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# ORCHIDS

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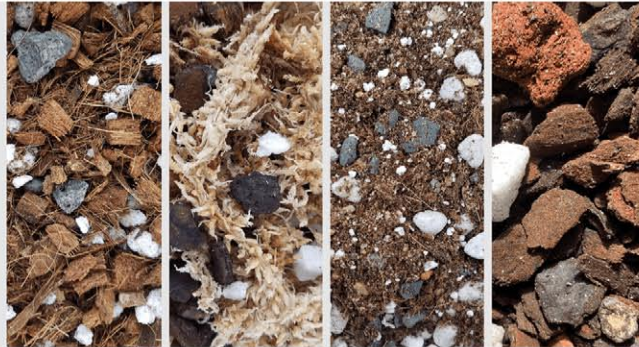






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## FRONT COVER

Only four of the approximately 100 species of *Goodyera* are found in North America north of Mexico. *Goodyera pubescens*, photographed by Greg Allikas, is found in the forests of central and eastern Canada and the eastern United States southward into Tennessee. Colony-forming, large stands can be particularly spectacular.

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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>.

- aberrans* (ab-AIR-anz)  
*Acineta* (a-sin-EE-ta)  
*Aciopea* (ay-see-OP-a)  
*acuensis* (ah-sue-EN-sis)  
*adductum* (ad-DUK-tum)  
*affine* (af-FEE-nee)  
*agrostophyllum* (ag-ros-toh-FILL-lum)  
*alagoensis* (al-a-goh-EN-sis)  
*alexandrae* (al-leks-AN-dree)  
*aloifolium* (ah-loh-ih-FOL-ee-um)  
*amaliae* (a-MAL-ee-eye)  
*ambrosia* (am-BROH-see-a)  
*amethystoglossum* (am-eh-thih-stoh-GLOSS-sum)  
*andrewsii* (an-DREW-zee-eye)  
*Angraecum* (an-GRAY-kum)  
*Anguloa* (an-gyew-LOH-ah)  
*anitum* (an-EE-tum)  
*anosmum* (an-OSS-mum)  
*armeniacum* (ar-men-ee-AY-kum)  
*atropurpureum* (at-roh-pur-PUR-ee-um)  
*Augochlora* (aw-goh-KLOR-a)  
*Augochorella* (aw-goh-kore-ELL-la)  
*aurantiaca* (aw-ran-tee-AY-ka)  
*batemanii* (bait-MAN-ee-eye)  
*Batemannia* (bait-MAN-ee-a)  
*belizensis* (bel-eez-EN-sis)  
*besseae* (BESS-ee-eye)  
*bigibbum* (bye-GIB-bum)  
*Bletilla* (bleh-TILL-la)  
*Brachionidium* (brak-ee-oh-NEE-dee-um)  
*Brassidium* (brass-ID-ee-um)  
*Brassidomesa* (brass-id-OH-meez-ah)  
*Brassocattleya* (brass-oh-KAT-lee-a)  
*brevipedunculata* (breh-vee-pee-dunk-yew-LAY-ta)  
*brysiانا* (brye-see-AY-na)  
*Bulbophyllum* (bul-boh-FILL-lum)  
*Calanthe* (kal-AN-thee)  
*canaliculatum* (kan-a-lik-yew-LAY-tum)  
*carmeniae* (kar-MEN-ee-eye)  
*Cattleytonia* (kat-lee-TONE-ee-a)  
*Cattlianthe* (kat-lee-AN-thee)  
*Caucaea* (KOW-kah-ee)  
*cernua* (SIR-new-ah)  
*chamaelepanthes* (kam-may-leh-PAN-theez)  
*coccinea* (kok-SIN-ee-a)  
*cochleata* (kok-lee-AY-ta)  
*Cochlioda* (kok-lee-OH-da)  
*colleyi* (KOL-ee-eye)  
*compactum* (kom-PAK-tum)  
*connata* (kon-NAY-ta)  
*cordigera* (kore-DIJ-er-ah)  
*Cymbidium* (sim-BID-ee-um)  
*Cypripedium* (sip-rih-PEED-ee-um)  
*Cyrtochilum* (sir-toh-KYE-lum)  
*Dactylophiza* (dak-till-oh-RYE-za)  
*delenatii* (del-en-AT-ee-eye)  
*Dendrocoryne* (den-droh-KORE-eye-nee)  
*denisoniana* (den-ih-son-ee-AY-na)  
*dichroma* (DYE-kroh-ma)  
*digbyana* (dig-bee-AY-na)  
*dunstervillei* (DUN-ster-vill-ee)  
*echinata* (ek-in-AY-tah)  
*Elleanthus* (ell-ee-AN-thus)  
*Empusella* (em-pew-SELL-la)  
*Encyclia* (en-SIK-lee-a)  
*endotrachys* (en-do-TRAKE-iss)  
*ensifolium* (en-sih-FOL-lee-um)  
*Epicattleya* (eh-pih-KAT-lee-a)  
*erythroxantha* (err-ith-roh-ZAN-tha)  
*falcata* (fal-KAY-ta)  
*farmeri* (FAR-mer-eye)  
*findlayanum* (find-lay-AY-num)  
*frostii* (FROST-ee-eye)  
*Galeandra* (gal-ee-AN-dra)  
*gigantea* (jye-GAN-tee-a)  
*gigantifolium* (jye-gan-tih-FOL-lee-um)  
*glanduliferum* (gländ-yew-LIF-er-um)  
*glauca* (GLAW-ka)  
*Gomesa* (GOH-meez-a)  
*Goodyera* (good-YEAR-ah)  
*grandiflora* (gran-dih-FLOR-a)  
*guarachea* (gwar-EK-ee-ah)  
*Guarianthe* (gwar-ee-AN-thee)  
*hangianum* (hang-ee-AY-num)  
*haynaldianum* (hay-nald-ee-AY-num)  
*hirsutissimum* (her-soo-TISS-ih-mum)  
*intermedia* (in-ter-MEE-dee-a)  
*Isabelia* (is-a-BEL-lee-a)  
*judii* (JUD-ee-eye)  
*Kraenzlinella* (krenz-lin-ELL-la)  
*Laeliocatanthe* (lay-lee-oh-kat-AN-thee)  
*lamellata* (lam-ell-LAY-ta)  
*lemniscatum* (lem-niss-KAY-tum)  
*leonis* (lee-OH-niss)  
*Leptotes* (lep-TOE-teez)  
*leucochilum* (loo-koh-KYE-lum)  
*lindleyi* (LIND-lee-eye)  
*longissimum* (lon-GISS-ee-mum)  
*lueddemannii* (loo-deh-MAN-ee-eye)  
*Lycaste* (lye-KAS-tee)  
*macrochila* (mak-roh-KYE-la)  
*macrophylla* (mak-roh-FILL-la)  
*mantiqueirae* (man-tee-KWARE-ee)  
*mariae* (MAR-ee-eye)  
*Metrosideros* (met-roh-SID-er-ohs)  
*micranthum* (mye-KRAN-thum)  
*mitrata* (mih-TRAY-ta)  
*moniliforme* (mon-il-ih-FOR-mee)  
*monophyllum* (mon-oh-FILL-lum)  
*mossiae* (MOSS-ee-eye)  
*Myrmecophila* (mir-meh-KOFF-ih-lah)  
*nobilior* (noh-BEE-lee-or)  
*noezlianum* (noze-lee-AY-num)  
*Oeonilla* (oh-ee-oh-NEE-ell-la)  
*Oncidiinae* (on-sid-ee-EE-nee)  
*Oncostele* (on-koh-STEE-lee)  
*Oncostelopsis* (on-koh-stee-LOP-sis)  
*onusta* (on-OO-sta)  
*Paphiopedilum* (paff-ee-oh-PED-ih-lum)  
*Papilionanda* (pap-ee-lee-oh-NAN-da)  
*Papilionantha* (pap-ee-lee-oh-NAN-tha)  
*Paraphalaenopsis* (pare-a-fail-en-OP-sis)  
*Paravanda* (pare-a-VAN-da)  
*parviflorum* (par-vee-FLOR-um)  
*patula* (PAT-yew-la)  
*pearcei* (PEARCE-eye)  
*pfavii* (PFAV-ee-eye)  
*Phalaenantha* (fail-en-AN-thee)  
*Phalaenopsis* (fail-en-OP-sis)  
*philippinense* (fil-lip-in-EN-see)  
*platyrachis* (plat-ee-RAK-iss)  
*Pleurothallis* (plur-oh-THAL-liss)  
*Pohlitanico* (pol-ih-TIN-ih-ko)  
*polliculosum* (pol-lik-yew-LOH-sum)  
*polyanthum* (pol-ee-AN-thum)  
*polymorpha* (pol-ee-MORE-fa)  
*polystachys* (pol-ee-STAKE-iss)  
*Procatavola* (proh-kat-a-VOL-la)  
*Prosthechea* (pros-THEK-ee-a)  
*pseudepidendrum* (sood-ep-ih-DEN-drum)  
*pubescens* (pew-BESS-senz)  
*pygmaea* (PIG-mee-a)  
*racemosa* (ras-see-MOS-a)  
*reginae* (reh-JYE-nee)  
*remotiflora* (ree-moh-tee-FLOR-a)  
*Renanthera* (ren-AN-ther-a)  
*Rhyncatlaelia* (rin-kat-LAY-lee-a)  
*Rhyncattleanthe* (rin-kat-lee-AN-thee)  
*Rhyncholaelia* (rink-oh-LAY-lee-a)  
*Rhynchostylis* (rink-oh-STYE-liss)  
*Rossioglossum* (ross-ee-oh-GLOSS-sum)  
*rothschildianum* (roths-child-EE-AY-num)  
*sanderianum* (san-der-ee-AY-num)  
*sargentianum* (sar-jent-ee-AY-num)  
*scabrilingue* (skab-rih-LIN-gwee)  
*schroederiae* (SHROH-der-ee)  
*schroederianum* (shroh-der-ee-AY-num)  
*Seidenanda* (sye-den-AN-da)  
*Seidenfadenia* (sye-den-fad-EN-ee-a)  
*serpentina* (ser-pen-tih-LING-yew-a)  
*sinense* (sin-EN-see)  
*smilliae* (SMILL-ee-eye)  
*Sobralia* (so-BRAL-ee-ah)  
*Sophranitis* (sof-RON-eye-tis)  
*Spatulata* (spat-yew-LAY-ta)  
*speciosum* (spee-see-OH-sum)  
*Specklinia* (spek-LIN-ee-a)  
*spectabilis* (spek-TAB-ih-liss)  
*splendida* (SPLEN-dee-dah)  
*Stanhopea* (stan-HOPE-a)  
*superbiens* (soo-PER-bee-enz)  
*taurinum* (taw-REE-num)  
*Telipogon* (tell-ih-POH-gon)  
*tetraspis* (teh-TRAS-pis)  
*Trichosalpinx* (trik-oh-SAL-pinks)  
*Trichocentrum* (Trik-oh-SEN-trum)  
*undulata* (un-dew-LAY-ta)  
*Vandachostylis* (van-da-koh-STYE-liss)  
*venosa* (vee-NOE-sah)  
*venustum* (vee-NOOS-tum)  
*vietnamica* (vee-et-NAM-ih-ka)  
*violacea* (vye-oh-LAY-see-a)  
*virginalis* (vir-gin-AY-lis)  
*volubile* (vol-YEW-bee-lee)  
*wenshanense* (wen-shan-EN-see)  
*Wilmottara* (will-MOTT-are-a)  
*wittigiana* (vit-tig-ee-AY-na)  
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## PRESIDENT'S MESSAGE

I HAVE EXPLAINED before how far in advance I need to write my President's Message to meet *Orchids* magazine's publication schedules. I am reminding you of this because I want to take you back to mid-February and my adventures at the Tokyo Dome Show (officially known as the Japan Grand Prix International Orchid and Flower Festival [JGP for short]) and the Taiwan International Orchid Show (TIOS). I will start by saying that I never thought that, within a two-week span, I would be on the same stage with Her Royal Highness, the Princess of Japan, and then be introduced to, and shake hands with, the president of Taiwan, Tsai Ing-wen!

Let me share my adventures at the Tokyo Dome Show in Tokyo, Japan. It is called the Tokyo Dome Show because the show is held on the infield of the Tokyo Giants baseball team's enclosed stadium. This year, in addition to orchids, the show was expanded to include other flowers and bonsai. The JGP lasts eight days during which you can sit in the stands and listen to lectures, hear a symphony orchestra play or view a fashion show. It is really an event.

Five days after I arrived home from Japan, I was on a plane for the TIOS, a 10-day event held in former greenhouses at the Orchid Plantation in Tainan, Taiwan. There are three halls for hobby growers and other show attendees to visit: the main exhibit hall, an individual plant entry hall and a separate hall for vendors selling all manner of orchid plants and orchid-related paraphernalia. In addition, exhibits line the walkway outside of those three halls. And, if you are a large wholesale buyer, there is another hall where you can see individual plants and purchase in bulk. It is all pretty amazing.

Although judging for the two events is similar, there are differences; both shows judge plants that are staged on "benches" by type and not in exhibits as we typically see in this country. Ribbon judging at the JGP consisted of 15 teams assigned to a specific plant group or exhibits to decide first, second and third place ribbons. A separate team that included international judges (Nancy Mountford, Clare Hermans and Liz Johnson) got to judge the exhibits for the first time. All of the blue ribbon plants (first place) were moved to a table where a group of judges (I was assigned to this team) decided if the plant deserved a medal. The medals parallel our HCC, AM and FCC, but in Japan they are called Bronze, Silver and Gold medals. One by one, we discussed and decided which plants would receive medals.



1  
RAMON DE LOS SANTOS



2  
NANCY MOUNTFORD



3  
SUSAN WEDEGAERTNER



4  
SUSAN WEDEGAERTNER

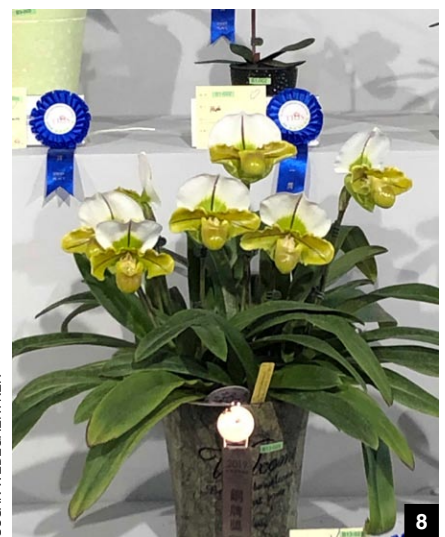


Flower descriptions are not written in Japan Orchid Growers Association (JOGA) judging although flower measurements are recorded. After we finished medal judging, the JOGA judges in the group decided which plant was to be the Grand Champion. This year's Grand Champion winner was *Paphiopedilum* Emerald Gate 'Green Globe' (Emerald Sea × Shun-Fa Golden). The winner received ¥2,000,000 (approximately US\$18,000) and a brand-new Mercedes Benz! The American Orchid Society also awards a trophy for the best specimen plant that shows the greatest skill in cultivation of Japanese native orchids. Our team of AOS judges gave this year's trophy to *Dendrobium moniliforme* 'Shutenno'. The Royal Horticultural Society and World Orchid Conference Trust also presented trophies to special plants.

For the TIOS judging, we were assigned to teams for ribbon judging as we had been in Japan. We looked over all of the plants in our categories and nominated plants for first-, second- and third-place ribbons. Depending upon the number of plants pulled, we voted up to three times and the plant with the most votes became the first-place winner, and so forth. Any ties were broken by the chair of our team. After ribbon judging, we then judged the 16 blue ribbon winners for the title of Grand Champion. We each were given a sheet of paper, listing 1–6; the entry number of the plant we liked best went in the first-place spot and so on.

Each spot on the sheet was weighted by a number (first place weighted higher than last place). Volunteers then added up all of the points assigned to determine the Grand Champion. This year, the title went to a magnificent specimen, *Rhynchostylis Chorchalood* 'Lai' (*gigantea* × *retusa*). After Grand Champion judging we broke into medal-judging teams. Unlike JGP judging, all plants entered were eligible for medals. Once again, all plants in the same category were looked over and nominated for a possible award. This continued until we completed with our assignment. Our team gave several Bronze and Silver medals and one Gold medal! As with the JOGA medal judging, no description (and, in addition, no measurements) were taken. Once medal judging had been completed, I gathered five AOS judges to decide which plant would get our AOS trophy. Our trophy is awarded to the best specimen plant in the show and we decided upon *Paphiopedilum* Wu's Giant Frog 'T.C. Wu #1' (Bruno × Kay Rinaman).

Each show judging was a delightful



judging-filled day. Although there was sometimes a language barrier, all worked out. I did find myself listening to the conversations just to see if I could understand something, which of course I could not. If you are interested in being amazed by both the sheer volume and very high orchid quality, you must see these two shows. I took lots of pictures but unfortunately, we do not have room in the magazine to show them all. I hope you like what I have selected to share.

Our next AOS Members' Meeting, October 16–20, 2019, will be held in Homestead, Florida, in conjunction with the East Everglades Orchid Society show. More details will be forthcoming as they are ironed out, but you can mark your calendars now. I hope you will plan to attend and see what fun we have even though all of the committees and trustees are working hard to make the AOS better for our members.

Until next time, happy growing!

— Susan Wedegaertner, President  
(email: susan@aos.org).

- [1] The Tokyo Dome Show gets its colloquial name from the baseball stadium in which it is housed.
- [2] Foreign dignitaries, left to right: Clare Hermans, MD, Chair of the Royal Horticultural Society's Orchid Committee, Susan Wedegaertner, President of the AOS and Liz Johnson, World Orchid Conference Trustee.
- [3] But a piece of one of the massive display that anchors the Taiwan show.
- [4] 2019 JGP Grand Champion winner, *Paphiopedilum* Emerald Gate 'Green Globe'.
- [5] 2019 JGP winner of the AOS trophy, *Dendrobium moniliforme* 'Shutenno'.
- [6] 2019 JGP winner of the RHS trophy, *Paphiopedilum wardii*.
- [7] 2019 TIOS Grand Champion winner, *Rhynchostylis Chorchalood* 'Lai'.
- [8] *Paphiopedilum* Wu's Giant Frog 'T.C. Wu #1', winner of the AOS trophy for the best specimen plant in the Taiwan International Orchid Show.

DEAR EDITOR:

I AM WRITING this response to comments made by Franco Pupulin in a review of *Orquideas, Tesoro de Colombia* in *Orchids* (2018), specifically in reference to the genus *Encyclia* that my wife, Claudia Elena Gutierrez, and I contributed based on the material of Pedro Ortiz Valdivieso. I would like to respond to the comment “a few perplexing things in the treatment” that Pupulin refers to. First, I would like to clarify that this series of books are compiled by Carlos Uribe Velez using the thousands of photographs taken by him and in honor of, and also based on the extensive 45 years of fieldwork by, Pedro Ortiz Valdivieso. Padre Ortiz, as his friends referred to him, had an extensive collection of sketches and pictures, which are used in the series of books.

There are a number of species of *Encyclia* that Padre Ortiz listed for Colombia that we have not yet found but that we feel should not be rejected. We should respect his information, which is based on years of fieldwork, as he was considered the leading authority on Colombian orchids. This is the case with *Encyclia belizensis*. The pictures in the book are from the archives of Padre Ortiz. Pupulin in his review of the second volume states, “I strongly suspect that the name of Colombian populations is misapplied, as it seems difficult to explain such a broad disjunction between the populations of northern Nicaragua and those of Colombia” (Pupulin, p. 880). This “broad disjunction” does not exist because the flora of San Andres and Providencia are part of the flora of Colombia and San Andres is 80 km from Nicaragua. Few orchids have been reported for the archipelago due to limited field research on the archipelago. *Myrmecophila brysiiana* is common on San Andres and Providencia and is reported for Nicaragua.

On Providencia, I have observed a species of *Encyclia*, which I have not been able to identify because it never seems to flower when I am there. This *Encyclia* could be the *E. belizensis* that Padre Ortiz photographed. I repeat that out of respect for Padre Ortiz and his knowledge we included many of his pictures and sketches of species that we have not yet verified as occurring in Colombia. A checklist of the genus *Encyclia* in Colombia is in preparation based on herbarium material and field studies.

In reference to the comment concerning *Encyclia macrochila* that “without a careful study of genetic and

morphological variation within and among the populations through the whole distribution range of the group, cannot resolve the taxonomy of *Encyclia cordigera*” (Pupulin 2018, p. 880) is ignoring the fact that plants from Mexico, Guatemala, Venezuela and Colombia of both *E. macrochila* and *E. cordigera* were selfed numerous times during a period of over 50 years and the resulting progeny from each country were compared and were always consistent with the type description of each. Although flower color in this case is important, what is most important is the actual genetics of the plant resulting from selfing and observing the results of hybridizing. These results unequivocally demonstrate that these are two genetically distinct species.

In the paper recognizing *Encyclia macrochila* as distinct from *E. cordigera*, Sauleda and Esperon (2017) state:

“Both *E. cordigera* and *E. macrochila* range from Mexico through Central America and much of northern South America. There appear to be within the populations of both species’ ecotypes or forms that exhibit gradual phenotypic and/or genetic differences over their geographical area possibly as a result of environmental heterogeneity. The populations of both species exhibit a behavior typical of a clinal distribution, which results from the change of allele frequencies within the gene pool of each species. However, the differences are not sufficient to classify individuals from the extreme ends of each population as distinct species since intermediates exist within each species throughout the range. In addition, there is no evidence of gene flow between the two species.”

Selfings of both *E. cordigera* and *E. macrochila* always result in progeny consistently similar to the parent. The progeny of *E. macrochila* always has a white labellum with a purple spot or purple veins on the disc. The labellum of selfings of *E. cordigera* always ranges from light purple to reddish-purple depending on the color form that was selfed. In addition, results of hybrids made with *E. macrochila* are distinctly different to hybrids made with *E. cordigera* demonstrating the genetic difference between *E. cordigera* and *E. macrochila*.

Hooker in the original description states, “lip is pure white having a red purple spot at the base.” His description

and plate leave no doubt what species he intended to describe. No mention is made of a light purple to reddish-purple lip in the species he was describing.

Selfing is an excellent tool for determining the true genetics of a plant. This tool has been used for *Encyclia tampensis* (Sauleda, 2017) and *Encyclia phoenicea* (Sauleda and Esperon, 2018). The difficulty in using selfing as a taxonomic tool is the time involved to gather results.

In addition, it is interesting that Juan Sebastian Moreno and Franco Pupulin in the series *Species Orchidacearum, Icones Colombianae 2*, illustrate in an icon *E. cordigera* with a typical *E. macrochila* flower and plant. They describe the flowers as: “showy and fragrant flowers with sepals curved at the apex, a deeply 3-lobed, white and variously striped with purple lip, and the subterete column without wings.”

Their statement in the next paragraph is also interesting: “The most similar species is probably *E. macrochila* (Hook.) Neumann from Central America, with which it has long been considered conspecific. In *E. macrochila* the petals lack the characteristic purplish coloration, and the magenta striping on the lip is reduced to a few stripes in front to the callus.”

This is confusing. They state that the most similar species is probably *E. macrochila* from Central America and in the next sentence go on to state the difference between *E. macrochila* and *E. cordigera* never stating that it is also found in South America! — *Ruben P. Sauleda and Claudia Elena Gutierrez* (email: [rpsauleda@gmail.com](mailto:rpsauleda@gmail.com)).

#### References

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— *Ruben P. Sauleda and Claudia Elena Gutierrez*, 22585 S.W. 187 Ave., Miami, FL 33170 (email: [rpsauleda@gmail.com](mailto:rpsauleda@gmail.com)).



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# May: The Month of the Gyrلز Getaway

Text and photograph by Thomas Miranda

LIVING IN THE heart of orchid country on Hawaii's Big Island, the tasks involved in growing orchids are pretty simple. It basically comes down to finding the right place on your property (light levels, airflow, substrate, etc.). Here, it is the month of May pretty much year round. Just like us Hawaiians, you can enjoy the luxury of letting Mother Nature grow your plants outside this month with the same minimal care. Many of you know I have a pair of cockatoos (Celia and Manga, aka the Gyrلز) that have been part of my family for over a decade. They love being outside in the fresh, airy conditions of my tropical garden as much as the orchids do. Trouble is, they are unbelievably loud, especially at dawn when they wake up with the sun, an ability that allows them in their natural habitat, to communicate with other cockatoos over great distances.



Thomas Miranda

Imagine my contentment when yesterday, they seemed to be shrieking much more softly, allowing me to stay under the covers a bit longer than usual. That contentment was short-

lived, as I went outside to find them gone from their enclosures. Manga, who can fly, was about 50 feet (15.25 m) up in an ohia tree (*Metrosideros polymorpha*), and Celia (who has forgotten she can fly) was nowhere to be found, quite lost, trudging around in the undergrowth. After calling them for a few minutes, Manga flew down and delighted me by landing directly on my shoulder. Celia heard me and started screeching from what seemed a huge distance, but her innate vocal prowess made her, thankfully, much easier to track down and retrieve.

