November 2017

The Orchid Grower

Orchid Growers' Guild of Madison
Website orchidguild.org

Meeting Dates

- November 19
- December 17
- January 21, 2018
- February 18, Atrium
- March 11
- April 15
- May 20
- June, Picnic TBA
- September 16
- October 21
- November 19
- December 17

Meetings start at 1:30 pm at Olbrich Gardens unless otherwise noted

Up-Coming Events

- **November 8-12** -- World Orchid Conference
- **January 27-28, 2018** -- MN Orchid Show
- **February 3-4** -- Orchid Quest
- **February 17-18** -- Batavia Orchid Society Show
- **February 24-25, 2018** -- WOS Spring Show
- **March 3-4** -- NEWOS Show
- **March 10-11** - Illinois Orchid Society
- **March 24-25, 2018** -- Illowa Show
- **April 7** -- Spring Sale

Officers and Committees

President:
Lorraine Snyder (2018)
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NEXT MEETING NOVEMBER 19th
Jeff Baylis: Where Orchids Grow: Climate and Habitats

FROM THE PRESIDENT
Hello Orchid Lovers,

Come join us Sunday, November 19th at Olbrich Gardens for our meeting ,with ribbon judging at 1:00 P.M. Our speaker is our own Jeff Baylis, speaking on Where Orchids Grow: Climate and habitats.

Bring you growing and plant doctor questions for member expertise.


Keith Nelson with his *Gomesa crispa*

Sunday December 17th is our holiday party and potluck. If you would like a holiday orchid, please pre- order and pre-pay $10.00 to Denise. It is also not too early to think about dues for 2018, as well. Dues are $20 per individual and $24 per family membership payable to OGG.

Cynthia Wadsworth and I welcome your ideas and requests for programs for 2018 for February through April. Is there anything in particular you would like to learn? Please let us know.

I also would appreciate any suggestions you may have to make Orchid Quest successful. Ideas needed. [See OQ Up-date page 5].

See you soon.

--Lorraine

INSIDE THIS ISSUE

(Continued on page 2)

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MAOC: Keith Nelson
Orchid Digest: Open

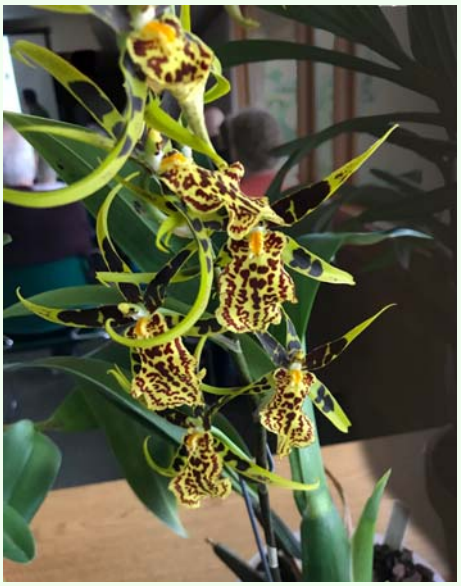
OCTOBER OGG RIBBON JUDGING

First Place

Nancy Thomas	*Phragmipedium* Sunspot x *besseae* v. flavum
Nancy Thomas	*Bcd.* [*Banfieldara*] Gilded Tower 'Mystic Maze'
Nancy Thomas	*Habenaria rhodocheila*
Gary Lensmeyer	*Cyn* [*Cycnoches*] *warscewiczii*
Gary Lensmeyer	*Brassovola nodosa* x Ctna
Gary Lensmeyer	Epi Volcano Trick 'Fireball'
Keith Nelson	*Holcoglossum wangii*
Keith Nelson	*Gomesa crispa*
Nancy Thomas	*Paphiopedilum henryanum*

Second Place

Shirl Roberts	*Ansellia* (or *Africana*) *gigantea* v. *nilotica* 'Waunakee'
Doug Dowling	*Christensonia vietnamica x neostylis* Lou Sneary
Keith Nelson	*Brassovola nodosa*
Keith Nelson	*Phalaenopsis* Vio Vio (Jungo Viotris x *violacea)*



Photographs by Susan Reed

Clockwise from top left: *Bcd.* Gilded Tower 'Mystic Maze'; *Cyn. Warscewiczii*; *Phrag.* Sunspot x *besseae* v. flavum, and *Phal.* Vio Vio (Jungo Viotris x *violacea)*

