

Odontoglossum Alliance Newsletter

Odontoglossum Alliance Meeting

28 April 1995

The Odontoglossum Alliance will hold its annual meeting on 28 April 1995, in conjunction with the Western Orchid Congress to be held 26-30 April 1995. The Congress and meeting will be at the Red Lion Hotel and Lloyd Center, Portland, Oregon. Material on the Congress has been mailed. All members of the Odontoglossum Alliance should be on the mailing list. If you have not received the registration material write to:

Loretta Welsh, 37106 SE Lusted Road, Boring, OR 97009-9706.

The Odontoglossum Alliance meeting has been carefully scheduled so as to not conflict with other lectures at the Congress. The meeting and program is as follows:

28 April 1995

8:00 am - 8:30 am

Coffee, juice, pastries and Conversation

A chance to greet old friends and meet new friends.

8:30 am - 11:30 am

Four lectures by well known odontoglossum growers.

Session Chairman: Wim B. Velsink

Wim Velsink is an amateur grower who has been growing orchids for fifteen years. Shortly after starting to grow orchids he decided to focus on a single sub group and settled on Odontoglossums because of their beauty.

Wim has done some hybridizing. He lives in Oregon and has been instrumental in organizing this Odontoglossum Alliance meeting.

1. Lemboglossums and Their Habitats

Sandro Cusi, Rio Verde Orchids, Mexico

Lemboglossums, formerly aggregated with Odontoglossums, are now separated by taxonomists as a distinct, separate genus. Lemboglossums have great charm and grace and have always been coveted by orchid growers. Hybrids made with Lemboglossums are increasingly popular with growers. Greater numbers of Lemboglossum hybrids are being created to meet demand. These intergenerics have greater temperature tolerance than straight odontoglossums. Intergeneric hybrids made with oncidinae have garnished a significant number of AOS and RHS awards recently and are noted for unique form and colors.

Lemboglossums and Their Habitats introduces this genus with in situ photographs, providing insight into their unique habitats and cultural requirements.

Sandro Cusi is owner of Rio Verde Orchids, in Mexico. Rio Verde was begun 25 years ago with the purpose of propagating and distributing world wide Mexican orchid species. Breeding is done with superior forms of species as well as line breed species. Rio Verde Orchids also produces decorative hybrids for the domestic, Mexican market. Mr. Cusi has years of experience growing in the natural environment of Lemboglossums. Rio Verde Orchids is in Apartado Postal No. 69, Valle de Bravo, Mexico 51300.

2.Colombian Orchids: Description and Species for Hybridizing

Juan Felipe Posada, Colomborquideas, Medellin-Colombia.

Colombia is home for most of the *Odontoglossum* species. Juan Felipe Posada continues the family lineage as owner of Colomborquideas, South America's premier orchid nursery. Juan Felipe's lecture is on the Colombian species, their habitat and natural environment. We have heard much about the rain forest destruction. Juan Felipe will give us an accurate and current picture of *Odontoglossums* in the wild. Further there are relatively few *Odontoglossum* species used in hybridizing. Juan Felipe

will suggest a number of lesser known and utilized species that he considers having significant potential for hybrid creation. The most important *Odontoglossums* - *crispums*, *nobile* (*pescatorie*) and *harrayanum* are found in Colombia. Importations of these species around the turn of the century formed progenitors of today's best hybrids. Current growing and hybridizing efforts, results, and future directions will be described.

Juan Felipe Posada was born in Medellin-Colombia. He grew up always involved with both parent families in farming, cattle, plants, etc. In 1963, along with his Mother started a small collection of native orchids. Five years later he was joined by his Father, Jamie Posada, in the hobby orchid collection. In 1972 the 7th World Orchid Conference was held in Medellin. At that time the orchid hobby was converted to a commercial nursery and named COLOMBORQUIDEAS. Since then the nursery has expanded considerably and specializes in cool growing Andean species. Today Colomborquideas is owned jointly by Juan and his mother, Ligia Posada.

Juan Felipe is President of Industrias Estra, a 500 person corporation in the plastic injection molding industry. He has been Trustee and President of the Colombian Orchid Society in Medellin.

Early this he was elected to another term as President. He is a corresponding member of the AOS Awards Committee.

Colomborquideas, Calle 11A, No.43B-69 A.A. 50494, Medellin-Colombia

3.Oncidinae Intergenerics

Helmut Rohrl, San Diego, California

Intergeneric hybrids within the *Oncidinae* produce spectacular plants. With hundreds, and perhaps thousands of inter-fertile species to choose from, endless combinations of new intergenerics can be created. In his presentation *Oncidinae Intergenerics*, Helmut Rohrl details his hybridizing efforts. At its best, this type of breeding provides flowers with new colors, patterns, and shapes. Through careful, directed breeding specific traits such as grow-ability and stem length; temperature tolerance and flowering habit can be improved. Dr. Rohrl uses stud plants acquired from collectors in the Americas and Europe. Growing is done in the coastal climate of Southern California, a near perfect environment. Helmut Rohrl is Professor Emeritus of Mathematics at the University of California, San Diego. Professor Rohrl has travelled world wide, extensively visiting nurseries, reviewing hybridization and amassing a superior collection of species and hybrids for his efforts in intergeneric hybridizing.