My point is that, adaptations, even annoying ones, have very good reasons for having evolved. Even if we cannot fully understand why our orchids look and grow the way they do, mysterious, vexing features such as short-lived flowers on sobralias, sharp thorns on lycaste pseudobulbs and disturbing odors generated by our bulbophyllums all have excellent explanations for existing, if only we could hear them as clearly as a cockatoo's call.

SPRING IS SCREAMING AT YOU All observant growers in the Northern



The author with the Gyrلز.

Hemisphere are seeing major activity in their collections this month. While many orchids, particularly phalaenopsis, cymbidiums, lycastes and deciduous dendrobiums are still holding glorious blooms from last winter, virtually every type of orchid is making new growths around now. If you have been waiting to repot and fertilize until your plants are in active growth that time has come! Go for it. Your plants are shrieking like hungry cockatoos.

FRESH AIR AND SUNSHINE I always used to feel rather guilty keeping the Gyrلز indoors over the winter when I lived in Virginia. No matter how much loving attention I gave them, I knew they were bored and frustrated looking out at the snowy landscape from a picture window. Orchids on windowsills and under lights must feel similarly in the winter, so when the opportunity arises to keep them outside in superb conditions arises, as it does in so many places this time of year, we should take advantage of this climatic excellence. Clear an area in the yard with dappled light and a good natural breeze for your epiphytic plants and let them

revel in the spring weather as my gyrلز do.

WHAT IS ONE MORE? While I would not dream of getting another cockatoo at this point (my current pair will outlive me by decades), I get a new orchid plant practically every day. There always seems to be room for another in a tropical garden. May is probably the best month to invest in new plants and share divisions of your specimen plants with friends as they tend to reestablish well and recover from any traumas in the perfect weather. Indeed, now that you are getting more proficient with your growing and learning about all the orchidaceous horticultural marvels that are out there, this is the time to diversify and try some awesome new species and hybrids from your local growers, or of course, you can always mail order them from Hawaii.

GOING NATIVE No matter where you live, there are probably some pretty fantastic wild orchids growing nearby (Antarctica excepted). A little research, online or otherwise, will often yield some prime locations to view these natural wonders in a park or natural area near



your home. For those of us in temperate climates, perhaps you have even planted cold-hardy terrestrial orchids such as cypripediums, calanthes, bletillas, or dactylorhizas in your gardens. Such orchids regularly appear in bulb and perennial catalogs now. Many, especially bletillas, are quite easy garden subjects, while many of the others are truly challenging to grow. Before you invest in some pricey new plant, do your research and make sure you can supply the correct cultural conditions for them, and of course, NEVER take an orchid plant from the wild. The Native Orchid Conference (<http://www.nativeorchidconference.org>) will meet in the Bruce Peninsula this June for some incredible field trips. It is a great way to learn about native orchids of North America and meet some really cool, like-minded orchid nutz. The Gyrz would approve of you going.

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

## Too hot in the summer greenhouse?

Stick one side of Velcro disks a foot apart onto the outside of the west side of the greenhouse to fit the shape of the foil-covered, bubble-wrap-type batts like the material used as jackets for hot water heaters. It can be purchased in rolls. The foil will reflect the hot west sun and the bubble wrap will help insulate against the heat. It may also be used to insulate the north side of the greenhouse on the inside to keep heat in and reflect the light back into the greenhouse. — *Jean Allen-Ikeson (email: [jean.ikeson@gmail.com](mailto:jean.ikeson@gmail.com)).*

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*leopoldii; luteola; schilleriana; violacea; walkeriana. Cycnoches: barthiorum; cooperi.*

*Dendrobium: atrovioleaceum; johnsoniae; laevifolium; purpureum; spectabile. Encyclia.*

*Oncidium: papilio; papilio v. alba; kramerianum. MANY MORE!*

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## FOR BEGINNERS

# Navagating the Sea of Information on the AOS Website

By Eileen M. Hector

A Multipart Series — Helping You Stay Afloat

**PESTS AND DISEASES** We often send out an SOS when dealing with orchid pests and diseases. SOS is the international Morse Code distress signal. Not only are our orchids stressed when they are bothered by pests and diseases but so are we, the humble orchid growers. Who knew when we started growing orchids that they too could be under the weather?

Under ALL ABOUT ORCHIDS (<http://www.aos.org/orchids.aspx>) there is a drop-down menu titled Pests and Diseases. This section identifies many of the conditions that can distress our plants. If you are concerned about your plant, there is information here that will help you identify what may be troubling your orchid. It can be confusing to discern if what you are seeing wrong with your plant is bacterial, fungal, viral or another problem. Here you

will find illustrations to help you sort it all out. Besides offering photo examples of ailments from A to Z, there are also tips on prevention and treatment of common disorders affecting our plants. All the pesky impediments to a healthy orchid collection include those little buggers that like to feed on our orchids. This section helps you identify a whole host of insect pests too.

After you have completed the section on Pests and Diseases you will know whether to put your plant in sickbay or throw it overboard. You will not have to walk the plank when you learn how to raise healthy, pest and disease free orchids.

— *Eileen Hector is an AOS Marketing and Membership Committee volunteer and a proofreader of Orchids Magazine (email: [em.hector@verizon.net](mailto:em.hector@verizon.net)).*

**Note:** The opinions and recommendations that may appear in this publication regarding the selection and use of specific plant-care products, including but not limited to pesticides, fungicides and herbicides, are those of the individual authors, and not those of the American Orchid Society, which neither adopts nor endorses such opinions and recommendations and disclaims all responsibility for them. When selecting and using such products, readers should seek and obtain the advice of the manufacturer and of responsible government agencies.

## SCALE INSECTS



### QUESTION

Last year in June I bought a *Guarechea* Black Comet (*Guarianthe bowringiana* × *Prosthechea cochleata*). Since then it has been growing on my windowsill in the living room. It has produced two new growths and looks relatively happy, although they are less vigorous than I think they could. The only matter is the white spots on the leaves and the pseudobulbs. My impression is that it is a salt deposit or calcium secretion. These are not mealybugs. I use a balanced fertilizer based on the MSU formula (Rainmix from Akerne Orchids in Belgium) and use rainwater as a basis. I have used tap water in the first few months (which is quite hard), but the white spotting started after that. Do you know what this could be? Is it harmful? How best to remove it? Any other care tips? I hope you can help with this. Many thanks in advance! — *Jean Pierre Viergever, Amsterdam, The Netherlands.*

### ANSWER

Jean Pierre, these white spots are actually scale insects. The large round ones are females and the males are little rods that look a lot like cotton if there are large numbers of them. At this point, the infestation isn't bad. You can remove the visible ones using rubbing alcohol and a cotton swab and keep the infestation under control but getting rid of them will require pesticides - preferably systemics. The plant likely had them on the roots when you acquired it.

For a more detailed discussion of the subject, see <http://www.aos.org/orchids/orchid-pests-diseases/scale.aspx> and for a discussion of their management see <http://www.aos.org/orchids/webinars/member-only/orchids-pest-management.aspx>

## VIRUS?



### QUESTION

Have you experienced this disease which has appeared on many of my phalaenopsis plants lately. I was told it was a form of virus from Thailand. I was careful about all growing conditions so I do not think that is the problem. Thanks. — *Frank Guida*

### ANSWER

Unfortunately, in may indeed be due to a virus. This phalaenopsis exhibits classic symptoms of Phalaenopsis Chlorotic Spot Virus (where it originated is debatable). The plants sometimes come in from Taiwan infected with it (not all imported plants as some people argue) and may not exhibit symptoms for some time and, in some cases, never exhibit visible symptoms.

There are other causes of damage that can look like this:

— Broad mites (also called phalaenopsis mites). Mite damage typically shows up on the mature leaves beginning with the oldest first and new leaves look just fine until they reach maturity and the mites then infest that leaf. Mite damage also does not usually just suddenly appear. If you believe it is broad mites, spray with a miticide (labeled for the Tarsonemid mite family) at the first sign of chlorotic spotting.

— Cold water damage. This is usually identifiable because it follows very quickly after an environmental change that exposes the plants to cold water on the foliage — most often the move of plants out in the spring.

— Infection by a microfungus. This is very difficult to cure. Spray first with Banrot plus Aliette, then Cleary's plus Subdue, then Banrot plus Subdue. These sprays / drenches should be seven days apart in

summer and 10 to 14 days apart in winter, all at label strength. The combination of fungicides appears to result in a synergistic effect. Follow all label instructions and wear protective equipment.

The only way to tell for sure is to have one or more of the plants tested for virus, especially viruses in the potyvirus family.

## BUSH SNAILS

### QUESTION

We at Niagara Frontier Orchid Society in Buffalo, New York are struggling with small snails in the medium of the collection at the Buffalo Botanical Gardens. We are interested in any comments and tips you might have to combat these tiny snails doing damage to the roots of the orchids. Thanks in advance. — *Donna Lipowicz, NFOS President.*

### ANSWER

Donna, these are so-called bush snails and they are very difficult to control. Little entices them to leave the potting medium so baits, either metaldehyde or iron-based products placed on the surface do little. They can be killed by drenches of a liquid metaldehyde product such as Deadline and, I have heard, peroxide drenches although I have not tested that assertion.

That all said, it turns out that they are attracted to the yellow sticky cards that are sold to trap flying insects (yellow cards specifically so not the white or blue ones). You take the sticky card, cut them up into about label-size strips and insert the card in the potting medium. Depending on the severity of the infestation, you take the cards out periodically and replace with a new card. The bush snails are attracted to that yellow card and get stuck, just like flying insects.

None of this addresses the eggs so you have to keep at it until the population drops off as eggs hatch and are scavenged but eventually, it does get the population under control.

## ROOTLESS DIVISIONS

### QUESTION

I recently purchased a few orchids for the first time from a person; not a store. He had a huge number of overgrown cattleyas in his backyard in Florida, and I was not sure what to expect. Among them, he sold me two cuttings from plants. I admit I should have paid a little more attention, but once I got home I realized that one of the cuttings had only two pseudobulbs and very little in the way of roots. I tried potting it, but both flowers fell off within a few days and it looked unhappy. I have done a



bit of research online, and was wondering what your suggestions would be to rescue it. — Jackie Dougherty.

ANSWER

The best thing to do with this at this point is to put a bit of bark medium in the bottom of a pot (an inch [couple of centimeters] or so), set the plant on the bark daily (the idea is a bit of moisture and not wet the bark) and just wait until the new eye breaks and roots start. It appears to be a healthy divisions (although I hate two pseudobulb rootless pieces) and it will eventually sprout a new growth. Ideally you shouldn't purchase a division of less than three pseudobulbs (not counting the immature growth) and some good roots simply because of the time it takes to re-establish smaller divisions and the skill it takes. Do not expect those flowers to last long at all because of the lack of roots.

You could actually set the division directly in an empty clay pot and mist the

clay pot and it will work as well.

I like these methods better than suspending the plant as you have because there's so little air movement around the rhizome it may rot.

### LIGHT METERS

QUESTION

I have a twofold question: is the common three-way light meter accurate for light? If so, my plants get 1,000 foot candles 3 inches (7.5 cm) under the small LED bulbs I have in two floor lamps, but 6 inches (15 cm) down, it reads only 200 foot candles. I live in a one-bedroom apartment and cannot have overhead fluorescent fixtures. Are there better bulbs that can be screwed into a floor lamp with about 6 inches (15 cm) of space in the fixture? Can I grow cattleyas with this setup? Mine look pretty good so far, but not sure I will get any blooms. — Lynn Meyer.

ANSWER

Light intensity drops off with the square of the distance so the measurements you have taken are behaving normally. If you measure the intensity at 3 inches (7.5 cm) at 1,000 footcandles and you double the distance from the light source to the meter, you would expect to get  $\frac{1}{4}$  the intensity or 250 footcandles. The minor discrepancy you see is more than likely nothing more than a minor error in measuring the two distances. This illustrates why it is important to keep plants close to the light source.

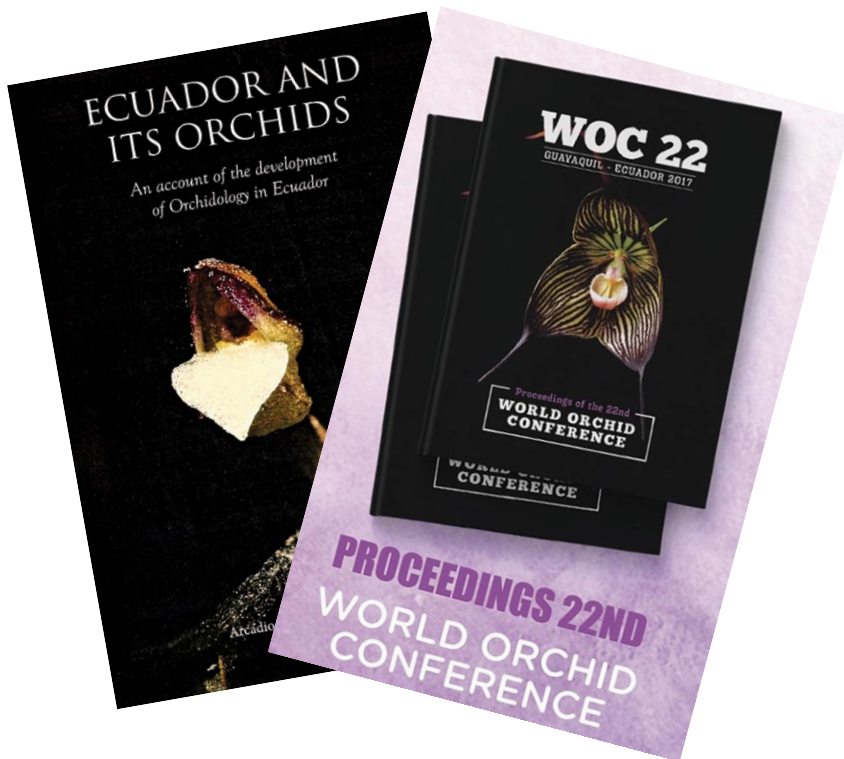
A floor lamp is not going to give you much usefully illuminated growing space even for phalaenopsis and a tabletop light garden with a linear LED lamp might be a better investment.

These questions were part of a recent monthly webinar Q&A. To view recorded Greenhouse Chats (Q&A webinars) or register for a future one, see <http://www.aos.org/orchids/webinars.aspx>. Send questions to [greenhousechat@aos.org](mailto:greenhousechat@aos.org) — Ron McHatton, AOS Chief Education and Science Officer.

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Sylvia Strigari

*Pleurothallis pfavi* 2011





*Specklinia pfavii*

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

Tribe Epidendreae  
 Sutribe Pleurothallidinae  
 Genus *Specklinia* Lindley

***Specklinia pfavii*** (Rchb.f.) Pupulin and Karremans, *Phytotaxa* 63: 8. 2012. Basionym: *Pleurothallis pfavii* Reichenbach (1886:555). TYPE: [Costa Rica or Panama]. Chiriquí, *R. Pfau. s.n.* (holotype, W).

Synonyms: *Masdevallia platyrachis* Rolfe, *Gard. Chron.* 4(86):178–179. 1888. *Pleurothallis platyrachis* (Rolfe) Rolfe *J. Bot.* 28:136. 1890, *comb. inval.* *Pleurothallis platyrachis* (Rolfe) Rolfe ex Hooker f. *Curtis's Bot. Mag.* 116: sub pl. 7129. 1890. *Kraenzlinella platyrachis* (Rolfe) Rolfe *Orchid Rev.* 23:326. 1915. TYPE: Costa Rica: "The plant was imported from Costa Rica by Mr. Shuttleworth, and sent to Kew in 1884, in which year a scape was produced. It has now become fully established and is bearing several scapes, the first flower having recently expanded", *E. Shuttleworth s.n.* (holotype, K).

Epiphytic, caespitose, erect *herb* to 17 cm tall. *Roots* flexuous, glabrous, to 1.5 cm in diameter. *Stem* abbreviated, terete, slender, to 1.5 cm long, monophyllous, covered by two glumaceous, imbricating, slightly loose, ancipitous, acute sheaths to 1.8 cm long, becoming dry-papyraceous with age. *Leaf* elliptic, obtuse, minutely retuse, 10.7–14.2 × 2.4–3.0 cm, the midvein protruding abaxially into a small apicule, gradually tapering toward the base into a deeply conduplicate-rounded petiole with ancipitous margins, subcoriaceous. *Inflorescence* produced laterally from the apex of the stem, without an annulus, an erect-subarched, congested, successively flowered, distichous raceme to 35 cm long; the rachis strongly fractiflex, producing up to 30 flowers; peduncle flattened, ancipitous, to 28 cm long, with 3–4 distant, tubular-amplexent, apically subuncinate, acute bracts, 6–7 mm long. *Floral bracts* infundibuliform, subuncinate laterally, ovate, abaxially ancipitous, subacuminate, 7×6 mm. *Pedicel* cylindrical, glabrous, to 12 mm long, persistent. *Ovary* subclavate, subtrigonous, to 5 mm long, green. *Flowers* with bright yellow sepals and lip, lip with longitudinal orange stripes, petals dark

red, column yellow. *Sepals* fleshy, densely papillose on the inner surface except on the basal third where they are hyaline, margins revolute, strongly keeled abaxially along the veins; *dorsal sepal* lanceolate, triveined, acute, the base hyaline, flushed with yellow along the veins, the distal two-thirds densely papillose, 24 × 8 mm; *lateral sepals* narrowly elliptic-subfalcate, triveined, 23.0 × 3.5 mm, connate at the base for about 3 mm into a deeply concave mentum, membranaceous-hyaline at the base, then densely papillose, margins slightly revolute. *Petals* small, ligulate-subfalcate, rounded, porrect, univeined, 12 × 3 mm, with a rounded keel abaxially along the vein, the apex thickened, minutely papillose inside, the labellar margin provided with low papillae in the basal half. *Lip* small, strongly arched-convex in natural position, lanceolate, articulate with the apex of the column foot by a hyaline claw, triveined, subtrullate when expanded, obtuse to subacute, with a small, rounded apicule, the distal half provided with two thin, high keels converging toward the apex but not reaching it, the clawed base thickened, subquadrate; entire lip 18 × 8 mm. *Column* arched, semiterete, provided with a foot, 6–7 mm long without the foot, with two broad, thin, membranaceous, rounded wings in the middle portion, the apex rounded, deeply cucullate, the clinandrium shallow, entire; column foot forward-projecting, stout, fleshy, 4 mm long. *Anther cap* deeply cucullate, ovate, strongly keeled in the middle, bilocular. *Pollinia* two, obovate-complanate, hooked at the attenuate base, lacking caudicles. *Fruit* not seen.

In 1886 Reichenbach described this species as *Pleurothallis pfavii* based on a living plant he received from the Swiss Rudolf Richard Pfau (1856–1897), who collected it in Chiriquí (Reichenbach 1886). The exact locality of the original collection remains unknown, and the region of Chiriquí (currently in Panama) was at the time shared by Panama and Costa Rica. Pfau mostly collected in Costa Rica, where he eventually owned a nursery in San José (Pupulin et al. 2012).

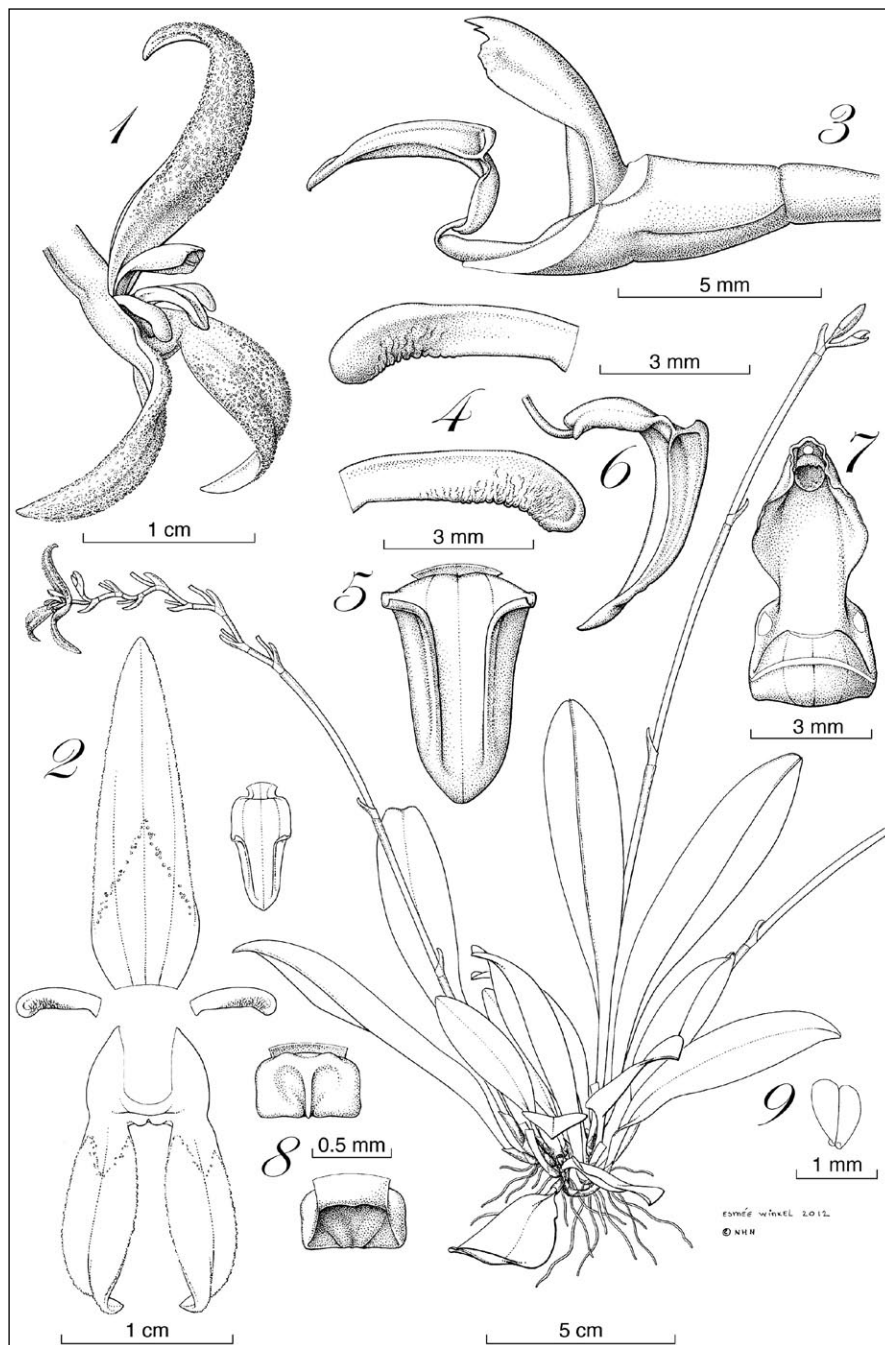
As stated by Rudolf Jenny (2014), there is little information available about the life

of Richard Pfau. Matthäus Pfau (1820–1877) was a merchant, officer, banker and politician. He was one of the founders of the precursor of the bank that became 150 years later the largest bank in Switzerland. Richard was the youngest of the three sons of Matthäus Pfau, born in 1856. The elder brothers were Jakob Pfau (born in 1846) who became an architect and later, professor in Switzerland, and Eduard (born in 1851) who became a merchant in Italy (Jenny 2014).

The date, when Richard Pfau left Europe for Costa Rica the first time is unknown, but it probably was around the year 1880 (Jenny 2014). Some of his articles published in the *Gardeners' Chronicle* between 1883 and 1884 provide insights or evidence that he already had been temporarily in Costa Rica, but at that time he also cultivated orchids and lived in Chiswick, England. While living in England, Richard Pfau made several trips to Costa Rica, and sometime around 1885 he settled in San José, the Costa Rican capital (Jenny 2014). Richard Pfau founded the first commercial orchid nursery in Costa Rica in San José and published a catalogue of orchids he had for sale and export (Pupulin et al. 2013a, Jenny 2014). He sent plants to Europe and sold them like other collectors through Eduard Ortgies from the Botanical Garden in Zurich. Although Richard Pfau mainly collected in Costa Rica, it is probable that he also collected in Colombia, Panama and Mexico. Richard Pfau died at the age of 41 on March 14, 1897 (Jenny 2014).

A few orchids have been named after him; all those species written as "pfavii" and not as "pfavii." The reason for this is most probably because in the Latin alphabet the letter U is written as V (Jenny 2014). *Trichocentrum pfavii* was described by Reichenbach in the *Gardeners' Chronicle* in 1881 based on material collected in 1880 by Pfau in Chiriquí; probably in Costa Rica at the time. *Telipogon pfavii* was described by Schlechter in *Repertorium Specierum Novarum Regni Vegetabilis* in 1921 — almost 25 years after Pfau's death — based on material also collected by Pfau in Costa Rica.

*Specklinia pfavii* is endemic to the lowlands of southern Costa Rica and



Reichenbach, H. G. 1886. Orchideae describuntur. *Flora* 69: 47–562.

*Specklinia pfavii*. The plant.

