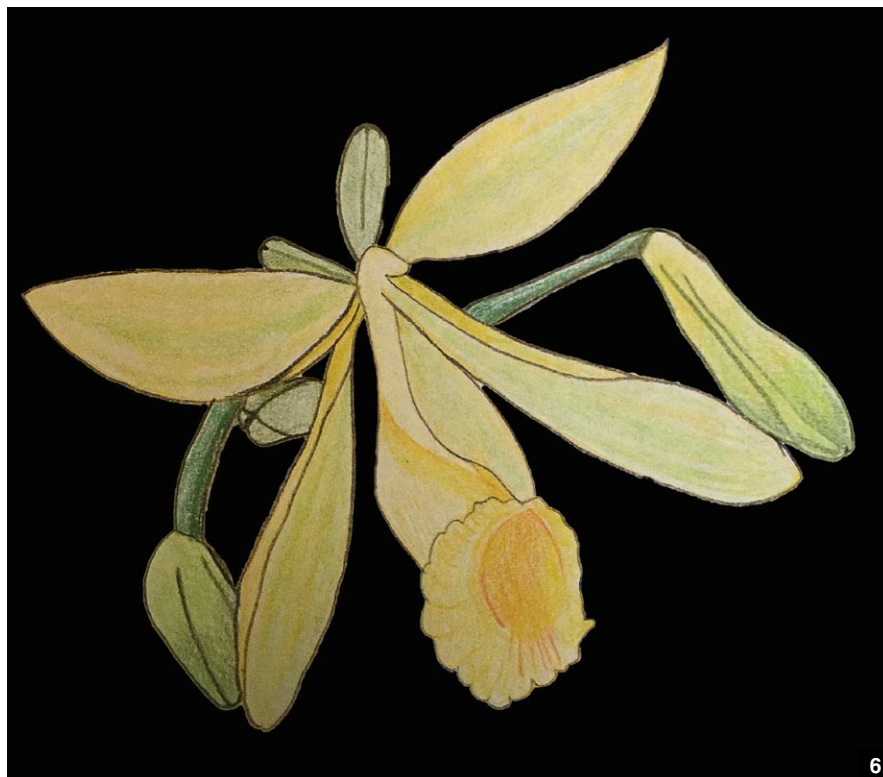
Portères, R. 1954. Le genre *Vanilla* et ses Espèces. In: G. Bouriquet, editor. *Le Vanillier et la Vanille dans le Monde*. Paul Lechevalier, Paris. p. 94–290.

Rodolphe, G., B. Severine, G. Michel, and B. Pascale. 2011. Biodiversity and Evolution in the *Vanilla* Genus. In: O. Grillo and G. Venora, editors. *The Dynamical Processes of Biodiversity—Case Studies of Evolution and Spatial Distribution*. p. 1–27. <http://www.intechopen.com/books>

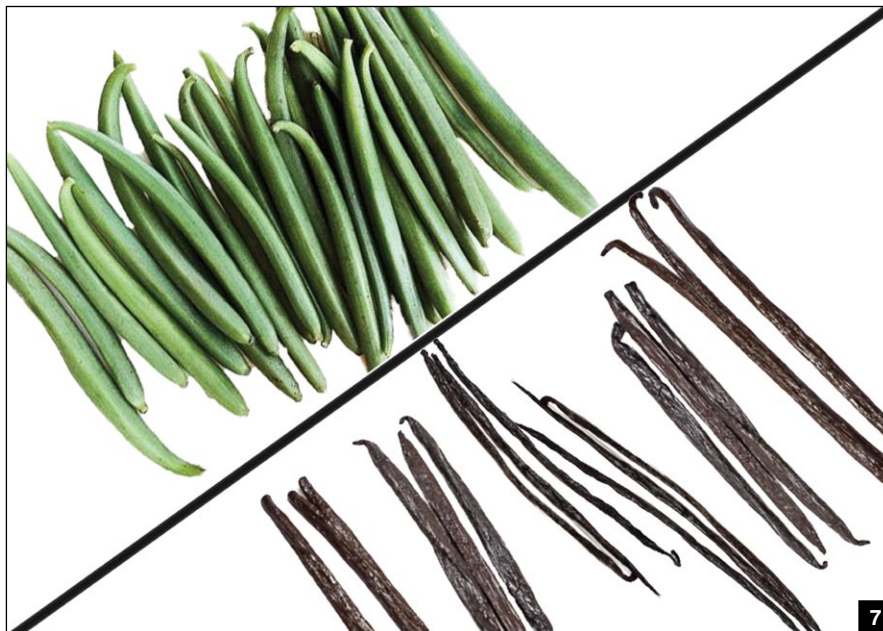
VanillaPura. 2018. *Vanilla Bee Extinction*. [www.vanillapura.com/pages/vanilla-bee-extinction](http://www.vanillapura.com/pages/vanilla-bee-extinction).

Zeeman, Johan, et al. The History of Vanilla. *National Geographic*, January 23, 2018, [www.nationalgeographic.com/people-and-culture/food/the-plate/2014/10/23/plain-vanilla/](http://www.nationalgeographic.com/people-and-culture/food/the-plate/2014/10/23/plain-vanilla/).

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ond book, *Orchid Care: For the Experienced Grower*. She has a Bachelor of Science degree in biology and chemistry and a teaching certificate in secondary science. She's been raising orchids for over 15 years and is a member of the AOS Education Committee and the Pennsylvania Horticultural Society. Her orchids have won a variety of awards, including first place ribbons at the Philadelphia International Flower Show. She has been doing speaking tours and teaching orchid classes throughout the country. She is a regular instructor at the Smithsonian Institute Associates Program,

[6] Drawing of a vanilla flower; either *Vanilla planifolia* or the closely related species *Vanilla pompona*.

[7] Freshly picked, green, and processed vanilla beans. Photographs from Gavin (2016) and Lantz (2018).

the U.S. Botanic Gardens and the New York Botanic Gardens. She maintains a website, [www.basorchidcare.com](http://www.basorchidcare.com), which provides orchid care information and hosts an orchid blog (email: [jentomsch@hotmail.com](mailto:jentomsch@hotmail.com) or [basorchidcare@gmail.com](mailto:basorchidcare@gmail.com)).



# Cypripedium guttatum

and Johann Amman

BY RUDOLF JENNY

***Cypripedium guttatum* Swartz, Kongl. Vetenskaps Academiens nya Handlingar 21:251 (1800)**

## Synonyms

*Calceolus minor flore vario* Amman, *Stirpium Rariorum in Imperio Rutheno sponte provenientium Icones et Descriptiones*: 132–134 and t.12 (1739)

*Cypripedium bouffordianum* Yong H.Zhang and H.Sun, *Annales Botanici Fennici* 43:481 (2006)

*Cypripedium calceolus* var.  $\delta$  Linne, *Species Plantarum* ed.1,2:951 (1753)

*Cypripedium calceolus* var. *variegatum* Falck ex Georgi, in Georgi, *Beyträge zur Topographischen Kenntniss des Russischen Reiches* 2:249 and t.17 (1786)

*Cypripedium guttatum* f. *albiflorum* Aver. Turczaninowia 2(2):30 (1999)

*Cypripedium guttatum* f. *albiflorum* Y.N.Lee, *Bulletin of Korean Plant Research* 2:29 (2002)

*Cypripedium guttatum* f. *bouffordianum* (Yong H.Zhang and H.Sun) J.M.H. Shaw, *Orchid Review Supplement* 120(1298):33 (2012)

*Cypripedium guttatum* var. *latifolium* Rouy ex E.G.Camus, in E.G. Camus, *Monographie des Orchidées de l'Europe, de l'Afrique septentrionale, de l'Asie mineure et des Provinces Russes transcasiennes*, p. 451 (1908)

*Cypripedium guttatum* f. *punicum* Y.N.Lee, *Bulletin of Korean Plant Research* 2:29 (2002)

*Cypripedium guttatum* f. *redowskii* (Rchb. f.) Soó, *Annales Universitatis Scientiarum Budapestensis de Rolando Eötvös Nominatae, Sect. Biologica* 2:54 (1969)

*Cypripedium guttatum* var. *koreanum* Nakai, *Bulletin of the National Science Museum* 31:150 (1952)

*Cypripedium guttatum* var. *redowskii* Rchb.f., *Icones Florae Germanicae et Helveticae* 13–14:166 (1851)

*Cypripedium guttatum* var. *vulgare* Rchb. f., *Icones Florae Germanicae et Helveticae* 13–14:166. (1851)

*Cypripedium guttatum* var. *tongolensis* Franchet ex U.C.Pradhan, *Orchid Digest*



50(3):85 (1986)

*Cypripedium orientale* Sprengel, *Systema Vegetabilium* ed.16,3:746 (1826)

*Cypripedium variegatum* Georgi, *Bemerkungen einer Reise im Russischen Reich im Jahre 1772* 1:232 (1775)

JOHANN AMMAN WAS born on December 22, 1707 in Schaffhausen, Switzerland, the son of a professor of physics, Johann Jacob Amman. From 1727 until 1729 Johann (Jr.) studied medicine and botany at the University of Leiden, Netherlands under Boerhaave. In 1730 he was employed at the recommendation of William Houstoun (1695–1733) as the supervisor of the museum of Hans Sloane in London. In December 1730 Houstoun wrote to Sloane:

“I hear you have employed my good friend Mr. Amman, which I am heartily glad of, and I hope he shall answer your expectations, and the character I gave of

[1] *Cypripedium guttatum* in its habitat in Yunnan, China Photograph courtesy of W. Eccarius. The inset close-up photograph clearly shows the species characteristically hooded dorsal sepal.

[2] First illustration of the later *Cypripedium guttatum* as *Calceolus minor flore vario* from *Stirpium Rariorum in Imperio Rutheno* (Amman, 1739).

[3] *Cypripedium guttatum* as *Cypripedium calceolus variegata* L. from Falk, *Beyträge zur Topographischen Kenntniss des Russischen Reiches*, 1786.

[4] *Cypripedium guttatum* drawing (Reichenbach, 1825).



him.”

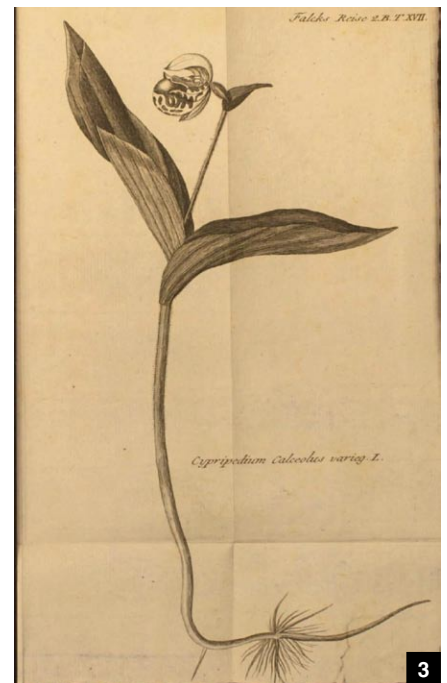
In 1731 Johann Amman became a Fellow of the Royal Society.

Peter the Great founded the University of St. Petersburg and the Russian Academy of Sciences; the Academy was divided into three disciplines: mathematics, natural sciences (including physics, chemistry, botany and later zoology) and arts. More than half of the scientists working at that time at the Academy originated from German-speaking Europe; the botanists were Johann Georg Gmelin, Johann Christian Buxbaum and later from Switzerland Johann Amman. In 1733 Amman, following the invitation of the Academy in St. Petersburg and proposed by Johann Georg Gmelin, replaced Johann Christian Buxbaum (1693–1730) as botanist. After Amman became professor of natural history, one of his lasting achievements was the establishment of the botanical garden on Vasilevsky Island in 1735 and the publication of the two last volumes of Buxbaum’s *Plantarum Minus Cognitarum, complectens plantas circa Byzantium & in Oriente observatas* in 1733 and 1740. Between 1736 and 1740 Amman corresponded regularly with Linnaeus and he obtained Linnaeus’s *Flora Lapponica* in 1737, the year of its publication. Johann Amman died on December 14, 1741 in St. Petersburg, only 33 years old. In his last letter to Sloane he wrote:

“Concerning my health, of which you desire to be acquainted, I find it from day to day to decay. I cannot bear this extremely rough and inconstant climate. The misfortunes, I suffered last year, the hardships and losses, the unsettled state of the Academy make me desirous to leave this country. I omit the irregular and mournful sort of live, we are obliged to lead here. A magnificent poverty is not what I aim at.”

The year of his death is variously given as 1740, 1741, and 1742. It would appear that 1741 is most probably correct as the last letter he wrote to Hans Sloane in England is dated January 24, 1741. Amman’s herbarium and his library were purchased by the Russian Academy of Sciences. Beside Buxbaum’s work, Amman published only a few smaller articles, the first part of his main work *Stirpium rariorum in imperio Rutheno sponte provenientium icones et descriptiones collectae an Ioanno Ammano M.D.* with 34 plates was published in 1739. Because of the unexpected early death of Amman, it remained unfinished.

In a letter dated September 6, 1736



Amman stated his opinion about the new system of classification proposed by Carl Linne:

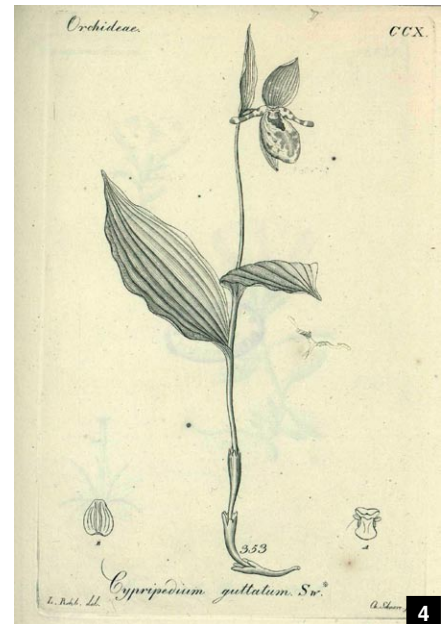
“I have received lately from Dr. Gronovius at Leyden some systematic tables concerning natural history, composed by Dr. Linnaeus. His botanical tables are in my opinion more curious than useful, and I doubt very much if any botanist will follow his method.”

