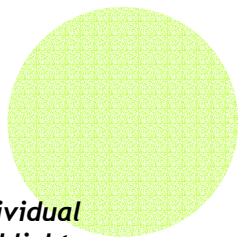




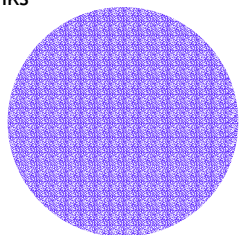
March 2003  
Issue 215

# Orchids Under the Sun



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Trustee	Bev Tall	480-813-4722	<a href="mailto:bevtall@talco.com">bevtall@talco.com</a>

### PRESIDENT'S MESSAGE

Wow! For those of you that missed the meeting, you missed a lot. Bev presented quite a few slides of great, good and not so good displays. This was followed by an interactive display with all members contributing. Hopefully this has given some of you the nerve to set up a display. Even if you do not have enough blooming plants of your own at show time, we will need someone to handle the Society display, so please think about helping out.

Please come prepared to sign up and volunteer your time at the sales booth, etc. Rich will have flyers to hand out, so if you frequent a business or are good friends with business owners, please ask if they would not mind displaying a flyer in their window. Every little bit of advertising helps.

We will have Fordyce Orchids here in March. I was a very new member the last time they were here, but remember the meeting as being a success. There will also be plants for sale. I am sure that you will find something to tweak your interest.

**Program for March**

Sue Fordyce from Fordyce Orchids will be speaking on miniature orchids. Her father, Frank is a world renowned miniature orchid hybridizer, known for many famous crosses. Sue will bring plants for sale, so come one, come all for a great meeting!

**Calendar of Events**

**March DVOS Meeting**

**Speaker: SUE FORDYCE**

Time: 7PM Thursday Mar 20, 2003

Place: SRP Building at –  
998 W. Washington Tempe, AZ 85281

**Future Dates:**

**March 21-23**

San Diego County Orchid Society Show, Scottish Rite Center, 1895 Camino Del Rio South, San Diego, CA. Contact: Ben Machado, 4044 Calavo Dr., La Mesa, CA 91941; 619-660-9810; [bmach16814@aol.com](mailto:bmach16814@aol.com)

**March 28-30**

Santa Barbara International Orchid Show, Earl Warren Showgrounds, Exhibit Building, Santa Barbara, CA. Contact: Frank Cobb, 1096 N. Patterson Ave., Santa Barbara, CA 93111.

**April 5-6**

Desert Valley Orchid Society Show, Baker Nursery, 3414 N. 40th St., Phoenix, AZ. Contact: Rich Franklin, 2346 W. Becker Lane, Phoenix, AZ 85028; (602) 992-5324.

**April 9-13**

The Greater New York International Orchid Show, Rockefeller Center, New York, NY. Contact: Carlos Fighetti, 4325 Piermont Rd., Closter, NJ 07624; (201) 767-0621.

**April 17-19**

\*New Mexico Orchid Guild Show and Sale, Albuquerque Bio Park's, Rio Grande Botanic Garden, 2611 Central NW, Albuquerque, NM. Contact: Diann O'Neill, 310 Camino Arco Iris, Corrales, NM 87048; (505) 890-1993; [info@dollcasa.com](mailto:info@dollcasa.com).

**April 18-20**

Greater Las Vegas Orchid Society & Torrance Cymbidium Soc. Show, California Hotel, Las Vegas, NV. Contact: Carol Siegel, 8601 Robinson Ridge Dr., Las Vegas, NV 89117; (702) 254-4168.

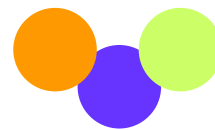
**Greenhouse For Sale**

A slightly used 6' x 8' aluminum frame with plastic sides and roof is for sale. Original price was \$800--make on offer. It is now put together and can be driven to your house by the seller still altogether. Make an offer to Jan Smythe (one of our new members at 650-722-1338 or 480-699-8836.

**Three tier light stand for sale with lights. Great for apartment or house. Room for many plants at varying heights. A \$500 value for \$75. Call Bev at 480-816-4722 if interested.**

**Reverse Osmosis System for Sale.** A good used RO system is available for sale for \$295. The original price was \$700-\$800. It has a very good capacity (100 gallons in 24 hours). If you are interested, give Bev a call at 480/816-4722

Everyone! Please save boxes for the show! We need boxes for the plant buyers to take their plants home so save all the boxes you can and bring them to the show when you can. We don't need large ones but small to medium boxes. Cut down ones work well also.