1. Flower.
2. Dissected perianth.
3. Column and lip, lateral view.
4. Petals.
5. Lip, ventral view.
6. Lip, lateral view.
7. Column, ventral view.
8. Anther cap (dorsal and ventral views).
9. Pollinia.

Drawn from Karremans 4825 (L-spirit) by Esmée Winkel.

western Panama, on the Pacific slope of the Talamanca-Chiriqui range at around 500 m elevation (Pupulin et al. 2012). According to the protologue, *Pleurothallis pfavii* has a combination of features that makes it unmistakable: falcate, obtuse petals provided with a thickened external margin and acute lip (Reichenbach 1886). The combination of bright yellow flowers with red petals, the acute yellow lip with a central red line, and the rounded, not apiculate petals, distinguish *Spe. pfavii* from other members of the *Specklinia endotrachys* complex.

The *Specklinia endotrachys* complex comprises six species, mostly found from

Costa Rica and Panama, but ranging north to southern Mexico and to Colombia and Venezuela in South America. Two of these species were described by Reichenbach, *Spe. pfavii* and *Spe. endotrachys*. A third species, *Specklinia spectabilis* was described by Ames and Schweinfurt. More recently, Archila (2012) added *Empusella judii* from Guatemala [= *Specklinia judii* (Archila) Pupulin and Karremans], while Pupulin and Karremans proposed *Specklinia remotiflora* from Costa Rica, and Karremans and colleagues described *Specklinia dunstervillei* from Central and South America in 2015a. Although the six species that Pupulin and Karremans referred to as “empusellous” *Specklinia* are quite similar among them, they are relatively easily recognized. We already discussed the morphological characters distinguishing *Spe. pfavii*, which is also the only species in the group with yellow flowers, instead of orange-red. *Specklinia remotiflora* has a distinct repent habit, very large leaves and lax inflorescence; the flowers do not spread widely and remain subperrect. *Specklinia endotrachys* has floral bracts as long as the pedicel with straight lateral sepals, while *Spe. spectabilis* has shorter floral bracts with the lateral sepals prominently twisted toward the apex (Pupulin et al. 2013b). *Specklinia judii* has patent flowers with acute, simple petals and an oblong-triangular lip, while *Spe. dunstervillei* is distinguished by its small habit with short leaves and small flowers, provided with obtuse petals that are shortly apiculate. The species of this complex are pollinated by fruit flies that are deceptively attracted by aggregation pheromones released from the sepals (Karremans et al. 2015b).

*Specklinia pfavii* is known in Costa Rica and Panama from a few, scattered populations composed of several adult individuals. Unfortunately, some of these populations are restricted to small remnant patches of woods along streams, and their survival is severely threatened by the expansion of neighboring villages.

This strikingly beautiful species can be grown potted in a mix of thin chips of coconut fiber, charcoal and sphagnum moss, with high humidity levels but well drained, as well as on large slabs of wood, where the plants have to be watered frequently. Warm temperatures and ample air circulation are important to keep specimens healthy.

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#### Selected Botanical Terms

abaxial – lower surface  
acute – pointed  
adaxial – upper surface  
amplectant – clasping  
ancipitous – flattened and having two edges  
annulus – ring-shaped structure or region  
apex – tip or top  
apicule – small point  
articulate – hinged  
attenuate – reduced in thickness  
bilocular – two-chambered  
caespitose – clumped  
caudicle – slender, elastic structure to which the pollen masses are attached  
claw – slender connection  
clinandrium – cavity on the column in which the anther is located  
column foot – extension at the base of the column in some orchids  
complanate – in one plane  
concave – bowl-shaped  
conduplicate – folded lengthwise  
congested – closely spaced  
connate – fused to form a single part  
convex – curved like the exterior of a circle or sphere

coriaceous – leathery  
cucullate – hooded  
distichous – arranged alternately in two opposite rows  
elliptic – oval  
epiphyte – a plant that grows on another plant for support  
flexuous – flexible, full of bends and curves  
fractiflex – zigzagged  
glabrous – smooth  
glumaceous – chaffy  
hyaline – glassy, translucent appearance  
imbricate – having adjacent edges overlapping as in scales  
infundibuliform – funnel-shaped  
ligulate – strap-shaped  
membranaceous – thin, pliable  
mentum – chinlike spur  
monophyllous – having one leaf  
obtuse – blunt or rounded  
ovate – egg-shaped with the narrow end up  
papillae – small fleshy projection  
papillose – covered in small fleshy projections  
papyraceous – papery  
pedicel – a stem carrying a single flower  
peduncle – the lower part of the inflores-

cence below the first bud  
petiole - the stalk joining a leaf to a stem or pseudobulb  
porrect – projecting, extended forward  
raceme – flowers arranged along a central stem  
rachis – the part of the inflorescence carrying the flowers  
retuse – apex rounded with a slight notch  
revolute – curved or curled back  
subacuminate – somewhat tapered to a point  
subclavate – somewhat club-shaped  
subcoriaceous – somewhat leathery  
subfalcate – somewhat sickle-shaped  
subquadrate – more or less four-angled  
subtrigonus – more or less triangular in cross-section  
subtrullate – somewhat trowel-shaped  
subuncinate – somewhat hooked  
terete – pencil-like  
univeined – having a single vein

# A Beginner's Guide to Vegetative

VEGETATIVE PROPAGATION IS a form of asexual reproduction, meaning there is only one parent plant involved. The new plants are identical in genetic makeup to the parent plant.

**DIVIDING AN ORCHID AND CULTIVATING BACK BULBS** Only orchids with a sympodial growth habit can easily be divided (monopodial orchids such as vandas can be propagated by top cuttings but often the lower portion of the plant does not produce new growing points). Sympodial orchids have a rhizome lying horizontally near the surface of the growing medium. New growth shoots are produced from nodes on this rhizome.



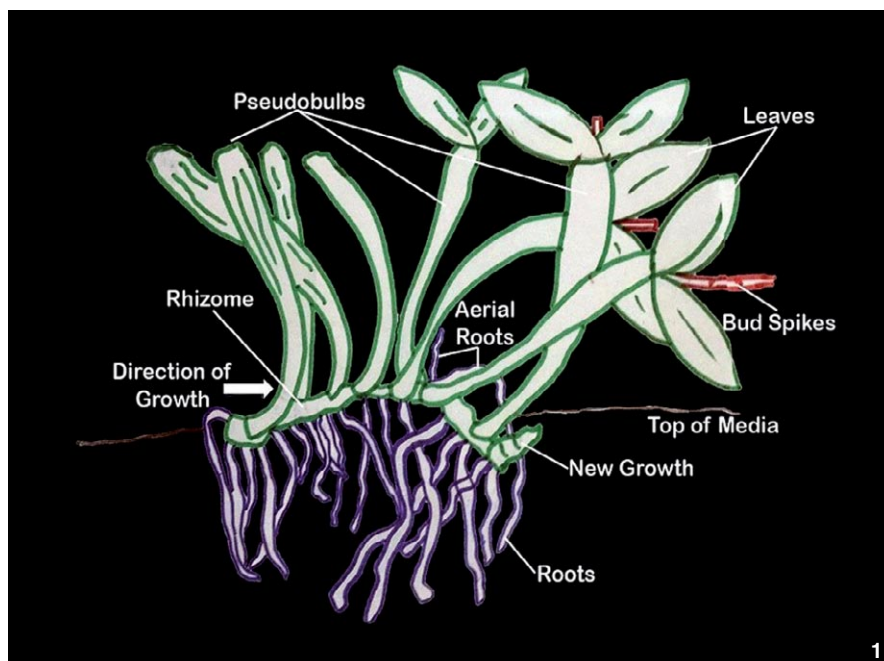
Barbara Schmidt

Sympodial orchids can grow in one of two ways: linear or round. Usually only one new shoot appears each growing season with a linear sympodial growth style. One end of the rhizome is the actively growing end, and the other end of the rhizome is old growth. Cattleya orchids are an example of a linear growth habit, although many cattleyas often produce two leads off a single pseudobulb with good culture.

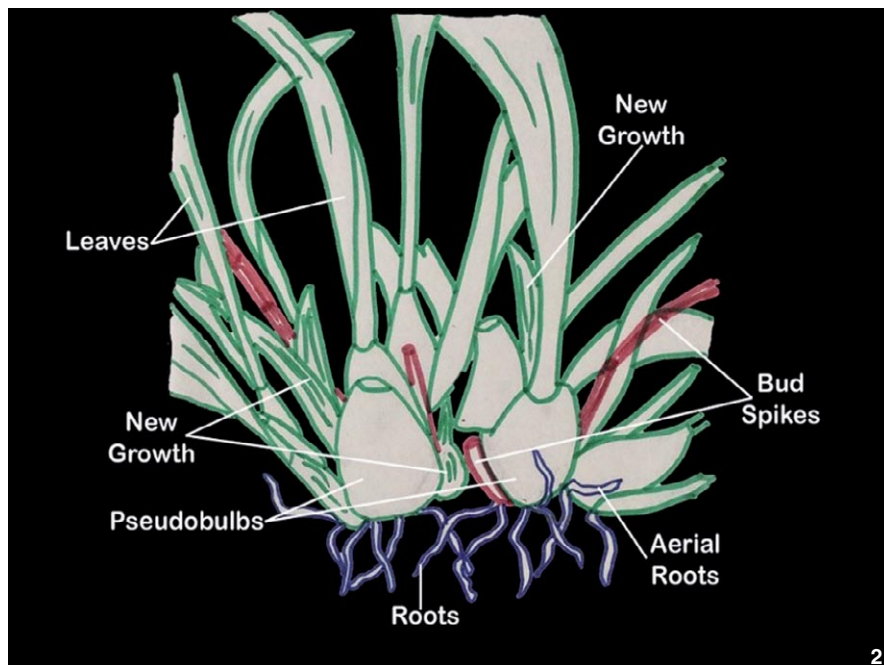
Sympodial orchids can also grow in a round style. With a round, sympodial growth habit, multiple shoots can appear each growth season, and the growth can occur from any side. In this case, the old growth is usually near the center of the plant and the plant grows outward. Oncidiums can be an example of a round growth style, as are most cymbidiums.

It is important to understand what type of sympodial growth habit your orchid has before you begin dividing it. It is also important to remember that the orchid's pseudobulbs are used to store water and nutrients for the plant. The more pseudobulbs with live roots an orchid has, the more water and nutrients it can store. This means a healthier plant, more blooms, bigger blooms and longer bloom life.

The two main reasons for dividing an orchid are to propagate the cultivar or because the plant has grown too



BARBARA SCHMIDT



BARBARA SCHMIDT

large. Dividing an orchid will stress the plant as it will lose some of its storage capacity. Never divide a small plant. The plant should have at least eight healthy pseudobulbs before dividing, so that four or five pseudobulbs can be kept with each division, with three as a minimum.

Dividing an orchid with a linear

- [1] A diagram of linear sympodial growth in a cattleya orchid. Notice how the plant grows in one direction.
- [2] A diagram of round sympodial growth in an oncidium. Notice how several new growths appear around the plant and the orchid grows outward.



# Propagation in Orchids

growth habit presents a unique problem. Typically, these orchids have active growth on one end and older growth on the other end. When dividing, you will have one new plant that consists of the new growth end and the other division(s) will have old growth. You need to make sure that any old growth divisions have healthy pseudobulbs, roots and dormant nodes on the rhizome that can begin to grow. It is important to find these nodes before you cut the rhizome. Look for small, green bumps near the base of the pseudobulbs. Make sure each old-growth division has one of these bumps. The stress of cutting the rhizome apart will usually encourage this dormant node to begin to grow. Some people make a cut halfway through the rhizome some time before dividing to encourage new growth on backbulbs, and finish the cut when new growth has started.

Another way to encourage certain orchid genera, such as cymbidiums, to produce a new plant is to sprout the backbulbs. A backbulb is a pseudobulb that has lost its leaves, but is still alive (i.e., not dried up). These backbulbs can be cut off the parent plant and grown in moist sphagnum moss or orchid potting medium. Dormant nodes, or “eyes,” on the backbulb may begin to produce leaves and eventually roots.

**STEPS IN DIVIDING AN ORCHID** It is best to divide an orchid after it has finished blooming and just as new growth commences. Dividing an orchid while it is blooming can stress the plant or the blooms.

Orchids that need to be divided are usually pot-bound; that is, the root system has become dense and tangled and often adheres to the side of the pot. Therefore, it is important to soak the plant in a bucket of water for 10 minutes or so to soften the roots and help loosen the grip that the orchid roots have on the inside of the pot. Remove the plant from the water and use a flat tool, such as a kitchen knife or cake knife, to detach the roots from inside of the pot. Put the knife down the inside of the pot and slide it around the entire inside circumference of the pot, or if necessary, break or cut away the pot.



TERRY BOTTOM

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- [3] This linear-growing cattleya can be divided as indicated by the shears. The portion to the left is the front lead portion and that to the right is the old-growth portion.
- [4] This small green bump on the rhizome of a *Cattlianthe* Loog Tone is a dormant node. The division should be made so that this node is with the older growth end of the rhizome.
- [5] Leafless cymbidium backbulb with a healthy new lead and roots.
- [6] These healthy leafless oncidium backbulbs were cleaned and placed in potting mix. Look closely at all the new growths sprouting.



Grab the crown of the plant and gently pull it from the pot. This may not be as easy as it sounds if the roots are still attached to the pot. You will break roots, but if the plant is healthy and large enough, it will recover. Sometimes pressing on the side of a plastic pot or even kneeling on it will loosen the plant.

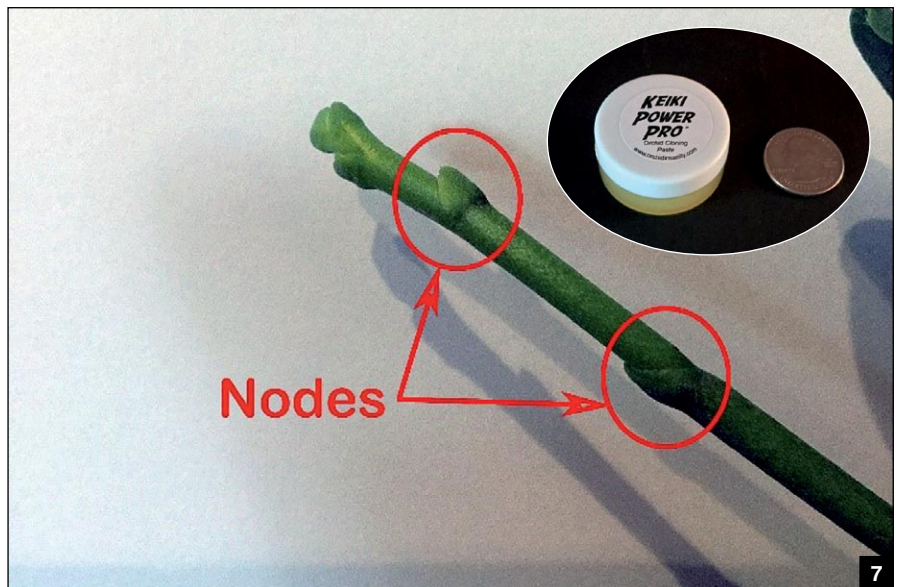
Lay the plant on a table and remove any remaining medium from the roots. Inspect the plant and remove any dead or decaying roots or dead, dried pseudobulbs. Decide where you will cut the pseudobulbs apart. Make sure you keep four or five healthy pseudobulbs with each division and have at least one dormant node on the rhizome in each division. Use a sterile, sharp knife or clippers to cut apart the pseudobulbs. Some orchids, such as cymbidiums, can have thick, dense roots and tightly packed pseudobulbs that may require a serrated knife or garden shears to cut apart. Finally, repot each division in a clean pot with new media.

**KEIKIS** Many orchids will produce a new baby plant, called a “keiki” (Hawaiian for baby). These keikis develop at the end of the canes, tops of pseudobulbs or at nodes on an older inflorescence depending on the type of orchid. A node is a place where undifferentiated cells exist and are usually associated with the presence of a bract. These cells can develop into a leaf, inflorescence, root or keiki.

Keikis can be confused with the sympodial growth habit of some orchids. Sympodial orchids produce new shoots that come from a singular rhizome. These shoots are still part of the original plant. Keikis will eventually produce their own root system, stem and leaves. They can be removed from the parent plant and will survive on their own.

Whether or not an orchid will readily produce keikis is determined by its genetics. Certain orchid genera, such as *Phalaenopsis*, will produce keikis on older inflorescences. Other orchid genera will produce keikis at the base of their stems. Some, such as nobile-type dendrobiums, usually produce their keikis at the unused nodes on older leafless canes. This process can sometimes be encouraged if you cut off a leafless, older cane and lay it horizontally on moist sphagnum moss. *Dendrobium kingianum* and some members of the Pleurothallid Alliance will also often produce keikis.

You can also try to encourage other orchids to produce keikis with a plant hormone product such as Keiki Power Pro



BARBARA SCHMIDT



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[7] Two orchid nodes on a *phalaenopsis* inflorescence. A cluster of undifferentiated cells is located under the protective bract at each node. These dormant nodes will often form a branch flower spike if the main inflorescence is cut but sometimes a keiki forms instead. Keikis can also be initiated using a hormone paste such as Keiki Paste (inset photograph).

[8] A keiki at the end of a *Phalaenopsis bastianii* inflorescence. This keiki grew from a node at the end of the stem that had not produced a bloom.

[9] Once the roots of a keiki reach a couple of inches long, the keiki can be removed from the mother plant and potted as you would any seedling.



([www.orchidinsanity.com](http://www.orchidinsanity.com)). This product, a combination of plant hormones, is a paste that is applied to dormant nodes. Using sterile tweezers, the flap covering the node (bract) is gently peeled away and the paste is applied with a clean cotton swab to the cells under the flap. This is not an exact science; while you may get growth at the node, it may not develop into a true keiki. For example, I tried it on two separate nodes on the inflorescence of my *Phalaenopsis* Surf Song. At one node, the plant produced nothing more than a small tumor-like lump of cells. The second node produced one very small leaf, which never grew or further developed into a keiki.

The obvious advantage of having keikis is that it is an easy form of propagation that produces a known plant that is an exact copy of the mother. Keikis can develop, grow and be separated from the parent plant in as little as a year or less. It is dependent on the genus of the plant producing the keiki. The main disadvantage is that not all orchids will easily produce keikis, and usually a plant will only produce, at most, a few keikis at a time.

Most orchid collectors will never venture into the area of orchid propagation by seed because of the time and materials needed. Certain orchids are more prone to making keikis. Dividing an orchid, however, is something that anyone can do if the plant is large and healthy enough. This is a great way to share your plant with other collectors. Many local orchid societies have a “swap table” at their meetings where members can bring in divisions of their orchids and swap them for divisions of a different orchid. In my case, I divide my orchids and pass them along to my daughter.

— Barb Schmidt published her first book, *Orchid Care: For the Beginner*, in 2016 and is currently working on her second 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 she is a regular instructor at the Smithsonian Institute Associates Program, 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)).



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- [10] Dendrobiums often produce keikis along their canes. The exact location depends on the type of dendrobium. In this canedendrobium, the keiki has formed at a dormant node out at the tip of the cane.
- [11] Here this nobile-type dendrobium is producing a keiki from a dormant flower bud.
- [12] This *Latouria* dendrobium has produced a keiki from a node at one of the sheathing bract scars along a mature cane.
- [13] Oncidiums as well as lycastes will sometimes produce keikis from dormant nodes at the top of their pseudobulbs. This keiki has nearly reached flowering size still attached to the main plant.

# Inkaterra, Part 2

Orchid Gardens and Reserves

Text by Thomas Mirenda/Photographs by Carmen Soto

LAST MONTH, I introduced you to the fabulous paradise that is Inkaterra's garden near Machu Picchu in Peru. Although the cloud forests in the region spanning from Cusco to Machu Picchu may be among the most visited in the world due to the thousands of people hiking the Inca Trail or visiting the spectacular ancient citadel, fewer visitors realize the botanical richness present there. Orchids, a huge component of this opulent biodiversity are sometimes overshadowed by colorful fuchsias, bromeliads, aroids, heliconias and palms, as so many orchids are of modest size and coloration. Often it is these smaller, subtler orchids that are the most interesting ecologically and display the most compelling physical features. Pleurothallids and maxillariids in particular, are extremely well represented.



Thomas Mirenda

Carmen Soto's orchid team is a group of brilliant explorers and climbers, often ascending extremely steep, practically vertical landscapes in search of species new to science.

Carmen and I share a particular appreciation for rarely grown, truly difficult genera such as *Brachionidium* and *Trichosalpinx* that hardly anyone has seen or been able to cultivate. These difficult, very high elevation plants survive well in the orchid garden as it is close enough to their natural habitat for them to adapt. Plants such as these can only be seen by the average person in an orchid garden such as the one surrounding the Inkaterra Pueblo Hotel. Finding them in the wild would necessitate extremely hazardous mountain climbing and outstanding physical fitness!

These rare and spectacular, sensitive alpine plants may be among the species most at risk due to climate change. If temperatures in their habitat warm too much, too quickly, their only recourse is to continue to colonize ever higher elevations. If this happens too rapidly, such plants cannot keep up and will be lost forever to extinction. How wonderful that places such as Inkaterra exist and can serve as repositories for these otherwise inaccessible and uncultivable species. We



*Anguloa virginalis*, one of the tulip orchids.





The exquisite flowers of *Brachionidium carmeniae* are little more than  $\frac{1}{2}$  inch (1.5 cm) long.





need to establish orchid gardens such as this one in all the ecological regions of the earth.

The Inkaterra organization maintains several other reserves in other parts of Peru (both lowland and highland areas) where they plan to replicate the success of the orchid gardens near Machu Picchu. My next installment in this series will feature some of the reserves that are currently being developed for the future.

— 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)).

[1] *Cyrtorchilum volubile*. The 2-inch (5-cm) flowers are carried on long, wiry inflorescences that can be up to 23 feet (7 m) long!

[2] *Elleanthus conifer*. Not often seen in cultivation today, these *Sobralia* relatives can be quite striking in their own right.

[3] Left to right: Richar Acuña, Ermitaño Quispe, Carmen Soto (with the camera) and Modesto Villavicencio. Others on Carmen's team not pictured are German Villena, Ciro Aucayallo, Rómulo Cabrera, Braulio Supa, Victoriano Zárate and Juan Carlos Pacheco.

[4] The striking flowers of *Oncidium wyattianum* can reach 3 inches (8 cm) in diameter.

[5] *Lycaste macrophylla* is a very variable species widespread from Costa Rica and Panama to the north southward into Peru and Venezuela.



# 2018 Keenan Award Winner, Jay O'Neill

Jay O'Neill, of the North American Orchid Conservation Center (NAOCC) Recognized for outstanding contributions to North American Native Orchid Conservation and Education

BY THOMAS MIRENDA

THE NORTH AMERICAN Orchid Conservation Center (NAOCC) is an innovative and collaborative organization originally initiated by renowned orchid ecologist, Dr. Dennis Whigham of the Smithsonian Environmental Research Center (SERC) in Edgewater, Maryland. There, a team of molecular biologists and ecologists, especially Dr. Melissa McCormick, have been exploring the ecological intricacies of our North American native species for many decades. The team's work has pioneered mycological inquiry and discovered numerous orchid fungi that DNA proves are completely new to science. Since its inception, NAOCC has always sought to collaborate with botanical and research institutions across the continent and has a well-deserved, prodigious list of cooperating organizations throughout the United States and Canada (<http://northamericanorchidcenter.org/partners/>). The NAOCC holds much of North America's orchid biodiversity by banking seed as well as mycorrhizae thought crucial to orchid seed germination and long-term ecological success. Indeed, the NAOCC team and collaborators have many outstanding achievements, including the creation of the superb Go Orchids Website (<http://goorchids.northamericanorchidcenter.org>) and the beautiful, educational Orchidgami models (<https://northamericanorchidcenter.org/orchid-gami/>).

At the center of this fantastic effort since the beginning, research technician Jay O'Neill has been quietly working, and instrumental in making these good things happen for the native orchid cause. Few people know that O'Neill painstakingly constructed the Go Orchids website, with information supplied to him by collaborators across the continent. He has also assiduously assembled and maintained the incredibly valuable seed and mycorrhizal banks at SERC and currently is promoting and soliciting additional partners and sponsors for the Orchidgami project. Even though O'Neill retired from the Smithsonian this year,



US BOTANIC GARDEN



he still comes to SERC daily to continue his good work for our precious North American orchids. For these reasons, the Conservation Committee of the American Orchid Society felt Mr. O'Neill most deserving of the 2019 Philip C. Keenan Award for Orchid Conservation (<http://www.aos.org/about-us/orchid-research/conservation-awards.aspx>).

Congratulations Jay!

— Thomas Mirenda, Chair AOS Conservation Committee (email: [biophiliak@gmail.com](mailto:biophiliak@gmail.com))

[1] Left to right: Liza McFarland, Jay O'Neill, Melissa McCormick, Dennis Whigham and Yini Ma.