To Linne himself Amman wrote in the same year:

“The tables evince great genius and knowledge in the study of nature. Your new method of arranging plants, by the number and situation of the stamens and anthers, appears to me very serviceable in defining the inferior genera.”

The first illustration of the plant known today as *Cypripedium guttatum* was published in 1739 as *Calceolus minor flore vario* (Amman, 1739); this drawing is today treated by Eccarius (2009) as holotype of the species. Several specimens collected by Johann Georg Gmelin in Siberia and distributed by Peter Simon Pallas are known (Berlin, Vienna, and British Museum); none of those was used by Olof Swartz as typus when he described *Cypripedium guttatum* (Swartz, 1800). Swartz referred to Gmelin’s *Flora Sibirica* where Gmelin referred to Amman’s plate from 1739. Swartz’s description was published in 1800 in *Kongl. Vetenskaps Academiens nya Handlingar*. Carl Linne mentioned the species in 1753 in his *Species Plantarum* as *Cypripedium calceolus* var.  $\delta$ .

Johann Gottlieb Georgi was born



on December 31, 1729 in Pomerania, Germany. He was a geographer, chemist and botanist. In 1769 he went to St. Petersburg and joined two expeditions to Siberia. The first one started in 1770 under the leadership of Johann Peter Falck, the second in 1772 under Peter Simon Pallas. Concerning the second expedition, Georgi published in 1775 *Bemerkungen einer Reise im Russischen Reich im Jahre 1772*, in its first part he mentioned the binomial *Cypripedium variegatum*. Georgi gave no further description, only adding a sentence about its habitat. *Cypripedium variegatum* is therefore treated as “nomen nudum.”

In 1775 Georgi was made a deputy



director of the Russian Academy of Sciences and in 1783 he became a member of the Academy and professor of chemistry in St. Petersburg. In 1778 Georgi was elected a member of the Prussian Academy of Sciences and one year later also a member of the Leopoldina. Johann Gottlieb Georgi died on October 27, 1802 in St. Petersburg.

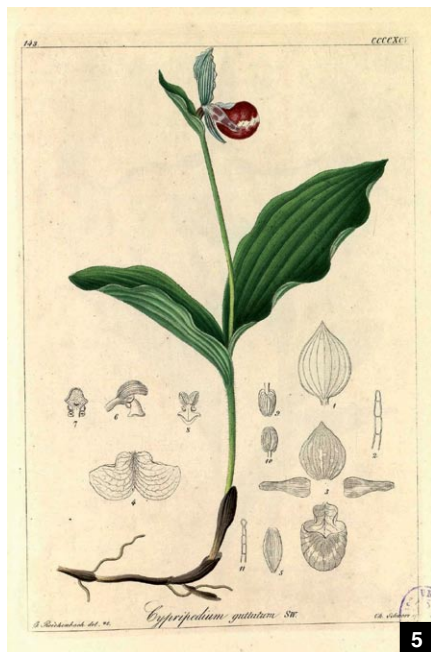
The naturalist Johan(n) Peter Falck (also spelled Falk) was born on January 20, 1732 in Kockstorp, Sweden. In 1751 he started his studies at Uppsala University under Carl Linne. He submitted his dissertation in June of 1762, and in 1765 he went to St. Petersburg and there became Professor of Medicine and Botany. Rowell (1980) wrote:

“Falck did not enjoy good health and was not well suited to his position in charge of the Apothecary Garden. He seems to have been a melancholy man obsessed with his health, but with a deep attachment for Linnaeus.”

In 1770 Falck led an expedition to Siberia and joined the Orenburgsche expedition in the Urals under the German geographer Peter Simon Pallas (who left St. Petersburg in June 1768). On November 1, 1774 on his way back to St. Petersburg, Falck fell into a depression and shot himself. Johann Gottlieb Georgi — also a member of the expedition team of Falck and Pallas — published in 1886 in the second volume of *Beyträge zur Topographischen Kenntniss des Russischen Reiches* a short note about *Cypripedium calceolus* and its varieties, referring to Gmelin’s *Flora Sibirica*. The three volumes of *Beyträge* were based on Falck’s notes from the expedition. Plate 17 in the second volume shows *Cypripedium guttatum* as *Cypripedium calceolus variegatum* L. (this combination is accepted today as *Cypripedium calceolus* var. *variegatum* Falck ex Georgi). The drawing used for the copper plate was done by Falck himself.

In chronological order, the next binomial for our species is *Cypripedium orientale*, used by Sprengel (1826); he lists *Cypripedium guttatum* Swartz (referred to as *Cypripedium calceolus* var.  $\delta$  Linne) and also lists *Cypripedium orientale* as its own new species with the remark *Sibir. orient. extrem.* *Cypripedium orientale* is today considered a synonym of *Cypripedium guttatum*.

*Cypripedium guttatum* var. *redowskii* and *Cypripedium guttatum* var. *vulgare* were both described by Reichenbach (1851). The term *vulgare* is used for the “normal variety” of *Cypripedium guttatum* (today this would be *Cyp. guttatum* var.



*guttatum*). Plate 395 shows the normal form of *Cypripedium guttatum*, based on a drawing by Reichenbach himself, and Plate 520 — also by Reichenbach — shows *Cypripedium guttatum* var. *redowskii*; the variety seems to be an albino form of *Cypripedium guttatum*. In Soo (1969) this variety was reduced to *Cypripedium guttatum* f. *redowskii*.

Another variety is *Cypripedium guttatum* var. *latifolium*, proposed by George Rouy and published in Camus (1908). According to that author, the plants of this variety are bigger and stronger.

Takenoshin Nakai published *Cypripedium guttatum* var. *koreanum*. The description was based on material collected in Korea (Nakai 1952).

The white-flowering form of *Cypripedium guttatum* was described twice as *Cypripedium guttatum* f. *albiflorum*, first by Averyanov (1999), and a second time by Lee (2002), together with *Cypripedium guttatum* f. *punicum*.

*Cypripedium bouffordianum* was first described and illustrated by Zhang and Sun (2006). The plant had been collected in western Sichuan, China; the drawing published together with the first description shows, in fact, a slightly aberrant form of *Cypripedium guttatum*. Consequently, Shaw (2012) reduced *Cypripedium bouffordianum* to *Cypripedium guttatum* f. *bouffordianum*. The material had been collected by David Boufford, assistant director of the herbaria of Harvard University.

*Cypripedium guttatum* var. *tongolensis* was described by Pradhan (1986); the



[5] *Cypripedium guttatum* drawing (Reichenbach, 1851).

[6] *Cypripedium guttatum* var. *redowskii* drawing (Reichenbach, 1851).

[7] Plate of *Cypripedium guttatum* (Planchon, 1850).

[8] Plate of *Cypripedium guttatum* (Hooker, 1900).





description was based on material collected by Adrian Rene Franchet. Following Cribb (1997), this variety represents an aberrant single plant of *Cypripedium guttatum*.

Because of the very large distribution of *Cypripedium guttatum* in North America, Eastern Europe, Russia (Sakhalin and Siberia), Korea, China, and Bhutan, a certain variability is to be expected; this is also reflected by the number of described varieties or forms. All of them belong to the concept of *Cypripedium guttatum*. The existence of an albino form was also to be expected — the correct name for the albinistic form of *Cypripedium guttatum* should be *Cypripedium guttatum* f. *redowskii* (Rchb.f.) Soó.

The closely related *Cypripedium yatabeanum* was described by Tomitaro Makino in 1899; the plant had been collected by Ryokichi Yatabe on Mount Togaksi in Sinano, Honshu. Most authors treated Makino's taxon as a variety of *Cypripedium guttatum*. Cribb kept it as its own species, mainly because of the distinct geographical distribution. The natural hybrid between *Cypripedium yatabeanum* and *Cypripedium guttatum* was described by Brown (1995) as

*Cypripedium* × *alaskanum*. The plant was collected near Anchorage, Alaska, and according to Brown, the hybrid had already been mentioned in 1968 by Eric Hulten in his *Flora of Alaska and Neighboring Territories*.

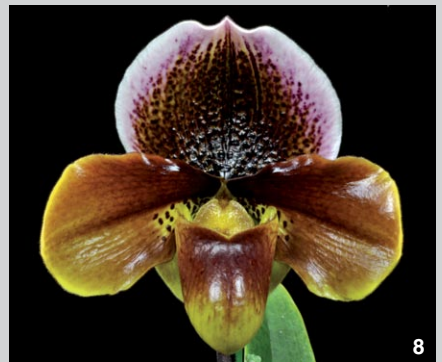
#### REFERENCES

- Amman, J. 1739. *Stirpium Rariorum in Imperio Rutheno sponte provenientium Icones et Descriptiones*. p. 132–134 and t.12.  
 Averyanov, L. 1999. *Turczaninowia* 2(2):5–40.  
 Brown, P.M. 1995. *North American Native Orchid Journal* 1(3):195–200.  
 Camus, E.G. 1908. In E.G. Camus (ed.), *Monographie des Orchidées de l'Europe, de l'Afrique septentrionale, de l'Asie mineure et des Provinces Russes transcaspiennes*. p. 450–451.  
 Chen, S.-C., Z. Liu, L. Chen, and L. Li. 2013. *The genus Cypripedium in China*. Science Press. p. 180–185.  
 Cribb, P.J. 1997. *The genus Cypripedium*. Royal Botanic Gardens, Kew, England. p. 236–240.  
 Dandy, J.E. 1958. *The Sloane Herbarium*. British Museum, London. p. 82–83.  
 Eccarius, W. 2009. *Die Orchideengattung Cypripedium*. Echinomedia, Buerger, Germany. p. 141–152.  
 Georgi, J.G. 1775. *Bemerkungen einer Reise im Russischen Reich im Jahre 1772* 1:232.  
 Georgi, J.G. 1786. *Beyträge zur Topographischen Kenntniss des Russischen Reiches* 2:249 and t.17.  
 Hooker, J.D. 1900. *Curtis's Botanical Magazine* 126: t.7746.  
 Hulten, E. 1967. *Arkiv för Botanik* 7(1):34.  
 Lee, Y.N. 2002. *Bulletin of Korean Plant Research* 2:29.  
 Linne (Linnaeus) C. 1753. *Species Plantarum* ed.1:2:951.  
 Matsumura, J. 1899. *Botanical Magazine (Tokyo)* 13:91–92.

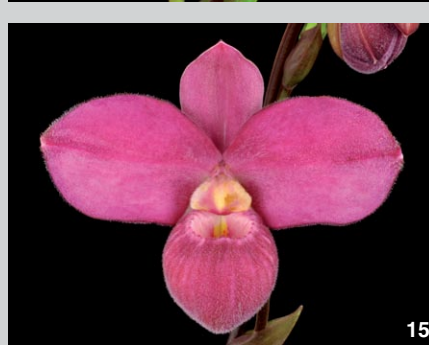
- Nakai, N.T. 1952. *Bulletin of the National Science Museum* 31:150.  
 Planchon, J.E. 1850. *Flore des Serres* 6:131–132 and t.573.  
 Pradhan, U.C. 1986. *Orchid Digest* 50(3):84–91.  
 Reichenbach, H.G. fil. 1851. *Icones Florae Germanicae et Helveticae* 13–14:166–169 and 186, t.495 and 520.  
 Reichenbach, H.G.L. 1825. *Iconographia Botanica seu Plantae Criticae* 3(1):8 and t.210.  
 Rowell, M. 1980. *Taxon* 29(1):15–26.  
 Schaible, K.H. 2013. *Geschichte der Deutschen in England*. Kessinger, Whitefish, MT. p. 386.  
 Shaw, J.M.H. 2012. *Orchid Review Supplement* 120(1298):33.  
 Soo, R. 1969. *Annales Universitatis Scientiarum Budapestensis de Rolando Eötvös Nominatae, Sect. Biologica* 2:63–74.  
 Sprengel, C. 1826. *Systema Vegetabilium* ed.16,3:745–746.  
 Swartz, O. 1800. *Kongl. Vetenskaps Academiens nya Handlingar* 21:250–252.  
 Trautvetter, E.R. 1837. *Grundriss einer Geschichte der Botanik in Bezug auf Russland*. p. 55.  
 Ying, S.-S. 1977. *Coloured Illustrations of Indigenous Orchids of Taiwan, Volume 1*. National Taiwan University, Taipei. p. 357–358.  
 Zhang, Y.H. and H. Sun. 2006. *Annales Botanici Fennici* 43:481–483.