**President's Message**

SRP lets us use the meeting room for free. Please upon leaving take all your trash (this includes drink glasses, napkins and plant material) to the receptacles that are at both exits. We want to be able to continue to use this room. A few of us spent some time cleaning up after last meeting

Well, that's all for this month (sorry so short, but am recovering from the flu). See all of you on the 20<sup>th</sup>.

Happy St. Patrick's Day!

Lucy

A reminder that Jarka is taking membership dues for the year.

**Orchid Society Show  
APRIL 5<sup>th</sup> at Bakers Nursery**

Our show is fast approaching and this next meeting will be the last one before the show. We need people to sign up to help set up on Friday, to sell plants on Saturday and Sunday, to be ambassadors talking with guests about the club and answering questions, and to help set up the club display. It is also very important for all of our members to plan to bring in several blooming plants for our display. That can be done Saturday morning. If you have 10-15 plants, why don't you plan to put in your own display? Several of the members who have done this before will be glad to help you on your first time around. The first display is always scary but when you do it, you will be very proud of yourself. Expand your horizons! The show is always a wonderful time talking with members and new orchid lovers and seeing all the gorgeous plants in one greenhouse (Bakers). So definitely plan to attend!



## Fragrance and Orchids

©Linnet Hamman

(A talk given at the LOG seminar in November 1999)



Ernest Hetherington aptly commented in 1994: "A bit of advice often given to people, who are hurrying frantically through life, is that they should pause their mad dash for a moment of enjoyment. 'Take time to smell the roses' is appropriate for all of us who raise and enjoy orchids. As we enjoy the beauty of a flower, take time to know and appreciate its fragrance. Nowhere in the floral world is there a family of plants that produce fragrances to compare with those of species of the orchid family."



### COMPOSITION

Orchid fragrance is a relatively volatile substance found in plants. It is stored as essential oils in special cells (osmopheres) at the periphery of flowers, leaves or roots. Only small amounts are present as the substance can be toxic to the plant. These fragrant oils can consist of few to many compounds. Being volatile, meaning that it readily changes into vapor at ordinary temperature, allows us to smell them. As early as 1884 Darwin mentions osmopheric tissue in plants. A lot of research has been done to analyze the components of floral fragrance to try to establish a link between fragrance and the pollinators.



### SCENT PRODUCTION

It has been estimated that as many as 75% of all orchids are 'fragrant'. That is, they emit detectable chemical compounds - some are very fragrant while in some instances they have particularly repulsive smells.

Only some of the odoriferous compounds released by a flower are detectable by the human sense of smell, since these are complex substances closely related to the body chemistry of the pollinator they are 'supposed' to attract.

Fragrances are produced in specialized glands (osmopheres) that can be located anywhere on a flower or bud, depending on function. These are glands of intense physiological activity and are a large drain on the plant's energy. The chemical turnover may be so active that in some cases it can even lead to the development of warmth. When non-fragrant flowers become isolated geographically, fragrance may evolve as a pollinator-attractant. There is, for example, a fragrant form of *Phalaenopsis amabilis* from New Guinea, although all other known forms of the species from other locations are without scent.

All flower parts can produce odors, from sepals and petals to calluses and basal spurs. Osmopheres in orchids may be diffuse and function only in very general attraction, or they may be confined to certain regions of the flower so that pollinators are attracted to these specific areas and remove or deposit pollinia in the process of being on that area: A urine-like smell is produced at the tips of the long sepals in *Phragmipedium caudatum* - Could this be to attract the ants that aid in pollination? The long tails of the sepals of *Cirrhopetalum ornatisimum* give rise to an odor of whale oil, while the lip smells of fresh herring! Scent glands are most often situated on the lip - e.g.