[2] An assembled ghost orchid (*Dendrophylax lindenii*) orchid-gami model. The ghost orchid was chosen for one of the early models because of its fascinating structure. Photograph courtesy of the NAOCC.



# GREATIdeas

Text, photographs and illustration by Norbert Dank

## Stay Cool, Dude!

DO YOU LOVE the fantastic beauties from the cool ranges of the Andean mountains, such as species from the genera *Caucaea*, *Cyrtorchilum* or the *Oncidium* species formerly known as *Odontoglossum*? It is rewarding to grow them, and some of these, such as *Oncidium alexandrae* (*Odontoglossum crispum*), actually can grow quite well and can develop into large specimens when given the right conditions.

What are the right conditions to grow these? Imagine the cloud forests high above at elevations from 6,000–10,000 feet (1829–3048 m) in Colombia, Ecuador and Peru. Clouds sail through the trees, humidity is high, and temperatures rarely go above 77 F (25 C). This is ideal. However, temperatures between as low as 50 F (10 C), with some species even down to 41 F (5 C) or just above freezing, and as high as 77 F (25 C) are acceptable.

What do you say? You live in a region where it can become quite hot in the summer and pretty cold in the winter? Anything outside the preferred temperature range is stressful for our plants. Stress means that growth slows down, plants become more susceptible to diseases, fewer flowers develop (if at all) and, over time, loss of the plant. In the winter, we can help them by heating our greenhouses and ensuring that humidity is not too low or too high (as we cannot give them as much fresh air as we would like during the winter). In the summer, it is more difficult. Some deviation from the ideal temperature during the day is acceptable, especially when the night temperatures go down to 59 F (15 C) or lower. However, in regions where summer daytime temperatures are above 86 F (30 C), or night temperatures are above 68 F (20 C) for a longer period, growing these species might become a challenge.

OK, I hear you — you REALLY want to cultivate these jewels from the cooler regions. Here is a secret: There are several ways to keep temperatures at an acceptable level, and you can even combine many of these methods. Before we get to the ways to influence the climate conditions, you can build some structural elements into your greenhouse, which will influence temperature and humidity. My greenhouse has, for example, a lowered, internal floor level compared to



the outside. I lowered it by 11.8 inches (30 cm), so that the concrete walls that are next to the outside soil cool the temperature down a bit. Second, there is an 11.8 inch (30 cm) layer of porous, lava rock gravel on the floor, which fills with water from watering the plants, so that humidity evaporates through the gravel. As the surrounding soil is loamy, the water does not drain away quickly. And finally, two walls of the greenhouse are concrete, built into the slope of my garden. Behind the walls is soil, which also contributes to some cooling as soil in the summer is cooler than the surrounding air. Of course, there are additional ways to help cool a

- [1] The author's greenhouse in beautiful flower in early April.
- [2] A centrifugal humidifier designed to be mounted near the greenhouse ceiling and operated by a humidistat.
- [3] The author's greenhouse is built into a natural slope on the property to take advantage of the thermal moderation of the soil.
- [4] Diagram illustrating the air-to-earth heat exchanger behind the back wall of the greenhouse.
- [5] Once backfilled, this plumbing manifold will become an efficient air-to-earth heat exchanger.

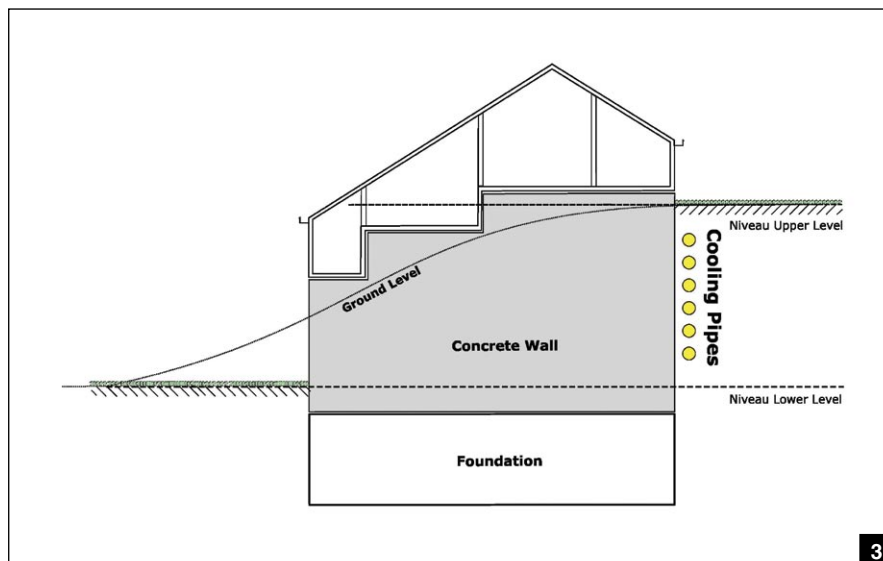


greenhouse; for example, you might get cooled air from a small pond or any other cool environment close to the greenhouse location ventilated into the greenhouse. If you can modify your greenhouse, or even better if you are building one, consider such ideas and integrate them into your plans if you want to grow cool growing species or hybrids.

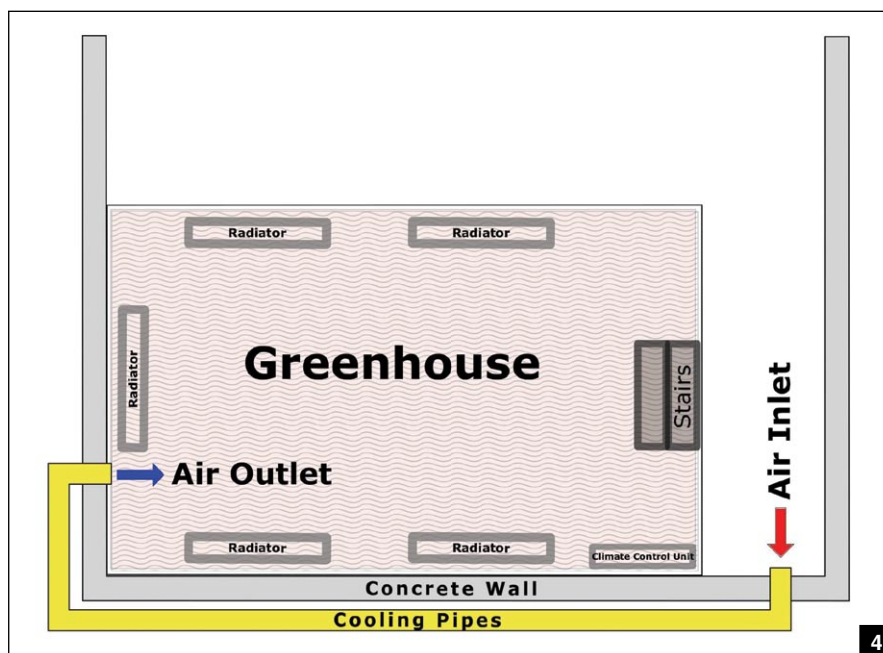
Now what about influencing the climate inside the greenhouse? Let me start with the easiest ones — shading, air circulation and misting. In the summer, most orchids need more or less significant shading, and this is especially true for most of the species and hybrids in the Oncidiinae with soft leaves. In nature, they usually grow in trees, meaning that they do not receive direct midday sunlight. An exception is *Zelenkoa onusta* (*Oncidium onustum*), which grows in Peru on cactus species, exposed to full sunlight. You can see from looking at the hard, stiff leaves that it might prefer more sunlight than many other *Oncidium* Alliance species. I have seen it growing well in a greenhouse in North Carolina and they like the hot and sunny conditions there. But this is the exception, as many *Oncidium* Alliance species come from lush rainforests at higher elevations.

Therefore, first consider putting shade cloth on your greenhouse. Before putting it on the greenhouse, check the location — does the house already receive some shade from surrounding trees or a building? How does the shade move during a day? Do not forget that the sun tracks differently in the winter versus the summer, especially in the northern and southern regions of the world. Do not make a decision about sun exposure of your greenhouse on a nice, sunny winter day. What is the spatial orientation of the greenhouse — north to south or east to west? I have a greenhouse with a spatial roof orientation from southeast to northwest. Using shade cloth on the top with 70% shade (30% of the light gets through) and, for the straight wall, 50% shade gives good light and heat reduction and works for March to October where I live. I remove it in October to give the plants the light they need at this time to compensate for the less intense sun in autumn and winter.

Now think about the issue with higher temperatures — why is it a problem for the plants? Like animals and other living creatures, plants consist of cells that work like little factories. Different cells have many different purposes, but all have one thing in common: they function with



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enzymes, which are proteins that produce energy or materials the cells (and plants) need or degrade substances they do not need anymore. Enzymes are prone to damage by high temperatures; if they are too high, they will cease operations, and at some point, they will be damaged irreversibly. This means that cells will die, and if too many cells die, leaves will drop or the whole plant will fade away. The maximum temperature a plant can tolerate depends on its adaptation to the environment it is living in. When coming from a desert, plants can often withstand temperatures higher than 122 F (50 C). They have adapted to these high temperatures. Our little treasures from the higher Andean elevations have not adapted, and why should they? Because they never have been confronted with such high temperatures, it would be a waste of resources to adapt for something you never need. They want to have steady, cool conditions and will die if exposed to temperatures above 104 F (40 C).

So, one further “trick” to help them survive is ventilation. Just test the leaf surface temperature on a sunny day with an infrared thermometer (such devices are not expensive, and a simple version will do a good job). I did such measurements and realized that the leaf temperature is sometimes higher than I would like it to be. You can also simply touch the leaf and compare: Does it feel cold or warm? If it feels warm, this might already be an issue for the plant. As hot air might build up around the leaves and other parts of the plants (because light warms up materials it hits, and energy is absorbed), good ventilation will help to keep temperatures cooler. In my greenhouse, two fans hung up in the roof run day and night to ensure good, but slow air movement throughout the year. Plus, I have a thermometer that switches these fans to higher speed once a certain temperature limit (I have set it to 77 F [25 C]) is exceeded. In addition, ensure that the greenhouse windows open with increasing temperatures, allowing fresh air to get in. By using ventilation and air exchange, the hot air building up around the leaves is moved around, and evaporation of water from the leaves can help the plants keep their leaves cooler. Which means in turn that the pots should not dry out during the hotter days of the year, so careful watering is essential during these times. In addition, I use clay pots. Yes, I know — there are quite a few disadvantages compared to plastic pots. Salts can build up in the pot walls and harm the root system when pots



- [6] Concrete back and side wall after the installation of the gravel floor.
- [7] The completed greenhouse viewed from the front.
- [8] Cooled air returns to the greenhouse under the back bench.
- [9] Fan inserted in the cool air return line assures that a constant flow of cooled air is maintained.
- [10] *Oncidium* Teipels Mitternacht, one of the author's beautifully flowered cool-growing oncidiums. It is these spectacular flowers that make it all worthwhile.



are overgrown, you need to water more frequently compared to plastic pots and they are more expensive, which means I reuse pots after thorough rinsing with water and disinfection to ensure no germs are spread from one plant to another. However, the advantages of clay pots prevail for me. Through evaporation of water via the pot walls they stay cool, which helps to make the plants feel better during the hotter summer days. And I can water more frequently, flushing the pots with rainwater and fertilizing every week. So far, the plants formerly regarded as *Odontoglossum* and *Cochlioda* grow well for me, with strong pseudobulbs and often two spikes per bulb.

In addition to shading and ventilation, you should consider misting the plants during warm periods of the year. I do this in various ways. First, there are misting nozzles under my benches, spraying water, which evaporates and also dampens the ground under the benches. Evaporation cools the air by a physical process called the adiabatic effect. This happens as evaporating water needs energy to transit from the liquid state into the gaseous state, and it takes this energy from the surrounding environment. Sucking up energy means lowering the temperature, and here we are: cooling our greenhouse. Of course, the effect is limited to the amount of water the air can take up, but it is already quite helpful. I have implemented some control mechanisms that start the misting once the humidity falls below 50% relative humidity, and switches between one minute on and 15 minutes off to allow the water to evaporate. In addition, the misting is triggered by temperatures above 82.4 F (28 C). Constant misting without intermittent pauses would eventually flood my greenhouse, which would not be useful, of course. I have also placed an air humidifier at the roof of the greenhouse, which by a rotating disk accelerating water particles against a headboard produces a fine mist. This mist usually evaporates before it reaches the plants. Misting thus has several beneficial effects: elevating humidity, which is usually quite low during hot summer periods, and cooling down the temperature by evaporation and supplying the plants with some water that they need in the form of mist that doesn't evaporate before it reaches the plants. What also helps the plants to feel well is letting the humidifier run in the morning for 15 minutes or so, mimicking the dew formation in the rain forest. I occasionally do this at 7 am with a timer for days when



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I know it will become very hot.

What else can you do to lower the temperature in your greenhouse? Shading, ventilation and misting are not the only options we have. I have implemented another cooling method that I think is a clever one. This method was recommended by Marko Holm from Orchideen Holm. I built a register of plastic tubes behind the wall to which my greenhouse is attached. There are six tubes with a diameter of 2 inches (50 mm) each, which then are bundled into a tube of 43.3 inch (110 mm) diameter. The tubes are surrounded by the soil from my backyard behind the greenhouse. In summer, the soil is several degrees cooler than the surrounding air. A fan in my greenhouse sucks air from the outside through the tubes in the soil into the greenhouse. This fresh breeze of cold air is distributed below the benches via an aluminum foil tube normally used in ventilation systems. When I tested the cooling effect during a very hot summer day, the outside temperature was 100.4 F (38 C). The air being pulled into the greenhouse through this system was cooled down to 82.4 F (28 C), which is much more acceptable for my plants. The fan pulling the air into the greenhouse is set to start at inside temperatures around 82.4 F (28 C) and ensures further cooling. Another option is to use air conditioning to keep your greenhouse cool. I have seen this at a nursery in Florida and know it from other orchid lovers. This works as well but consumes considerable energy and necessitates investment in the air conditioner.

My recommendation is to try to combine various ways of keeping your greenhouse cool. Check what works best



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in your setting and ensure proper settings of your control engineering. You might now ask if it is worth the effort? I can say yes, it definitely is. Seeing a nice *Oncidium alexandrae* (*Odontoglossum crispum*) or *Oncidium noezlium* (*Cochlioda noezliana*) in full flower is rewarding, especially if you grew it close to perfection yourself. I would never want to miss that experience!

— Dr. Norbert Dank is an amateur orchid grower from Germany, and got addicted to orchids at the age of 15. He is mainly interested in orchids from Central and South America, with special focus on the species and hybrids in the *Oncidiinae*. He is a member of the German Orchid Society, AOS and the International *Odontoglossum* Alliance. His second passion is photography and he likes to take pictures at exhibitions as well as nurseries, but also of orchids growing in the wild. His pictures can be found at [www.flickr.de/nurelias](http://www.flickr.de/nurelias). Im Buschfeld 15, 51399 Burscheid, Germany (email: [nurelias@nurelias.de](mailto:nurelias@nurelias.de)).





# *Sophronitis* Alliance (*Cattleya*) by Peggy Alrich and Wesley Higgins

A Tropical American Group



JOHN LINDLEY DESCRIBED the “drooping *Sophronia*” as *Sophronia cernua* in the *Botanical Register* 13:t.1129 (1828). Lindley commented:

“Found upon a tree at Botofogo, three miles from Rio Janeiro, by William Harrison, Esq. by whom it was transmitted to Mrs. Arnold Harrison, of Aigburgh, near Liverpool, whence it was obligingly sent with a sketch, in December 1826. It is a very remarkable little epiphyte, growing readily in decayed vegetable soil among moss, in a hot, humid shady part of the stove.”

The following year Lindley requested to substitute the generic name *Sophronitis* for *Sophronia* because there was already a genus of fungi named *Sophronia*: *Botanical Register* 14: ad t.1147 (1828).

Over the following years, 108 names have been published for *Sophronitis* species, subspecies, varieties, forms and natural hybrids. Since the turn of the century, Brazilian botanist Cassio van

den Berg et al. (2000) have published sequence data of internal transcribed spacers of nuclear DNA; it became clear that the Brazilian species of *Laelia* Lindl. did not belong with the Mexican group of species that included the type of the genus *Laelia*. Instead they were related to a South American group. The initial proposal was to place all of them in *Sophronitis* Lindl. but this classification was unsatisfactory. Then in 2008, Cassio van den Berg proposed a combination of the genera *Cattleya*, *Laelia* (Brazilian species) and *Sophronitis*. This classification has been accepted by the World Checklist of Selected Plant Families.

The group of nine former *Sophronitis* species has mostly red flowers but may include yellow, salmon pink, coral, and pink forms; the alba form is rarely found. The plants are small, the pseudobulbs congested (grouped) and the lip is sessile (attached to the base of the column). There are diminutive wings on the sides of the stigmatic cavity; the column is small

and there are eight pollinia.

*Cattleya acuiensis* (Fowlie) van den Berg  
*Cattleya alagoensis* (V.P. Cristo & Chiron) van den Berg  
*Cattleya dichroma* van den Berg  
*Cattleya brevipedunculata* (Cogn.) van den Berg  
*Cattleya cernua* (Lindl.) van den Berg  
*Cattleya coccinea* Lindl.  
*Cattleya mantiqueirae* (Fowlie) van den Berg  
*Cattleya pygmaea* (Pabst) van den Berg  
*Cattleya wittigiana* (Barb. Rodr. ) van den Berg

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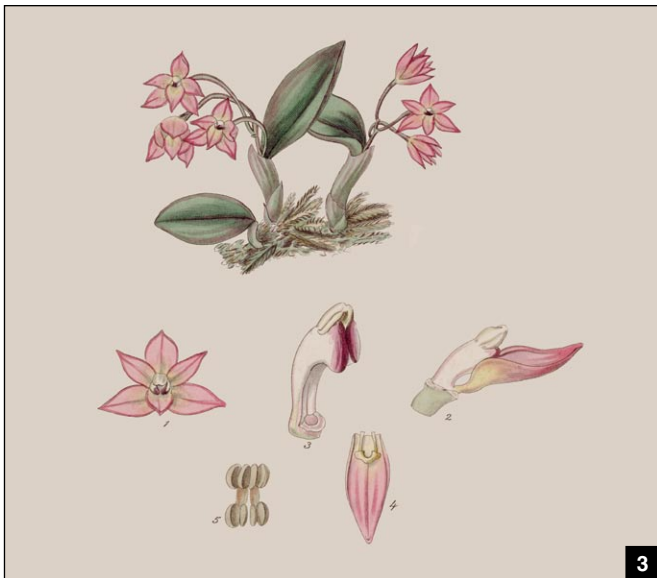
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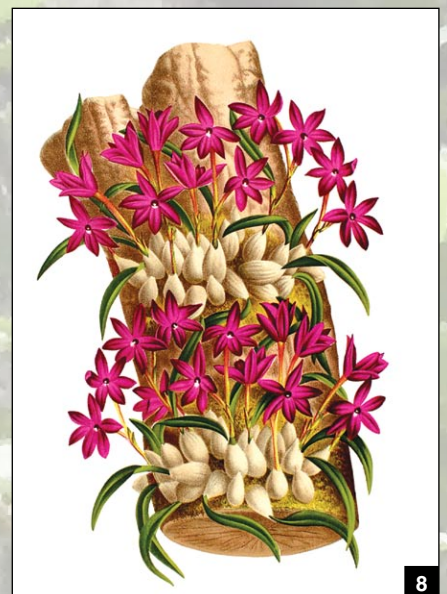


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**Antique Plates — *Sophronitis***

- [1] *Sophronitis grandiflora* (*Cattleya coccinea*), *Orchid Album* 11: t.504 (1897).
- [2] *Sophronitis coccinea* (*Cattleya coccinea*), *Dictionnaire Iconographique Orchidées*, t.1 (1897).
- [3] *Sophronitis cernua* (*Cattleya cernua*), *Botanical Register* 13: t.1129 (1827).
- [4] *Sophronitis coccinea* (*Cattleya coccinea*), *Flore des Serres et des Jardins de l'Europe* 17:t.1716 (1867).
- [5] *Sophronitis grandiflora* (*Cattleya coccinea*), *Orchid Growers Manual* (1852).
- [6] *Sophronitis coccinea* (*Cattleya coccinea*) and *Sophronitis grandiflora* var. *rosea* (*Cattleya coccinea*), *Iconografia Orchidaceas do Brasil*, t.132 (1949).
- [7] *Sophronitis grandiflora* (*Cattleya coccinea*), *Paxton's Magazine of Botany* 9:139 (1839).
- [8] *Sophronitis violacea* (*Isabelia violacea*), *Lindenia* 15:t.694 (1899).
- [9] *Cattleya bicolor* and *Sophronitis grandiflora* (*Cattleya coccinea*), *Sertum Orchidaceum* t.5 (1838).





# *Dendrobium bigibbum* Lindl.

A New Classification for the Complex and Hybrid Registration

BY PETER ADAMS

PHOTOGRAPHS BY THE AUTHOR

UNLESS OTHERWISE CREDITED



OPENING A COPY of *The Gardeners' Chronicle*, October 10, 1891, at page 41, and sitting with a Saturday morning cup of tea, potential London buyers considered a full page advertisement with six "stated facts" about the "Orchid Sensation of the Century," the "King of the Genus," and whether to attend the Sanders auction at Messrs. Protheroe and Morris on Friday next. A single plant will cost 50 guineas or more (equivalent to approximately \$7,000 today) for the first wave of growers of *Dendrobium phalaenopsis* var. *schroederianum*, named after the sole owner, Baron Schroeder of Engham, based near Windsor. The new owners faced uncertainty about the origins of these plants, a confusion that has not ended. The name entangles it immediately with *Dendrobium phalaenopsis* Fitzg. R.D. Fitzgerald described several locations in northern Australia for a plant that had flowered in the Balmain garden in Sydney of the collector, Captain Bloomfield. It was grown for years at Kew Gardens and was known as the "Kew variety." Baron Schroeder's variety was listed in the advertisement as being from New Guinea, where it does not occur. Although there were clear differences in growth form and flower color, Sir J.D. Hooker considered the two sets of plants identical. The new classification makes significant changes to *Den. phalaenopsis* and var. *schroederianum*, and the good news is that previously registered hybrids will not change.

*Dendrobium bigibbum* was described by Lindley in 1852 following collection by Dr. John Thomson in 1849 from Mt. Adolphus Island, Australia, in the Torres Strait. Various taxonomic classifications and more than 40 different names were applied to the *Den. bigibbum* complex over the next 125 years. Most were based on one or a few plants. The taxa under the broad circumscription of the *Den. bigibbum* complex have been classified in the past as separate species, subspecies, varieties, subvarieties and forms. Some of the illustrations of *Den. bigibbum* variants that were published in gardening magazines were superb, especially the lithographs of var. *schroederianum*. Until the early 21st century, there was no significant population study of the relationships of the proposed taxa, which have a distribution range from the Cairns area in North Queensland, to the Tanimbar and Ambon islands of Indonesia, and in the south of New Guinea.

There was some deliberate misinformation in the recording of early

October 10, 1891. THE GARDENERS' CHRONICLE. 419

**THE ELEPHANT MOTH DENDROBE.**  
**Dendrobium Phalaenopsis,**  
**var. Schroederianum,**  
**THE KING OF THE GENUS.**

Which may be considered the grandest and in every way the finest known Orchid, and

**THE ORCHID SENSATION OF THE CENTURY.**

It is the grandest Orchid ever introduced. There is no gem in the whole Orchid Flora comparable to this, the "KING OF DENDROBES"; and, for the introduction, we were indebted to the energy and enterprise of Mr. F. SANDER.

Nearly 1000 Grand Plants will be SOLD by AUCTION at

**Messrs. PROTHEROE & MORRIS' ROOMS,**  
 on FRIDAY NEXT, OCTOBER 10.

There are only Seven Plants in Europe, which are mostly in the private Collection of Baron J. H. W. Schroeder. This Orchid is among the Vanids, Dendrobium among Vanids, and as such, distinct from all other Dendrobium or Vanid Dendrobium from all other Vanids. It must be distinctly understood, that the Dendrobium we offer is absolutely unlike any other Dendrobium phalaenopsis variety, and is gone among Orchids quite unrepeatable.

**THE FACT** of Baron Schroeder flowering each of his plants annually proves how true-growing this Dendrobium is.

**THE FACT** of the sensation it caused this spring when exhibited before the Royal Horticultural Society, at the Hort. Hall, proves that when we state this Dendrobium to be "The King of the Genus," we do not overstate its beauty.


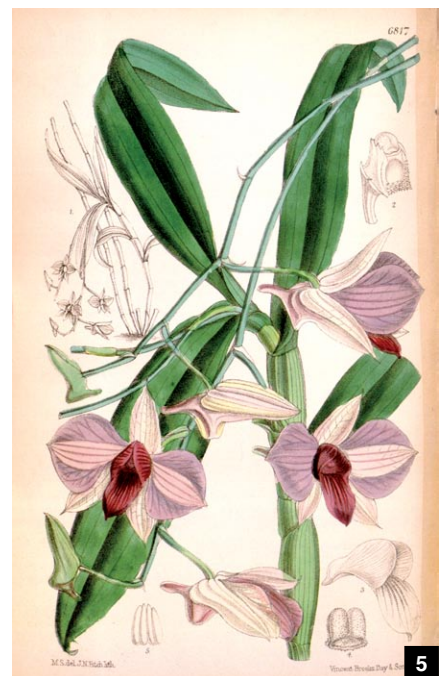
**THE FACT** that about seven plants, now in collections, come from two small plants originally introduced to the Royal Gardens at Kew, conclusively proves its true growth.