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- [1] *Paphiopedilum* Jewel Memories 'Slipper Zone Pink Gracefully' HCC/AOS (Jewel Green x Memoria Jeffrey Ma) 75 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [2] *Paphiopedilum* Oriental Green 'Slipper Zone Gracefully' AM/AOS (Oriental Jewel x *sukhakulii*) 80 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [3] *Paphiopedilum* Oriental Green 'Slipper Zone B Freshly' AM/AOS (Oriental Jewel x *sukhakulii*) 80 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [4] *Fredclarkeara* After Dark 'Elaine' AM/AOS (*Mormodia* Painted Desert x *Catasetum* Donna Wise) 80 pts. Exhibitor: Derek Lowenstein; photographer: Malcolm McCorquodale. Houston Judging Center
- [5] *Paphiopedilum* Macabre Illusion 'Slipper Zone T'other' HCC/AOS (Hawaiian Illusion x Macabre Contrasts) 78 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [6] *Paphiopedilum* Millennium Falcon 'Rheda Superstar' AM/AOS (Millennium Dream x Eyecatcher (2011)) 82 pts. Exhibitor: Popow Orchids - Alexej Popow; photographer: Glen Barfield. Hawaii Judging Center
- [7] *Paphiopedilum* Memoria Kevin Hipkins 'Newman's Nursery' AM/AOS (Marlborough x Novenka) 80 pts. Exhibitor: Newman's Nursery Jeffrey Newman; photographer: Glen Barfield. Hawaii Judging Center
- [8] *Paphiopedilum* Brain Buster 'Slipper Zone Spots in Hiding' AM/AOS (Wood Wonder x Memoria Sabrina Mark) 80 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [9] *Paphiopedilum* Mooning Fred 'Slipper Zone Thankfully' HCC/AOS (Luna Magic x Fred's Moon) 77 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [10] *Paphiopedilum* Hsinying Alien 'M&M Orchids' HCC/AOS (Raisin Pie x Super-suk) 75 pts. Exhibitor: Matt and Michelle Jaenke; photographer: David Taylor. Mid-America Judging Center
- [11] *Paphiopedilum* Toni Semple 'Quintal's Elegance' AM/AOS (*haynaldianum* x *lowii*) 81 pts. Exhibitor: Quintal Farms; photographer: Glen Barfield. Hawaii Judging Center
- [12] *Phragmipedium* Fritz Schomburg 'Hawaiian Punch' AM/AOS (*kovachii* x *besseae*) 80 pts. Exhibitor: Orchids Ltd. Jerry Fischer; photographer: Glen Barfield. Hawaii Judging Center
- [13] *Phragmipedium* Ekolu 'QF Hawaiian Spectacular' AM/AOS (Perufloora's Cirila Alca x *dalessandroi*) 86 pts. Exhibitor: Quintal Farms; photographer: Glen Barfield. Hawaii Judging Center
- [14] *Phragmipedium* QF Agnes Atkinson 'QF Sunday Best' HCC/AOS (*fischeri* x Haley Decker) 76 pts. Exhibitor: Quintal Farms; photographer: Glen Barfield. Hawaii Judging Center
- [15] *Phragmipedium* QF Agnes Atkinson 'QF Da Best' AM/AOS (*fischeri* x Haley Decker) 85 pts. Exhibitor: Quintal Farms; photographer: Glen Barfield. Hawaii Judging Center
- [16] *Phragmipedium* Perufloora's Cirila Alca 'QF Ekolu' HCC/AOS (*kovachii* x *dalessandroi*) 75 pts. Exhibitor: Quintal Farms; photographer: Glen Barfield. Hawaii Judging Center









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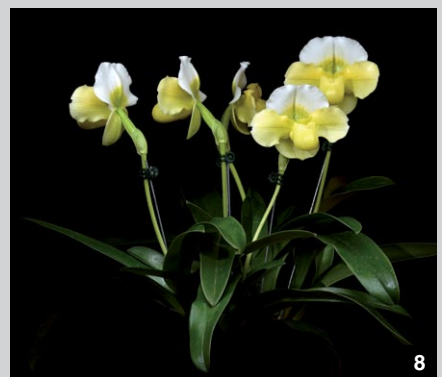
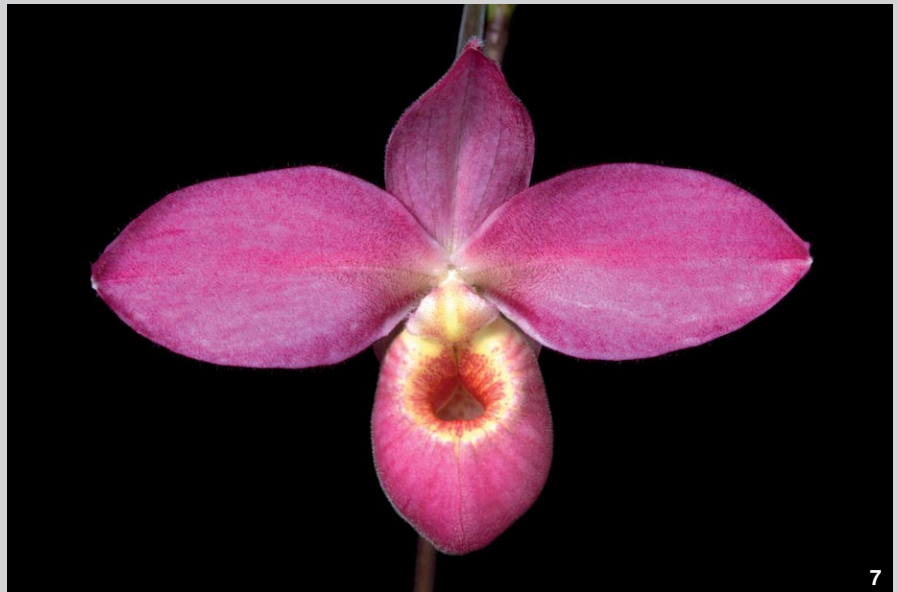
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- [1] *Paphiopedilum* Yellow Leopard 'Intense' HCC/AOS (Crown Jewel x Thunder Eagle) 76 pts. Exhibitor: Hilo Orchid Farm; photographer: Glen Barfield. Hawaii Judging Center
- [2] *Paphiopedilum* Delightfully Macabre 'Slipper Zone's Sepal Galore' AM/AOS (Luna Magic x Macabre Delight) 84 pts. Exhibitor: Lehua Orchids; photographer: Glen Barfield. Hawaii Judging Center
- [3] *Paphiopedilum* Petula's Sensation 'Slipper Zone Black Contrastingly' AM/AOS (Macabre Contrasts x Petula's Flame) 81 pts. Exhibitor: Lehua Orchids; photographer: Ben Oliveros. Hawaii Judging Center
- [4] *Lycaste* Phoebe 'Loretta' CCM/AOS (*brevispatha* x *macrobulbon*) 87 pts. Exhibitor: Chris Rehmann; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [5] *Paphiopedilum* Memoria Sophia Rosalik 'Newman's Nursery' HCC/AOS (Emerald Sea x White Knight) 76 pts. Exhibitor: Newman's Nursery Jeffrey Newman; photographer: Glen Barfield. Hawaii Judging Center
- [6] *Paphiopedilum* Pacific Wunder 'White Summit' HCC/AOS (Pacific Fire x Lip-pewunder) 78 pts. Exhibitor: Hilo Orchid Farm; photographer: Glen Barfield. Hawaii Judging Center
- [7] *Paphiopedilum* Memoria Kevin Hipkins 'Jack' HCC/AOS (Marlborough x Novenka) 75 pts. Exhibitor: Chris Rehmann; photographer: Maurice Marietti. Mid-Atlantic Judging Center
- [8] *Dendrochilum glumaceum* 'Jardin botanique de Montréal' CCM/AOS 80 pts. Exhibitor: Jardin botanique de Montréal; photographer: Thang Dam. Toronto Judging Center
- [9] *Cattleya* Irene's Circle 'Westway Farms' HCC/AOS (Irene Finney (1964) x Circle of Life) 78 pts. Exhibitor: Don Ghiz; photographer: Malcolm McCorquodale. Houston Judging Center
- [10] *Dendrochilum wenzelii* 'Makawao Red' CCE/AOS 95 pts. Exhibitor: Andrew Okada; photographer: Michael Blietz. Hawaii Judging Center
- [11] *Paphiopedilum* Ella Dancing 'Slipper Zone Sky High' HCC/AOS (Cruella x Luther Pass) 79 pts. Exhibitor: Lehua Orchids; photographer: Ben Oliveros. Hawaii Judging Center
- [12] *Pholidota cantonensis* 'Jardin botanique de Montréal' CCM/AOS 85 pts. Exhibitor: Jardin botanique de Montréal; photographer: Thang Dam. Toronto Judging Center
- [13] *Mediocalcar decoratum* 'Mie' CCE/AOS 93 pts. Exhibitor: Andrew Okada; photographer: Michael Blietz. Hawaii Judging Center
- [14] *Mediocalcar decoratum* 'Mieko' CCM/AOS 83 pts. Exhibitor: Andrew Okada; photographer: Michael Blietz. Hawaii Judging Center
- [15] *Mediocalcar decoratum* 'Laha' CCM/AOS 85 pts. Exhibitor: Jeff Bagshaw; photographer: Michael Blietz. Hawaii Judging Center









- [1] *Maxillaria neglecta* 'Jardin botanique de Montréal' CCM/AOS 81 pts. Exhibitor: Jardin botanique de Montréal; photographer: Thang Dam. Toronto Judging Center
- [2] *Cyrtochilum macranthum* 'Jardin botanique de Montréal' CCM/AOS 84 pts. Exhibitor: Jardin botanique de Montréal; photographer: Thang Dam. Toronto Judging Center
- [3] *Brassia* Steve Male 'Orange Glow' AM/AOS (*keiliana* x *Memoria Bert Field*) 84 pts. Exhibitor: Jeanne Kaeding; photographer: Bryan Ramsay. National Capital Judging Center
- [4] *Paphiopedilum* Snow Dancer 'Dust Storm' AM/AOS (*Memoria Jack Tonkin* x *Skip Bartlett*) 81 pts. Exhibitor: Marriott Orchids; photographer: Bryan Ramsay. National Capital Judging Center
- [5] *Phragmipedium besseae* var. *flavum* 'Broadwaters' AM/AOS 84 pts. Exhibitor: William Goldner; photographer: Bryan Ramsay. National Capital Judging Center
- [6] *Cymbidium* Sultry Seven 'Morright' CCE/AOS (*Rincon* x *Kalimpong*) 90 pts. Exhibitor: Jeff Morris; photographer: Bryan Ramsay. National Capital Judging Center
- [7] *Phragmipedium* Elizabeth Castle 'Penns Creek' AM/AOS (*Memoria Dick Clements* x *Hanne Popow*) 82 pts. Exhibitor: Woodstream Orchids; photographer: Julie Rotramel. National Capital Judging Center
- [8] *Paphiopedilum* In-Charm Mystique 'Hsiao' CCM/AOS (*Stone Lovely* x *Saint Ouens Bay*) 83 pts. Exhibitor: Marriott Orchids; photographer: Bryan Ramsay. National Capital Judging Center
- [9] *Paphiopedilum* Kayday 'Golden Sun' HCC/AOS (*Kay Rinaman* x *Golden Days*) 76 pts. Exhibitor: Marriott Orchids; photographer: Bryan Ramsay. National Capital Judging Center
- [10] *Paphiopedilum* Mystic Knight 'Powerhouse' AM/AOS (*Elfstone* x *White Knight*) 87 pts. Exhibitor: Marriott Orchids; photographer: Bryan Ramsay. National Capital Judging Center
- [11] *Cymbidium* Icy Green 'Purity' HCC/AOS (*Olymilum* x *mastersii*) 79 pts. Exhibitor: John & Shirley Dunkelberger; photographer: Bryan Ramsay. National Capital Judging Center
- [12] *Calanthe rubens* (Alba) 'Irene' CHM/AOS 81 pts. Exhibitor: Al & Irene Messina; photographer: Charles Marden Fitch. Northeast Judging Center
- [13] *Rossioglossum* Rawdon Jester 'Carlisle' FCC/AOS (*grande* x *Williamsianum*) 95 pts. Exhibitor: Floradise Orchids Stephen Shifflett; photographer: Bryan Ramsay. National Capital Judging Center
- [14] *Oncidium* Twinkle 'Lauren' CCE/AOS (*cheirophorum* x *sotoanum*) 95 pts. Exhibitor: Bill Keating; photographer: Maurice Garvey. Northeast Judging Ctr.
- [15] *Paphiopedilum* Firecatcher 'Screamer' FCC/AOS (*Orchilla* x *Hsinying Charles*) 90 pts. Exhibitor: Marriott Orchids; photographer: Bryan Ramsay. National Capital Judging Center
- [16] *Dendrobium* Graham Spearman 'Ermela Kaferi' HCC/AOS (*Gillieston Jazz* x *Brimbank You Beauty*) 79 pts. Exhibitor: Graham Spearman; photographer: Maurice Garvey. Northeast Judging Ctr.