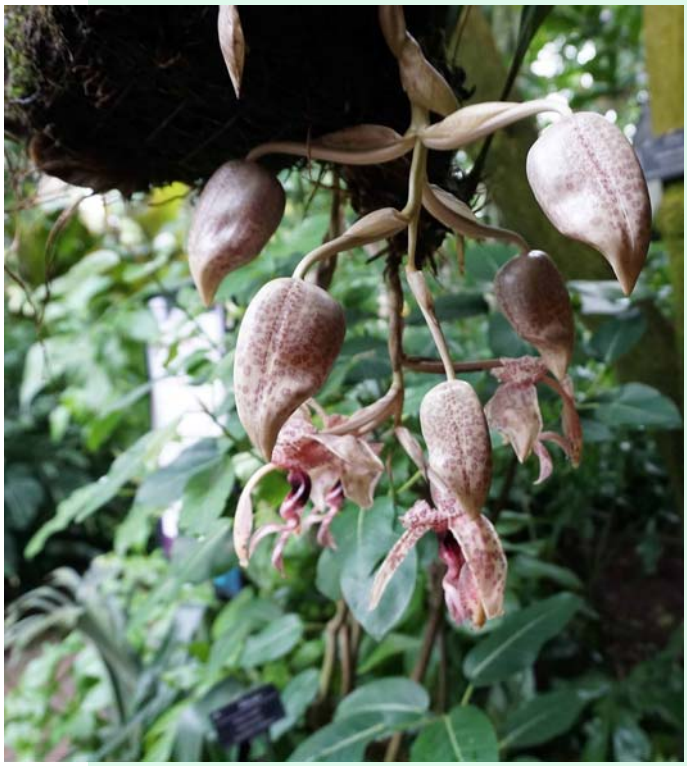
Bolz Conservatory, What's Blooming

Center: These Lady's-tresses (a cultivar of *Spiranthes)* were growing in the gardens at Olbrich. They are past their peak but still blooming in October

Stanhopea intermedia 'Jungle Bunny'

Maxillaria fraxctiflexa

*Eria spicata (*Syn. *Eria convallarioides)*



Stanhopea madouxiana

Cattleya Bowringiana

LAB UP-DATE FROM PROF. CAMERON

Prof. Ken Cameron gave an update on the activities of members of his research group at the University of Wisconsin. The group works mostly on orchids [pleurothallids, the role of fungi in orchid seed germination, *Epistephium, Spiranthes,* tropical aroids (arum), *Tillandsia, Mormolyca (Maxillaria),* Chinese fir, Asian Cistaceae] but their research uses some aspect of DNA sequencing.

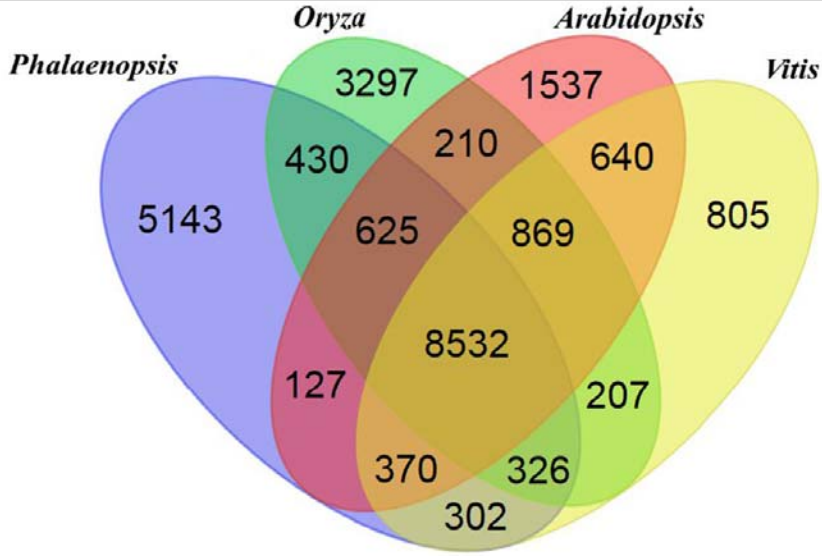
Of General Interest

James McDaniel is working on *Porroglossum*, composed of 53 described species, most of them endemic to Ecuador, that are distributed throughout the Andean cloud forests of South America. The lip is hinged and has a mechanism that snaps shut when stimulated by an insect pollinator, causing it to actively snap inward thus trapping the insect and thrusting it against the column to ensure that the pollinia will be removed and later transferred to the receptive surface. The lip opens after 30 minutes or so to release the insect, but also closes at night and reopens at dawn. He recorded high-speed videos of the active, floral snap-trap at the orchid nursery Ecuagenera in Gualaceo, Ecuador.