Stanhoepa, Herschelia and Catasetum. Members of the Catasetinae and Gongorinae sub tribes produce the most voluminous quantities of scent known amongst orchids. The fragrance of Catasetum flowers is interrupted within a few hours of pollination to conserve energy by limiting osmopheric activity. The lip of an orchid flower is often its most attractive part. It is adorned with decorative and sometimes stunning masses of calli. These calli and other flower parts may contain unicellular trichomes (hairs), papillae and scales that produce starch, proteins, oil drops, fragrances and other substances to attract pollinators. While feeding or scratching and gnawing the calli, the pollinators may pollinate the plant. The intricate flowers of the scented Gongoras last only two or three days but the plant compensates for this by several flowers opening in succession. It is found that if the lip (where the scent is produced) is removed, the flower lasts for two to three weeks. In some cases, other segments than the lip take over the function of scent production.



Orchid floral fragrances are produced in a daily cycle with the time of maximum fragrance production generally being during the time when the pollinator of that species would be active. Fragrance production consumes energy. Therefore, the timing of scent production often coincides with the time of visitation of pollinators to use the least energy to achieve the maximum effect. Lady of the Night orchid (*Brassavola nodosa*) will perfume a warm summer's evening with its heavy fragrance. The medicinal, sweet odor is released shortly after sunset, reaching maximum strength around midnight, and fading quickly after sunrise. In experiments done mainly with *Brassavola*, it was found that under conditions of extended artificially produced darkness, the flower scent remains, albeit at levels which appear lower than during the normal night cycle. Results showed that scent-release is strictly a

light-controlled phenomenon and not regulated by some endogenous clock mechanism that is part of the orchid's metabolism. It is a photochrome trigger. Other experiments concluded that it is actually the inflorescence that detects the presence or absence of daylight.

Orchid fragrance may be produced at peak times during the day or night: Fragrances may change throughout the day quantitatively and qualitatively as well as from day to day: *Clowesia rosea* smells of Vicks in the morning and cinnamon in the afternoon. *Catasetum expansum* smells of turpentine in the morning and rye bread in the afternoon. Bee-pollinated flowers are fragrant early in the day. *Cattleya luteola*, for example, is very fragrant between 4:00 am and 8:00 am. Bees usually visit it between 5:30 and 5:45. Most bee-pollinated orchids are not fragrant after nightfall and are barely scented at all on dark, gray days. Most of the diurnally pollinated flowers are brightly colored. Some orchids such as *Epidendrum difforme* are moderately fragrant throughout the day with peak fragrance production at



night. Others such as *Epidendrum falcatum* change fragrance quality and intensity during the day from the delicate haunting scent of jasmine in the morning to a stronger note resembling that of Easter lilies or narcissi during the afternoon. *Brassavola nodosa* (see photo #4, © Andy's Orchids) flowers produce a heavy fragrance and abundant nectar hidden deep in



the cavity embedded in the ovary. The medicinal sweet odor is released shortly after sunset, reaching maximum strength around midnight, and fading quickly after sunrise. *Catasetum tenebrosum* comes from Peru and adjacent regions of South America. The chocolate-brown, almost black flowers are spectacular, resembling birds in flight. The flowers emit a warm resinous fragrance with a sharp citrus note. Fragrance is apparent during the day about four days after the flowers open and lasts until the flowers fade about three weeks later. *Encyclia radiata* perfumes the greenhouse for an extraordinary length of time with a spicy floral fragrance. For a short time before the end of flowering, the scent becomes slightly unpleasant. This then disappears and they become odorless for the last few weeks before the flower fades. *Encyclia fragrans* (see photo #2, © Greg Allikas) smells of honey and vanilla in the mornings. *Encyclia lancifolia* (see photo #3, © Andy's Orchids) has a spicy fragrance.



Fragrant compounds can be manufactured synthetically and used to attract pollinators in the field. This helps to identify pollinators where field observations may be lacking. In orchids, insects are by far the most important pollinators. Because of their small size, insects have unusual visual characteristics inherent in their compound eyes. The repetitive visual field the insect eye produces will have great difficulty in seeing the colors of orchid flowers from any great distance, yet we all know that insects (bees, for example) unerringly head for flowers of specific color. The initial attractant (over a long range) is fragrance in most instances. When the insect approaches a flower of 'proper' fragrance, it ultimately gets close enough to be guided visually to a successful landing. Flowers pollinated by butterflies and birds do not have a well-developed scent because they rely mostly on color or nectar to attract their pollinators.