**THE FACT** is, Mr. James O'Brien says it is a very free doer, as is evidenced by fact of the plants, now in collection, having been grown from such small scraps as the original plants were when first received.

**THE FACT** that those will be shown, on the day of Sale, dried flowers, ranging from white to rose and purple, proves that our New Guinea variety is finer than the original.

**THE FACT** that we are able to show quantities of flower-spikes over 2 feet long, proves that this Dendrobium is as fine for cutting purposes as *Chamaeleon*, *Alexandria*, and it even surpasses that grand Orchid in its more brilliant coloring, lasting equally long in perfection.

**SANDER, ST. ALBANS.**

collections to protect commercial sources and there is no certainty about the origin of plants used in early hybrids. The dominance of *Den. bigibbum* makes it almost impossible at times to detect other species that may have been introduced into *Den. bigibbum* line breeding or into its hybrids.

A study of morphological characters of *Den. bigibbum* (Adams 2015) in Australia showed that a number of features previously regarded as diagnostic for taxa were unreliable due to inadequate sampling over the distribution range. Their use in the 20th century has further confused the parentage in line breeding and hybridization. The characters found to be unreliable in classifying taxa included flower shape and dimensions, reflexing

- [1] *Dendrobium bigibbum* var. *bigibbum*; Weipa, Queensland.
- [2] Advertisement from the *Gardeners Chronical* October 10, 1891, p. 419.
- [3] *Dendrobium bigibbum* from *Curtis's Magazine*; plate 4898, 1856.
- [4] *Dendrobium bigibbum* Lindl. *L'illustration Horticole* Vol. 30 t. 476 (1883) P. Stroobant. = *D. bigibbum* var. *bigibbum*.
- [5] *Dendrobium phalaenopsis*. Curtis 111 ser. 3 no. 41 plate 6817 (1885). = *D. bigibbum* var. *schroederianum*.

of sepals and petals, labellar apex shape, white patch of labellar hairs, midlobe dimensions and lithophytic habit.

The results of field studies of *Dendrobium* sect. *Phalaenanche*, including character frequency, morphometrics, DNA sequencing and review of the history and type specimens, showed that there is a single species, *Dendrobium bigibbum* (Adams 2015, Adams and Lawson 2016). It has four closely related varieties. There are three in northern Australia — var. *bigibbum*, var. *superbum* and var. *compactum*, and *Den. bigibbum* var. *schroederianum* in Indonesia (Table 1). The new classification is accepted by the World Checklist of Selected Plant Families and the Royal Horticultural Society International Orchid Register for hybrids.

In the new classification, *Den. phalaenopsis* Fitzg., a name used for many decades and involved in almost half of the 12,000 *Dendrobium* hybrids, was reduced to synonymy with *Den. bigibbum* var. *superbum*, which was described two years before Fitzgerald's description of *Den. phalaenopsis*, and was accompanied by an unsatisfactory type specimen consisting of a single partially open flower with no identifiable characteristics for this variety.

Molecular (ITS-DNA) and morphometric results supported the classification of one species, *Den. bigibbum*, which is made up of four varieties. The three Australian varieties intergrade where they meet over parts of Cape York in northern Queensland. Their characteristics are summarized in Table 2.

**THE VARIETIES OF *DENDROBIUM BIGIBBUM*** *Dendrobium bigibbum* var. *bigibbum* was collected on numerous occasions from far north Queensland toward the tip of Cape York and in the Torres Strait islands, with plants of various color and growth forms illustrated in gardening magazines and described as varieties. This variety also occurs in small populations on the south coast of New Guinea. Most flowers have a white patch of hairs centrally on the labellar midlobe, but some plants of *Den. bigibbum* var. *superbum* also have this feature, as high as 20% in some populations, so it is not reliable for identification. The plants are more difficult to cultivate than the other three varieties. The flowers tend to be smaller and have more reflexing, especially with age.

*Dendrobium bigibbum* var. *superbum* is attractive, often large-flowered, and found over much of Cape York Peninsula. It was first published by Reichenbach without

Table 1. New classification of the *Dendrobium bigibbum* Lindl. complex.

<i>Dendrobium bigibbum</i> var. <i>bigibbum</i> Lindl.
<i>Dendrobium bigibbum</i> Lindl. var. <i>superbum</i> Hort. ex Rchb.f.
<i>Dendrobium bigibbum</i> Lindl. var. <i>compactum</i> (C.T. White) Peter B. Adams
<i>Dendrobium bigibbum</i> Lindl. var. <i>schroederianum</i> (Hort. ex W. Watson) Peter B. Adams

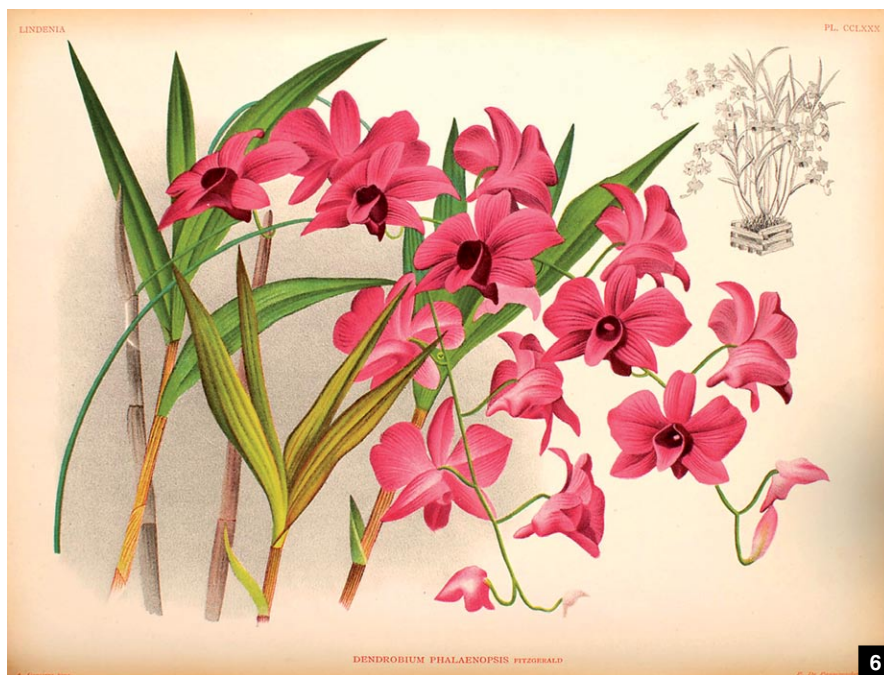


Table 2. Characteristics of varieties of *Den. bigibbum*.

Taxon	Plants	Flowers	Labellum
var. <i>bigibbum</i> Lindl.	No diagnostic characters; variable	Tend to round, reflex significantly, spur usually < 8 mm	Most have a white patch of hairs of variable width, emarginate or curved at midlobe apex
var. <i>superbum</i> Hort. ex Rchb.f.	No diagnostic characters; variable.	Tend round to rectangular, spur usually > 8 mm	Purple to white patch of hairs, midlobe apex mainly curved
var. <i>compactum</i> (C.T. White) Peter B. Adams	Stems mainly short, moderate length when an epiphyte	Very similar to var. <i>superbum</i>	Purple to mauve patch of hairs, midlobe apex mainly curved
var. <i>schroederianum</i> (Hort. ex W. Watson) Peter B. Adams	No diagnostic characters; variable.	Similar to var. <i>superbum</i> . Colors tend to be paler, many with white center and mauve/purple in outer zone.	Prominent mauve to purple on midlobe, midlobe apex curved

a description in 1876 and later validated with a description in the *Gardener's Chronicle* in 1878. In 1872, Rolfe claimed that it was introduced to collections in England by J.G. Veitch in 1865, but exact collection details are uncertain. There has been much confusion about this

variety, known for many years as *Den. phalaenopsis* in the commercial trade. The name *Den. bigibbum* var. *superbum* was overlooked for many decades until S.T. Blake reviewed the historical material following the 1959 Queensland Government Act that declared *Den.*



*phalaenopsis* the state floral emblem. This variety can be successfully cultivated and there has been some line breeding, but the provenance of many plants used is uncertain. Other varieties are likely to be present in most line breeding.

*Dendrobium bigibbum* var. *compactum* is commonly a short-stemmed lithophyte (<7.9 inches or 20 cm) from an approximately 12.4 mile (20 km) strip on the eastern side of the Macalister Range, northwest of Cairns, Queensland. Plants growing on trees or in shade may be considerably taller stemmed. In the research study of populations, the flowers are not separable from *Den. bigibbum* var. *superbum*, and like Blake, St. Cloud and Dockrill, I regard it as a short variant of var. *superbum*, but chose to retain it as a variety for historical and geographic reasons. It intergrades with var. *superbum* and can have a similar number of color forms including white and bicolor examples.

*Dendrobium bigibbum* var. *schoederianum* was collected by Forbes and Micholitz in 1882 from the Tanimbar Islands in Indonesia, and it occurs on a few other islands in the region. It was well illustrated in gardening magazines in the later nineteenth century, but a type specimen was not established. In 2016, Dr. Pina Milne and staff from the National Herbarium in Melbourne assisted me in importing a dried specimen from a well-provenanced, long-term collection in Thailand, and a lectotype and description were prepared. A duplicate was sent to Kew in the United Kingdom.

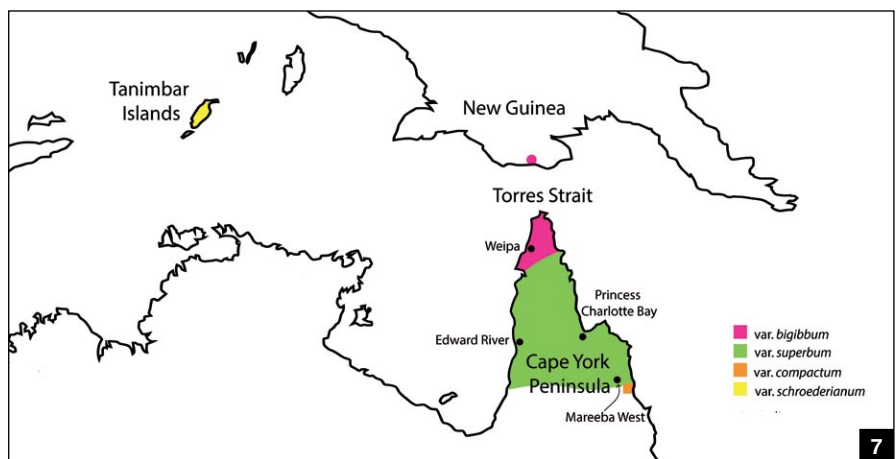
The early writers selected large, pale and variably colored flowering plants to illustrate and describe, but the full range includes many less outstanding forms. The flowers are similar to var. *superbum* although the color of the sepals and petals is usually paler, with a mauve-purple blush in the outer parts. Contrary to some suggestions, the striae or colored veins are not more pronounced or frequent than in var. *superbum*.

PHOTOGALLERY OF *DENDROBIUM BIGIBBUM* VARIETIES Racemes of the four varieties are illustrated in Figures 8–11. A few of the many Australian floral variants are illustrated in Figures 12–14. *Den. bigibbum* var. *schoederianum* and hybrids with *Dendrobium discolor*, natural and artificial, are shown in Figures 15–16.

REGISTRATION OF *DEN. BIGIBBUM* HYBRIDS *Dendrobium bigibbum* is a component of around 6,000 registered hybrids. Many hybrids have been repeatedly backcrossed to variants of *Den.*

Table 3. Some early registered hybrids that are crosses of subtaxa of *Dendrobium bigibbum*.

Hybrid	Parents listed as species	Registrant and Year
Boisseyense	<i>bigibbum</i> x <i>schoederianum</i>	Vacherot-Lecoufle 1926
Orchidwood	<i>bigibbum</i> x <i>phalaenopsis</i>	Orchidwood 1934
Lady Constance	Orchidwood x <i>phalaenopsis</i>	Weber 1947
Helen Fukumura	Lady Constance x <i>schoederianum</i>	Fukumura 1952
Lehua	Lady Constance x Helen Fukumura	Fukumura 1957
Lovely Hawaii	Orchidwood x Lady Constance	McCoy 1959
Helen Banks	Helen Fukumura x <i>phalaenopsis</i>	Palmer (Fernandez) 1963
Myola	Lady Constance x <i>bigibbum</i>	D’Bush 1982



*bigibbum*, especially to *Den. phalaenopsis*, due to its outstanding characteristics and dominance. The most significant consequence of the new classification for registration is that this taxon has been reduced to synonymy with *Den. bigibbum* var. *superbum*. Taxa below the level of species are generally not recognized by the RHS for hybrid registration, so all taxa come under the name of *Den. bigibbum*. In the RHS records the origins of most plants used in early hybrid breeding are unavailable — either not recorded, or if originally noted, then information has not been passed on. As it is unknown which varieties were used, most if not all registered hybrids, remakes and progeny are of uncertain provenance. Many plants in collections and breeding programs are also of uncertain provenance.

As an example of the difficulties with registrations within the *Den. bigibbum* complex, a look at the earliest registrations including *Dendrobium* Boisseyense (*bigibbum* × *schoederianum*, 1926), *Dendrobium* Orchidwood (*bigibbum* × *phalaenopsis*, 1934), and *Dendrobium* Lady Constance (Orchidwood ×

[6] *Dendrobium phalaenopsis* Fitz. *Lindenia* 435566 pl. CCLXXX. = *D. bigibbum* var. *superbum*.

[7] Distribution map of the four varieties of *Dendrobium bigibbum*.

*phalaenopsis*, 1947) shows that these hybrids are intervarietal or interform combinations of *Den. bigibbum* (Table 3). The results of all these crosses were similar, now understandable in the light of the new taxonomy, as they all involve breeding with the same species. Other examples are *Dendrobium* Helen Fukumura, *Dendrobium* Lovely Hawaii and *Dendrobium* Myola. These have been used in various lines and can be understood as involving different subtaxa of *Dendrobium bigibbum*, not separate species.

Hybrids made using different subtaxa of *Den. bigibbum* are usually impossible to distinguish by examining the plants or flowers. It is not possible to review past registered hybrids and revise them, so the RHS will continue to use established hybrid names, understanding that their exact original composition will always be unknown. Hybridizers are encouraged to

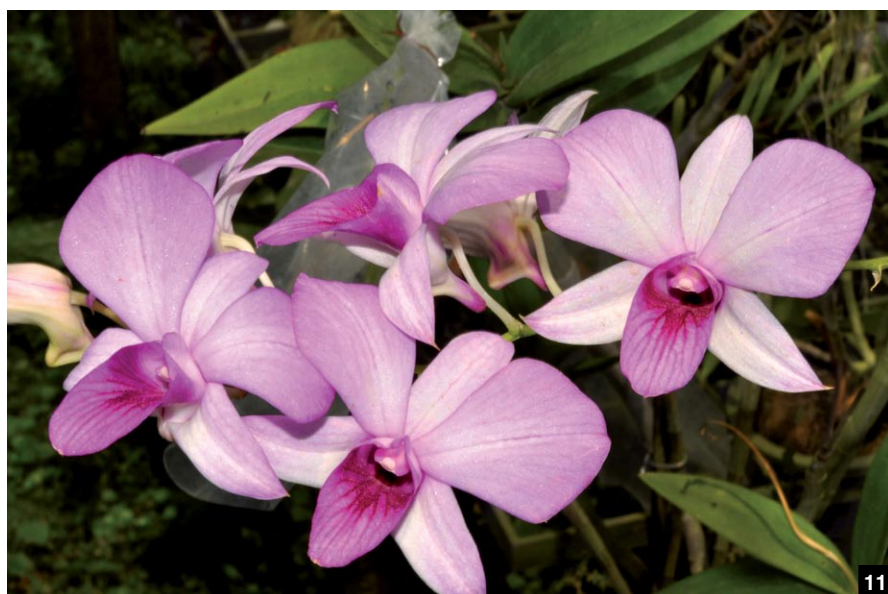
include the provenance details of parents on their registration application for future reference. Some plants identified as *Den. bigibbum* parents used in breeding have features suggesting that they are actually hybrids with other *Dendrobium* species in their background, and this adds to the uncertain provenance of some hybrids.

There is a case to be made for remaking *Den. bigibbum* hybrids, starting with plants of well-established natural provenance and developing lines with accurate records. The line breeding of *Den. bigibbum* is also complicated by lack of provenance and a similar approach could be taken. Superior progeny could then be used to make hybrids with other *Dendrobium* species.

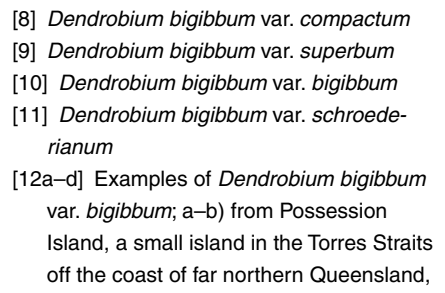
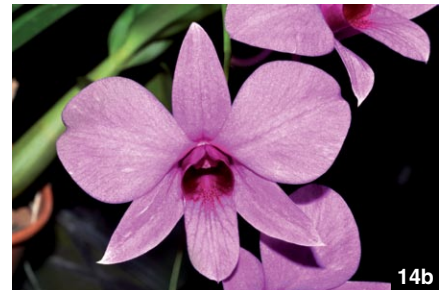
**DENDROBIUM BIGIBBUM BREEDING** The outstanding characteristics of the large, colorful, rounded flowers of *Den. bigibbum* were recognized as potential for breeding by classic orchid nurseries in the first part of the 20th century. The first phase of breeding in France and England involved crossing different plants of *Den. bigibbum*, forms often described as separate species, and also combining them with other warm-growing dendrobiums in sect. *Spatulata*. Early results showed that *Den. bigibbum* was dominant in the progeny. There were no other species with such rounded shape, so progeny were repeatedly crossed back to *Den. bigibbum*, mostly plants labeled *Den. phalaenopsis*, which could have been any of the taxa of the *Den. bigibbum* complex.

The early hybrids had flat, rounded, mainly mauve flowers. Vacherot (1926) produced *Den. Boisseyeence*, *Dendrobium Louis Bleriot* (*Den. phalaenopsis* × *Den. superbiens*, 1929) and *Dendrobium Pompadour* (*Louis Bleriot* × *phalaenopsis*, 1934). Early hybrids were illustrated in many books and articles of the time.

In the second phase from 1950, breeders in the UK and Hawaii produced large, mauve-colored flowers with improved shape and plant form, but progressively fewer flowers per raceme. Sanders bred *Dendrobium Sanders Crimson* (*phalaenopsis* × *taurinum*, 1935), *Dendrobium Diamond Head Beauty* (McCoy, 1951) and *Dendrobium Lady Hamilton*. Kamemoto in Hawaii began a large international horticultural program for developing cut flowers and plants. A vast number of hybrids resulted, often used for further breeding. They included *Dendrobium Anouk*, *Dendrobium Sagarik*, *Dendrobium Helen Fukumura*, *Dendrobium Maui Beauty*, *Dendrobium*







[8] *Dendrobium bigibbum* var. *compactum*

[9] *Dendrobium bigibbum* var. *superbum*

[10] *Dendrobium bigibbum* var. *bigibbum*

[11] *Dendrobium bigibbum* var. *schoederianum*

[12a–d] Examples of *Dendrobium bigibbum* var. *bigibbum*; a–b) from Possession Island, a small island in the Torres Straits off the coast of far northern Queensland, c) from Weipa, Queensland and d) from the tip of Cape York Peninsula.

[13a–d] Examples of *Dendrobium bigibbum* var. *superbum*: a) a rare white example, b) from Mareeba in the far north of Queensland, c) from Princess Charlotte Bay on the east coast of far northern Queensland and d) from the Edward River.

[14a–c] Examples of *Dendrobium bigibbum* var. *compactum*; a) from Hartley's Creek, the type location, b–c) plants illustrating the variation in natural coloration.

Lady Constance, *Dendrobium* Lady Fay, *Dendrobium* Lady Hay and *Dendrobium* American Beauty.

A third phase from the 1960s, led by Rapee Sagarik in Thailand, produced another international breeding program. A significant example was *Dendrobium* Hickam Deb (Kuchima, 1961), which led to red and purple colors with improved shape, size and floriferousness. White and bicolored flowers were produced by breeding back to better forms of *Den. phalaenopsis*. Kamemoto, Amore and Kuehnle (1999, p. 3) shows an illustration of *Den. phalaenopsis* that is consistent with *Den. bigibbum* var. *superbum*, and his group appreciated the difference between this taxon and the often bicolored flower of *Den. bigibbum* var. *schoederianum* from the Tanimbar Islands of Indonesia. The latter were used in other successful

breeding lines, and some tetraploid plants were used.

From the 1970s, Australian breeders finally realized the potential of *Den. bigibbum* in breeding, although a significant commercial industry of international importance has never been established in Australia. Limberlost, Kirkwood and McFarlane nurseries entered the breeding arena already involving Japan, Thailand and the Singapore Botanical Garden. McFarlane registered *Dendrobium* Impact (Fiftieth State × *phalaenopsis*) in 1970, and the progeny extended the flowering season. The D'Bush nursery extended *Den. Impact* breeding with flowering for most of the year and with less leaf drop. In the 1980s, it was noted that the flower counts per raceme were reduced. Although floral quality was much improved, there were only a few Australian awards, perhaps

reflecting an unrealistic expectation of floral size (Paget 1987). Breeding of *Den. bigibbum* hybrids in Australia continues at a lower rate.

In recent years, hybrids such as *Dendrobium* White Grace (Fiftieth State



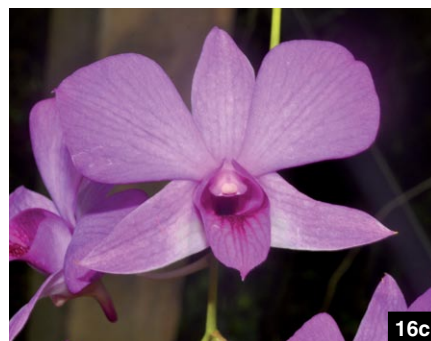
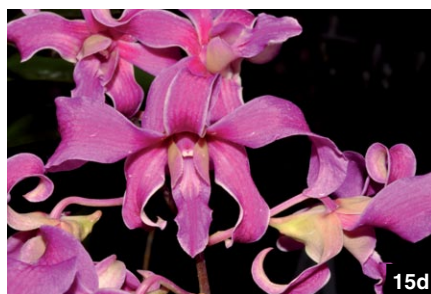
× *speciosum*, Sato Orchids, 1999) have produced outstanding displays on large plants, and some plants have received quality awards. *Dendrobium* Esme Poulton and *Dendrobium* Warringah are frequently exhibited at late winter and spring shows in Australia.

**HYBRIDS OF *DENDROBIUM BIGIBBUM* WITH OTHER AUSTRALIAN DENDROBIUMS** There are at least 18 primary hybrids using *Den. bigibbum* with other Australian species, including eight from sect. *Spatulata*, six from sect. *Dendrocoryne*, *Dendrobium monophyllum*, *Dendrobium agrostophyllum*, and the other species in section *Phalaenanthe*, *Dendrobium affine* (Table 4). Julian Shaw, the registrar of the Orchid Hybrid Registration List at the RHS, examined the original registrations at my request, and the provenance of the *Den. bigibbum* taxa used, as in other hybrids, cannot be determined from the records.

*Dendrobium bigibbum* (in the sense of the new classification) has been used as a direct parent in 123 crosses and has been a component of many more hybrids used in breeding over almost 100 years. Of these 123 crosses, 41 are synonyms, with the same cross having been registered two or more times. Most were made in the first three phases of breeding up until 1970 by breeders outside Australia. There have been only eight crosses registered by Australian breeders in the period 1975–2010.

Most of the early hybridizers are now deceased and have left no available record of the details of the crosses. The number of many of these primary hybrids in collections and exhibitions is low. In some cases, few seedlings were produced or even only a single plant, for example, *Den.* Esme Poulton, which has not been successfully remade despite many attempts. Most breeding occurred in the period 1969–1997.

Hybrids involving *Den. bigibbum* and sect. *Dendrocoryne* species are an important group, being common in Australian collections. As the composition of *Den. bigibbum* falls in hybrids, the influence decreases but is still apparent in wide labellums and petals. Many of these hybrids can be grown in cool conditions, down to 46.4 F (8 C). Examples of common and striking hybrids include *Den.* Warringah, *Den.* Esme Poulton, *Dendrobium* Pee Wee, *Dendrobium* Colonial Maid, *Dendrobium* Brinawa, *Dendrobium* Samford Rose, and *Dendrobium* Mini Pearl. In the more advanced hybrids, the influence of *Den.*



[15a–e] Examples of *Dendrobium* × *superbiens*, the natural hybrid between *bigibbum* and *discolor*; a,b) (*bigibbum* var *schroederianum* × *discolor*), c) *Dendrobium* × *superbiens* nothovar. *vinicolor* (*bigibbum* var. *compactum* × *discolor*), d, e) Seedlings resulting from the man-made hybrid of *Dendrobium bigibbum* and *Dendrobium discolor*.