La Jolla, California, E-mail address: hrohrl@ucsd.edu

4. Classic Odonts.

Steve Gettel, Sunset Orchids, San Francisco, California

Classic Odonts conjure up visions of the finest Charlesworth Co.Ltd. *crispum* type *Odontoglossums*. These *Crispum* types reigned supreme in the 1920's and 1930's. Tragically many of these lines were lost during World War II. In the 1970's Charlesworth Co, Ltd closed and the collection dispersed. What is the state of Classic Odonts today? Steve Gettel of Sunset Orchids will present an overview of the past, present, and future directions in Classic Odonts.

Steve Gettel is the owner and operator of Sunset Orchids with nurseries in Burlingame and Colma, California. He recently acquired Unicorn Orchids in Daly City, California. He has raised orchids for 20 years and specializes in the cultivation and hybridization of Classic Odontoglossums and Odontiodas. Steve also raises Lycastes, Miltoniopsis, Masdevallias and Draculas. He does both his own hybridizing and primary laboratory work. Steve is an accredited AOS judge, a past President of the San Francisco Orchid Society, and one of the founders of the Odontoglossum Alliance.

Sunset Orchids, 2709 Hillside Drive,
Burlingame, CA 94010

11:30 -1:30 pm

Wine, luncheon, business meeting and auction of fine Odontoglossum Alliance material.

This meeting of the Odontoglossum Alliance promises to be an interesting and exciting one. This being held on the West Coast in conjunction with the Western Orchid Congress and AOS Trustees meeting provides an opportunity to gather a large number of the Odontoglossum Alliance growers. It is expected that there will be substantial numbers of commercial sales representatives at the Congress providing an wide variety of alliance material for sale. All-in-all this will be an exciting week. Mark your calendar and make plans to attend the meeting and Congress.

An exciting part of every meeting is the auction of fine and unusual odontoglossum alliance material. This year is no exception as many fine plants will be available. Pat Petit, Director of the Odontoglossum Alliance and owner of Cheiri Orchids is in charge of our auction this year. Please see the announcement for the auction in this newsletter.

The President will give a short talk on the status of the alliance, the request for an AOS trophy, and plans for the future.

AOS Odontoglossum Alliance Trophy Report

We have exceeded our minimum financial goal of \$5000.00 for the establishment of the endowment fund for the Robert B. Dugger Trophy. The President, Bob Hamilton has submitted our request to the AOS Chairman of the Committee on Awards, Ms. Anita Aldrich. We expect that the committee will act upon the request at the Western Orchid Congress during their meeting on 27 April 1995.

The award criteria proposed for award consideration is:

"Any odontoglossum or hybrid with odontoglossum in its parentage, exhibited to the AOS Judging System"

If the trophy is approved the award will be granted annually.

The Odontoglossum Alliance voted at it's meeting in Santa Barbara in March 1994 to have the goal of establishing an AOS Trophy for the best AOS awarded Odontoglossum Alliance material shown each year. The Alliance agreed to contribute \$2000.00 raised from previous auctions. The proceeds from the auction in Santa Barbara were added to this. The membership dues form for the year contained an ability for members to contribute to this fund. Generous contributions have been received. As of this newsletter we have exceeded the minimum required amount of \$5000 to establish the endowment fund for the trophy.

The Alliance plans has submitted our proposal to the AOS Awards Committee.

The criteria we plan to use for eligibility for consideration is "Any odontoglossum or hybrid with odontoglossum in its parentage awarded by the AOS in the past year will be eligible for consideration of the trophy award." The trophy is planned to be named "The Robert B. Dugger Odontoglossum Alliance Award".

Recent Trophy Contribution

The following have generously contributed to the establishment of the award and have added their names to the list previously published:

Genevieve F. Grisham

Maiya Orchid Laboratory

William Mishler

Helmut Rohrl

Wanted

Material for the Odontoglossum Alliance Auction

The Odontoglossum Alliance will conduct its annual auction of fine Odontoglossum Alliance material at the 28 April 1995 meeting in Portland, Oregon. In the past the auction has been one of the highlights of the occasion with the opportunity to acquire some of the finest plants and other alliance material. Many of the items were unavailable otherwise. This year the proceeds of the auction will go towards the funding of the AOS Odontoglossum Alliance Trophy to be named the Robert Dugger award. We would like to have a listing of the material to be sold at the auction. Everyone is urged to contribute.

Ms. Pat Petit, Cheiri Orchids, is in charge of our auction this year. The auction will be conducted during the luncheon and business meeting 11:30 - 1:30.

For those who are contributing, if you would like, you can send your material ahead of time to:

Mr. Wim Velsink
7950 South West Green Lane
Portland, OR 97005

If you are bringing material we would appreciate your notifying Wim Velsink either by mail or phone (503-646-1387) as to what you will be bringing for the auction. You may also call Pat Petit (206-752-5510) with the same information.

This will permit us to have a prepared list of material to distribute to all attendees. So look your collection over and pick out something very choice to bring or send for the auction. Also notify Wim or Pat.

Odontoglossum Alliance Species

Leonore Bockemuhl

Cochlioda

Lindl. 183

Lindley founded the genus on a Peruvian plant, discovered by Mathews 1838. This species, which is still unknown in a living state in our collections, was named *Cochlioda densiflora* and published in *Folia Orchidacea* in 1853.