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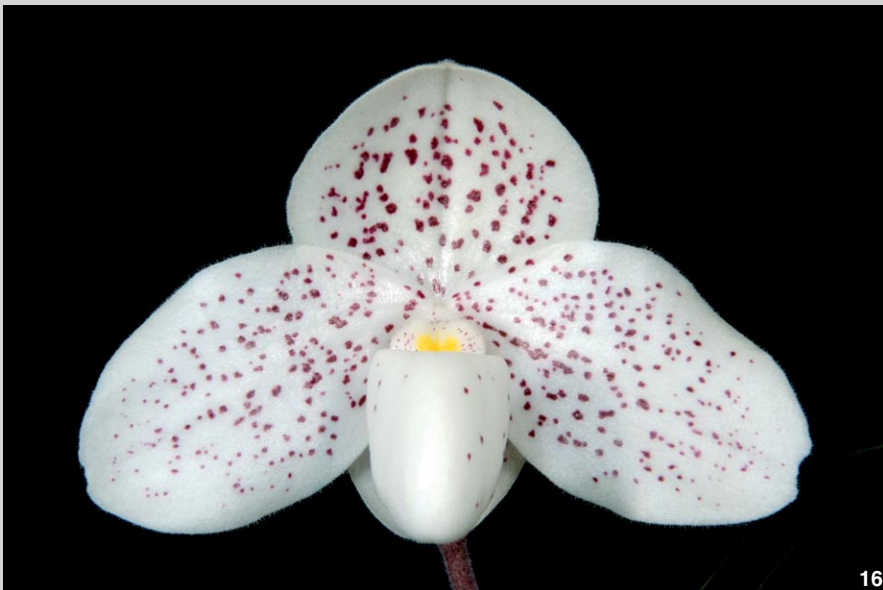
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- [1] *Paphiopedilum* Berenice 'Ophelia's Grace' HCC/AOS (*lowii* x *philippinense*) 79 pts. Exhibitor: Mary Ann Denver; photographer: Charles Marden Fitch. Northeast Judging Center
- [2] *Dendrobium* Australian Robbie McInnes 'Timothy Henry' HCC/AOS (Aussie Parade x *speciosum*) 79 pts. Exhibitor: Carrie Buchman; photographer: Charles Marden Fitch. Northeast Judging Center
- [3] *Masdevallia tatianae* 'Susan' CHM/AOS 83 pts. Exhibitor: Chuck & Sue Andersen; photographer: Robert Hesse. Northeast Judging Center
- [4] *Cymbidium sinense* 'Black Diamond' HCC/AOS 79 pts. Exhibitor: Amy & Ken Jacobsen; photographer: Japheth Ko. Pacific Central Judging Center
- [5] *Vandoglossum* Carolyn Hakim 'Aryeh' CCM-AM/AOS (*Holcoglossum amesianum* x *Vanda nana*) 84-80 pts. Exhibitor: Marlow Orchids; photographer: Maurice Garvey. Northeast Judging Center
- [6] *Lycaste* Chita Impulse 'Cotton Tail' AM/AOS (Chita Melody x Alan Salzman) 82 pts. Exhibitor: Cal-Orchid; photographer: Chaunie Langland. Pacific Central Judging Center
- [7] *Cymbidium* Joseph Schmidt 'Cassandra' CCM/AOS (Canal Parish x *sinense*) 83 pts. Exhibitor: Robert Burkey; photographer: Tim Morton. Pacific Northwest Judging Center
- [8] *Pleurothallis truncata* 'Boo-Boo' CCM/AOS 83 pts. Exhibitor: Masaki Asuka; photographer: Chaunie Langland. Pacific Central Judging Center
- [9] *Paphiopedilum* Chiu Hua Dancer 'Sunset Valley Orchids I' HCC/AOS (*gigantifolium* x *sanderianum*) 78 pts. Exhibitor: Fred Clarke; photographer: Arnold Gum. Pacific South Judging Center
- [10] *Paphiopedilum* Nori's Song 'MikeAl' AM/AOS (Norito Hasegawa x *mali-poense*) 80 pts. Exhibitor: Michael Curtin; photographer: Tim Morton. Pacific Northwest Judging Center
- [11] *Sudamerlycaste peruviana* 'Katie Marie' CBR/AOS. Exhibitor: Thomas Walker; photographer: Tim Morton. Pacific Northwest Judging Center
- [12] *Cymbidium goeringii* 'Green Giant' AM-CCM/AOS 80-89 pts. Exhibitor: Amy and Ken Jacobsen; photographer: Japheth Ko. Pacific Central Judging Center
- [13] *Paphiopedilum* Chiu Hua Dancer 'Sunset Valley Orchids II' HCC/AOS (*gigantifolium* x *sanderianum*) 78 pts. Exhibitor: Fred Clarke; photographer: Arnold Gum. Pacific South Judging Center
- [14] *Cattlianthe* Kool Treat 'Sunset Valley Orchids' AM/AOS (*Cattleya* Koolau Seagulls x Golden Treat) 81 pts. Exhibitor: Fred Clarke; photographer: Arnold Gum. Pacific South Judging Center
- [15] *Cycnoches warszewiczii* 'SVO Green Goddess' AM/AOS 81 pts. Exhibitor: Fred Clarke; photographer: Arnold Gum. Pacific South Judging Center
- [16] *Paphiopedilum* Phyllis Prestia 'Sunset Valley Orchids' AM/AOS (Conco-bellatulum x *thaianum*) 81 pts. Exhibitor: Fred Clarke; photographer: Arnold Gum. Pacific South Judging Center



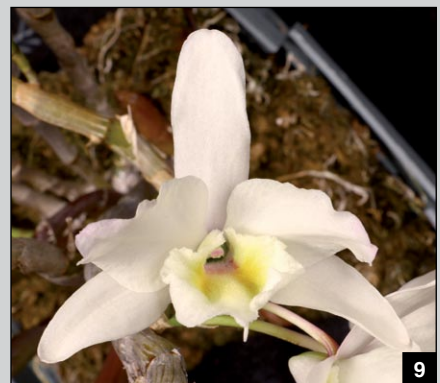




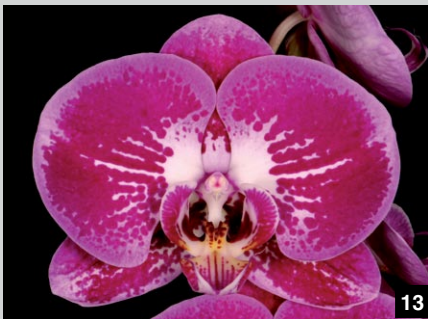
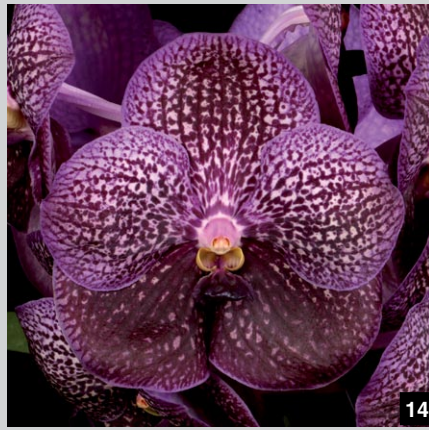


- [1] *Cattleya wittigiana* 'Windflower' AM/AOS 84 pts. Exhibitor: Betty Kelepecz; photographer: Arnold Gum. Pacific South Judging Center
- [2] *Restrepia mendozae* 'Windflower' AM/AOS 81 pts. Exhibitor: Betty Kelepecz; photographer: Arnold Gum. Pacific South Judging Center
- [3] *Paphiopedilum* Cascade Creek 'Julio David' AM/AOS (*adductum* x Prince Edward of York) 84 pts. Exhibitor: Dr. Julio D. Rios; photographer: Irma Saldaña. Puerto Rico Judging Center
- [4] *Fredclarkeara* Turning Point 'B-C' AM/AOS (*Mormodia* Lime Tiger x *Catasetum expansum*) 81 pts. Exhibitor: B. Butts - C. Lefaive; photographer: Robin McLaughlin. Toronto Judging Center
- [5] *Clowesetum* Donna Ballard 'Green Dragon' AM/AOS (*Clowesia* Rebecca Northen x *Catasetum kleberianum*) 80 pts. Exhibitor: Donna Ballard; photographer: Arthur Pinkers. Pacific South Judging Center
- [6] *Catasetum* Irma Scott 'B-C' AM/AOS (Louise Clarke x *denticulatum*) 81 pts. Exhibitor: B. Butts - C. Lefaive; photographer: Robin McLaughlin. Toronto Judging Center
- [7] *Paphiopedilum* Hsinying Fairtron 'Tyrone' AM/AOS (Hsinying Citron x *fairrieatum*) 82 pts. Exhibitor: Charles R. Fouquette; photographer: Arnold Gum. Pacific South Judging Center
- [8] *Paphiopedilum* Doctor Brian Edwards Incharm 'Alyssa Fernández' HCC/AOS (In-Charm White x Pinocchio) 76 pts. Exhibitor: José Fernández; photographer: Irma Saldaña. Puerto Rico Judging Center
- [9] *Dendrobium sanderae* (Luzonicum) 'Maria's Kaos' AM/AOS 83 pts. Exhibitor: Jesús A. Mercado; photographer: Irma Saldaña. Puerto Rico Judging Center
- [10] *Dendrobium* Miva Abracadabra 'Carmen Fernandez' CCM/AOS (*atroviolaceum* x *polysema*) 81 pts. Exhibitor: Carmen Fernández; photographer: Irma Saldaña. Puerto Rico Judging Center
- [11] *Cattlianthe* Red Viking 'Tania's Own' CCM/AOS (*Cattleya* Bonanza (Bracey) x Chocolate Drop) 81 pts. Exhibitor: Svend Munkholm; photographer: Judith Higham. Western Canada Judging Center
- [12] *Ceratostylis retisquama* 'Bibiana' AM/AOS 82 pts. Exhibitor: Jesús A. Mercado; photographer: Irma Saldaña. Puerto Rico Judging Center
- [13] *Clowesetum* Jumbo Eden 'B-C' AM/AOS (*Clowesia* Rebecca Northen x *Catasetum barbatum*) 85 pts. Exhibitor: B. Butts - C. Lefaive; photographer: Robin McLaughlin. Toronto Judging Center
- [14] *Clowesetum* Donna Ballard 'B-C' AM/AOS (*Clowesia* Rebecca Northen x *Catasetum kleberianum*) 81 pts. Exhibitor: B. Butts - C. Lefaive; photographer: Robin McLaughlin. Toronto Judging Center
- [15] *Georgecarrara* Memoria George Carr 'B-C' AD/AOS (*Fredclarkeara* After Dark x *Cynoches warszewiczii*). Exhibitor: B. Butts - C. Lefaive; photographer: Ed Cott. Toronto Judging Center
- [16] *Paphiopedilum haynaldianum* 'Charlie' HCC/AOS 76 pts. Exhibitor: John Marcotte; photographer: Ed Cott. Toronto Judging Center



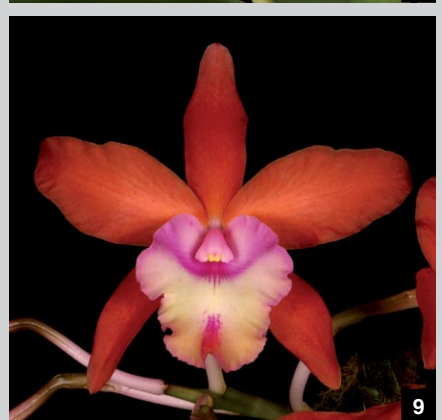






- [1] *Guarianthe* Herbert Oesterreich 'Crownfox' AM/AOS (Guatemalensis x *aurantiaca*) 81 pts. Exhibitor: R.F. Orchids; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [2] *Vanda* Carla Wood 'Crownfox Marmalade' AM/AOS (Kultana Gold Spot x Nina Patterson) 83 pts. Exhibitor: R.F. Orchids; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [3] *Vanda* Carla Wood 'Crownfox Butter-scotch' AM/AOS (Kultana Gold Spot x Nina Patterson) 83 pts. Exhibitor: R.F. Orchids; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [4] *Aeridovanda* Peach Delight 'Crownfox Gold' AM/AOS (*Vanda* Pralor x *Aerides lawrenceae*) 83 pts. Exhibitor: R.F. Orchids; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [5] *Cattlianthe* Gold Digger 'Fuchs Mandarin' CCE-AM/AOS (Red Gold x Warpaint) 95-85 pts. Exhibitor: R.F. Orchids; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [6] *Vanda* Will Riley 'Crownfox Big Boy' FCC/AOS (Crownfox Gold x Crownfox Goliath) 90 pts. Exhibitor: R.F. Orchids; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [7] *Dendrobium* Spring Dream 'Apollon' CCM-AM/AOS (Constance Wrigley x Thwaitesiae) 83-81 pts. Exhibitor: Christine Morales and Alex Rodriguez; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [8] *Lycaste* Dainty 'Perseverance' AM/AOS (*brevispatha* x *campbellii*) 84 pts. Exhibitor: Judy Bailey; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [9] *Dendrobium amoenum* 'Other Worlds' CBR/AOS. Exhibitor: John Romano; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [10] *Dendrobium goldschmidtianum* 'Other Worlds' CCE/AOS 93 pts. Exhibitor: John Romano; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [11] *Papilionanda* Motes Toledo Blue 'Yen HKN Nguyen' HCC/AOS (*Vanda tricolor* x Mimi Palmer) 78 pts. Exhibitor: Ho-kin Ng; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [12] *Cattleya lueddemanniana* 'Encendida' AM/AOS 80 pts. Exhibitor: Luiz Hamilton Lima; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [13] *Phalaenopsis* Fuller's Black Mask 'Lauren Schwartz' AM/AOS (Fuller's Mask x Fuller's Black Stripe) 86 pts. Exhibitor: Judy Mezey; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [14] *Vanda* Melida Demorizi 'Teresa Helena' AM/AOS (Tony Viggiani x Ray Rodriguez) 80 pts. Exhibitor: Luiz Hamilton Lima; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [15] 'Garden's Mini Jewels' AC/AOS. Exhibitor Elaine Gates; photographer: Brian Monk. West Palm Beach Judging Center
- [16] *Vanda coeruleascens* 'Crownfox Sky' AM/AOS 81 pts. Exhibitor: R.F. Orchids; photographer: Tom Kuligowski. West Palm Beach Judging Center