[16a–d] Examples of *Dendrobium bigibbum* var *schroederianum* from the Tanimbar Islands of the Maluku Province of Indonesia.





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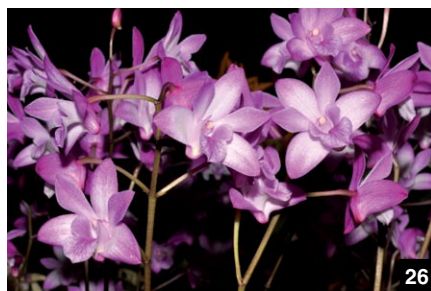
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[17–29] Some examples of hybrids of *Dendrobium bigibbum* and section *Dendrocoryne* species.

- 17) *Dendrobium* Touch of Class (Class x Ray's Spot)
- 18) *Dendrobium* Elegant Heart 'Aussie' (PeeWee x *speciosum*)
- 19) *Dendrobium* Brinawa Charm (Pee-Wee x *kingianum*)
- 20) *Dendrobium* Jayden 'Greta' (Elegant Heart x *speciosum*)
- 21) *Dendrobium* (Stunning x Tyabb)
- 22) *Dendrobium* Colonial Maid 'Verity' (*bigibbum* x *falcorostrum*). Photograph by Jon Cara.
- 23) *Dendrobium* Warringah 'Lipstick' (*bigibbum* x *speciosum*)
- 24) *Dendrobium* Warringah 'Snowdrop'
- 25) *Dendrobium* Warringah
- 26) *Dendrobium* Esme Poulton (*bigibbum* x *kingianum*)
- 27) *Dendrobium* Syd's Delight (Warringah x *falcorostrum*)
- 28) *Dendrobium* Warringah 'Manly'
- 29) *Dendrobium* Nanny Joy 'My Love' (Nelly Bay x Cassidy)



Table 4. Some historic *Dendrobium bigibbum* hybrids made with other Australian dendrobiums.

Hybrid Name	Second Parent	Hybrid registrant	Year of Registration
Lois Bleriot	× <i>superbiens</i>	Vacherot-Lecoufle	1929
Pompadour	Louis Bleriot	Vacherot-Lecoufle	1934
Roger Sander	<i>mirbelianum</i>	Sanders	1936
Albertine	<i>antennatum</i>	Nagrok	1940
David Sander	<i>nindii</i>	de Sarem	1944
White Gem	<i>affine</i>	Sanders	1946
Lady Constance	Orchidwood	Weber	1947
Helen Fukumura	Lady Constance	Fukumura	1952
David Baver	<i>johannis</i>	Baver	1956
Betty Matuka	Pompadour	Takaguchi	1957
Gregor Duruty	× <i>superbiens</i>	Duruty	1957
Rosy Tips	<i>canaliculatum</i>	Muir	1960
Suzanne (syn.)	<i>tetragonum</i>	Willersdorf	1965
Mini Pearl	<i>bigibbum</i>	Yagi	1974
Esme Poulton	<i>kingianum</i>	Poulton	1978
Pee Wee	<i>tetragonum</i>	Cannons	1979
Berry	Mini Pearl	Oda	1983
Warringah	<i>speciosum</i>	Upton	1984
Pink Ballerina	<i>agrostophyllum</i>	Upton	1985
Clifford Heers	Rockhampton Prince	Elder	1987
Brinawa	Hilda Poxon	Jarvis	1988
Red Ballerina	Pink Ballerina	Upton	1988
Mini Gem	<i>carronii</i>	Univ. Hawaii	1990
Colonial Maid	<i>falcorostrum</i>	Spence	1991
Fantasy Land	Cherry Dance	Morita	1994



*bigibbum* continues through flower shape, pink-mauve color and wide labellums.

A wide range of flower styles are seen when *Den. bigibbum* is hybridized with other *Dendrobium* sections. Although there may be some infertility problems, there is potential for further development of exciting new lines of *Den. bigibbum* hybrids.

#### Acknowledgments

Pina Milne and staff of the National Herbarium in Melbourne assisted in importing an herbarium specimen of *Den. bigibbum* var. *schroederianum* from Thailand. The Royal Botanic Gardens, Kew and Ernst Vitek (Natural History Museum, Vienna) supplied photographs of type specimens. Queensland Parks and Wildlife Service provided permits for study. Sheryl Lawson has been a colleague in this project since its inception.

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— Peter B. Adams (Ph.D., University of Melbourne) is a senior research associate at the School of Biosciences, University of Melbourne and National Herbarium, Royal Botanic Gardens Melbourne. He has published numerous scientific articles on Australian orchids, is a grower and breeder of Australian *Dendrocoryne* (email: gallangowan@optusnet.com.au).

[30] *Dendrobium* Class 'WOC'

[31] *Dendrobium* [Donovan × (Gilleston Gem × Delicate Ellen)]

[32–37] Some examples of hybrids of *Dendrobium bigibbum* and other sections of the genus *Dendrobium*:

32) *Dendrobium* Berry 'Oda' (*kingianum* × Mini Pearl)

33) *Dendrobium* White Gem (*bigibbum* × *affine*)

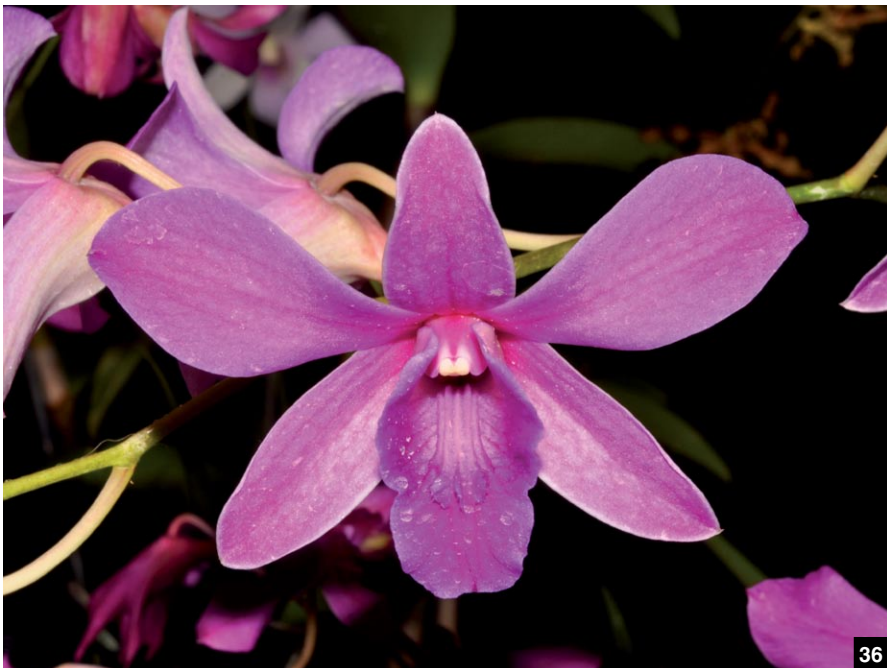
34) *Dendrobium* Mini Pearl (*canaliculatum* × *bigibbum*)

35) *Dendrobium* (*trilamellatum* × *bigibbum*)

36) *Dendrobium* Australia (*bigibbum* × *nindii*)

37) *Dendrobium* White Grace 'Sato' AM/AOS (Fiftieth State × *speciosum*)





# Orchids in Watercolor

## *Cypripedium reginae*

Marcia Whitmore

*Cypripedium reginae* is a rare native lady's slipper orchid found in northern North America and southern Canada. It is rare due to habitat loss and illegal collection. The tall stately plant produces one to two lovely flowers at the top of the stem. The inflated pouch is 1–2 inches (2.5–5.1 cm) long and is a gorgeous raspberry pink. Occasionally, completely white flowers are found. *Cypripedium reginae* is the state flower of Minnesota. This orchid is now available from several vendors who have successfully propagated the plant legally and also have produced lovely hybrids with other species of *Cypripedium*.

A few years ago, I attended the Native Orchid Conference at Lake Itasca, Minnesota, and was fortunate to see hundreds of these lovely plants in full bloom. I took pictures, made sketches and returned home to do this painting on 300 lb. Arches watercolor paper. I now have a nice clump of these lady's slippers growing in my orchid bed on the northeast side of the house. They were purchased as pips (dormant growths) from a certified hybridizer. I cover the bed in the fall with pine needles and oak leaves, rake the bed clean in late April and wait for the plants to emerge alongside *Cypripedium* × *andrewsii*, *Cypripedium parviflorum* and several hybrids.

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>).







# Who Were These Guys, Part 8

James Bateman (1811–1897)

DAVID ROSENFELD, MD





IN OUR 2019 world of technical imagery you can pick up your 1-pound (454-gram) iPad and comfortably read almost any book in the world no matter its original length, size or weight. If there are pictures in the book, you can utilize your device to admire the super high quality images. In contrast, imagine you desired to publish a book illustrating the orchids of Guatemala and Mexico in 1840 and you wanted it to be impressive. James Bateman did just that when he published his 38-pound (17.27-kg), 30 × 20 inch (76 × 50 cm) *Orchidaceae Of Mexico And Guatemala*. Truly you needed a wheelbarrow to transport this magnum opus and a special table to hold it. Richard Hamilton said in the *AOS Bulletin* in 1990, "It was one of the first products of the orchidmania that swept England's upper classes" during the Victorian age (Hamilton 1990, p. 1246), but more about this tome later. Who was James Bateman and why did he undertake this project at the age of 29?

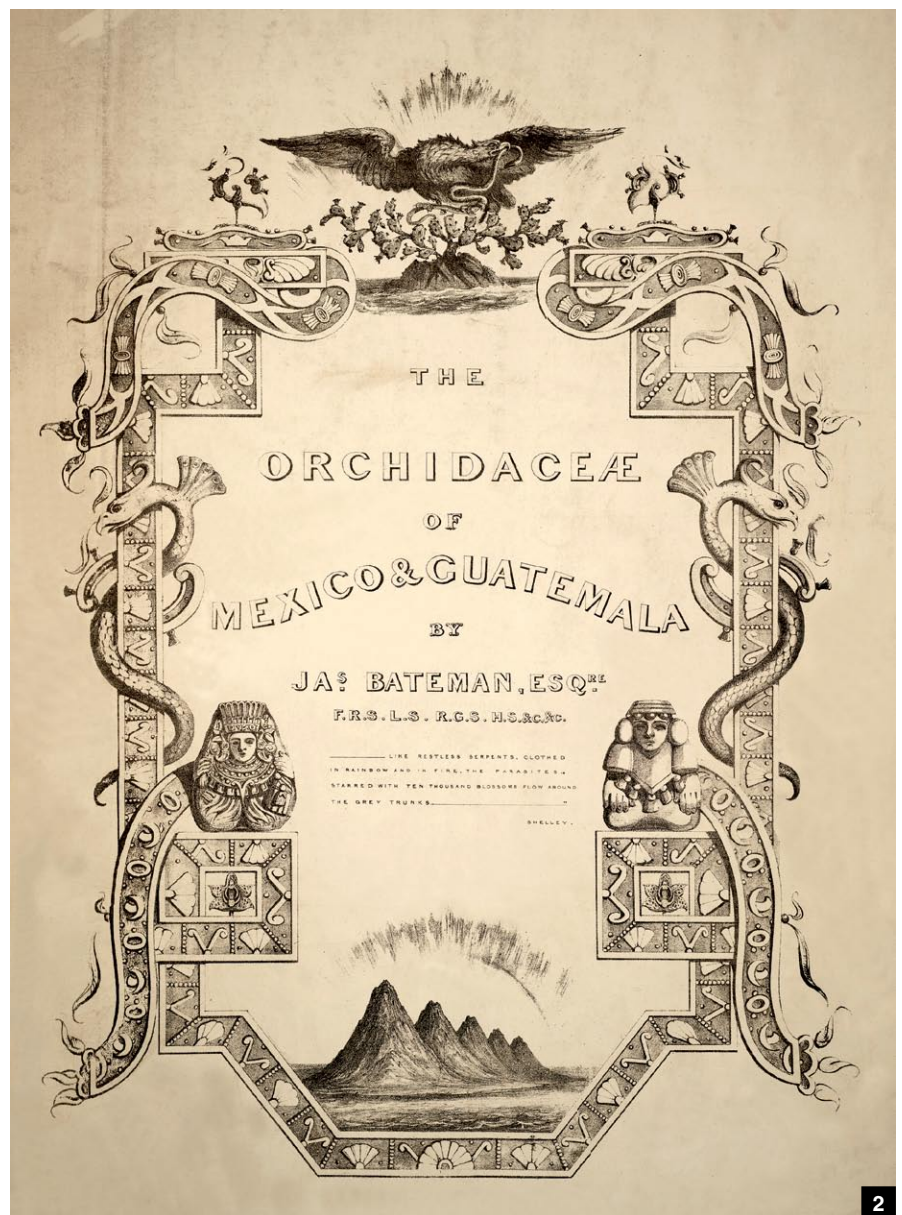


David Rosenfeld, MD

Bateman was what we would call today nouveau riche. He was not born into the English landed aristocracy but was the fortunate product of the 18th and 19th century Industrial

Revolution. His grandfather amassed a huge fortune in iron foundries, coal mines and steam engines. James Bateman and his almost exact contemporary Charles Darwin (Darwin was an heir to the Wedgewood fortune) had no financial worries. They were able to mix with the aristocracy and pursue intellectual endeavors. Bateman attended the University of Oxford receiving his BA in 1834 and MA in 1835. There is a famous, if somewhat apocryphal story, about Bateman while an undergraduate. Skipping class, he ventured to the nursery of Thomas Fairburn who had been employed previously by the then famous orchidologist Sir Joseph Banks. During the visit he became entranced with a specimen of *Renanthera coccinea*, which he purchased as his first orchid. "It was certainly a vision of beauty that Mr. Fairburn...showed me. Of course I fell in love at first sight" (Hamilton 1991, p. 39). As punishment for his absence from class, Bateman had to write out half of the Book of Psalms.

Encouraged by his father to delve further into horticulture, Bateman did what many affluent Englishmen of the



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age did. They hired orchid hunters to collect orchids for their conservatories. In 1833, while still an undergraduate, Bateman sent Thomas Colley, Fairburn's supervisor to Demerara, in what is now British Guyana on the north coast of South America. He returned with 60 specimens, 30 of which were new to cultivation in England. This was the inception of Bateman's orchid collection at his Knypersley Hall estate. John Lindley even named one of the orchids *Batemannia colleyi* commemorating both gentlemen. One of Bateman's earliest botanical writings was in *Loudon's Gardeners' Magazine* describing the expedition and commenced his notable literary career (Reinikka 1995, Ferry 2007)

Bateman's initial interest in orchids very rapidly became an all-encompassing passion. In 1834 while still a student, he

- [1] *Batemannia colleyi* 'Sunset Valley Orchids' HCC/AOS. Lindley described this species in 1834, citing it as the type species for his new genus, *Batemannia*, named in honor of James Bateman. Photograph by Loren Batchman.
- [2] The frontispiece of Bateman's *Orchidaceae of Mexico and Guatemala*.

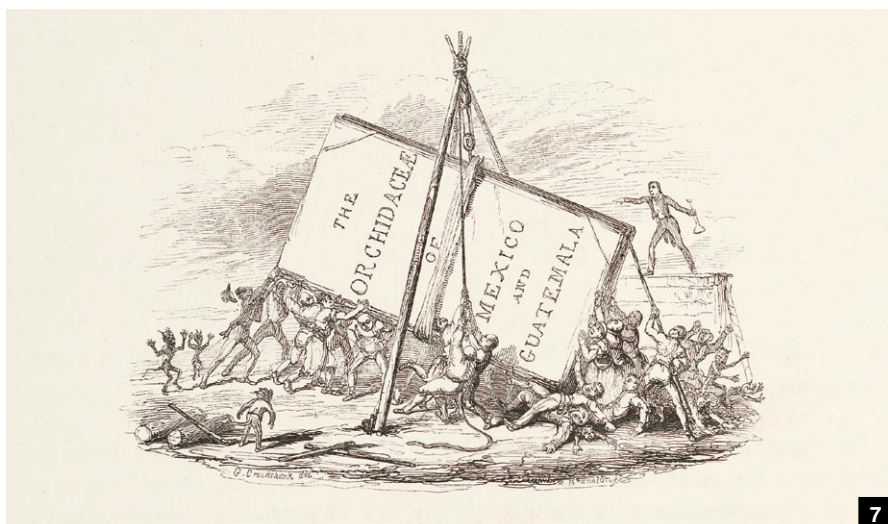
became aware of shipments of birds and insects being sent from Guatemala to the Museum of Natural History in Manchester by George Ure Skinner (Rosenfeld 2019). He surmised that there must be a treasure trove of orchids just waiting to be discovered in this region. Although Skinner was a complete stranger, Bateman wrote Skinner a letter that is now lost to history in which he suggested that Skinner consider exploring the country



for orchids and send him specimens. He even provided descriptions and sketches in the letter. Thus began a special relationship between orchid hunter and botanist that lasted 30 years until Skinner's death in 1867. Soon, frequent shipments were arriving at his estate. They were established, flowered and named, mostly by John Lindley (Rosenfeld 2018). Within 10 years Bateman had the finest collection of Guatemalan orchids in England (Hamilton 1990).

Even while he was acquiring his orchidaceous bounty from Guatemala he decided on the monumental project outlined at the beginning of this article. He conceived the idea of publishing an elephant-sized folio so he could share his orchid bounty with the masses. In reality it would be very select members of the upper class of Victorian society who would have to opportunity to buy this tome. The cost of production of the *Orchidaceae Of Mexico And Guatemala* was not a consideration. The largest printing press available in that era was utilized, and 40 plates were eventually produced. Two illustrators painted 37 of the orchids: Twenty were by Augusta I. Withers, the painter for Queen Adelaide (spouse of William IV England) and 17 were by a Miss S.A. Drake about which almost nothing is known. They were lithographed by M. Gauci of London, who is described as an unsurpassed master of lithography. Several of the original paintings have been conserved at the Lindley Library of the Royal Horticultural Society. The page adjacent to the lithograph contained both taxonomic and botanical information as well as informative vignettes. At least 15 were written by Skinner and they often included his own drawings. These vignettes frequently included scenery of where the orchids were found and anecdotes related to their collection. There were also descriptions discussing the orchid culture of these exotic plants (Hamilton 1990).

In the end, this gargantuan folio was published in seven installments from 1837 to 1843. Only 125 were eventually produced. The cost was 20 guineas (about \$2,000 today) per book; it was clearly not a book published for the masses. This holy grail of orchid books sold at auction 20 years ago for \$250,000, and AbeBooks is currently selling an original for the same price. Bateman later stated that he lost \$60,000 to \$80,000 on the project. To Bateman the cost of production was not a concern. Where are these 125 originals now? Most have probably







been dismantled and sold as individual lithographs. My research indicates that there is an original in the library at the Marie Selby Botanical Gardens in Sarasota, Florida, and I am told that the AOS has an original, as does the Royal Botanical Garden, Kew (Siegel 2013). In 1973 a reprint was issued in a reduced format 14 × 20 inches (35 × 50 cm) in an edition of 1,000 copies. A used copy of the reprint can be purchased today for around \$300. I also found a more recent 6 × 10 inch (15 × 24 cm) reprint on Amazon for \$22, so of course I bought it. Sadly, it was printed only in black and white and difficult to read due to indistinct and fuzzy lettering.

James Bateman also wrote two additional major books on Orchidaceae. The first was published in 1867 as *A Second Century Of Orchidaceous Plants*. This book was a compilation or earlier articles written by Bateman for *Paxton's Botanical Magazine*. It contained 146 lithographs and texts. His third treatise, published between 1864 and 1874, was his *Monograph Of Odontoglossums*. This book comprised 30 lithographs and included an introduction describing the correct culture of these cool-growing orchids. This introduction precipitated, as Bateman states, "a general raid was made upon the more accessible countries in which

they were known to abound...the rival envoys, much to their own mortification and chagrin, found themselves sailing for the same destination in the same steamer on the same errand" (Reinikka 1995, p. 184–186).

James Bateman lived out his remaining years as a country gentleman. He designed his famous gardens at Biddulph Grange, very close to his family's estate at Knypersley Hall. It has been restored by the British National Trust to its original beauty (Siegel 2013). Bateman lectured frequently on horticultural topics and was a member of numerous prestigious horticultural societies. He died in 1897 at the age of 86.

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— David Rosenfeld, MD, has been growing orchids with his wife Joan for 40 years. David is a retired professor of

[3] Painting of James Bateman.

[4] *Rossioglossum grande* (as *Odontoglossum grande*); plate 24

[5] *Oncidium leucochilum* from the *Orchidaceae of Mexico and Guatemala*.

[6] *Guarianthe aurantiaca* (as *Epidendrum aurantiacum*) from plate 12 of Bateman's compendium.

[7] *Bateman was good-natured enough to actually include this cartoon poking fun at the sheer weight of his Orchidaceae of Mexico and Guatemala* in the volume itself.

[8] *Galeandra batemanii* 'Ms. Vicki' HCC/AOS. Described by Rolfe in 1892, this species also honors James Bateman for his contributions to the 19th century orchid world.

*pediatric radiology at the Rutgers Medical School. They have a 700-square foot (about 65-sq m) greenhouse with both warm and cool sections where they grow a mixed collection of species and hybrids. Their skill as growers is illustrated by their 95 flower quality and 28 cultural awards. David wrote about George Ure Skinner (his 14th article) in the January 2019 issue of Orchids magazine (88(1):38–41) (email: orchiddoc@comcast.net).*



# A Handsome “Snake” in the Grass

*Goodyera pubescens*

BY SORAYA CATES PARR/PHOTOGRAPHS  
BY THE AUTHOR UNLESS OTHERWISE CREDITED





AS A MEMBER of Orchidaceae, *Goodyera pubescens* is an herbaceous perennial native to the eastern part of the United States. It is sometimes called the downy rattlesnake plantain or the downy rattlesnake orchid. There are four *Goodyera* species found in North America north of Mexico, with *G. pubescens* being very dominant in middle Tennessee and the Southeastern United States. The word “plantain” is misleading as it is not a common plantain at all. It resembles the common plantain by the basal rosette of leaves that it forms. The foliage is dramatic with its color and venation. It has some of the showiest leaves in the Southeastern woodlands.

The plant grows in forests and woodland areas that have a wide range in temperature during the year. It thrives in moderately acid humus on well-drained slopes. Sunlight is usually screened by forest trees and overhanging branches. The leaves of this terrestrial remain evergreen throughout the year and are oval about 1–2.5 inches (2.5–6.3 cm) long. New leaves are produced in the spring through early autumn, and flowering occurs in mid-to-late summer. The name *Goodyera* honors the English botanist John Goodyer (1592–1664).

When walking in deciduous forests, it is very surprising to happen upon the foliage of *Goodyera* species. The markings on *G. pubescens* seem to resemble the skin of a snake, hence the name rattlesnake orchid. Striking reticulate markings on each leaf are of a cream to white color. Leaves are ovate to oblong with a deep green or bluish green color. Each leaf has a wide creamy white center with a network of white to cream-colored veins originating from the center. Leaves consist of three to eight in a basal rosette. All parts of *G. pubescens* have fine downy hair, giving it a softened appearance. The word *pubescens* is a Latin adjective meaning “downy.”

*Goodyera pubescens* has been used by the early Native Americans for various ailments such as the common cold and kidney dysfunction. It was used by the pioneers for skin diseases and burns. The leaves were made into a poultice and used externally. “Old Timers” in the Deep South believed it was an antidote for snakebite. In Colonial America, it has a history of folkloric uses such as an aphrodisiac to lure a husband for a young maiden. The leaves were mixed into a poultice with animal fat (usually groundhog fat) by the light of the waxing moon. The maiden used this oily mixture on her skin and face, then



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- [1] *Goodyera pubescens* in the late spring or early summer just as the inflorescence is beginning to open. Flowering takes place over months and ripening seed capsules are often present with freshly opening flowers and unopened buds on the same inflorescence. Photograph by Greg Allikas.
- [2] The rattlesnake plantain takes its name from the rosette of attractively marked foliage. This photograph was taken at the beginning of December, at which time, only spent seed capsules remain on the inflorescence.
- [3] Rosettes are connected by a series of branching horizontal rhizomes at or very near the surface.
- [4] Rhizome sections seen during the winter.