Several more species had been added to this genus. Some years later Reichenbach f. transferred some of them to his own genus *Mesospinidium*. So it happened that some species of the genus *Cochlioda* became known for a long time under genera to which they did not belong. When Schlechter in "Orchis" 1910 made revisions of the genus, he accepted merely four species. All species of the genus are distributed in the Andean regions of Ecuador, Peru, and Bolivia. The most typical feature which distinguishes *Cochlioda* from other allied genera is the column, decorated with two separate twin like stigmas.

The plants are medium sized, the somewhat flattened bulb is surrounded by 1-2 foliaceous sheaths, bearing a solitary rather soft-textured linear leaf. The inflorescence arises from the base of the bulb, densely many flowered. Flowers are about 3 centimeters across, brilliant scarlet or rose colored. The column and lip are adnate basally. Distribution is from Ecuador to Bolivia in the Andean region.

The species are said to flower freely and breed inter-fertile with other genera and have been used extensively for producing artificial hybrid genera:

Odontoglossum x Cochlioda = Odontioda

Oncidium x Cochlioda = Oncidioda

Miltonia x Cochlioda = Miltonioda

Cochlioda noezliana

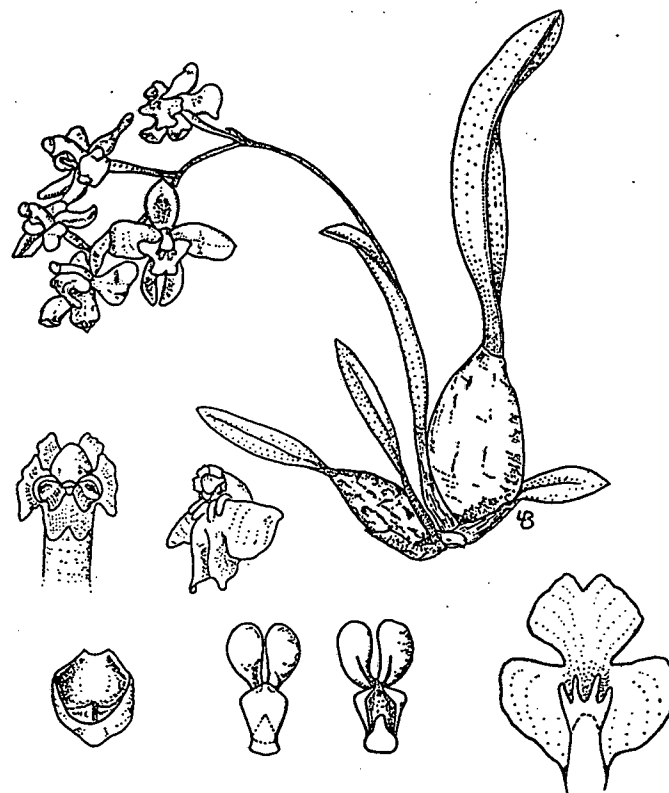
Rolfe 1891

Epiphytic growing plant, medium sized, with somewhat flattened bulbs, surrounded by 1-2 foliaceous sheaths, bearing a solitary soft-textured linear leaf. The inflorescence arises from the base of the bulbs, somewhat arching with about 6 to 8 bright scarlet colored flowers. Flowers opening widely, about 3 cm across; sepals and petals more or less elliptic, the tips recurved, ca. 15 x 8 mm. The lip basal adnate to the column, three lobed, lateral lobes subquadrate 6 x 4 mm, mid lobe trapezoid 6 x 6 mm with 4 yellow keels on the disc. Column 12 mm long, clavate; stigmatic hollow shaped.

The plant was discovered in Peru by John Noezli and introduced to Europe in 1891. It was described by Rolfe in *Lindenia* VI, plate 266 a named in honor of the collector.

Habitat: Epiphytic on mossy twigs of trees at the forest edge in cloud forests about 2000 - 2400 meters, Peru.

The species most utilized for breeding is *Cochlioda noezliana* with its bright scarlet colored flowers. There have been produced more than 100 artificial hybrids. Crossing with several species on the genus *Odontoglossum* have been successfully produced hybrids with: *Odontoglossum*; *cirrhosum*, *crispum*, *halli*, *harryanum*, *pescatorei*, *tripudians*, *triumphans* (*spectatissimum*); *Lemboglossum*; *cordatum*, *maculatum*, *madrense*, *uro-skinneri*



Cochlioda noezliana

Cochlioda rosea

(Lindl.) Benth. 1844

Plant medium sized, bulb 1-2 foliate, surrounded by 1-2 foliaceous sheaths. The inflorescence arises from the base of the bulb, densely, many flowered, flowers about 25 mm across, rose colored, sepals and petals spreading, similar elliptic-oblong-acute, 12 x 5 mm. Lip three lobed, as long as the petals, crest consisting in 1-2 pairs of stout, fleshy plates. Column basally adnate to the lip, decorated at top with a 3-lobed hood.

Hartweg discovered the plant in 1840 in the Andes of Ecuador near Loja. It was described by Lindley in "*Benth.Pl.Hartwegianae*" 1844, p.151, named *Odontoglossum roseum*. Bentham transferred the species in 1881 to the genus *Cochlioda* (*Journal of the Linnaean Society*).

Habitat: Epiphytic, sometimes lithophytic at forest edge of cloud forest. Altitude about 2000 m.

Distribution: In the Andean region of Ecuador and Peru.