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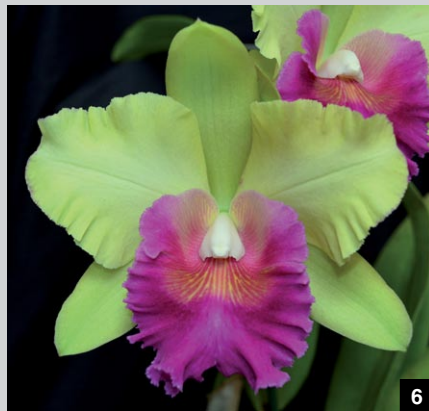
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- [1] *Paphiopedilum* Batik 'Crystelle' AM-CCM/AOS (Michael Koopowitz x *glanduliferum*) 83-85 pts. Exhibitor: Krull-Smith; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [2] *Cattleya* Quest Picante 'Quest' AM/AOS (Pradit Spot x Nestor (1914)) 81 pts. Exhibitor: Quest Orchids; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [3] *Cattleya lueddemanniana* (Coerulea) 'Jean Gilliland' FCC/AOS 92 pts. Exhibitor: Krull-Smith; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [4] *Paphiopedilum* Micran Magic 'Adkins Bodacious' HCC/AOS (Shun-Fa Golden x *micranthum*) 75 pts. Exhibitor: Adkins Orchids, Inc.; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [5] *Clowesetum* Alexandra Savva 'Red Hawk' AM/AOS (*Clowesia* Rebecca Northen x *Catasetum denticulatum*) 84 pts. Exhibitor: Sheri Liggett-Macchia and Red Hawk Nursery; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [6] *Rhyncattleanthe* Love Triangle 'Doris' HCC/AOS (*Rhyncholaeliocattleya* San Damiano (1) x *Cattlianthe* Chocolate Drop) 76 pts. Exhibitor: Krull-Smith; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [7] *Paphiopedilum* Lunatic Left 'Krull Smith' CCM/AOS (F. C. Puddle x Lunacy) 83 pts. Exhibitor: Krull-Smith; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [8] *Rhyncholaeliocattleya* Suzanne's Hal-lelujah 'Florida SunCoast' AM/AOS (Doctor Joe Walker x Mahina Yahiro) 82 pts. Exhibitor: Jim Roberts Florida SunCoast Orchids; photographer: Brian Monk. West Palm Beach Judging Center
- [9] *Rechingerara* Graf's Fantasia 'Crownfox' AM/AOS (*Laelia undulata* x *Rhyncattleanthe* Twentyfour Carat) 82 pts. Exhibitor: R.F. Orchids; photographer: Tom Kuligowski. West Palm Beach Judging Ctr.
- [10] 'Serenity Garden' AC/AOS. Exhibitor Elaine Gates; photographer: Brian Monk. West Palm Beach Judging Center
- [11] *Brassocattleya* Clear Stars 'Marty Martin' AM/AOS (*Brassavola nodosa* x *Cattleya* Hsinying Pub) 80 pts. Exhibitor: Ronnie Meeks; photographer: Marc Bein. West Palm Beach Judging Center
- [12] *Vanda* Ben's Delight 'Coffee' AM/AOS (Duang Porn x Soontharee Red) 85 pts. Exhibitor: Jim Longwell; photographer: Brian Monk. West Palm Beach Judging Center
- [13] *Cattleya* Brabantiae 'Krull's Leopard' AM/AOS (*aclandiae* x *loddigesii*) 82 pts. Exhibitor: Krull-Smith; photographer: Brian Monk. West Palm Beach Judging Center
- [14] *Oncidium* Tiger Night 'North Carolina' AM/AOS (Tiger Butter x *tigrinum*) 84 pts. Exhibitor: Krull-Smith; photographer: Brian Monk. West Palm Beach Judging Center
- [15] *Lycaste* Florida Gold 'Jim Krull' AM/AOS (*macrobulbon* x Golden Emperor) 85 pts. Exhibitor: Krull-Smith; photographer: Brian Monk. West Palm Beach Judging Center
- [16] *Rhyncattleanthe* Mildred Hollingsworth 'Sunbulb' CCM/AOS (Yellow Imp x *Rhyncholaeliocattleya* Delta King) 84 pts. Exhibitor: Eunice Walker; photographer: Brian Monk. West Palm Beach Judging Center









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- [1] *Paphiopedilum* Saint Swithin 'Krull's Prince' CCE-AM/AOS (*philippinense* x *rothschildianum*) 90-89 pts. Exhibitor: Krull-Smith; photographer: Brian Monk. West Palm Beach Judging Center
- [2] *Phalaenopsis* I-Hsin Sesame 'MoGlo' HCC/AOS (Ching Her Buddha x Leopard Prince) 79 pts. Exhibitor: Carolyn Fuentes; photographer: Robert Bermea. Alamo Judging Center
- [3] *Dendrobium* *aphyllum* 'Aunt Alma' CCM/AOS 84 pts. Exhibitor: John Bridges; photographer: Joseph Paine. Atlanta Judging Center
- [4] *Paphiopedilum* Saint Swithin 'Carolyn' AM/AOS (*philippinense* x *rothschildianum*) 87 pts. Exhibitor: Carolyn Fuentes; photographer: Robert Bermea. Alamo Judging Center
- [5] *Rhyncholaeliocattleya* Muscadine Wine 'Beautiful Sophie' AM/AOS (Lake Murray x Eagle Island) 83 pts. Exhibitor: Ann Truesdale; photographer: James Curtis. Carolinas Judging Center
- [6] *Rhyncholaeliocattleya* Young Kong 'Jodie' AM/AOS (Green Fantasy x Tassie Barbero) 82 pts. Exhibitor: Jodie L. Shumaker; photographer: Joseph Paine. Atlanta Judging Center
- [7] *Cattleya* Orglade's Grand 'Tian Mu' AM/AOS (Mildred Rives x Persepolis) 85 pts. Exhibitor: Carson Barnes; photographer: Jason R. Mills. Atlanta Judging Center
- [8] *Rhyncattleanthe* California Love 'Ella' AM/AOS (*Cattleya* California Apricot x Love Sound) 81 pts. Exhibitor: Joseph Paine; photographer: Jason R. Mills. Atlanta Judging Center
- [9] *Cymbidium* Mad Irishman 'New Horizon' HCC/AOS (Mary Pinchess x *madidum*) 79 pts. Exhibitor: Ed Dumaguin; photographer: Ramon de los Santos. California Sierra Nevada Judging Center
- [10] *Cattleya trianae* 'Memoria Lauren Trefny' AM/AOS 82 pts. Exhibitor: Fred Missbach; photographer: Jason R. Mills. Atlanta Judging Center
- [11] *Dendrochilum* *wenzelii* 'Mello Spirit' CCM/AOS 82 pts. Exhibitor: David Mellard; photographer: Jason R. Mills. Atlanta Judging Center
- [12] *Phalaenopsis* Pylo's Mustard 'Freckles' HCC/AOS (Sogo Ponsai x Pylo's Dixie Gelb) 76 pts. Exhibitor: Robert Hydzik; photographer: James Curtis. Carolinas Judging Center
- [13] *Paphiopedilum* Columbia Bulldog 'Mendenhall' AM/AOS (Via Rio Vista x Louis V. Dorp) 80 pts. Exhibitor: Carter and Holmes; photographer: James Curtis. Carolinas Judging Center
- [14] *Laelia anceps* 'Megan Kiyome' HCC/AOS 77 pts. Exhibitor: Doug Kubo; photographer: Ramon de los Santos. California Sierra Nevada Judging Center
- [15] *Cattleya* Royal Life 'Haley' AM/AOS (Royal Emperor x Circle of Life) 83 pts. Exhibitor: Joseph Paine; photographer: Jason R. Mills. Atlanta Judging Center
- [16] *Dendrochilum* *arachnites* 'Shan' CCM/AOS 88 pts. Exhibitor: Carolina Orchids; photographer: James Curtis. Carolinas Judging Center



LINDLEYANA

# *Rodriguezia dodsoniana*

A New Species of *Rodriguezia* (Orchidaceae: Oncidiinae)

From Ecuador

by Hugo Medina, José Portilla and  
Iván Portilla





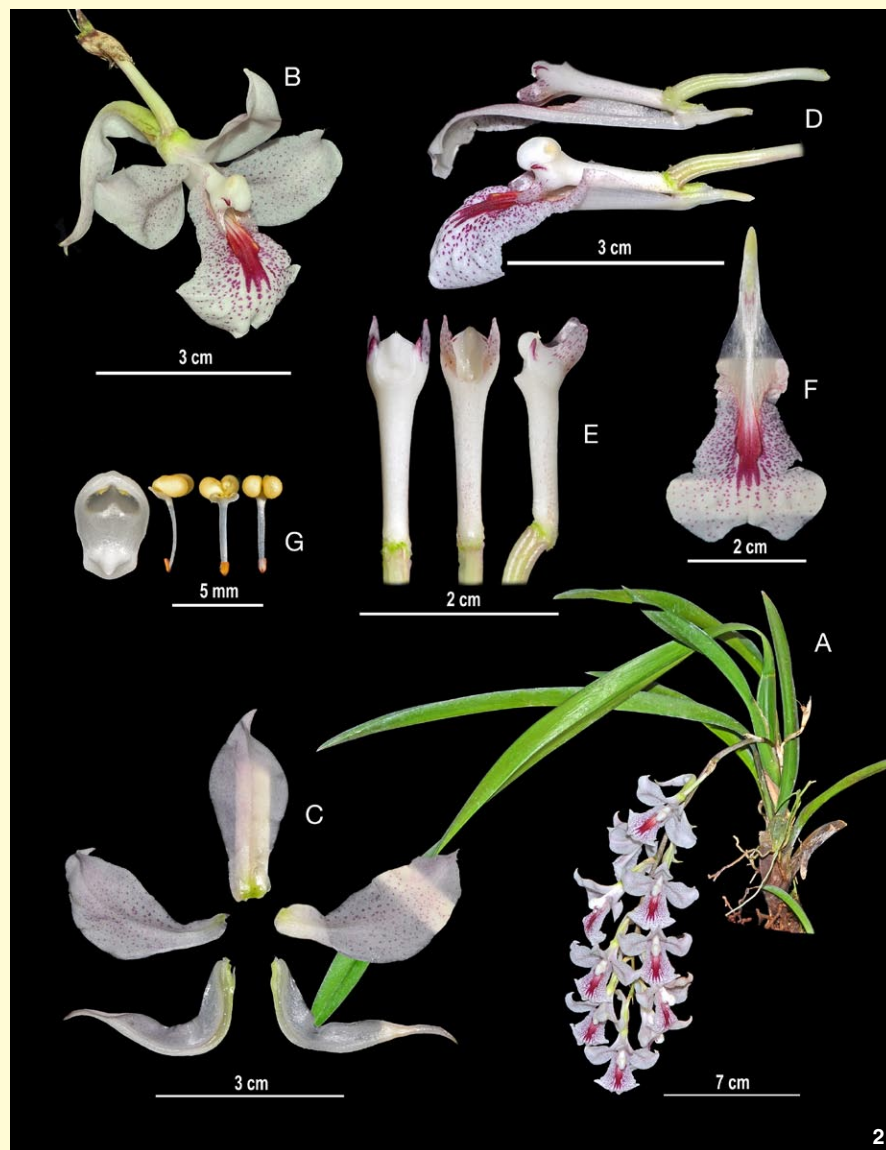
**ABSTRACT** A new species of *Rodriguezia*, *Rodriguezia dodsoniana*, is described and illustrated, and compared with *Rodriguezia satipoana*, from which it differs mainly by the inflorescences up to 20 cm long with up to 10 pink flowers with purple spots, the apical column stelidia, marked with purple, shorter than the stigmatic arms and the filiform stipe of the pollinarium.

**KEYWORDS** Ecuador, new species, Orchidaceae, *Rodriguezia*, *Rodriguezia dodsoniana*

Described by the Spanish botanists H. Ruiz and J. Pavón in 1794 based on Peruvian material, the genus *Rodriguezia* comprises about 47 species distributed throughout the Neotropics. Most of the species are found in South America, especially in the humid tropical forests of Brazil (Bock 1988). Within the Oncidiinae, the genus can be recognized by the caespitose or elongate rhizomatous habit, the sigmoid seedlings when young that develop conduplicate coriaceous leaves in the adult stage, the lip with a laminar callus, the column with two striking stigmatic arms and two teeth at the apex, and a nectary formed by the fusion of the labial base, sepals and column (Chase 1986).

They are mostly epiphytic plants, which grow preferably in exposed conditions and altered areas, often in *Citrus* species (Rutaceae), *Coffea* species (Rubiaceae), *Crescentia* species (Bignoniaceae), *Psidium guajava* (Myrtaceae) and *Theobroma cacao* (Sterculiaceae). Although most species are caespitose plants, three Brazilian (*Rodriguezia decora*, *Rodriguezia obtusifolia* and *Rodriguezia rigida*) and one Ecuadorian species (*Rodriguezia pulcherrima*) show a characteristic elongated rhizomatous habit and inflorescences in the form of long clusters. Although this individual character should not be used to separate this group into a different genus, it is very useful to distinguish previous species.

When Lindley described the genus *Burlingtonia* in 1837, based on *Burlingtonia candida* Lindl., he stated that "in many aspects it agrees with the genus *Rodriguezia* especially in the synsepal, the lip with a horn at the base and the similar form of pollinarium." However, the membranous and convolute flowers, the unguiculated sepals and petals, a long thin column and the bilobate lip longer than the other floral segments were sufficient characteristics for Lindley to



consider *Burlingtonia* a separate genus from *Rodriguezia* (Lindley 1837). In this concept, he included *Burlingtonia venusta* Lindl. ex Lem., *Burlingtonia fragrans* Lindl., *Burlingtonia rubescens* Lindl. and *Burlingtonia rigida* Lindl. ex Lem., with elongated rhizomatous habit. All previous species were transferred to *Rodriguezia* by Reichenbach (1852). Phylogenetic studies in Oncidiinae support this conclusion and show *Rodriguezia* as a monophyletic genus closely related to *Comparettia* Poepp. & Endl., *Ionopsis* Kunth, *Notylia* Lindl., *Scelochilus* Klotzsch., *Stigmatorthos* M.W.Chase and D.E.Benn. and *Sutrina* Lindl., which make up the so-called Rodriguezia Alliance (Williams et al., 2001). Although there is no systematic review of the genus, Bock (1988) has published a preliminary serial approach.