Using high-speed digital video, McDaniel calculated the average time to snap-trap closure for each of the 30 species of *Porroglossum* species studied, as well as the average velocity and acceleration of the snap-trap for each species. Additionally, he implemented statistical methods to map the aforementioned continuous traits for each species onto a fully-resolved phylogenetic tree produced through genotyping by DNA sequencing. He found that evolutionary shifts in trait evolution of closely related species resembled each other more than expected by chance in relation to time, velocity, and acceleration. Furthermore, he detected three evolutionary shifts in trait evolution (a shift to slow snap-traps within a monophyletic group, a shift back to fast snap-traps for two species within the aforementioned clade, and a shift to a slow snap-trap for one species within a clade exhibiting fast snap-traps).

Species found at high elevation demonstrated a faster snap-trap closure than their lower elevation relatives, mere seconds to almost 120 seconds. There was one outlier in the among those at lower elevations however its bright red coloration might indicate a different pollinator being targeted.

In 2015 *Phal equestris* was the first orchid sequenced. Now using new and faster techniques, genome sequencing is expanding beyond plants of common value, especially by the Chinese.



Venn diagram showing unique and shared gene families between and among *Phalaenopsis*, *Oryza*, *Arabidopsis* and *Vitis*.

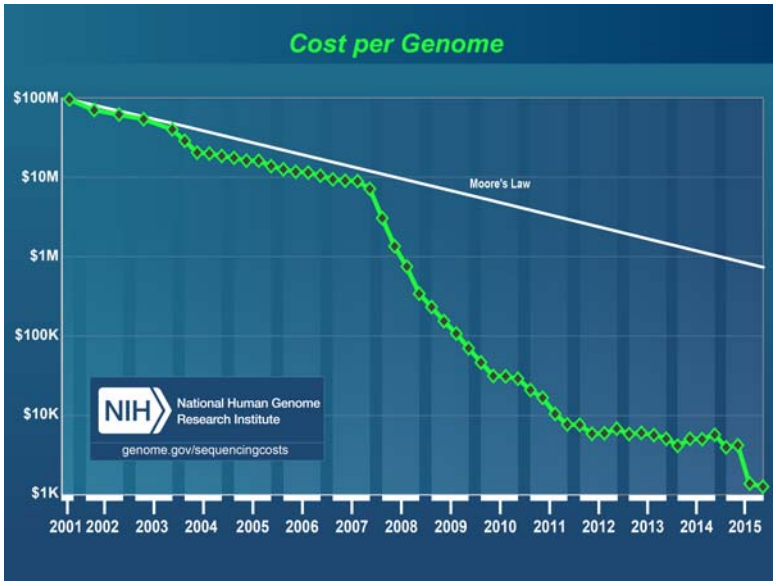
Orchid Phylogeny

In 1981 Robert Dressler, an American botanist specialist of the taxonomy of the Orchidaceae, offered a family tree of orchidacea in his book *The Orchids: Natural History and Classification* but their relationships were inferred. In 1986 *A phylogenetic analysis of the Orchidaceae* by Burns-Balogh and Funk, created a tree using their morphology.

(Continued on page 5)

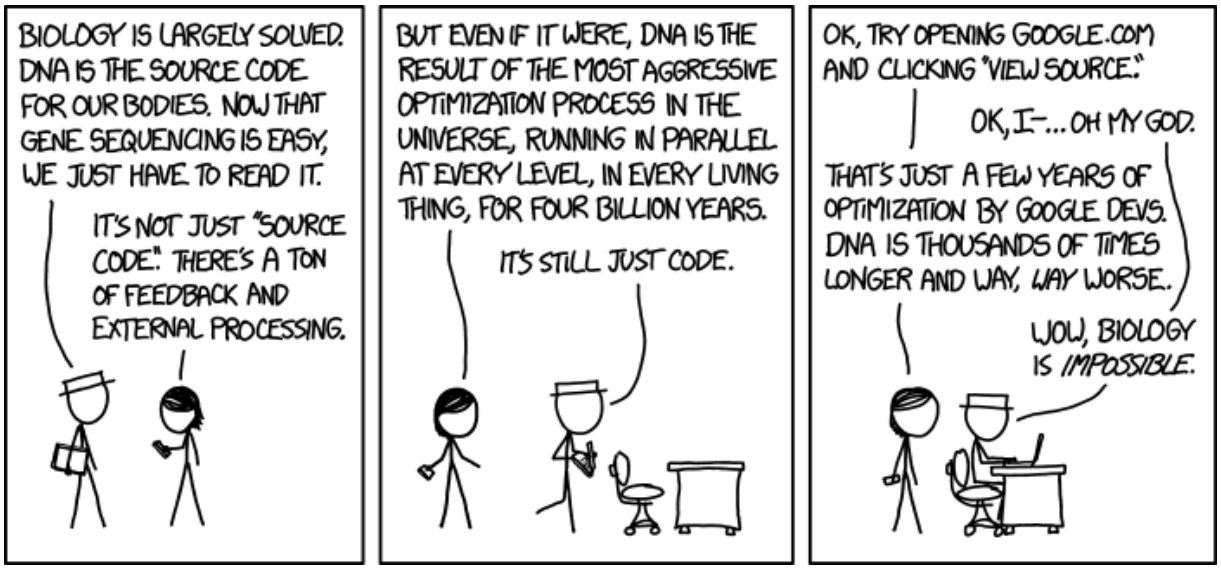
(Continued from page 4)