Cochlioda rosea

Editors Note:

This completes the publication series of the description of the odontoglossum alliance species produced by Leonore Bockemuhl. The series has been carried in the past twelve newsletters. The descriptions are complete with word, line drawings and colored photographs of the species. If there was sufficient interest by the members of the Odontoglossum Alliance this series could be combined into a separate publication and made available. If you are interested please let myself or one of the officers of the organization know of your interest.

The Alliance is indebted to Leonore for her work in this important area. Her book 'Odontoglossum A Monograph and Iconograph' is the modern day authority on the classification and description of the odontoglossum species. Many thanks and much appreciation to Leonore Bockemuhl.

Available to Members
New Stock Available
Currently Shipping Orders

*Veitch's Manual of Orchidaceous Plants
1887 - The Oncidiinae*

We have recently received a new stock of this valuable book. The previous supply being exhausted quickly.

The New Zealand Odontoglossum Alliance has re-printed Veitch's Manual of Orchidaceous Plants - The Oncidiinae. The Alliance is offering this publication for sale. We have received a supply and have filled all back orders for the book. The book is the Oncidiinae section removed and enlarged from A5 to A4 and with the original color maps re-printed in color. It is priced at \$50.00 per copy post paid. This classic work contains 250 pages of cultural, historical and habitat information plus many beautiful line drawings, a glossary of terms and three color maps of where they come from.

Orders should be sent to the Editor along with payment. Shipment will be done promptly. Send order and check to:

John E. Miller
P.O. Box 38
Westport Point, MA 02791

make check payable to:
Odontoglossum Alliance

For those planning on attending the Odontoglossum Alliance meeting in Portland, Oregon; the Odontoglossum Alliance will be donating one of these fine books to the auction.

Sources of Supply

The Odontoglossum Alliance maintains a list of known suppliers of such material. The list is published once a year in the newsletter. I plan to publish the list again in the May issue of the Newsletter. If you are a Supplier of Odontoglossum Alliance material and wish to be included on the list; Please let me know. I need only your firms name, address, and telephone numbers (Office and FAX). It would be helpful to have a one paragraph description of your products. Please send this information to:

Odontoglossum Alliance

P. O. Box 38

Westport Point, MA 02791

I need your response by 1 May 1995.

Sunset Orchids acquires Unicorn Orchids
Sunset Orchids has announced the acquisition of Unicorn Orchids. The Unicorn Orchid collection which was assembled by Bruce Cobbledick is dominated by odontoglossum alliance material. It is a world famous collection assembled over a twenty year period through plant acquisition and an aggressive hybridization program.

Sunset Orchids has greenhouses in Burlingame, Colma, and now Daly City all in California. It is well known with a growing reputation for fine quality odontoglossum alliance material, a vigorous hybridization program, and excellent culture. The collection also contains Lycastes, Masdevallias, Miltoniopsis, and Draculas. Steve Gettel, proprietor of Sunset Orchids has stated; "The acquisition of the fine collection of Unicorn Orchids adds depth and strength to the odontoglossum program at Sunset. We are expanding our offerings of both named and awarded plants as well as plants from our expanding hybridization program."

Both Steve Gettel and Bruce Cobbledick are founders of the Odontoglossum Alliance.

Sunset Orchids is located at 2709 Hillside Drive, Burlingame, CA 94010. By Appointment (415) 342-2092

IN SEARCH OF ECUADORIAN CYRTOCHILUM

Dr. Howard Liebman

For many years I have been intrigued by cyrtorchilum oncidiums. In the late 1970's, I created one of my most interesting hybrids using the cyrtorchilum oncidium, *Onc macranthum*. Cultivars of this cross, *Miltonidium Maxine* (*Milt vexillara* X *Onc macranthum*) received awards from both the AOS and RHS. Unfortunately, finding other cyrtorchilum species to use in my hybridizing program proved quite difficult. The few that I did acquire were also difficult to grow and bloom in my Massachusetts greenhouse. However, upon my return to California, I began to acquire, from a variety of sources, a large collection of cyrtorchilum species and hybrids. An additional incentive for the accumulation of these plants was the fact that my new residence was located in a damp canyon near the ocean and I found that I could grow beautiful specimen plants outdoors. Over the last two years my cyrtorchilum collection has grown to over 120 different cultivars, including 23 different species and 6 different oncidium (*cyrtorchilum* X *cyrtorchilum*) hybrids. While the possession of six different oncidium hybrids containing cyrtorchilum may not appear to be an accomplishment, it should be noted that only 13 oncidium hybrids with cyrtorchilums have been registered as of 1995.

Like any good scientist, my enlarging collection forced me to research the literature to better understand the culture, growth and hybridizing characteristics of the cyrtorchilum oncidiums. While the full characteristics of this family are debated by most taxonomists, a growing consensus of experts do not believe that the cyrtorchilum belong in the family of oncidium and

most likely represent a separate genus. It is believed that there are between 40 and 60 different *cyrtorchilum* species. They are located predominantly on the Pacific slope of the Andes from Venezuela through Colombia, Ecuador, Peru and Bolivia. In addition, natural hybrid populations are believed to exist between several overlapping populations of distinct species.