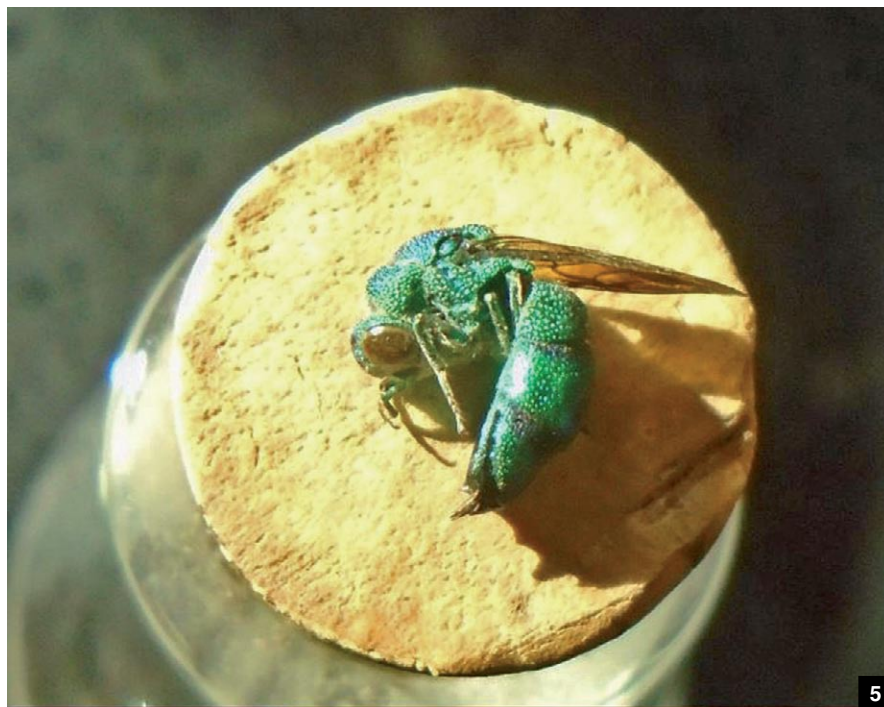
secret incantations were chanted. These incantations were only chanted out loud by an older female member of the family (usually a grandmother) during the spring equinox. The young man would appear within the year to court the maiden, if all went well. This story was recited to me as a child by a World War I veteran friend years ago. He referred to the orchid as a “rattlesnake plant.” He took delight in reciting it when the wind was high and moon was a slender crescent.

The flowers are intricate upon magnification. The white to cream flowers appear on a somewhat tall (5–20 inch [12.7–50.8 cm]) green stalk produced from the center of the mature rosette of leaves. The flowers have a pouch-like shape and are nearly spherical (globose). The petals converge with the dorsal sepal to form a hood over the lip. On the ends of the sepal and petals, a light green tip looks etched on and adds to the beauty of this orchid. The spurless lip is characteristic of the genus (Correll 1950). The floral bracts are lanceolate. This raceme is covered with fine, downy hairs that glisten in the sun.

*Goodyera pubescens* harbors and provides shelter for many insects in the forest. Crouching in the blooms, crab spiders claim their territory, waiting patiently for their prey. Several *Augochlora* and *Augochorella* bee species appear to act as pollinators. These Halictid bees are bright metallic colors ranging from bold greens to blue-greens to iridescent blues, and several types of bumblebees (*Bombidae*) have been observed to visit the flowers.

The subterranean parts of the plant is a series of rhizomes, looking as though they are creeping along level with the ground. Through the intricate branching of the rhizome, the plants spread clonally, rooting at the base of each of the leaf rosettes. The plant grows on decaying wood and other organic matter.

The inflorescence of the *G. pubescens* begins to change in the late summer and early autumn, as flowers produce mature seed capsules. The mature capsules begin to dry in late summer and autumn. Seeds fall to the ground within the area of the colony. The dust-like seeds, characteristic of orchids, lack an endosperm. They become scattered among the rhizomes of the parent plant, lying dormant through the winter. The seeds, viewed under a microscope, show an easy-to-define embryo. To germinate, they must depend on a specific fungus to invade the seed coat. The string-like threads of the



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fungal hyphae enter the embryo within the seed. It increases in size to form numerous cells forming a protocorm. This living arrangement of fungus and plant is called a symbiotic relationship, in which both plants benefit by the association. Mycorrhizal fungi are very specific for the different species of terrestrial orchids but the appropriate species is most likely to be present where the mother colony of plants was located.

During the winter, the plant’s leaf rosettes become longer as if reaching for the sun. The leaves become thinner and seed capsules can still be present after the first snowfall of the winter season.

On the subject of conservation, these plants are used in abundance in terrariums and table centerpieces for their foliage. These plants, as you might surmise, die quickly without the natural environment and mycorrhizal symbiosis. Education is usually the best tool we can use to inform plant societies and garden clubs, children’s gardening classes and master gardener’s programs. It is essential that we put into practice the conservation of our native orchids.

#### References

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— Soraya Cates Parr pursues life-long learning! She was the Orchid Specialist at Cheekwood Botanical Gardens, Nashville TN; appointed member of The Governor’s Council on Physical Fitness and Health for the State of Tennessee, author and speaker, degreed scientist, professional fitness



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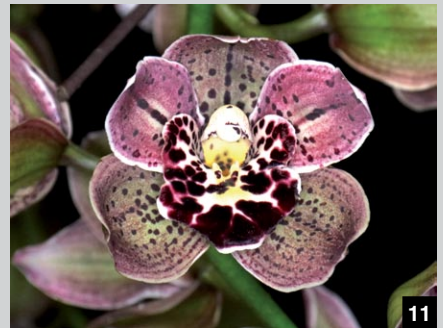
- [5] Bees of the genus *Augochorella* are known to visit the flowers.
- [6] Seed of *Goodyera pubescens* as seen through a microscope. The dark areas in the middle of individual seeds are the embryos surrounded by the husklike outer covering.
- [7] A plant in full flower is really quite beautiful viewed up close.

instructor with BellyTone® and a professional teaching/performing musician. She is the facilitator with the American Lung Association’s Better Breathers Club and has written a course on COPD with Fitness Learning Systems. She is a member of the Orchid Society of Middle TN and the winner of the AOS 2017 Dillon/Peterson essay prize (email: [uptoparr747@gmail.com](mailto:uptoparr747@gmail.com)).













- [1] *Cymbidium* Abundance 'Mary Lee Gray' AM/AOS (Lyoth x *canaliculatum*) 82 pts. Exhibitor: Mary Lee Gray; photographer: Arthur Pinkers. Pacific South Judging Center
- [2] *Paphiopedilum* Red Hawk 'Springwater' HCC/AOS (Hsinying Franz x Johanna Burkhardt) 79 pts. Exhibitor: Springwater Orchids and Thanh Nguyen; photographer: Nick Nickerson. West Palm Beach Judging Center
- [3] *Laecholaelia* Graf's Alegria 'Gigi's First' AM/AOS (*Rhyncholaelia glauca* x *Laelia undulata*) 80 pts. Exhibitor: Gigi Louis; photographer: Nick Nickerson. West Palm Beach Judging Center
- [4] *Catyclia* Kasey Ray's SunCoast 'Odom's Orchids' AM/AOS (*Cattleya* Peckaviensis x *Encyclia* Paula Gross) 81 pts. Exhibitor: Odom's Orchids; photographer: Nick Nickerson. West Palm Beach Judging Center



- [5] *Oncostelopsis* Sunkissed 'Buttercup' HCC/AOS (*Oncidopsis* Living Fire x *Oncostele* Catatante) 76 pts. Exhibitor: Kim Hober; photographer: Jay Norris. Toronto Judging Center
- [6] *Paphiopedilum* *delenatii* f. *albinum* 'Springwater Cloud Nine' HCC/AOS 79 pts. Exhibitor: Springwater Orchids and Thanh Nguyen; photographer: Nick Nickerson. West Palm Beach Judging Center
- [7] *Cattleya* *nobilior* var. *amaliae* 'Red Hawk' AM/AOS 81 pts. Exhibitor: Sheri Liggett-Macchia and Red Hawk Nursery; photographer: Nick Nickerson. West Palm Beach Judging Center
- [8] *Guaricyclia* Honey 'Bonnie' FCC/AOS (Rosita x *Guarianthe aurantiaca*) 90 pts. Exhibitor: Bonnie and Will Riley; photographer: Nick Nickerson. West Palm Beach Judging Center
- [9] *Brassocattleya* Hawaiian Kaleidoscope 'Crownfox Canary' AM/AOS (Hippodamia x Richard Mueller) 86 pts. Exhibitor: R.F. Orchids, Inc.; photographer: Nick Nickerson. West Palm Beach Judging Ctr.



- [10] *Dendrobium* *lindleyi* 'Inspiration Jim Kerns' CCE-AM/AOS 92-85 pts. Exhibitor: Marissa Gittleman; photographer: Nick Nickerson. West Palm Beach Judging Center
- [11] *Cymbidium* Vogel's Magic 'Waikanae' AM/AOS (Tethys x Vogelsang) 81 pts. Exhibitor: Deb Boersma; photographer: Ed Cott. Toronto Judging Center
- [12] *Disa* Veitchii 'Charlie' AM/AOS (*uniflora* x *racemosa*) 80 pts. Exhibitor: John Marcotte; photographer: Jay Norris. Toronto Judging Center
- [13] *Dendrobium* SOOS Celebrates 50 'Synea' CCM/AOS (*aberrans* x Little Atro) 86 pts. Exhibitor: Synea Tan; photographer: Jay Norris. Toronto Judging Center
- [14] *Paphiopedilum* *delenatii* 'Charlie' AM/AOS 84 pts. Exhibitor: John Marcotte; photographer: Jay Norris. Toronto Judging Center
- [15] *Leptotes* *bicolor* 'Springwater' CCM/AOS 82 pts. Exhibitor: Springwater Orchids and Thanh Nguyen; photographer: Nick Nickerson. West Palm Beach Judging Center

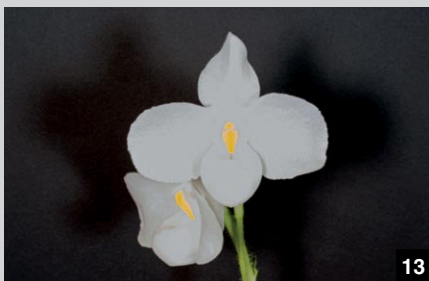








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- [1] *Dendrobium smilliae* 'Kyra's Smile' CCM/AOS 81 pts. Exhibitor: Wayne Green; photographer: Nick Nickerson. West Palm Beach Judging Center
- [2] *Cymbidium* Australian Midnight 'Naples Midnight' AM/AOS (*canaliculatum* x *atropurpureum*) 83 pts. Exhibitor: Jim Longwell; photographer: Nick Nickerson. West Palm Beach Judging Center
- [3] *Angraecum leonis* 'Robert Bailey' AM/AOS 86 pts. Exhibitor: David Genovese; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [4] *Epicattleya* René Marqués 'Tyler' CCE/AOS (*Epidendrum pseudepidendrum* x *Cattleya Claesiana*) 92 pts. Exhibitor: David Genovese; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [5] *Vanda* Marty Brick 'Pink Sapphires' AM/AOS (*lamellata* x Motes Mandarin) 81 pts. Exhibitor: David Genovese; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [6] *Dendrobium* Spring Smile 'Lovely' AM/AOS (To My Kids x Wave King) 83 pts. Exhibitor: Mary Southall; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [7] *Papilionanda* Batram 'Crownfox' AM/AOS (Mimi Palmer x *Vanda denisoniana*) 82 pts. Exhibitor: R.F. Orchids, Inc.; photographer: Nick Nickerson. West Palm Beach Judging Center
- [8] *Oeoniella polystachys* 'Marion's Just An Accent' CCM/AOS 84 pts. Exhibitor: Marion Steele; photographer: Tom Kuligowski. West Palm Beach Judging Ctr.
- [9] *Rhyncattleanthe* East Texas Sunset 'Benttree' AM/AOS (*Cattlianthe* Rojo x Orange Nuggett) 84 pts. Exhibitor: Bonnie and Will Riley; photographer: Nick Nickerson. West Palm Beach Judging Center
- [10] *Dendrobium faciferum* 'Other Worlds' CCM-AM/AOS 88-84 pts. Exhibitor: John Romano; photographer: Nick Nickerson. West Palm Beach Judging Center
- [11] *Disa uniflora* 'Charlie' HCC/AOS 76 pts. Exhibitor: John Marcotte; photographer: Jay Norris. Toronto Judging Center
- [12] *Dendrobium* Aussie's Chip 'Charlie' CCE/AOS (*aberrans* x *atroviolaceum*) 92 pts. Exhibitor: John Marcotte and Synea Tan; photographer: Jay Norris. Toronto Judging Center
- [13] *Paphiopedilum delenatii* f. *albinum* 'Trish the Dish' AM/AOS 82 pts. Exhibitor: Carolyn Fuentes; photographer: Charlotte Randolph. Alamo Judging Center
- [14] *Chysis limminghei* 'Maya' HCC/AOS 77 pts. Exhibitor: Ritchie Jasmin; photographer: Tom Kuligowski. West Palm Beach Judging Center
- [15] 'Lost in the Forest' AC/AOS 91 pts. Exhibitor Vicki Hallock; photographer: Nick Nickerson. West Palm Beach Judging Center
- [16] *Paravanda* Golden Delight 'Crownfox' AM/AOS (*Paraphalaenopsis denevei* x *Vanda Suksamran Sunshine*) 80 pts. Exhibitor: R.F. Orchids, Inc.; photographer: Nick Nickerson. West Palm Beach Judging Center









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- [1] *Cattlianthe* Redland Ibis 'Crownfox' CCE/AOS (*Cattleya milleri* x *Guarianthe Guatemalensis*) 93 pts. Exhibitor: R.F. Orchids, Inc.; photographer Nick Nickerson. West Palm Beach Judging Center
- [2] *Rhyncholaeliocattleya* Cordelia 'Justine Marie' AM/AOS (*Rhyncholaelia digbyana* x *Cattleya intermedia*) 81 pts. Exhibitor: Peg Geria; photographer: Nick Nickerson. West Palm Beach Judging Center
- [3] *Cattleya* Sagapyle 'Ryleigh's Dream' AM/AOS (Sagana x Ernie Pyle) 82 pts. Exhibitor: Carole Gage; photographer: Charlotte Randolph. Alamo Judging Center
- [4] *Paphiopedilum haynaldianum* 'The Boys' HCC/AOS 77 pts. Exhibitor: Jeanne Buchanan; photographer: Charlotte Randolph. Alamo Judging Center
- [5] *Cattleya walkeriana* 'F. M. Orchids' AM/AOS 81 pts. Exhibitor: Canaima Orchids; photographer: Jason R. Mills. Atlanta Judging Center
- [6] *Cattleya intermedia* (Orlata) 'Canaima's Patrick' AM/AOS 80 pts. Exhibitor: Fred Missbach; photographer: Jason R. Mills. Atlanta Judging Center
- [7] *Phragmipedium* Don Wimber 'Benji' HCC/AOS (Eric Young x *besseae*) 79 pts. Exhibitor: Kurt A. Studier; photographer: Jason R. Mills. Atlanta Judging Center
- [8] *Phalaenopsis* Miva Smartissimo 'Firelli' AM/AOS (Entrechat x Elise de Valec) 80 pts. Exhibitor: Jon Crate; photographer: Jason R. Mills. Atlanta Judging Center
- [9] *Rhyncholaeliocattleya* Clouds Creek 'Heavenly Scent' HCC/AOS (Table Rock Mountain x Campobello) 78 pts. Exhibitor: James G. Morris; photographer: Kathy Barrett. California-Sierra Nevada Judging Center
- [10] *Lycaste* Memoria Kageyuki Mito 'Jaime' AM/AOS (Shoalhaven x Memoria Bill Congleton) 82 pts. Exhibitor: Jaime Yu; photographer: Jason R. Mills. Atlanta Judging Center
- [11] *Brassidomesa* Golden Stars 'Sierra Vista' AM/AOS (*Gomesa echinata* x *Brassidium* Shooting Star) 81 pts. Exhibitor: Curtis Gean; photographer: Cecil Bullard. California-Sierra Nevada Judging Center
- [12] *Cymbidium* Joseph Schmidt 'Nate Padilla' HCC/AOS (Canal Parish x *sinense*) 78 pts. Exhibitor: Bill Padilla; photographer: Cecil Bullard. California-Sierra Nevada Judging Center
- [13] *Cattleya schroederiae* 'Magic Love' AM/AOS 81 pts. Exhibitor: Carson Barnes; photographer: Jason R. Mills. Atlanta Judging Center
- [14] *Rhyncholaelia* Aristocrat 'Odom's Orchids' HCC/AOS (*glauca* x *digbyana*) 78 pts. Exhibitor: Odom's Orchids; photographer: Jason R. Mills. Atlanta Judging Center
- [15] *Vanda* Kulwadee Fragrance 'Brenda's Pride and Joy' AM/AOS (Gordon Dillon x Guo Chia Long) 80 pts. Exhibitor: Brenda Rithner; photographer: Jason R. Mills. Atlanta Judging Center
- [16] *Cymbidium* Gordon Gibbs 'Dashing' HCC/AOS (*aloifolium* x Cabernet) 78 pts. Exhibitor: Ed Dumaguin; photographer: Kathy Barrett. California-Sierra Nevada Judging Center









- [1] *Cymbidium* Mama Betty 'Jaybee' HCC/AOS (Face Painter x Bronze Idol) 76 pts. Exhibitor: Ed Dumaguin; photographer: Kathy Barrett. California-Sierra Nevada Judging Center
- [2] *Paphiopedilum* Krull's Prometheus 'Ben Belton' AM/AOS (Jan Ragan x *rothschildianum*) 83 pts. Exhibitor: Ben Belton; photographer: James Harris. Carolinas Judging Center
- [3] *Phalaenopsis* Germaine Vincent 'Blue Ridge Sunrise' HCC/AOS (*violacea* x *tetraspis* f. *speciosa*) 79 pts. Exhibitor: Mike Mims; photographer: Julie McMillan. Carolinas Judging Center
- [4] *Paphiopedilum* Liberty Taiwan 'Ben Belton' AM/AOS (*micranthum* x *hangianum*) 81 pts. Exhibitor: Ben Belton; photographer: James Curtis. Carolinas Judging Center
- [5] *Phalaenopsis* CTL Tetras PrinGelb 'Scooter' HCC/AOS (Yungho Princess Gelb x *tetraspis*) 79 pts. Exhibitor: Ben Belton; photographer: Julie McMillan. Carolinas Judging Center
- [6] *Phalaenopsis violacea* 'Blue Ridge Blueberry' AM/AOS 81 pts. Exhibitor: Mike Mims; photographer: Julie McMillan. Carolinas Judging Center
- [7] *Leptotes pohlitinocoi* 'Love Potion' CCM/AOS 85 pts. Exhibitor: Sarah Patterson; photographer: James Harris. Carolinas Judging Center
- [8] *Dendrobium findlayanum* 'Sweet Eclipse' HCC/AOS 77 pts. Exhibitor: Sarah Patterson; photographer: James Curtis. Carolinas Judging Center
- [9] *Cattleya* Rock City 'Pisgah' AM/AOS (Frank Lind x *mossiae*) 83 pts. Exhibitor: Looking Glass Orchids; photographer: Julie McMillan. Carolinas Judging Center
- [10] *Phalaenopsis* Pylø's Phoenix 'Bristol' AM/AOS (KV Golden Star x Lawrie Springate) 83 pts. Exhibitor: Joe Armstrong; photographer: Julie McMillan. Carolinas Judging Center
- [11] *Aciopea* Eric Sauer 'Geri' AM/AOS (*Stanhopea connata* x *Acineta erythroxantha*) 82 pts. Exhibitor: Bob Meyer; photographer: James Curtis. Carolinas Judging Center
- [12] *Phalaenopsis* Jong's Gigan Cherry 'Blue Ridge' HCC/AOS (*gigantea* x Kung's Red Cherry) 78 pts. Exhibitor: Mike Mims; photographer: James Harris. Carolinas Judging Center
- [13] *Phalaenopsis* Mituo King Bellina 'Marley' FCC/AOS (LD's Bear King x LD Bellina Eagle) 92 pts. Exhibitor: Mike Mims; photographer: Julie McMillan. Carolinas Judging Center
- [14] *Paphiopedilum* Wössner Black Wings 'Hayden Jensen' HCC/AOS (*rothschildianum* x *anitum*) 77 pts. Exhibitor: Krull-Smith; photographer: Julie McMillan. Carolinas Judging Center
- [15] *Phalaenopsis* YangYang Hannover 'Blue Ridge Blood' HCC/AOS (Jong's Gigan Cherry x Hannover Passion) 75 pts. Exhibitor: Mike Mims; photographer: Julie McMillan. Carolinas Judging Center
- [16] *Paphiopedilum* Hung Sheng Eagle 'Krull-Smith' AM/AOS (*gigantifolium* x *rothschildianum*) 81 pts. Exhibitor: Krull-Smith; photographer: Julie McMillan. Carolinas Judging Center



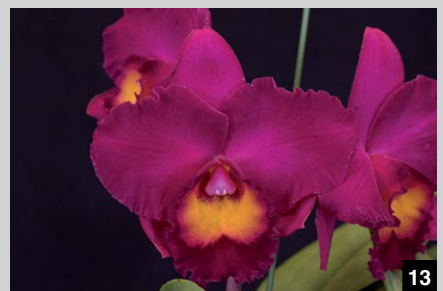
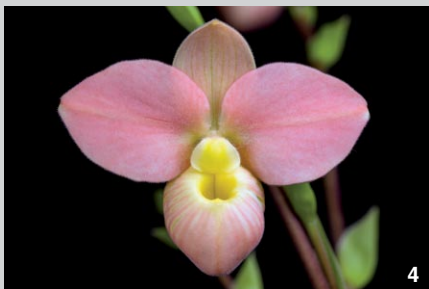






- [1] *Rhyncholaeliocattleya* Volcano Glory 'Asheville Spring' HCC/AOS (Volcano Star x Blanche Aisaka) 79 pts. Exhibitor: Krull-Smith; photographer: Julie McMillan. Carolinas Judging Center
- [2] *Phalaenopsis* Krull's Florida Moon 'Ponkan' HCC/AOS (Heartbeat x John Naugle) 77 pts. Exhibitor: Krull-Smith; photographer: Julie McMillan. Carolinas Judging Center
- [3] *Paphiopedilum hirsutissimum* (Album) 'Sam's Choice' FCC/AOS 92 pts. Exhibitor: Orchid Inn, Ltd.; photographer: Katie Payeur. Chicago Judging Center
- [4] *Dendrobium scabrilingue* 'Biju' HCC/AOS 78 pts. Exhibitor: Patricia Kono Steve Gonzalez; photographer: Katie Payeur. Chicago Judging Center
- [5] *Cattleya schroederae* 'Michael' AM/AOS 84 pts. Exhibitor: William Rogerson; photographer: Katie Payeur. Chicago Judging Center
- [6] *Paphiopedilum* Hampshire Kin 'Hampshire' HCC/AOS (Hampshire Beau x Kinzua) 76 pts. Exhibitor: Arnold J. Klehm; photographer: Katie Payeur. Chicago Judging Center
- [7] *Dendrobium polyanthum* 'Magic' CCM/AOS 86 pts. Exhibitor: Rosalie Peters; photographer: Julie McMillan. Carolinas Judging Center
- [8] *Paphiopedilum* Hsinying Alien 'Cheri' HCC/AOS (Raisin Pie x Supersuk) 78 pts. Exhibitor: Dave Wujek; photographer: Nile Dusdieker. Chicago Judging Center
- [9] *Paphiopedilum* Hampshire Man 'Hampshire' HCC/AOS (Hampshire Beau x Manayunk) 79 pts. Exhibitor: Arnold J. Klehm; photographer: Katie Payeur. Chicago Judging Center
- [10] *Trichosalpinx patula* 'Cheryl's Joy' CBR/AOS. Exhibitor: Cheryl Erins; photographer: Nile Dusdieker. Chicago Judging Center
- [11] *Phalaenopsis* Jordon Winter (Citrus Candy 'Krull-Smith' AM/AOS x Krull's Red Bird 'Crystelle' AM/AOS) AQ/AOS. Exhibitor: Krull-Smith; photographer: Julie McMillan. Carolinas Judging Center
- [12] *Phalaenopsis* Jordon Winter 'Anthony's Choice' AM/AOS (Citrus Candy x Krull's Red Bird) 82 pts. Exhibitor: Krull-Smith; photographer: Julie McMillan. Carolinas Judging Center
- [13] *Phalaenopsis* Citrus Candy 'Sweet Mama' AM/AOS (Tying Shin Forever Love x Tying Shin Golden City) 83 pts. Exhibitor: Krull-Smith; photographer: Julie McMillan. Carolinas Judging Center
- [14] *Paphiopedilum* Milt and Joe 'Lorraine's Lemon Lime' AM/AOS (Hampshire Green Glass x Kay Rinaman) 80 pts. Exhibitor: Lorraine Heyden; photographer: Katie Payeur. Chicago Judging Center
- [15] *Phragmipedium* Sue Omeis 'Pride of Mingoville' CCM-FCC/AOS (Saint's Apprentice x Lynn Evans-Goldner) 83-92 pts. Exhibitor: Woodstream Orchids; photographer: Julie McMillan. Carolinas Judging Center
- [16] *Cymbidium* Geno's Gem 'Emerald Fire' AM/AOS (Mad Hatter x Kalimpong) 83 pts. Exhibitor: John and Cheryl Jaworski; photographer: Richard Noel. Cincinnati Judging Center