Nearly 8% of the orchid species that are moth-pollinated (*Phalenophilus*), are night-scented and they mostly belong to the African genera *Angraecum* and *Aerangis* (see photo #7 © Andy's Orchids). These orchids give off delightful scents such as jasmine, honeysuckle, tuberose, lilies and gardenia at night. Flowers pollinated nocturnally have strong nighttime odors and abundant nectar and are generally white or light green in color. The light-colored flowers also present a strong landing platform, a characteristically larger labellum, which is more readily visible to moths when they follow the scent trail to flowers. Both flower and pollinator are adapted to suit one another. *Angraecum sesquipedale* native to Madagascar is a well-known example. This is one of the most beautiful and extraordinary *Angraecum* species. The large star-shaped waxy flowers are scentless during the day, but with the onset of darkness, they exude an attractive and powerful scent until the following morning. The fresh-floral scent of the flower is fully developed by the third or fourth night. The pollinator, the moth *Xanthopan morgani forma praedicta*, needs a proboscis that matches the 20-35 cm long spur of the flower to reach the nectar at the bottom. Flowers pollinated by moths of the family *Sphingidae* (sphinx or hawk moths) are called *sphingophilous*. They typically have a



reduced labellum and long nectar tubes, e.g. *Brassavola cucullata* (see photo #1, ©Andy's Orchids). The hawk moths are strong flyers and feed much like hummingbirds, hovering in front of the flower and extending their tongues deep into the nectary cavity.

In dramatic contrast to the night-scented orchids are the putrid and fecal scents of those orchids that mimic carrion in both scent (stench) and color and thus attract carrion-feeding insects like flies. These are especially well represented by the *Cirrhopetalum* genus, which is spread across the whole of Southeast Asia. *Dracula chestertonii*, an inhabitant of Colombia, mimics a fungus chemically and visually and so attracts the fly, which normally lays its eggs on the fungus - this ensures pollination.

It is thought that about 60% of orchids are pollinated by insects belonging to the order

Hymenoptera (bees, wasps, etc.). These flowers are fragrant with scents of lily-of-the-valley, rose, sweet pea, hyacinth, carnation, primula, limeblossom, violet, narcissus and many combinations. Scent is produced during daytime, the time the insects are active. Flower colour is often bright violet, blue, green and yellow. Orchids like *Coryanthes*, *Gongora*, *Stanhopea* and *Castasetum* do not produce any nectar but attract their pollinators, male euglossine bees, by the intensity and quantity of their scent. Scent drops are collected on the hairy front legs of the bees and transferred to the back legs where it is stored. It is believed that the scent

is collected and then converted to sexual pheromones, which attract the females. In the process of visiting different flowers of the same species, pollination takes place. The scent and often the shape of the flower attract specific specie of euglossine bee (of which there are about 180). The remarkable Insect-like flowers of the *Ophrys* orchid do not produce nectar or utilizable pollen. They imitate the female wasp or bee in both appearance and scent. The powerful scent, similar to that of the sexual pheromone of the female, attracts male insects over a long distance. In the attempt to mate with the flower, pollination takes place. So powerful is the attraction that in controlled experiments male insects preferred the *Ophrys* flower to the female insect.

#### IN CONCLUSION

For us who have a scientific interest in orchids, the most important aspect of fragrance must be that it is becoming a useful taxonomic aid - the complex compounds of the fragrances can be studied and used for species identification. One of the few fragrant *Phalaenopsis*, for example, is *Phalaenopsis violacea*. Two species have been known under the name *Phalaenopsis violacea* and have been referred to as the Borneo and the Peninsular Malaysia type. The Borneo type, now recognized as the distinct species *Phalaenopsis bellina*, is more uniform in shape, size and basic color. Both species have a sweet rosy-floral fragrance, but *Phalaenopsis violacea* has an additional blend of cinnamon.



When I walk through my own greenhouse, I experience a variety of fragrances - the most prominent one must be that of *Maxillaria tenuifolia* (see photo # 6 © Greg Allikas), which smells overpoweringly like coconut and tropical suntan lotion. The spicy-scented *Lycaste aromatica* (see photo # 5 © Greg Allikas) comes from Central America. The large orange flowers last more than a month, being fragrant on warm, sunny days. There are limits on how long we can look at a favorite beautiful bloom, yet the scent of flowers is with us constantly in the growing area. The aspect of fragrance has already brought a new interest in greenhouses and at shows, and even if this is just a passing fancy, at least it is a pleasant one.