The largest and possibly richest populations of *cyrtorchilums* grow in Ecuador. It was for this reason that I took advantage of the generous nature of Dennis D'Alessandro, owner of Gypsy Glen Orchids and an expert on Ecuadorean species, to invite myself along on his trip to Ecuador in late November of last year. I had hoped to study the *cyrtorchilum* in the wild, acquire some new species from Ecuadorean growers and learn from their experiences collecting and growing these beautiful plants. The trip was sadly brief, only 8 days, since I had to return early to present a paper at the American Society of Hematology meetings. However, it was still adventuresome and rewarding.

In Ecuador, two of the most commonly seen and collected orchids are *cyrtorchilum macranthum* and *serratum*. Both species are found in all provinces of Ecuador (including northern Peru) except for the Amazon region. *Cyrtorchilum macranthum* is probably the best known species in this genus and without a doubt the most frequently cultivated member of this family. While Ecuadorean growers talk about many, so called, special populations of this species, there are probably only two or three separate forms of the species. Many growers offer the *nanum* or short spike form of the species. The first *nanum* forms were shown by Charlesworth & Co to the RHS orchid committee in 1891. The description stated 'Messrs Charlesworth sent fine plants of *Oncidium macranthum*, some of which bore large flowers on spikes only a few inches to one foot in height'. This was a uniform characteristic of the plants in bloom. However, most of the imported *nanum* forms seen today have medium length inflorescence which increase in size as the size of the plant increases. In reality, the

inflorescence length of *cyrtorchilum macranthum* varies in all regional populations from 1 to 4 meters. The properties of the individual flowers better define unique populations of this species. The 'type' form of the species has larger yellow petals with olive to olive brown sepals. The lip is marked with varying amounts of purple. The finest forms, besides having a full shape, have dark mahogany sepals and clear yellow petals for a striking contrast. I saw two fine examples of this type of *macranthum*. One plant was in the collection of Alfonso Poro in Cuenca. He was without a doubt the finest grower I encountered in Ecuador and he possessed an excellent collection of *cyrtorchilum*. The plant he had in bloom was of superb shape, 8 cm flowers on a 3 meter inflorescence. The second example of this type *macranthum* was in the botanical garden in Cuenca. Dr. Eduardo Sanchez, the director, was kind enough to give me a division of this fine specimen. It is interesting that the Ecuadoreans are most attracted to the larger forms of the species and less impressed by round or fuller formed flowers.

Two other distinct color forms of *macranthum* include the *splendens* variety which is the all yellow form and the *williamsianum* variety, notable for a large blotch of purple at the base of the petals. The *splendens* variety is found throughout the range of *cyrt. macranthum* and exists in all stem lengths. I asked many of the growers whether they had plants of the *splendens* variety, but none possessed such plants. However, when I returned to Los Angeles after my trip I found a plant of the 'so called' *nanum* form that proved to be a lovely plant of *splendens*. The *williamsianum* variety is much more controversial. Walter Teague wrote a very nice article in the September 1977 AOS bulletin arguing that this form of *macranthum* is really a natural hybrid between *macranthum* and *cyto. monachicum*. Although his arguments were convincing, the recent blooming of two different *macranthum* X *monachicum* crosses calls into question his hypothesis. My own guess is that this is a true unnamed species, however, only a selfing or sibling cross of these plants will

determine if this is true. Unfortunately, no one I talked to in Ecuador had a plant of this variety, including Padre Angel Andreetta, who had previously collected several of these plants.

Cyrtorchilum serratum is one of the most vigorous species in this family. It has a tendency to form plantlets from its inflorescence similar to phalaenopsis. I have never been impressed with any significant variation in the overall quality of different cultivars of *serratum* until I saw several plants of this species in bloom in the garden of Dr Sanchez. One plant in particular had a wonderful large dorsal sepal and was 1 1/2 times larger than the typical form. Dr Carl Dodson believes that *cyрто. serratum* belongs to a swarm of varying forms of the species merging into *cyрто. lamelligerum*, which he believes to be closely related. Therefore, the cultivar I saw at Dr Sanchez may have been more closely related to *lamelligerum*. Padre Andreetta, told me that he had a true plant of *cyрто. lamelligerum* which was unfortunately not in bloom during my visit.

One of the most spectacular *cyrtorchilums* is *cyрто. pastasae*. Considered by some, along with *cyрто. orgale*, to be the red *macranthum*. *Cyрто. pastasae* is considered one of the most difficult *cyrtorchilums* to bloom. Everywhere I went I saw plants of *pastasae* in Ecuadorean collections. However, most have never bloomed. Alex Hirtz, Eduardo Sanchez, Padre Andreetta and others have never bloomed their plants. The reasons given include; *pastasae* is warmer growing, needs more light or has to be a very large plant. Alfonso Poro, in cold Cuenca, did have a very large plant outdoors that he bloomed every year. I have bloomed my large plant outdoors in L.A. On this trip, I did learn that there are two forms of *pastasae*. The typical red-brown form similar to the plant shown by Vacherot and LeCoufle to the RHS orchid committee and mistakenly awarded an AM/RHS in 1987 as *orgale 'Loja'*. This form tends to have the petals recurve on older flowers. The second form, pictured in this article, has a red-purple color and a flatter formed flower. I did acquire two plants of this variety and have rapidly established them on cork

bark.