When Cameron, a pioneer in using DNA sequencing to determine orchid phylogeny, began work on the genetics of orchids over 20 years ago, DNA analysis was time consuming, difficult and expensive. These limitations meant that he only able to focus on a limited number of genes from a limited number of related species.



The effect of Moore's Law [In 1965, Gordon Moore extrapolated that computing would dramatically increase in power, and decrease in relative cost, at an exponential pace] resulted in a rapid expansion in technologyFollowing the development of fluorescence-based sequencing methods with a DNA sequencer, DNA sequencing has become easier and orders of magnitude faster as well as cheaper. Now his lab can prepare up to 96 different samples by tagging them, send the mixture to a lab at the Technology Center, and shortly afterwards receive the raw data. The data is sorted by the aforementioned tag , and then the data are painstakingly analyzed to create a genome for each sample.

When the results of the most recent DNA techniques are compared to the earlier work using morphology, much of the earlier work is confirmed but there are also many surprises. Now the key evolutionary steps in orchid evolution can be dated by using the DNA analysis.



ORCHID QUEST UP-DATE

The next Orchid Quest planning meeting will be Tuesday, November 14 at 6:30 pm at Panera Bread, 601 Junction Road, Madison.

This meeting is for the entire membership! Come and see how this big event comes together. A few things have been decided and some tasks are in progress, but there are a lot of extra details that need to be covered.

Hope to see you there.
Terri Jozwiak,
Orchid Quest 2017 Co-Chair

ADVENTURES WITH WATER CHEMISTRY
By Keith Nelson

I was discussing orchids with Chuck Acker and said I thought I should be getting more blooms than I do. Chuck asked if I checked my water chemistry and I said yes, well sometimes, well I checked in a few months ago. After I realized that was a lame answer I asked him to tell me more. This led to a serious discussion about water chemistry.

I purchased some pH meters and a TDS meter (total dissolved solids) Fig. 1. One of the pH meters came with two calibration solutions, Fig. 2.

Figure 1. pH meters and a TDS meter

Firgure 2. One of the pH meters came with two calibration solutions

The other one has a calibration screw on top which one turns to calibrate the reading. I calibrated the one pH meter with the solutions and then calibrated the other one to match the first one. In scientific terms this is a secondary calibration, Fig 3. Now I am compulsively testing everything before watering, which has added a lot of time, but also another interesting aspect to the hobby.

The results I have found are summarized here. Numbers are the average of several measurements. [See chart below]

(Continued on page 7)

	pH	TDS
Commercial Distilled Water		
Ice Mountain	6.2	1
HyVee	6.4	2
Dehumidifier	4.9	22
RO Water	6.0	41
Well Water	7.3	632
90% RO with 10% well	6.9	129
RO with 1/8 tsp Michigan State Fertilizer for RO Water	6.1	148
RO with ¼ tsp Michigan State Fertilizer	6.0	295
RO with ½ tsp Michigan State Fertilizer	6.0	580
RO with 1 tbsp Green Jungle Fertilizer from Orchids Ltd.	6.1	280

Figure 3.

(Continued from page 6)

A good pH range is 6.5 to 6.8. Closer to 6.8 is better. As bark and moss degrade they become more acidic. I have been using 6.8 to 7.0

A TDS of 250 to 300 is good for Paphs, Phrags, Bulbos, mounted plants, and other sensitive genera. Up to 500 TDS is acceptable for mature Catts, Phals, Oncidiums, Dendrobiums and other hardy genera. For misting a low TDS is best.

I have a 2 gallon RO system which we use for drinking water. It is small for my orchid needs so I am frequently filling containers and storing them. Small RO systems used for drinking water do not produce the ultra pure water you would have with Larger RO systems used for greenhouses or other commercial purposes. I had been typically been using the 90% RO and 10% well water combination when watering. This has provided a good range for orchids.