In Ecuador, 10 species of *Rodriguezia* have been recorded so far, all of them plants with a caespitose habit, except one

[1] The attractive flowers of *Rodriguezia dodsoniana* are pink with purple spots. Photograph by H. Medina.

[2] *Rodriguezia dodsoniana* H. Medina. (A) Habit. (B) Flower. (C) Perianth dissected. (D) Column and lip, side view. (E) Column, ventral and lateral view. (F) Lip, adaxial view. (G) Anther cap and pollinarium (three views). Prepared from the plant that served as holotype, by H. Medina.

with rhizomatous growth, *Rodriguezia pulcherrima* Bogarin, Pupulin & Medina (Dodson 2004, Bogarín et al. 2008). Here we present a new species for science, originally from the Ecuadorian Amazon:

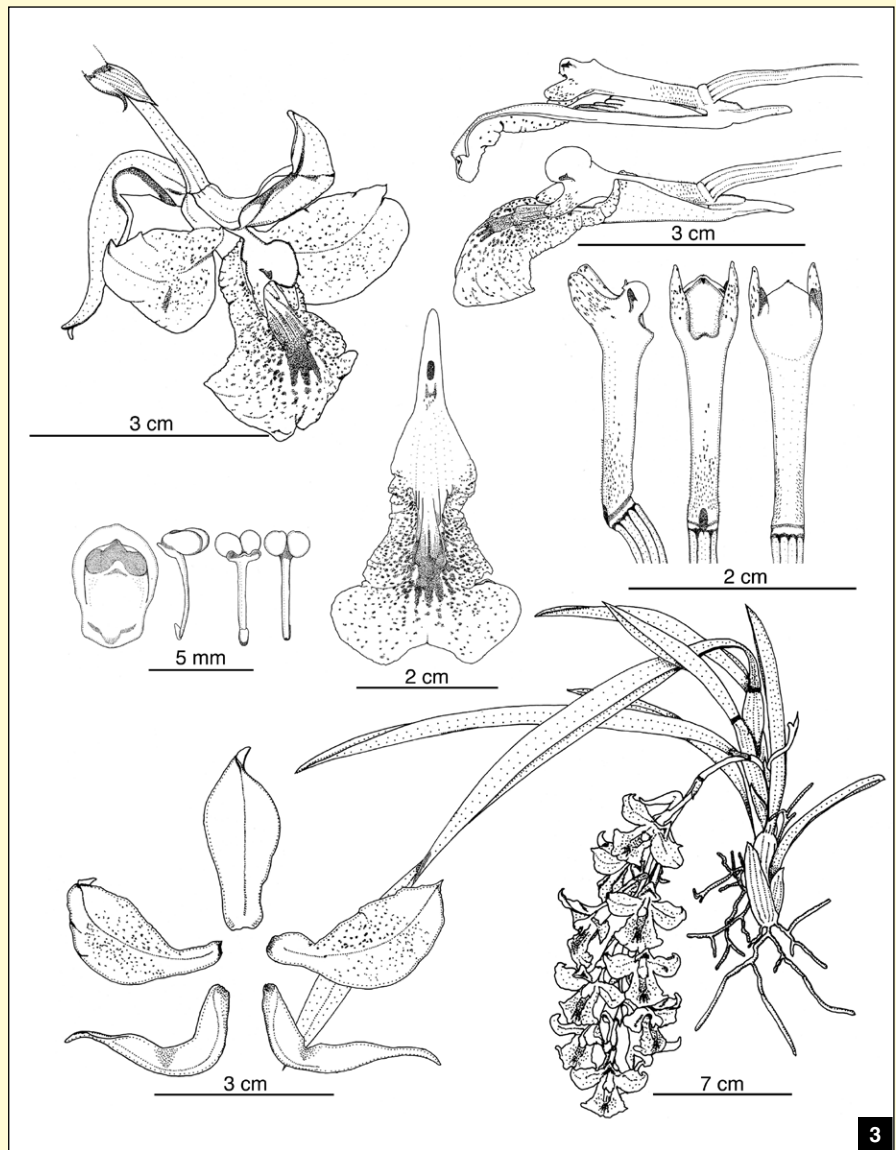
***Rodriguezia dodsoniana*** H. Medina, **sp. nov.** Type: ECUADOR. Morona Santiago: between Coangos and Teniente Ortiz, 3°02'09.53" S, 78°08'07.06" W, 846 m, 2018, flowered in cultivation at Ecuagenera Nursery in El Pangui, J. Portilla



0259 (holotype: QCNE).

**DIAGNOSIS** *A Rodriguezia satipoana* Dodson & D.E. Benn. *similis*, *floribus patentibus rosaceis purpureo punctatis, dentibus apicalibus columnae acutis brunneis brachiiis stigmaticis lanceolatis leviter falciformis obtusis subequalis sed gracilioris, cavea stigmatica lata, pollinarium stipite ligulato spatulato recedit.*

**DESCRIPTION** *Plant* epiphytic, erect, pseudobulb, up to 45 cm high. *Roots* flexuous and branched near the base, 1.5 mm in diameter, whitish with light-green tips. *Pseudobulb* flattened, unifoliate, 6.5 cm long and 3.0 cm wide, covered by semipapyraceous conduplicate sheaths of 1.2–4.5 cm long, 2–3 cm wide, articulated with the leaves. *Leaf* apical lanceolate, flattened, tightly acuminate, 35 cm long and 4 cm wide, the basal cataphylls elliptic to lanceolate, conduplicate, acuminate, abaxially provided with a short appendage, leathery, subpruinous-tessellated, from 9.0 to 22.5 cm long and 1.9 to 3.7 cm wide. *Inflorescence* lateral, racemose, distichous, arising from the base of the pseudobulbs, about 22 cm long, multiflowered (9–10), the peduncle covered basally by ascending, papyraceous, acute, tubular sheaths, up to 17 mm long and 4 mm wide. *Ovary* cylindrical, 27 mm long and 3 mm in diameter. *Flowers* showy, pinkish with purple spots, with a slight citrus fragrance similar to lemon verbena, the callus of the labellum faintly suffused yellow with brown spots, up to 4.5 cm long. *Dorsal sepal* elliptic, unguiculate, obtuse, conduplicate, deeply concave at the base, 3.5 cm long, 1.4 cm wide, pink without spots. *Lateral sepals* elliptical, acuminate, diverging slightly downward to form a curved sickle shape, 4.6 cm long, 0.7 cm wide, forming a basal sac that covers the apex (top) of the lip. *Petals* lanceolate, obtuse, briefly unguiculate, slightly reflexed upwards, 3.8 cm long, 1.8 cm wide. *Lip* elliptic, deeply emarginate, forming two broad lobes at the apex, larger than the other floral segments, 6.4 cm long and 2.6 cm wide, wavy margins, basally unguiculate forming a horn-like spur surrounded by the base of the synsepal in the form of sac or mentum, the disc provided with a laminar callus, composed of four brown lamellae on each side that go from the base to the middle of the laminae, the lateral lamellae shorter than the internal lamellae. *Column* clavate, slender at the base, swollen near the apex to appear baseball bat-shaped, with two stigmatic arms that touch the lip callus, white with brown spots, apically with two teeth, one



on each side, suffused with magenta-brown on the edge, basally hairy, apically glabrous, 25 mm long and 3 mm in diameter; stigma ventral; anther apical-subdorsal. *Anther cap* cucullate, oblong, concave, unilocular. *Pollinia* 2, globose, cleft, on a filiform stipe; viscidium oblong. *Capsule* not observed.

**ETYMOLOGY** Named in honor of Dr. Calaway Dodson, a dedicated and famous scholar of the Orchidaceae, especially of Ecuador, who also wrote and illustrated the five volumes of *Ecuadorian Orchids*.

**DISTRIBUTION** Known in the south and northeast of Ecuador in the province of Morona Santiago, between the populations of Coangos and Teniente Ortiz. In the province of Pastaza, Puyo city, near of the town of Canelos.

**PHENOLOGY** Plants in cultivation have flowered freely in February, May and August.

**HABITAT AND ECOLOGY** Plants of this

species grow as epiphytes in secondary forests and grassland areas with high light in warm and humid conditions. It has been found growing epiphytically in trees of *Theobroma cacao*, *Coffea*, *Citrus* and others not yet identified.

**DISCUSSION** The new species belongs to a group of *Rodriguezia* that is distributed throughout South America and has been registered in Brazil, Venezuela, Colombia, Ecuador, Peru, Bolivia and the Guyanas, which includes *Rodriguezia bahiensis* Rchb.f., *Rodriguezia batemanii* Poepp. & Endl., *Rodriguezia bracteata* (Vell.) Hoehne, *Rodriguezia leeana* Rchb.f., *Rodriguezia pubescens* Rchb.f., *Rodriguezia strobilii* Garay and *Rodriguezia satipoana*. Among the *Rodriguezia* species of Ecuador, *R. dodsoniana* is very similar to *R. satipoana* Dodson & D.E. Benn., which can be distinguished by the pink flowers with purple spots and a faint yellow or brown



suffusion on the callus of the lip, with the flowers spreading (vs. campanulate whitish flowers with pale spots), the apical teeth of the column acute, distally tinged with dark purple, barely shorter than the stigmatic arms, broadly obtuse (vs. the teeth notoriously shorter than the stigmatic arms), the stigmatic arms lanceolate, slightly falciform and thinner, the column with little hairiness at the base (vs. densely hairy) with a wide stigmatic cavity (vs. reduced) and stipe of the pollinarium ligulate and spatulate (vs. oblong).

#### ACKNOWLEDGMENTS

We are indebted to Franco Pupulin for reading this article carefully, and making some corrections.

#### REFERENCES

- Bock, I. 1988. Die Gattung *Rodriguezia* (Teil I). *Die Orchidee (Hamburg)* 39(4):145–150.
- Bogarin, D., F. Pupulin, and H. Medina. 2008. A new *Rodriguezia* (Orchidaceae: Oncidiinae) from Ecuador. *Lindleyana in Orchids (Bull. Am. Orch. Soc.)* 21(2):15–18.
- Dodson, C.H. 2004. *Native Ecuadorian Orchids. Volume V. Rodriguezia–Zygosepalum*. Dodson Publishing, Sarasota, Florida.
- Lindley, J. 1837. *Burlingtonia candida*. *Edward's Botanical Register*, sub pl. 1927.
- Reichenbach, H.G. 1852. *Rodriguezia* Rz. Pav. *Botanische Zeitung. Berlin* 10:771–772.
- Williams N.H., M.W. Chase, T. Fulcher, and W.M. Whitten. 2001. Molecular Systematics of the Oncidiinae Based on



Evidence from Four DNA Sequence Regions: Expanded Circumscriptions of *Cyrtochilum*, *Erycina*, *Otoglossum*, and *Trichocentrum* and a New Genus (Orchidaceae). *Lindleyana* 16:113–139.

[3] *Rodriguezia dodsoniana*, illustration of the plant that served as holotype, by Hugo Medina.

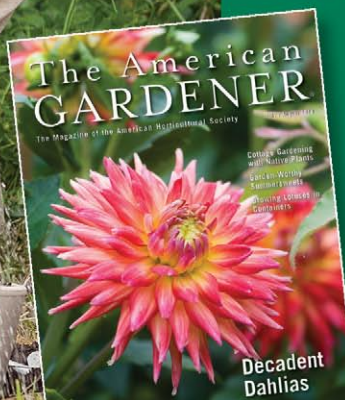
[4] Picture of *Rodriguezia satipoana*.