Cyrtorchilum carderi is a species that I thought only grew in Colombia. Mistaken in some botanical descriptions for *cyрто. orgale*, this large flowered *cyrtorchilum* of dark brown coloration with white tipped petals has the rank growth habit of *pastasae* and *orgale*. I learned on this trip that *carderi* is also located throughout the northern provinces of Ecuador. Many collections had plants of *carderi* and I was able to acquire two different cultivars which I will grow along with my colombian collected plants. The notable aspect of *carderi* is that it is very cold tolerant and I was told that in some regions the plants survive short frosts. They are semi-terrestrial and grow up bushes, over tree branches or boulders.

The one *cyrtorchilum* species that I was most interested in seeing was *cyrtorchilum cuencanum*. When Dennis D'Alessandro originally described this species to me I thought that it might be the lost white and pink *cyрто. leopoldianum*. However, *cuencanum* is a smaller (4-5cm) flowered species with white and purple-brown spotted flowers. It is quite beautiful and I was happy to obtain two plants of this unique species. The breeding potential of a white *cyrtorchilum*, I believe, is tremendous. The botanical description of this species is in Fr Kranzlin 1922 monograph on *cyrtorchilum*. Unfortunately the growth habit of this species is similar to *pastasae* and *carderi*, requiring cork bark mounted culture.

711 Greentree, Pacific Palisades, Los Angeles, CA 90272

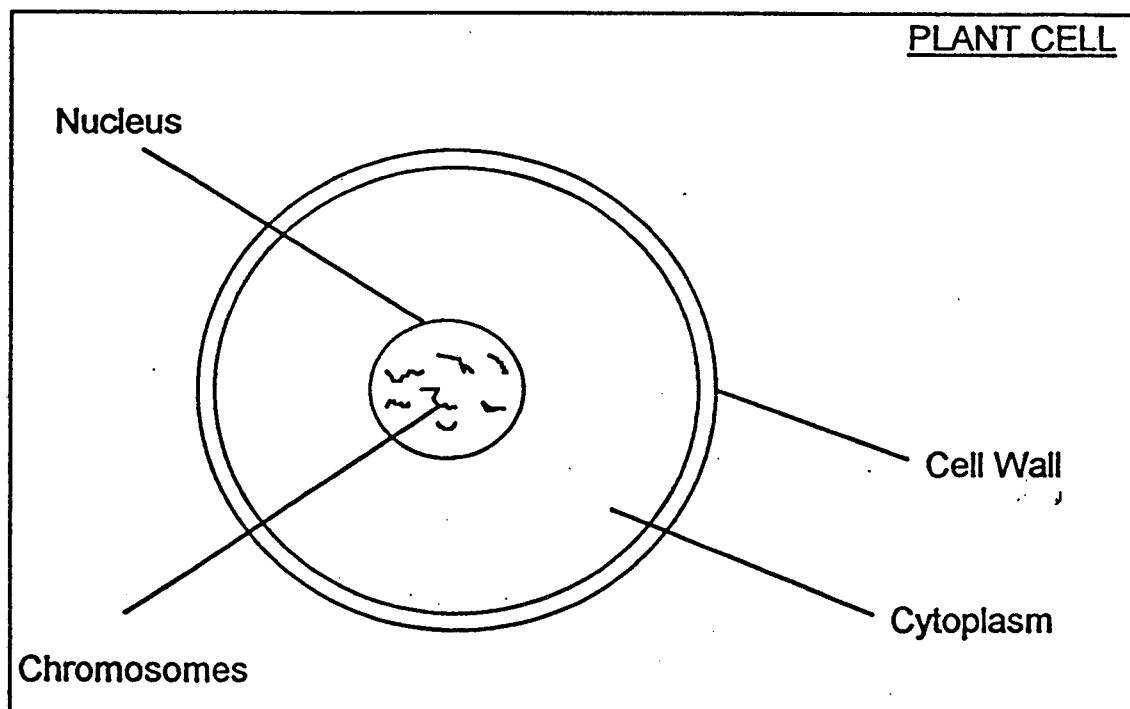
TO BE CONTINUED:

POLYPLOIDY - What is it?

by David Harrap

In order to understand what polyploidy is and its effect on plants, we must first look at plant cell structure.

A plant cell consists of a central nucleus (containing the genetic information) surrounded by a fluid called the cytoplasm, all contained in a thick cell wall.



The genetic information in the nucleus, which programmes the future growth and development of the plant, is contained in "chromosomes". These appear as elongated fuzzy black worms and can vary in number from as low as 2 to over 1000. Each chromosome consists of a single length of a chemical molecule called DNA (Deoxyribonucleic Acid) which is tightly coiled and twisted so as to appear as one short thread.

A good way of visualising the structure of a chromosome is to liken it to a "string of pearls". The individual pearls correspond to "genes" which control specific characteristics, e.g. flower colour. Many thousands of genes are then stuck end-to-end to make up an individual chromosome.

Each plant or animal which is produced through sexual reproduction obtains chromosomes from both the male and female parent. In the vast majority of cases it receives the same number of chromosomes from both parents.