I alternate Michigan State Fertilizer and Green Jungle fertilizer from Orchids Ltd. in Plymouth, Minnesota. An AOS webinar recommended several fertilizers as all fertilizers are a little different and rotating fertilizers is a good practice.

Figure 4

MSP recommends ½ tsp per gallon and Green Jungle recommends 1 tbsp per gallon. The chart shows these results for several mixtures

I have a basement dehumidifier that runs in the summer. I had assumed this water was similar to commercial distilled water. Measuring the pH now I was shocked to see it was 4.9. Water with that low of a pH could be toxic to orchids. I had been using this mixture with 10% well water on my outside Catts and they had not been growing well. When I gave them better water they responded with vigorous growth.

I purchased pH UP from Paradigm Fig. 4., to adjust pH. There are no directions for amounts to use as the amount of pH UP needed to raise the pH varies widely depending on the TDS of the water. The commercial distilled water I use for misting has a low pH so I want to raise it to about 6.8 of 7.0. I have found 2-3 drops of pH UP in ½ gallon can often shoot the pH up to 9 or 10. The lower the TDS in the water the greater effect the pH UP. All my fertilized water needs the pH raised. Water with about 150 to 200 TDS can take several eye droppers full of pH UP to raise the pH. The higher the TDS the more pH UP is required to raise the pH. One has to add the pH UP solution slowly and then measure the solution several times until you obtain an understanding of how much pH UP is needed for each situation. The pH meters both requite a short time to stabilize for an accurate measurement. The TDS meter stabilizes quickly.

Measuring the water chemistry has provided a new dimension to the hobby of growing orchids. If you choose to do so, have fun measuring. I suspect your orchids will grow better and appreciate the effort.

NOTE: Jeff Baylis tested his well water. The well is located in rural Cross Plains. The well is 240 feet deep and water came in at 120 feet. pH = 7.23, TDS = 366

KNOW YOUR WATER
by Chuck Acker

When Keith contacted me regarding an issue he was having with his orchids, I knew almost immediately what the root of the cause would be. Several other hobby growers and former customers of mine had also contacted me over the past year or so with similar issues.

It has become known in the past decade or more that our orchids do prefer water that is somewhat pure in makeup versus using water right out of any tap or other source. With this knowledge many of us have invested in some sort of water purification method whether it is collecting rain water, using dehumidifier water or installing an RO (reverse osmosis) system. While all these methods may indeed give the near pure water that our orchids love, they also present other less desirable qualities.

Water of these types generally have a low pH reading, some so low that it can and does become toxic to the plants. It is very important to know the pH of the water you are using, as well as your fertilized water too. When you start with water of a low pH and add nearly any type of fertilizer to it, the pH will drop and in some cases drop dramatically. That is why I recommended Keith should use the "pH UP" product.

If your orchid(s) do not respond favorably to your new pH regimen then they may need to be repotted into some fresh medium. As Keith had mentioned, the potting mediums will become more acidic as they age and break down, so simply changing the pH of your water and fertilizer water may not always be the answer alone.

One way to test the pH of your potting medium is to catch some of the water draining out of the pot on your watering day and check the pH of that water. If your drain water has a higher pH than it did before it went into the pot, then you have an acidic potting medium that should be changed.

Happy Growing!

Chuck Acker

How do you get one hundred orchids in bloom at any one time?
Start with a thousand....

UP-COMING EVENTS

- **November 8-12** -- 22nd World Orchid Conference, Guayaquil, Ecuador
- **January 27-28, 2018 --** MN Winter Carnival Orchid Show
- **February 3-4**- Orchid Quest 2018
- **February 17-18** - Batavia Orchid Society Show
- **February 24-25, 2018** -- WI Orchid Society Spring Show
- **March 3-4** - Northeast WI Orchid Society Show, Neenah
- **March 10-11** - Illinois Orchid Society show at the Chicago Botanic Garden
- **March 24-25, 2018 --** Illowa Orchid Society Spring Show

OGG Orchid Pot Sales

- Small green square (2x2"h), 5 @$1.00
- Small Clear square (2x3"h), $.50 / pot
- Medium Clear square (3½x4"h), $.75/ pot
- Medium Clear Round (4x4"h), $1.00/pot
- Large Clear Round (6½x5"h), $1.25/pot
- 3" Clay pot $.50/pot

To order pots for delivery at the next OGG meeting, contact Sue Reed greed@chorus.net