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MARCH

**1–2—Englewood Area Orchid Society “Orchids by Lemon Bay,”** Englewood United Methodist Church, 700 E Dearborn Street, Englewood, FL; Contact: Mary Anne DiGrazia, 941–697–9237; tommaryanne@centurylink.net

**1–3—Central California Orchid Society Spring Show,** Fresno Home and Garden Show, Fresno Fair Grounds, 1121 S. Chance Ave., Fresno, CA; Contact: Gordon Wolf, 209–999–0181; gwsangca@yahoo.com

**1–3—Martin County Orchid Society “Orchids in The Land of Oz,”** Martin County Fairgrounds, Building G, 2616 SE Dixie Hwy., Stuart, FL; Contact: Debbie Wilson, 561–351–1515; davedebwilson@hotmail.com

**1–3—Mobile Area Orchid Society 42nd Show,** Bellingrath Gardens and Home, 12401 Bellingrath Road, Theodore, AL; Contact: Joseph Paine, 251–209–1008; joe6w@aol.com

**1–3—Orchid Society of the Ozarks “9th Annual Orchids in the Garden,”** Botanical Garden of the Ozarks, 4703 North Crossover Road, Fayetteville, AR; Contact: Stephen Marak, 479–841–4275; samarak@cox.net

**1–3—Triad Orchid Society “Destination: Orchids,”** A.B. Seed Education Annex, 8432 Norcross Road, Colfax, NC; Contacts: Will Bottoms, 336–420–8872; wlbottoms@gmail.com/Tammy Goldberg, 336–491–3670; famgoldberg@hotmail.com

**1–10—Pennsylvania Horticultural Society “2019 Philadelphia Flower Show,”** Pennsylvania Convention Center, 100 N. 20th St., 5th Floor, Philadelphia, PA; Contact: Betty Greene, 215–988–8826; bgreene@pennhort.org

**2–3—Greater Akron Orchid Society Show,** Donzell’s Garden Center, 937 East Waterloo Rd., Akron, OH; Contact: Jane Bush, 330–468–2589; bushjij@juno.com

**2–3—Montego Bay Orchid Club Show,** Pier One, Howard Cooke Boulevard, Montego Bay, Jamaica; Contact: Audrey McIntosh, 1–876–774–6431; audreyemcintosh@hotmail.com

**2–3—Northeastern Wisconsin Orchid Society Show “Orchid Magic,”** DoubleTree by Hilton, 123 East Wisconsin Ave., Neenah, WI; Contact: Cheryl Wilinski, 920–660–8777; cmwili33@gmail.com

**2–3—Santa Cruz Orchid Society Show & Sale,** Cabrillo College Horticulure Center, 8600 Soquell Drive, Aptos, CA; Contact: Chen Wagner, 831–818–9933; cjw\_online@baymoon.com

**2–3—Tampa Bay Orchid Society Show “Orchids ‘Round the World,”** Tampa

Scottish Rite Center, 5500 Memorial Highway, Tampa, FL; Contact: Eileen Hector, 813–368–7353; TampaBayOrchidSociety@verizon.net

**2–3—Tucson Orchid Society Show “Fiesta de las Flores,”** Mesquite Valley Growers, 8005 E. Speedway Blvd., Tucson, AZ; Contact: Wes Addison, 520–305–6150; wesadd@cwa-cpa.com

**2–3—Victoria Orchid Society Spring Show,** Our Lady of Fatima Hall, 4635 Elk Lake Dr., Victoria, BC, Canada; Contact: Barbara Davies, 250–477–2393; bygord@telus.net

**8–9—Greater North Texas Orchid Society Show & Sale,** Richardson Civic Center, 411 W Arapaho Rd., Richardson, TX; Contact: Linda Horton, 972–977–6969; henry.horton4@verizon.net

**8–10—Atlanta Orchid Society Show & Sale,** Atlanta Botanical Garden, 1345 Piedmont Ave., Atlanta, GA; Contact: Danny Lentz, dblgongora@bellsouth.net

**8–10—Gulf Coast Orchid Alliance Show,** North Collier Regional Park, 15000 Livingston Road, Naples, FL; Contact: Jim Longwell, 239–340–5520; jlongwell1@comcast.net

**8–10—Maryland Orchid Society Spring Show,** Maryland State Fairgrounds, 2200 York Road, Timonium, MD; Contact: Joan Roderick, 410–992–1811; jomarod@verizon.net

**8–10—Orchid Society of Coral Gables Show,** Fairchild Tropical Botanic Garden, Garden Room, 10901 Old Cutler Road, Coral Gables, FL; Contact: Melana Davison, 760–212–8919; orchidiva@att.net

**9–10—Greater Cincinnati Orchid Society Spring Show & Plant Sale,** Krohn Conservatory, 1501 Eden Park Drive, Cincinnati, OH; Contact: Cheryl Jaworski, 812–438–2898; jaworchid@gmail.com

**9–10—Illinois Orchid Society Spring Show & Sale,** Chicago Botanic Garden, Nichol’s Hall, 1000 Lake Cook Rd., Glencoe, IL; Contact: Don Neal, 847–702–6256; dcn4312@yahoo.com

**9–10—Mount Baker Orchid Society Show & Sale,** Skagit Valley Gardens, 18923 Peter Johnson Road, Mount Vernon, WA; Contact: Elizabeth Pernotto, 360–647–1752; betsy1045@gmail.com

**15–17—North Carolina Piedmont Orchid Society Show,** Daniel Stowe Botanical Garden, 6500 South New Hope Road, Belmont, NC; Contact: Linda T. Wilhelm, 704–393–1740; orchidfrau@bellsouth.net

**15–17—Orchid Society of Western Pennsylvania Annual Spring Show,** The Artsmiths of Pittsburgh, 1635 McFarland

Road, Pittsburgh, PA; Contact: Gary VanGelder, 412–638–9756; gvangelder@verizon.net

**15–17—Santa Barbara International Orchid Show,** Earl Warren Showgrounds, 3400 Calle Real, Santa Barbara, CA; Contact: Nancy Melekian, 805–403–1533; info@sborchidshow.com

**16–17—Ann Arbor Orchid Society “Orchid Festival,”** Methaei Botanical Gardens, 1800 North Dixboro Rd., Ann Arbor, MI; Contact: Abby Skinner, 517–816–7979; aaos2019festival@comcast.net

**16–17—Illowa Orchid Society Spring Show,** Quad City Botanical Center, 2525 4th Avenue, Rock Island, IL; Contact: Dano Kandis, 309–737–2672; emkandis@mchsi.com

**16–17—Jacksonville Orchid Society Show,** Garden Club of Jacksonville, 1005 Riverside Ave., Jacksonville, FL; Contact: Art Russell, 904–309–3030; russell\_art@bellsouth.net

**16–17—London Orchid Society Show,** Mother Teresa Catholic Secondary School, 1065 Sunningdale Road East, London, ON, Canada; Contact: Sean Moore, 519–645–7747; spmoore@rogers.com

**16–17—Nutmeg State Orchid Society Show “Come See Our Bloomers,”** West Hartford Meeting & Conference Center, 50 South Main St., West Hartford, CT; Contact: Sandy Myhalik, 860–677–0504; myhalik@comcast.net

**16–17—Springfield Orchid Society Show & Sale,** Springfield Greene County Botanical Center, 2400 S. Scenic Ave., Springfield, MO; Contact: Nathan Bell, 660–888–0225; nbell@cofo.edu

**22–24—Alamo Orchid Society Show,** San Antonio Garden Center, 3310 North New Braunfels Ave., San Antonio, TX; Contact: Luis Valdez, 210–753–3693; valdezluis2013@yahoo.com

**22–24—Jamaica Orchid Society Show,** Jamaica Horticultural Society Show Hall, Gibson Drive, Kingston, Jamaica; Contact: Nicole Simons, 1–876–927–6713; nicsim@cwjamaica.com

**22–24—San Diego County Orchid Society Spring Show “Orchid Treasures,”** Scottish Rite Center, 1895 Camino del Rio South, San Diego, CA; Contact: Deborah Halliday, 858–353–5392; debhallid@gmail.com

**22–24—Windward Orchid Society Show,** Samuel Wilder King Intermediate School, 46–155 Kamehameha Highway, Kaneohe, HI; Contact: Susan L. Lim, 808–728–1014; slim@hawaiiintel.net

**23–24—Greater Omaha Orchid Society “32nd Annual Orchid Show & Sale,”** Lauritzen Gardens, 100 Bancroft St.,



Omaha, NE; Jim Pyszynski, 402-734-4112; jpyrzynski@cox.net

**23-24—Orchid Society of Highlands County “Orchids by the Lake,”** Jack Stroup Civic Center, 355 West Center Avenue, Sebring, FL; Contact: Pete Otway/Lori Coon, 863-699-1575/863-414-3381; gatorgalanddoughboy@embarqmail.com

**23-24—The Central Pennsylvania Orchid Society’s 54th Annual Orchid Show,** Ag Arena, Penn State University, Park Avenue, University Park, PA; Contact: Wade Hollenbach and Cathy Riemer, 570-837-9157; wadeh@ptd.net

**23-24—Vancouver Orchid Society 2019 Annual Show & Sale,** VanDusen Botanical Garden, Floral Hall, 5251 Oak St., Vancouver, BC, Canada; Contact: Evelyn Nash, 604-874-5534; ewnash@live.ca

**23-24—Wisconsin Orchid Society Show “Spring 2019 Orchid Festival,”** Milaeger’s Garden Center, 4838 Douglas Ave., Racine, WI; Contact: Richard Odders, 262-632-3008; odders2445@gmail.com

**28-31—Puerto Rico Orchid Society “70th Festival de Orquideas,”** Jardín Botánico, Universidad de Puerto Rico, Sur Carretera, Intersección 847, San Juan, PR; Contact: Carlos Fighetti, 787-518-4467; cf3@columbia.edu

**29-30—Genesee Region Orchid Society’s 45th Annual Orchid Show,** Rochester Museum & Science Center, Eisenhart Auditorium, 657 East Avenue, Rochester, NY; Jonathan Jones, 585-721-7150; jonathanjones2012@gmail.com

**29-31—Barbados Orchid Society Show,** Barbados Horticultural Society, Balls Plantation, Christ Church, Barbados, West Indies; Contact: Michael Waithe, 246-427-0112; waithe@caribsurf.com

**29-31—Deep South Orchid Society “33rd Savannah Orchid Show,”** Coastal Georgia Botanical Gardens, 2 Canebrake Road, Savannah, GA; Contact: Jenni Brodie, 912-614-2531; tuckerbrodie@msn.com

**29-31—Denver Orchid Society Spring Show & Sale “Celebrate the Orchid,”** Denver Botanic Gardens, 1007 York Street, Denver, CO; Contact: Debbie Martin, 720-352-0416; deberaem@comcast.net

**29-31—Manitoba Orchid Society Show “Orchid Elegance,”** Breezy Bend Country Club, 7620 Robin Blvd., Headingley, Manitoba, Canada; Contact: Rick Askinis, 204-253-9630; raskinis@hotmail.com

**29-31—New Mexico Orchid Guild Show “Masked in Mystery—Mardi Gras,”** Albuquerque Garden Center, 10120 Lomas Boulevard NE, Albuquerque, NM; Contact: Keith Mead, 505-379-6786; orchidsinabq@gmail.com

**29-31—San Joaquin Orchid Society Annual Show,** Sherwood Mall, 5308 Pacific Ave., Stockton, CA; Contacts: Barry Barlow, 209-465-5454; rbbarry8990@sbcglobal.net; Robert Huntly, 209-487-228, bobearlhuntley745@gmail.com

**30-31—Central Ohio Orchid Society Spring Show,** Franklin Park Conservatory and Botanical Gardens, 1777 East Broad St., Columbus, OH; Contact: Dave Markley, 614-354-9044; davemarkley27@gmail.com

**30-31—Connecticut Orchid Society Show “Spring into Orchids,”** Bristol Senior Center, 240 Stafford Avenue, Bristol, CT; Contact: Cheryl Mizak, 203-264-6096; cmizak@alcher.com

**30-31—Five Cities Orchid Society “Central Coast Orchid Show,”** South County Regional Center, 800 W Branch St., Arroyo Grande, CA; Contact: Eric Holanda, 805-929-5749; cbh@charter.net

**30-31—Les Orchidophiles de Montréal “Orchidexpo 2019,”** Collège de Maisonneuve, 2700 Bourbonniere St., Montreal, Quebec, Canada; Contact: Michel Tremblay, 450-966-6339; mdppa.tremblay@sympatico.ca

**30-31—Michigan Orchid Society Annual Sale & Show,** United Food & Commercial Workers Union Bldg., 876 Horace Brown Drive, Madison Heights, MI; Contact: Joe Peterson, 248-528-1453; jandjandabbey@aol.com

**30-31—Nature Coast Orchid Society Spring Show 2019,** VFW Post 8681, 18940 Drayton Street, Spring Hill, FL; Contact: Marita Riesz, 732-673-1179; maritariesz404@gmail.com

**30-31—Sonoma County Orchid Society “Educational Orchid Exposition and Sale,”** Santa Rosa Veteran’s Memorial Building, 1351 Maple Ave., Santa Rosa, CA; Contact: Alison Bies, 207-844-0909; orchidswtf@aol.com

**30-31—Spokane Orchid Society Show & Sale,** Spokane Community College – Student Lair, 1810 N. Green St., Spokane, WA; Contact: Jim Pearce, 509-299-5152; info@spokaneorchidsociety.org

#### APRIL

**5-7—Asociación Orquideológica de Cartago “Exposición Nacional de Orquideas Cartago 2019,”** Centro Comercial Paseo Metrópoli, La Lima, Entrada a Cartago, Cartago, Costa Rica; Contact: Carlos Granados, (506) 8379-1513; cagranados48@gmail.com

**5-7—Orchid Society of Alberta “Orchid Fair 2019,”** Enjoy Centre, 101 Riel Drive, St. Albert, AB, Canada; Contact: Darrell Albert,

780-903-2299; darrell@albert-it.com

**5-7—Southeastern Pennsylvania Orchid Society International Orchid Show & Sale,** Greater Philadelphia EXPO Center at Oaks, 100 Station Ave., Oaks, PA; Contact: Robert Sprague, 484-919-2922; bobsatcyndal@aol.com

**6-7—Cherry City Orchid Society Show “Orchid Magic,”** Bonaventure of Salem, 3411 Boone Road SE, Salem, OR; Contact: Janeil Payne, 503-931-3441; janeilorchidjudge@gmail.com

**6-7—Desert Valley Orchid Society Show,** Berridge Nurseries, 4647 E. Camelback Road, Phoenix, AZ; Contact: Cindy Jepsen/Gloria Zemina, 602-743-0146; cindyjepsen@cox.net

**6-7—Houston Orchid Society Show & Sale,** Memorial City Mall, 303 Memorial City Way, Houston, TX; Contact: Jay Balchan, 713-898-1265; balchan.jay@gmail.com

**6-7—Les Orchidophiles de Quebec “Orchidofolie 2019,”** Pavillon Environnement, 2480 Boulevard Hochelaga, Quebec, Quebec, Canada; Contact: Michel Tremblay, 450-966-6339; mdppa.tremblay@sympatico.ca

**6-7—Utah Orchid Society Bench Show,** Red Butte Gardens, 300 Wakara Way, Salt Lake City, UT; Contact: Shawn Quealy, 801-831-7359; shquealy@comcast.net