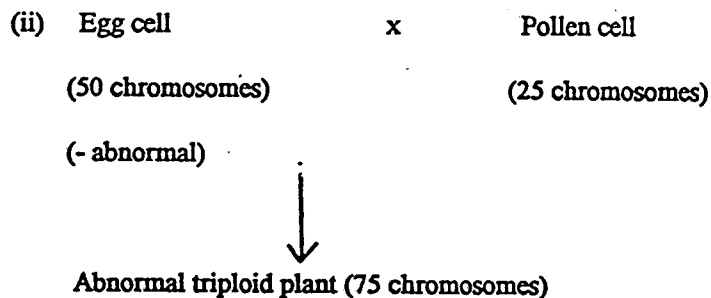
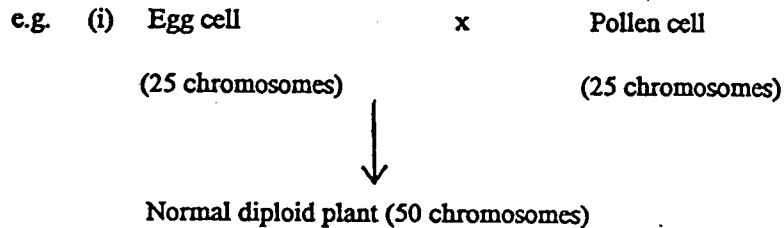
In humans the number of chromosomes in each nucleus is 46. (Twenty three chromosomes from each parent). Because we contain two "sets" of chromosomes (one from each parent) we are called "diploids" and a lot of plant species are also "diploids", although they may have different numbers of chromosomes.

Occasionally in nature plants occur which have more than two sets of chromosomes, e.g. 3 sets (triploids) and four sets (tetraploids). Plants seem to be able to tolerate and even thrive with more than two sets of chromosomes, whereas in humans - if it ever occurs - it is invariably fatal soon after inception.

For example, some *paphiopedilum* species have about 50 chromosomes. If these are the diploids then the triploids would have 75 chromosomes and the tetraploids 100 chromosomes.

How do these triploids and tetraploids come about?

There are several possibilities, but one way is for there to be a breakdown in the normal event of producing eggs and pollen. In order that each generation contains the same number of chromosomes at some point in the production of eggs and pollen, the cells must halve their number of chromosomes. This occurs in the vast majority of cases, but occasionally a cell gets through the system which contains the "unreduced" number of chromosomes. If this cell is successful in producing a new plant by fusing with a normal egg or pollen cell, it produces a triploid plant.



Very occasionally it is possible for two unreduced cells to fuse during reproduction and these then produce a "tetraploid" plant with four sets of chromosomes. However, this is extremely rare.

These "levels of ploidy", as they are known, can continue upwards and in some plants "polyploid series" are known, where different but closely related species contain ascending multiples of a base number of chromosomes. In some ferns this has reached its climax with over 1000 chromosomes in each nucleus and a ploidy level of over 100.

What effect does this change in the "level of ploidy" have on the growth and development of a plant?

When a nursery grows up a batch of seedlings of a cross or a species, it is often possible for the practised eye to pick out polyploid plants. (These occur in most cases at a low frequency - less than 1%). The polyploid plant may look slightly "different" to its diploid neighbours - it could be "chunkier" looking with wider thicker leaves and it may also be slower growing.

Plants which are potentially polyploid can be picked out and tested. An easy way is to examine the size of the guard cells on the leaf surface. These are cells which open and close the "pores" on the leaf. In polyploids they tend to be 25-30% larger than in normal diploids.

A more direct way is by counting the chromosomes from a region of the plant where they are easily seen - usually the root tips.

A more notable effect of polyploidy is on the flowers, where they are generally larger, thicker (of better substance) and often have brighter colours. As an example - compare pictures of *hybrid cymbidiums* before and after treatment to produce polyploids. The difference in flower quality is often quite startling.

Because of the improvements in flower quality polyploids are obviously important horticulturally and it is now possible to increase the proportion of polyploid seedlings produced from a cross by exposing the developing protocorms whilst in flasks to a chemical called colchicine. This chemical interferes with the normal growth of the cells and prevents them dividing. Since the cells have to double the number of chromosomes before each cell division (in order to stop the chromosomes becoming hopelessly diluted during growth), if the chemical prevents just one round of cell division it can double the number of chromosomes in a cell. When the colchicine is removed the protocorms carry on growing as normal, but a significant proportion of them are now polyploids. This procedure is now routinely carried out in many orchid nurseries around the world to increase the number of tetraploids. The Eric Young Orchid Foundation, with help from the eminent scientist Don Wimber, have been exploring this avenue recently and many of the orchids that they have grown were produced by this method.

Polyploids are therefore very important from a horticultural point of view and in my next article I shall look at how they are used in breeding.

Editors Note:

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Trekking The Andes

Robert Hamilton

Odontoglossums and their culture have been my obsession since 1979, the year I bought my first odontoglossum, Oda. Glenn Pollard. Since then, my interest in odonts has followed an evolutionary path, first buying flasks, growing compots, raising seedlings, blooming mature plants and finally breeding and flasking my own hybrids.

After 12 years of growing, a glaring milestone remained, a visit to the cloud forests of the Andes for a first hand look at how and where odontoglossums and allied genera grow. Fortunately, my partner John Leathers had become a master of masdevallia and dracula culture, building an excellent collection. As a result, John became friends with other cool growers. One of these friends, Walter Teague is a noted and experienced plant collector and an extraordinary plantsman. Walter has spent decades discovering habitats and new species of cool growing orchids throughout the world. Originally Ecuadorian, Walter has lived in San Francisco for the last 25 years.