Our thanks to Linet Hamman, SAOC Accredited judge, P.O. Box 703, WHITE RIVER, South Africa 1240, Tel. +27 (0) 13 750 0325, E-mail: orchidssa@mweb.co.za, website: <http://mysite.mweb.co.za/residents/orcvro/fragrance.htm> for this wonderful article on orchids and their fragrances. Thanks to Andy and Harry Phillips of Andy's Orchids for the use of photos from their website, [www.andysorchids.com](http://www.andysorchids.com). You can find many exciting and fragrant orchid species for sale at Andy's Orchids, and Andy and Harry are always willing to give advise on caring for their orchids in your environment. Finally, our thanks to Greg Allikas for the use of his photos to highlight this article. Greg, who was awarded the American Orchid Society's Silver Medal of Merit at the Fall Members Meeting for his distinguished contributions and outstanding service to the AOS, is webmaster for [www.orchidweb.com](http://www.orchidweb.com), the American Orchid Society's website, and also has his own website where many of his award-winning orchid





...orchids will produce constant light, visible to the human eye, for up to 5 hours in a stretch...

### Creating a "Glow-in-the-dark" Orchid

(from <http://www.hybridorchids.com/details.html>)

The world's first and only genetically modified bioluminescent orchid has been successfully developed by Prof. Chia Tet Fatt from the National Institute of Education (NIE). To create the bioluminescent orchid, Prof. Chia transformed tissues from orchids (the Dendrobium genus) using the firefly luciferase gene. Using a method called "particle bombardment", biologically active DNA from the firefly gene was delivered into orchid tissues. Transformed cells were identified by their bioluminescence trait. These transformed tissues were propagated and used to generate transgenic plants (plants with a foreign gene incorporated). This process was repeated several times, and the bioluminescent trait was present in all transgenic plants. This confirms that the firefly luciferase gene has been integrated into the orchid.

Unlike the fluorescent traits, which store and re-emit light energy, the bioluminescent trait of the orchid uses its own energy to create light. These bioluminescent orchids will produce constant light, visible to the human eye, for up to 5 hours in a stretch. This greenish-white light is emitted from the whole orchid, including roots, stem, leaves and

petals. The intensity of light produced varies across the different parts, ranging from 5,000 to 30,000 photons per second.

Genetic transformation can help supplement traditional breeding of orchids to create orchids with desirable traits, such as novel colours, longer shelf life and increased resistance to pests and diseases. It is also possible that this procedure can be used for the transformation of other species.

*Forwarded by Eric Goo*

### SHOW-N-TELL for February

Thanks for bringing in a gorgeous array of plants!

- Bev Tall
- Steve Grass
- Robert Lin
- Kevin Dubiel
- Jarka Kazda
- Lois Sauer
- Pearl Bays
- Cris Lee
- Lucy Redmond-Hall

From Lucy



To see this orchid transform from white flower to glowing flower go to <http://www.hybridorchids.com/images/Effect/flower.gif>



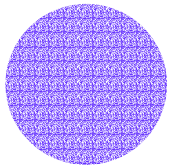
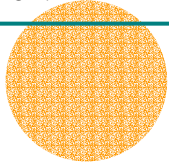


## Orchids Under the Sun.

We're on the Web!

See us at:

[www.geocities.com/RainForest/5679/index.html](http://www.geocities.com/RainForest/5679/index.html)



## Refreshments

MONTH	MUNCHIES	DRINKS
March	Lucy Redmond-Hall	Robert Lin
April	Sally/Steve Glass	Ken/Shirl Phillips

## Orchid Links

American Orchid Society

<http://orchidweb.org/index.html>

### About Our Organization...

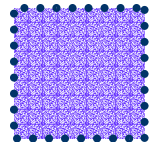
DVOS exists as a group where orchid lovers can meet to share experiences, tips, and guidance about growing orchids. This group is in the Phoenix, Arizona area and is very knowledgeable on how to grow orchids in a desert environment.

Editor's Note:

It's time to plan your show display. Start cleaning up those plants and stake those bloom spikes now.

See you at the meeting. Bill

Bill Hull  
507 W. Cheyenne Dr  
Chandler, AZ 85225



ADDRESS LABEL