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- [1] *Paphiopedilum* Hampshire Red Gem 'Forest Park' HCC/AOS (Winston Churchill x Hampshire Gem) 78 pts. Exhibitor: Deno Kandis; photographer: Nile Dusdieker. Chicago Judging Center
- [2] *Paphiopedilum* Liberty Taiwan 'Timberlane' AM/AOS (*micranthum* x *hangianum*) 84 pts. Exhibitor: Marcia Whitmore; photographer: Nile Dusdieker. Chicago Judging Center
- [3] *Paphiopedilum* Pedro's Moon 'Timberlane' HCC/AOS (*armeniicum* x Pinocchio) 77 pts. Exhibitor: Marcia Whitmore; photographer: Nile Dusdieker. Chicago Judging Center
- [4] *Phragmipedium* Saint Ouen 'Memoria Dorothy D. Young' AM/AOS (Hanne Popow x *besseae*) 82 pts. Exhibitor: Tom Stinson; photographer: Richard Noel. Cincinnati Judging Center
- [5] *Laeliocatanthe* Graf's Atardercer 'Oma' AM/AOS (Cattlianthe Trick or Treat x *Laelia undulata*) 82 pts. Exhibitor: Plantio La Orquidea; photographer: Carmen Johnston. Florida-Caribbean Judging Center
- [6] *Paphiopedilum* *hirsutissimum* 'Cheri' AM/AOS 86 pts. Exhibitor: Dave Wujek; photographer: Nile Dusdieker. Chicago Judging Center
- [7] *Paphiopedilum* Odette's Wish 'Blushing Empress' AM/AOS (Odette's Glory x Magic Fred) 81 pts. Exhibitor: Mary Kandis; photographer: Nile Dusdieker. Chicago Judging Center
- [8] *Phragmipedium* Patti MacHale 'Brazos' AM/AOS (*pearcei* x *sargentianum*) 83 pts. Exhibitor: Mitsi R. Runyan; photographer: David Gould. Dallas Judging Center
- [9] *Vanda* Motes Pixie Dust 'Karina Motes' HCC/AOS (*vietnamica* x Motes Ruby Pixie) 78 pts. Exhibitor: Motes Orchids; photographer: Carmen Johnston. Florida-Caribbean Judging Center
- [10] *Laeliocatanthe* Taiwan Orange 'Chloe' AM/AOS (*Laelia lueddemannii* x *Cattlianthe* Trick or Treat) 82 pts. Exhibitor: Sandra Elliott; photographer: Carmen Johnston. Florida-Caribbean Judging Center
- [11] *Oncidium alexandrae* 'Cream' AM/AOS 82 pts. Exhibitor: New Vision Orchids; photographer: Richard Noel. Cincinnati Judging Center
- [12] *Dendrobium lindleyi* 'Pepper' CCM/AOS 86 pts. Exhibitor: Sandra Elliott; photographer: Carmen Johnston. Florida-Caribbean Judging Center
- [13] *Rhynchoaeliocattleya* Florida Plum 'Apopka' HCC/AOS (Winners' Circle x Hisako Akatsuka) 77 pts. Exhibitor: Krull-Smith; photographer: Carmen Johnston. Florida-Caribbean Judging Center
- [14] *Phalaenopsis* Cinnamon 'Black Coffee OTO 049' HCC/AOS (*venosa* x Darling Taiwan) 78 pts. Exhibitor: Robert Bannister; photographer: Nile Dusdieker. Chicago Judging Center
- [15] *Dendrobium amethystoglossum* 'Bredren's Spectacular' CCE/AOS 94 pts. Exhibitor: Bredren Orchids and Phillip Hamilton; photographer: Carmen Johnston. Florida-Caribbean Judging Ctr.
- [16] *Cymbidium* Peter Pan 'Demonette' CCE/AOS (*ensifolium* x Miretta) 91 pts. Exhibitor: Larry Atwood; photographer: Richard Noel. Cincinnati Judging Center









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- [1] *Rhyncatlaelia* Graf's Rio Negro 'Javak' AM/AOS (*Rhyncholaeliocattleya* Rio Negro x *Laelia splendida*) 82 pts. Exhibitor: Plantio La Orquidea; photographer: Carmen Johnston. Florida-Caribbean Judging Center
- [2] *Rhyncholaeliocattleya* Lots of Spots 'Lady Stella' AM/AOS (*Cattleya* Katherine Clarkson x *Leopard Gem*) 82 pts. Exhibitor: Yife Tien; photographer: Carmen Johnston. Florida-Caribbean Judging Center
- [3] *Bulbophyllum ambrosia* 'Alexander' CCM/AOS 81 pts. Exhibitor: Laurie Stoner; photographer: Jay Loeffler. Florida North-Central Judging Center
- [4] *Perreiraara* Mu Qi Malisa Wendy 'Karina' HCC/AOS (*Vandachostylis* Pine Rivers x *Vanda* Peggy Foo) 77 pts. Exhibitor: Motes Orchids, Inc.; photographer: Brian Monk. Florida-Caribbean Judging Center
- [5] *Paravanda* Thai Flare 'Karina Motes' AM/AOS (*Paraphalaenopsis serpentina* x *Vanda* Peggy Foo) 84 pts. Exhibitor: Motes Orchids, Inc.; photographer: Brian Monk. Florida-Caribbean Judging Center
- [6] *Paphiopedilum* Cascade Creek 'Krull-Smith' AM/AOS (*adductum* x Prince Edward of York) 84 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging Center
- [7] *Paphiopedilum* Susan Booth 'Apopka' CCM-AM/AOS (*rothschildianum* x *glanduliferum*) 85-85 pts. Exhibitor: Krull-Smith; photographer: Carmen Johnston. Florida-Caribbean Judging Center
- [8] *Bulbophyllum polliculosum* 'Whisper Fuzzy Chaps' CBR/AOS. Exhibitor: Laura and Wes Newton; photographer: Wes Newton. Florida North-Central Judging Center
- [9] *Paphiopedilum* WingDreams 'First Flight' HCC/AOS (*Saint Swithin* x *Paul Parks*) 78 pts. Exhibitor: Julio and Eileen Hector; photographer: Wes Newton. Florida North-Central Judging Center
- [10] *Wilmotteara* Hamlyn's Glory 'Liz Hamilton' HCC/AOS (*Cattleytonia* Marley Beckford x *Jamaica Glory*) 77 pts. Exhibitor: Bredren Orchids and Phillip Hamilton; photographer: Wes Newton. Florida North-Central Judging Center
- [11] *Paphiopedilum* Cascade Creek 'Apopka' HCC/AOS (*adductum* x Prince Edward of York) 77 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging Center
- [12] *Rhyncholaeliocattleya* Emily's Jim 'Cherry' HCC/AOS (*Cattleya* Circle of Life x *Robert Ferguson*) 77 pts. Exhibitor: Bill Thoms and Doris Dukes; photographer: Wes Newton. Florida North-Central Judging Center
- [13] *Seidenanda* Ucho 'Motes Snow Drift' CCM/AOS (*Vanda falcata* x *Seidenfadenia mitrata*) 84 pts. Exhibitor: Motes Orchids, Inc.; photographer: Brian Monk. Florida-Caribbean Judging Center
- [14] *Epidendrum ciliare* 'Vene Mae' CCM/AOS 84 pts. Exhibitor: Roy Klinger; photographer: Jay Loeffler. Florida North-Central Judging Center
- [15] *Rhyncholaelia digbyana* 'Quest' CCM/AOS 84 pts. Exhibitor: Quest Orchids; photographer: Carmen Johnston. Florida-Caribbean Judging Center









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- [1] *Dendrobium farmeri* 'Mac's First' FCC/AOS 91 pts. Exhibitor: Mac's Orchids; photographer: H. A. Russell III. Florida North-Central Judging Center
- [2] *Procatavola* Becka Ketchum 'Gorgeous Gem' HCC/AOS (*Brassocattleya* Binosa x *Prosthechea mariae*) 79 pts. Exhibitor: Victor Elliott; photographer: Beth Lamb. Florida North-Central Judging Center
- [3] *Bulbophyllum* Meen Poison Raspberry 'A-doribil' AM/AOS (*bicolor* x *frostii*) 80 pts. Exhibitor: Bill Thoms and Doris Dukes; photographer: Wes Newton. Florida North-Central Judging Center
- [4] *Paphiopedilum* Prince Edward of York 'Boyce M. Arnold' AM/AOS (*rothschildianum* x *sanderianum*) 85 pts. Exhibitor: James Arnold; photographer: H. A. Russell III. Florida North-Central Judging Center
- [5] *Paphiopedilum* Petula's Flame 'Winter Haven' HCC/AOS (Macabre x Petula's Mystery) 75 pts. Exhibitor: Keith and Dina Emig - Winter Haven Orchid Nursery; photographer: Wes Newton. Florida North-Central Judging Center
- [6] *Dendrobium anosmum* var. *album* 'Cera's Delight' AM/AOS 80 pts. Exhibitor: The Orchid Fix Nursery Jurahame Leyva; photographer: Glen Barfield. Hawaii Judging Center
- [7] *Paphiopedilum venustum* 'Springwater Mars Attack' AM/AOS 83 pts. Exhibitor: Springwater Orchids and Thanh Nguyen; photographer: H. A. Russell III. Florida North-Central Judging Center
- [8] *Phalaenopsis* Citrus Candy 'Crystelle' FCC/AOS (Tying Shin Forever Love x Tying Shin Golden City) 91 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging Center
- [9] *Paphiopedilum wenshanense* 'Fajen's Orchids' AM/AOS 82 pts. Exhibitor: Fajen's Orchids; photographer: Kay Clark. Florida North-Central Judging Center
- [10] *Paphiopedilum* Double Piece 'Krull-Smith' AM/AOS (Double Trix x Centerpiece) 82 pts. Exhibitor: Krull-Smith; photographer: Wes Newton. Florida North-Central Judging Center
- [11] *Cattleya nobilior* var. *amaliae* 'Springwater Chiffon' AM/AOS 84 pts. Exhibitor: Springwater Orchids and Thanh Nguyen; photographer: Beth Lamb. Florida North-Central Judging Center
- [12] *Paphiopedilum* Saint Swithin 'Jake Butler' CCM-AM/AOS (*philippinense* x *rothschildianum*) 88-84 pts. Exhibitor: James Arnold; photographer: H. A. Russell III. Florida North-Central Judging Center
- [13] *Rhyncholaeliocattleya* First Class 'Strawberry Milk' AM/AOS (Tokyo Bay x *Cattleya* Winter Gift) 81 pts. Exhibitor: Jaime Yu; photographer: H. A. Russell III. Florida North-Central Judging Center
- [14] *Bulbophyllum lemniscatum* 'It's Alive' CBR/AOS. Exhibitor: Kathy Cox; photographer: Wes Newton Florida North-Central Judging Center
- [15] *Bulbophyllum* L. Soleil Croft 'Lora's Delight' CCM-AM/AOS (*A-doribil* Lava Flow x *longissimum*) 85-84 pts. Exhibitor: Lora Kubsch; photographer: Beth Lamb. Florida North-Central Judging Center
- [16] *Phalaenopsis* Krull's Scarlet Prince 'Orange Delight' AM/AOS (Tying Shin Golden Rose x H. P. Norton) 83 pts. Exhibitor: Krull-Smith; photographer: H. A. Russell III. Florida North-Central Judging Center



# CALENDAR

## MAY

**3–5—Memphis Orchid Society Show & Sale,** Memphis Botanic Garden, 750 Cherry Rd., Memphis, TN; Contact: David Potts, 901–301–5950; david@medicalcenterbookstore.com

**3–5—Platinum Coast Orchid Society “Orchid Safari,”** Kiwanis Island Park Gymnasium, 951 Kiwanis Island Park Road, Merritt Island, FL; Contact: Laura Blackmon, 321–308–4256; leblackmon@bledsoe.net

**4–5—Oklahoma Orchid Society Show “Orchid Fiesta,”** Will Rogers Garden Exhibition Center, 3400 NW 36th Street, Oklahoma City, OK; Contact: Jana Butcher, 405–209–7657; w.butcher@cox.net

**11–12—Orchid Society of California “Mother’s Day Weekend Orchid Show & Sale,”** Lakeside Park Garden Center Nursery, 666 Bellevue Ave., Oakland, CA; Contact: Helga Mahlmann, 510–635–2940; helgam@batnet.com

**11–12—Volusia County Orchid Society Show “Rocking with Orchids,”** Volusia County Fairgrounds, Hester Bldg., 3100 East New York Ave., DeLand, FL; Contact: Denise Christensen & Mike Orpi, 386–873–4300; denise@denisechristensen.com

**17–19—Redland International Orchid Festival,** Redland Fruit & Spice Park, 24801

SW 187th Ave., Homestead, FL; Contact: Bill Peters, 305–242–1333; whimsyOrchids@gmail.com

**31—June 2—New Orleans Orchid Society’s Show & Sale,** Lakeside Mall, 3301 Veterans Memorial Blvd., Suite 209, Metairie, LA; Contact: Randy Johnson, 225–205–8181; randy.johnsonian2000@gmail.com

## JUNE

**1–2—Central Florida Orchid Society Show “Orchid Hunt,”** National Guard Armory, 2809 S Ferncreek Ave., Orlando, FL; Contact: Teri Scott, 407–463–0274; teriscottfla57@aol.com

**1–2—Foothills Orchid Society “Orchids for Everyone,”** Triwood Community Center, 2244 Chicoutimi Drive NW, Calgary, Alberta, Canada; Contact: Marguerite Salsberry, 403–973–2687; msalsberry@telus.net

**28–30—Hilo Orchid Society Show “Orchid Odyssey,”** Edith Kanaka’ole Stadium, 350 Kalanikoa St., Hilo, HI; Contact: Karl Mendonca, 970–989–8064; karlsandi@comcast.net

## JULY

**12–14—Baton Rouge Orchid Society’s Show & Sale,** Burden Museum and Gardens, 4560 Essen Lane, Baton Rouge, LA; Contact: Wesley Mathews, 225–321–

1912; wdmattthew@hotmail.com

## AUGUST

**2–3—Houston Orchid Society Workshop and Sale,** First Christian Church, 1601 Sunset Blvd., Houston, TX; Contact: Derek Lowenstein, 631–459–7327; dereklowenstein@gmail.com

**6–11—Sociedad Colombiana de Orquideologia “Exposición Orquideas, Flores & Artesanias,”** Jardín Botánico – Carrera 52 #73–298, Medellín – Antioquia, Colombia; Contact: Javier Rios, (57) 313 660 0946; secretariaexposicion@sco.org.co

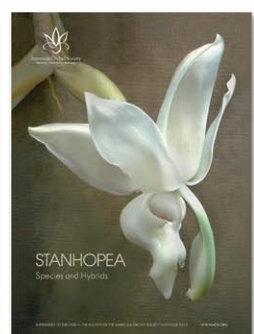
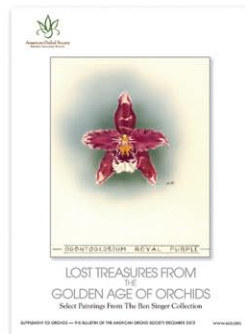
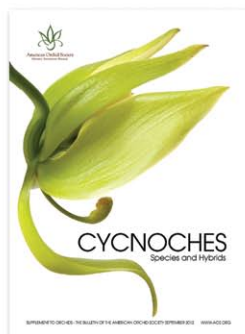
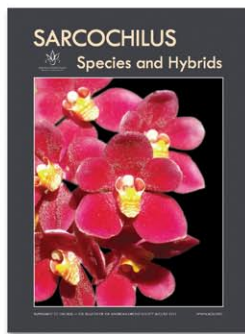
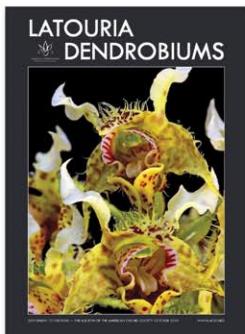
**7–11—Virtual Orchid Society “2nd Expo Orchids Shopper,”** Plaza Centro Mall, Ave. Rafael Cordero #200, Caguas, PR; Contact: Reinaldo Rodriguez, 787–565–5287; vladimir4875@hotmail.com

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

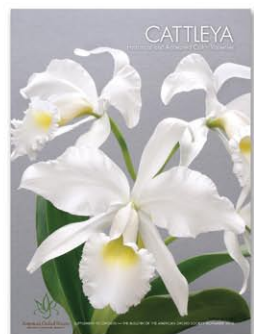


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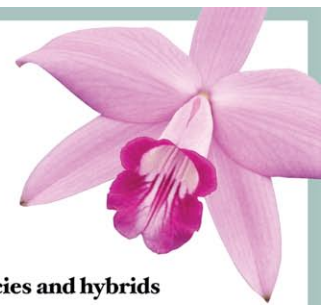


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88(1):C1 — *Orchids Magazine*  
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The *Cattleya maxima* identified in the in-situ photograph was incorrectly identified as a highland form of the species. It is correctly a *lowland* form.

88(4):297 *Orchids Magazine* April,  
 2019

The flower pictured in image #13 on page 297 of the award gallery was incorrectly identified. The correct name is *Paphiopedilum Fanaticum* 'Zach' AM/AOS (*malipoense* × *micranthum*) 83 pts; exhibitor: Orchid Inn, Ltd; photographer: Scott Weber. Chicago Judging Center

We regret these errors and thank our members who brought them to our attention.

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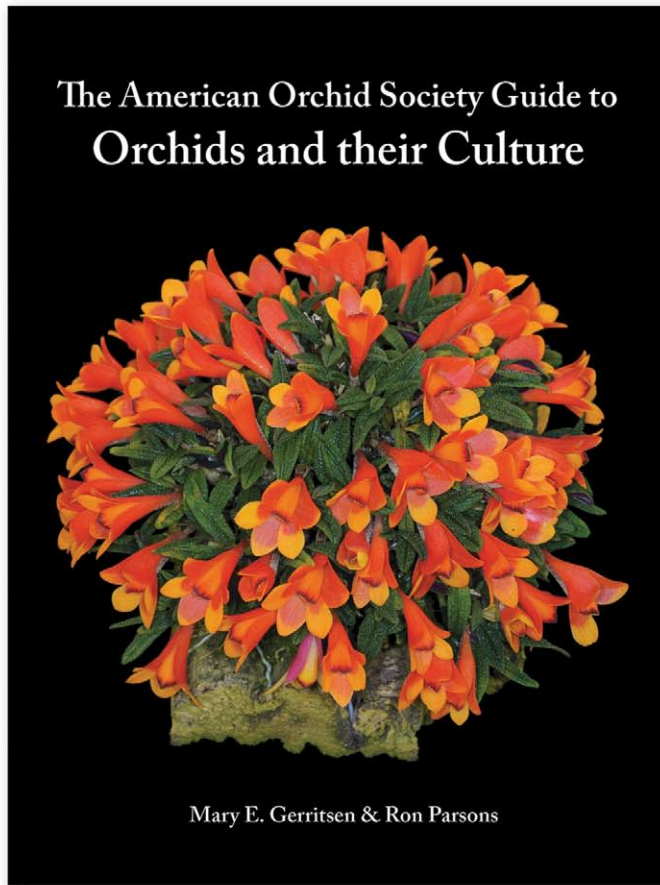


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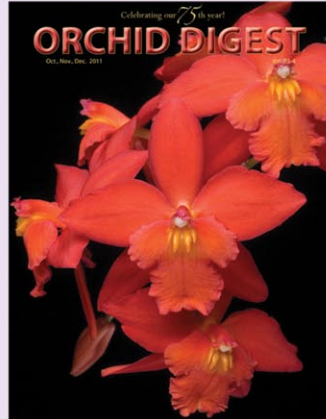


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# A Wardian Display Case For Orchid Shows

Text and photographs by Joyce Medcalf

I FIRST BECAME enthralled with the idea of displaying my pleurothallids in a Wardian-type case after reading Lynn O'Shaughnessy's (2003) article "Pleurothallids on Display" in *Orchids* magazine. I had my first case made at a local plastics company (Canus Plastics, <http://canusplastics.com/>) in Ottawa, Ontario. The sides and bottom of the case were fixed, so it was an acrylic box 19 inches (48.3 cm) wide by 30 inches (76.2 cm) tall.

The top was the plastic grid used for suspended ceilings, with three 12-inch (30-cm) long T12 fluorescent light fixtures on top. For humidity, I used an ultrasonic mister in a bowl of water, disguised as a tree stump and placed in a lower rear corner.

This case worked adequately, but with the fixed walls, it was hard to set up, demanding many trips up and down my three-step ladder. As well, the old-fashioned T12 lights heated up the inside of the case too much, especially for my cool growers.

For version two, I had Canus Plastics cut four pieces of acrylic so the case was now 31 inches (78.7 cm) wide and 30 inches (76.2 cm) tall. I then made a wooden base and top, fitting the plastic grid sheet into the top. To make the interior of the case resemble a natural rocky environment, I sprayed the side and back panels with Great Stuff spray-foam insulation (<https://www.greatstuff.dupont.com/insulating-foam-sealant-products.html>) in a rough pattern and, when the first coating was cured, I sprayed that with green, gray and brown paint to make it resemble a distant backdrop in a rainforest. When you are selecting the foam product, use Windows & Doors (minimal expansion), or for larger features, use Gap & Crack (low expansion) filler rather than the kind for filling large spaces; otherwise the foam may expand excessively. When spraying Great Stuff foam and when painting it, spray outside or in a garage with lots of fresh air and leave the application there for a day or two until it cures completely.

For air movement, two small computer fans were added on top, directed down into the case, one at the back and one at the front. The ultrasonic mister continued to be used until I discovered



a "reptile fogger" (<https://www.chewy.com/zoo-med-reptile-fogger-terrarium/dp/154855>), which sits on a small board screwed across the right rear top corner, with the supply tube coming through a 1-inch (2.5-cm) hole in the back panel a few inches from the top. I use only distilled or rainwater in this reptile fogger to help avoid calcium buildup and to prolong the fogger's life. This fogger is adjustable for flow rate so I run it on low when the display is finished; the water reservoir will last about eight hours. While I am setting up, I run it on high to keep any of the flowers from drying out and deteriorating.

To help solve the heat problem from the T12 lights, I stuck a strip of LED lights to an acrylic sheet, again the type used for suspended ceilings, for the case top. I also added a small fan on a long wire that reaches into the lower-right front corner to help circulate the mist from the fogger.

As the plants grew in my grow area, I found that the case was not tall enough, so I had four new panels 47 inches (119.38 cm) tall made and used the same Great Stuff spray foam and spray-paint procedure. The dimensions of the taller case, with the same base and top, also comply with the floral design rule to have a table top or case display height approximately 1.5 times the width. The outside of the case is covered in material to hide the underside of the foam on the acrylic walls.

The pots that are on the walls are hung with wires hooked over the top or with curtain hooks stuck into the foam. For the



[1] The author's Wardian case staged for the Winsor, Ontario 2018 show.

[2] Wardian cases are indispensable for maintaining the close, humid conditions cloud-forest orchids need.

plant labels, I use dark green poster paper and a silver pen. Then I waterproof them with clear packing tape so that they will not deteriorate.

With this setup, my cool-growing pleurothallids and related species happily survive the often dry-and-warm conditions at a show. The flowers do not deteriorate and there is no damage to my cool-growing, rainforest orchids. The display always is different from show to show depending on what is in bloom. This setup would work well with any selection of miniature species or hybrids.

— Joyce Medcalf lives on Hill Island in the St. Lawrence River where she grows *Pleurothallid Alliance* miniatures in a specially designed grow area in her basement. She is an accredited AOS judge, Chair of the Toronto Judging Center and a member of the Southern Ontario Orchid Society and the Ottawa Orchid Society. She is also interested in conservation and has traveled extensively on orchid tours and judging shows in Central and South America (email: [jmedcalf@100island.net](mailto:jmedcalf@100island.net)).

## Reference

O'Shaughnessy, L. 2003. Pleurothallids on Display. *Orchids* 72(9):684-691.



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Dr. Yin-Tung Wang from California, retired professor from Texas A&M University, well known in the *Phalaenopsis* world for all his research on *Phalaenopsis* culture. He will be lecturing on how to grow a perfect *Phalaenopsis*.

In addition, there will be panel discussions on species, breeding and culture, which will include besides the speakers, Mr. C.C. Chen from Taiwan, Alan Koch from California

Vendors for the event will be Mainshow Orchids from Taiwan, Gold Country Orchids from California, Big Leaf Orchids from Texas, Mike Mims Orchids from North Carolina and Krull-Smith.

The new book by Olaf Gruss on *Phalaenopsis* species will be available during the Symposium only.

**for more information and registration  
visit [www.phal.org](http://www.phal.org)**