**6-7—Western North Carolina Orchid Society “An Orchid Expedition,”** North Carolina Arboretum, 100 Frederick Law Olmsted Way, Asheville, NC; Contact: Mike Mims, 828-329-2126; michaelmims@gmail.com

**12-13—Central Louisiana Orchid Society Spring Show,** Kees Park Community Center, 2450 Highway 28 E, Pineville, LA; Contact: Linda Roberts, 318-352-2683; lmrjnk@yahoo.com

**12-14—Pan American Orchid Society “Orchid Festival 2019,”** R.F. Orchids, Inc., 28100 SW 182 Ave., Homestead, FL; Contact: Carlos Ochoa, 786-344-3318; emailchoa@yahoo.com

**13-14—Acadian Orchid Society Show & Sale,** Ira Nelson Horticulture Center, 2206 Johnson St., Lafayette, LA; Contact: Melissa Fournet, 337-280-7246; melissa@redlerilles.com

**13-14—Central Indiana Orchid Society Show,** Garfield Park Conservatory, 2505 Conservatory Drive, Indianapolis, IN; Contact: Foster Flint, 317-601-2649, flintlowell@hotmail.com

**13-14—Sacramento Orchid Society Show “Dreaming of Orchids,”** Scottish Rite Temple, 6151 H St., Sacramento, CA; Contact: Carolyn M. Jones, 530-219-0043;



sacramentoorchidshowchair@gmail.com  
**13–14—Toronto Artistic Orchid Association Orchid Show 2019**, Center for Immigrant & Community Services, 2330 Midland Ave., Toronto, Ontario, Canada; Contact: Nancy Leung, 905–597–6665; nancyleung.taoa@gmail.com

**13–14—Treasure Valley Orchid Society Show & Sale**, Hilton Garden Inn Boise, 7699 Spectrum St., Boise, ID; Contact: Ruth Mayer, 208–860–5254; ruthmayer@cablone.net

**18–20—Maui Orchid Society Easter Show**, Maui Mall, 70 East Kaahumanu Ave., Kahului, Maui, HI; Contact: Bert Akitake, 808–250–1585; jakitake@hotmail.com

**20–21—Flamingo Gardens Orchid Society Show**, Flamingo Gardens, 3750 S Flamingo Rd., Davie, FL; Contact: Jan Amador, 954–347–2738; jbamador@bellsouth.net

**20–21—Tulsa Orchid Society Show “Orchids Wild and Wonderful,”** Tulsa Garden Center, 2435 S. Peoria Ave., Tulsa, OK; Contact: Soundra Schacher, 918–299–6466; schacher1@cox.net

**26–28—Sacajawea Orchid Society Show**, Gallatin Valley Mall, 2825 W. Main St., Unit 3–J, Bozeman, MT; Contact: Charlie Spinelli, 406–282–7621; companion406@gmail.com

**27–28—Oregon Orchid Society Spring Show**, Aquinas Hall, 1333 NE Martin Luther King Jr Blvd., Portland, OR; Contact: Greg Stanley, 626–818–2806; greges1@aol.com

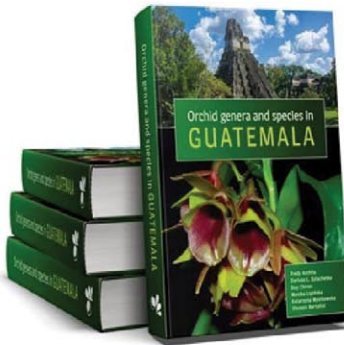
**27–28—Ottawa Orchid Society Show “ORCHIDOPHILIA,”** RA Recreational Centre, 2451 Riverside Drive, Ottawa, ON, Canada; Contact: Marcel Carriere, 613–673–1807; chipwendover@videotron.ca

**27–28—Vero Beach Orchid Society Annual Show “Aloha Orchids,”** Riverside Park, 3001 Riverside Park Dr., Vero Beach, FL; Contact: Carol Marvin, 772–778–7600; carolmarv@aol.com

**27–28—West Shore Orchid Society Spring Show**, Strongsville Recreation Center, 18100 Royalton Road, Strongsville, OH; Contact: Chester Kieliszek, 330–467–3731; kieliszek@aol.com

Events preceded by an asterisk (\*) in this listing will not be judged by the AOS.

## Koeltz Botanical Books



**Archila, F., D. L. Szlachetko, G. Chiron, M. Lipinska, K. Mystkowska and V. Bertolini:** *Orchid genera and species in Guatemala*. 2019. approx. 300 color photographs. 724 p. gr8vo. Hardcover. – Bilingual English and Spanish. (Koeltz ID 107905)  
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*Orchids and Orchidology in the Antilles. An Encyclopaedic History*. 2016. many col. illus. 744 p. 4to. Hardcover. (978-3-946583-01-1) (Koeltz ID 106164) €228.00+shipping (US\$260.00+ship.)

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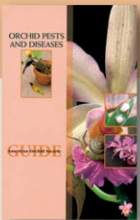
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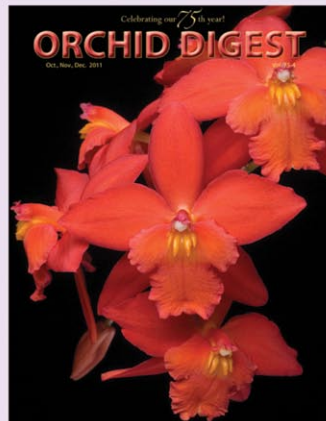
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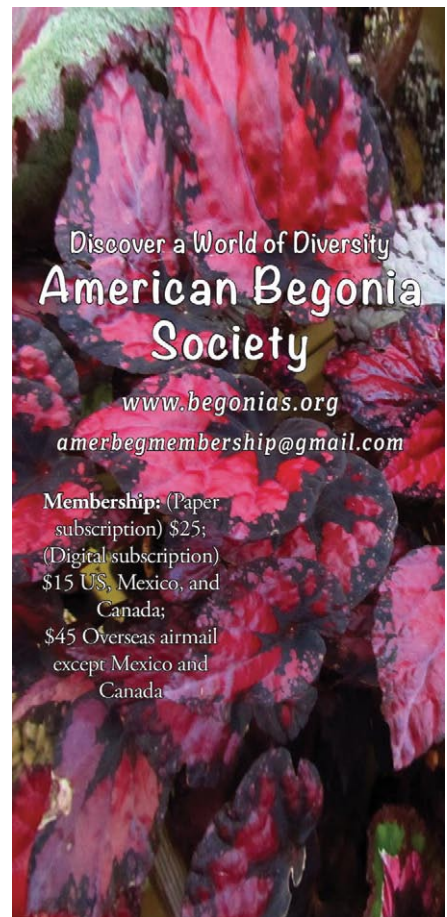


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## Submission of articles for *ORCHIDS* magazine

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

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

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# How Do They Compare?

Text and photographs by Leon Glicenstein



First bloom seedling of *Habenaria* Pink Butterfly

WHENEVER SOMEONE MAKES a hybrid they try to figure out what they would like the outcome to be. Things do not always work out as one might want, but the hybridizer uses his or her imagination based upon experience. However, if one of the plants has never been used in a hybrid one does not know how it will breed.

I was hoping that my hybrid of *Habenaria* (*erichmichelii* × *janellehayneiana*) would be in flower in time for my article *A New Habenaria in Town* (Glicenstein 2018), but the buds did not cooperate. Nevertheless, they did open the week before the September issue was delivered to my house, and the hybrid was registered as *Habenaria* Pink Butterfly.

It was a precocious flowering and the seedling only had two, attractive, pink flowers. As I write this, more plants are in flower. The natural spread of the flower is about 1 inch (2.54 cm). So how does it compare with its parents?

If we look at the shape of the flower, in some ways it is a mixture of both

parents. The lip shape is closer to that of the *Hab. janellehayneiana* than the *Hab. erichmichelii*, and does not even have the usually dominant *Hab. erichmichelii* “stoop shoulders” to the side lobes of the lip, although they do not rise up as much as they are in *Hab. janellehayneiana*. The lip is pink, as was expected, but the *Hab. erichmichelii* mercurochrome-colored claw comes through. The claw itself is completely swept forward, as in the *Hab. janellehayneiana*. The lateral sepals do reflex a bit, but are not as reflexed or twisted as they may be in *Hab. erichmichelii*, and they are pink and appear higher on the flower, more like the *Hab. janellehayneiana* parent, but not as high; the petals are more like those of *Hab. janellehayneiana* too, and are pink instead of green. The rostellum lobe is more or less intermediate between the two parents, but the rostellum arms favor the *Hab. janellehayneiana* parent in shape and positioning. The stigmatic processes have straightened out and are

not as tiny as those of *Hab. erichmichelii*. *Habenaria erichmichelii* is more dominant in the nectary shape, because the nectary of *Hab. Pink Butterfly* is very similar to it, instead of the stretched-out nectary that is found in *Hab. janellehayneiana*.

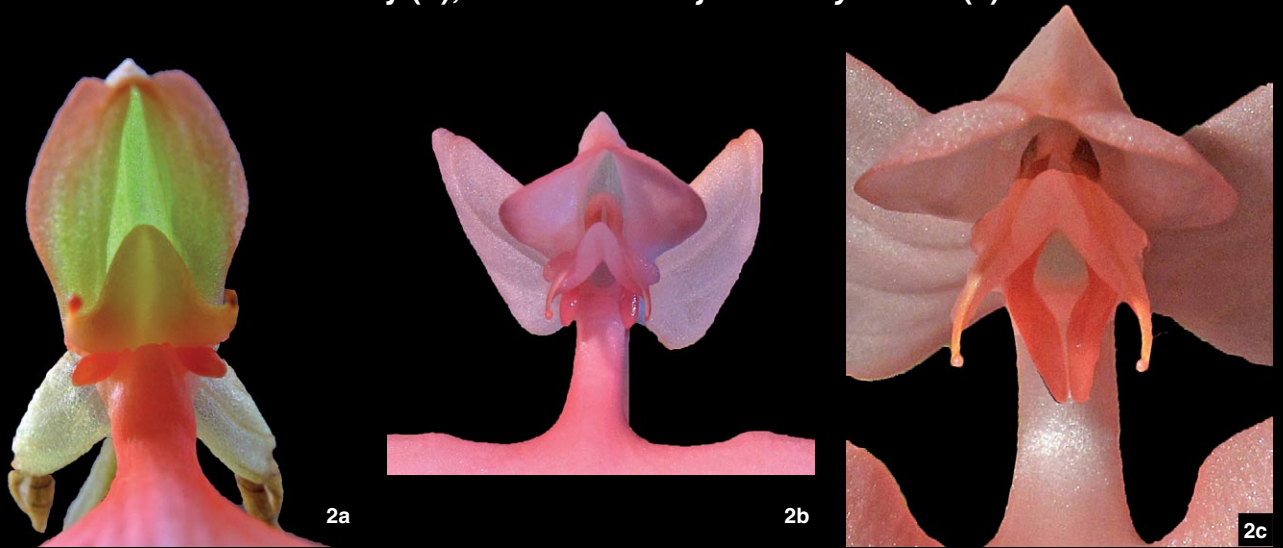
Oh, I nearly forgot, as an added bonus, even I can detect the pleasant fragrance of the flowers. This is not unexpected, as both parents are fragrant (to some people). A few friends have said that the flowers have the aroma of roses. One wonders if that trait will be found in other hybrids with *Hab. janellehayneiana*.

— Leon Glicenstein, PhD, is an international lecturer who speaks to orchid and plant societies. He has grown orchids for more than 55 years and was a breeder of novel orchid hybrids for the former Hoosier Orchid Company, especially in the Gongorinae, Zygopetalinae, Pleurothallidae, angraecoids, jewel and painted-leaf orchids; Orlando Avenue, State College, Pennsylvania 16803 (glicenstein33@msn.com).





[1a,b,c] Comparisons of the shape of the flower; *Habenaria erichmichellii* (a), *Habenaria Pink Butterfly* (b), and *Habenaria janellehayneiana* (c).



[2a,b,c] Comparisons of the sepals, petals, and gynostemium; *Habenaria erichmichellii* (a), *Habenaria Pink Butterfly* (b), and *Habenaria janellehayneiana* (c).



[3a,b,c] Comparisons of side views; *Habenaria erichmichellii* (a), *Habenaria Pink Butterfly* (b), and *Habenaria janellehayneiana* (c)




*Be sure to visit us at  
these shows in 2019!*



Jacksonville Orchid Society  
March 16 & 17  
Garden Club of Jacksonville  
1005 Riverside Ave.  
Jacksonville, FL 32204



Tampa Bay Orchid Society  
March 2 & 3  
Tampa Scottish Rite  
5500 Memorial Hwy.  
Tampa, FL 33634



Fairchild Tropical Botanic Garden  
March 9 & 10  
Fairchild Tropical Botanic Garden  
10901 Old Cutler Rd.  
Coral Gables, FL 33156



Western North Carolina  
Orchid Society  
April 6 & 7  
North Carolina Arboretum  
100 Frederick Law Olmsted Way  
Asheville, NC 28806



Orchid, Native &  
Garden Art Festival  
April 6 & 7  
Sawgrass Nature Center  
3000 Sportsplex Dr.  
Coral Springs, FL 33065



Flamingo Gardens  
April 20 & 21  
Flamingo Gardens  
3750 S. Flamingo Rd.  
Davie, FL 33330



Redland International  
Orchid Festival  
May 17, 18 & 19  
Fruit & Spice Park  
24801 SW 187th Ave.  
Homestead, FL 33031



Central Florida Orchid Society  
June 1 & 2  
National Guard Armory  
2809 S. Ferncreek Ave.  
Orlando, FL 32806



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