In 1991, Walter invited Steve Beckendorf, John and I to Ecuador to attend the Fall 1991 Orchid Show. Knowing this would be one of the rare opportunities to get a CITES export permit from the government of Ecuador, John, Steve and I jumped at this opportunity. In addition, Walter asked Moises Behar, a noted Guatemalan lepanthes grower and hybridizer if he too would like to join us. With lepanthes flowers being amongst the smallest in the orchid world I suspected Moises would be a character. At 6:45 a.m. on a November morning, three Yankees and one Yankee/Ecuadorian left for Quito, Ecuador via Miami. During our stop over in Miami we met up with Moises Behar who had flown in from Guatemala to join us. Within the hour the five of us were aboard an American Airline flight bound for Quito. The flight from Miami to Quito takes about 5 hours, flying over the

Caribbean, across Panama to the Pacific Ocean, across part of Colombia, then landing in Quito.

On landing, I commented to Walter that my ears never felt more comfortable when descending to an airport. Walter tersely replied, "Of course, the pressure of the atmosphere at the altitude of Quito is the same as the pressure in a pressurised planes cabin". At 2836 meters, the Quito airport is amongst the highest in the world. Lower air pressure also means less lift for a plane so landing and takeoffs occur at extremely high speed, a thrill if your not prepared for it.

Ecuador is about the size of England. Its capital, Quito must rank as on of the best of the Latin American capitals. The climate is spring-like even though Quito is only 22 km south of the equator. This pre-Colombian city was originally inhabited by the peaceful Quito people, hence the name. About a century before the arrival of the Spanish the city was destroyed by one of Atahualpas generals. The modern city of Quito was established by Sebastian Benalcazar on the 6th of December, 1534 and much of the rustic city he began remains today. Quito is Ecuador's second largest city with a population around 1,000,000.

After landing, a check through customs and a three hour time change from San Francisco, it was close to 10:00 p.m. We took a taxi to our hotel and along the way Steve pointed out a poster advertising a meeting of neo-tropical bird scientists. This added to my anticipation. From experience, Walter has selected a markedly Ecuadorian hotel, The Embassy. We were unanimous in not wanting an US-style tourist hotel. At the time we checked on the US Swim Team was at the front desk preparing to check out after a 3 week stay. A member of the team explained Quito had the second highest Olympic-size swimming pool in the world and that a 3 week workout at this altitude increased

red blood cell count enhancing endurance.

In the morning we headed off to rent two, four-wheel drive "Troupers". While grouping in front of the hotel Walter shouted, "Oh look, an orchid". There, on the roof tops of the surrounding buildings were reed stem epidendrams growing in the rain gutters. Within days I would learn how ubiquitous these epis were and more about Walter's sense of humor. After renting a car, we headed off to an native market to explore. Food was abundant is a large variety. There were more kinds of potatoes available than I could count. The small stature of the indigenous peoples was a surprise. Many were less than 4 feet in height. More surprising was the stamina of these people and there ability to carry weight. I asked Moises Behar if he knew anything about their health. On the plane ride from Miami to Quito I learned from Moises that he was a doctor who had specialized in pediatrics and nutrition. As an employee of the World Health Organization, Moi told me he had studied the health of similar indigenous Guatemalan populations. He explained body fat was exceptionally low with cardiovascular disease rare. Life expectancy was less than that for industrial countries with the major killer being pulmonary and respiratory infection.

On this first day in Ecuador, Walter introduced us to a typical Ecuadorian dish, Locro. Locro is a unique potato and cheese soup which soon became our preferred staple. Liking and, I began to ask for it whenever we stopped to eat. In the afternoon, Walter introduced us to some of his orchid growing friends living in Quito, Juan Del Hierro, President of the Society of Orchidology of Quito, Dr. Alex Hirtz and Fernando and Monica Navarro. They were busy painting a backdrop for their display at the 1991 Ecuadorian Show to be held in a week in Quayaquil, Ecuadors largest city, a port about a days drive southwest of Quito. Plants, the backdrop and props needed to be packed a driven several hundred miles. This group planned to go collecting the following day for plants for their exhibit. Following the exhibit they would place

plants in the Quito Botanical garden. We were invited along and we gladly accepted!

Geographically, Quito is towered over by the Pichincha, an volcano still considered active. This November the Pichincha had snow blanketing its top which added to its beauty. Ecuadorians refer to their mountains with endearment much the way I would speak of a friend or one of my relatives I liked the Pichincha has snow this year. After meeting early in the morning, we headed west, out of town toward the volcano. Immediately, I was surprised by the abundance of eucalyptus trees. As an Australian tree, Eucalyptus seemed so out of place and these trees were everywhere. With more thought, it occurred to me that my home, Berkeley has hills covered in Eucalyptus. In destroying their native forests and replacing them with Ecuadorian were doing what two generations before me had done to the San Francisco - Bay Area.

The road toward the Pichincha took us through the Quito suburbs and then into the countryside. Views were quite striking. Steep mountainsides are covered in a patchwork of varying shades of green making up small cultivated fields. The Andes are incredibly steep mountains. The road in Ecuador are difficult to build and maintain in good repair because of the steepness and high rainfall. The Andes run from the north of the country to the south and are split into two major ranges, the Occidental and the Oriental. Soon we had to slow to less than 10 miles per hour as road conditions precluded faster driving. We bounced and clambered along, rocked by chuck holes and rocks. After a couple of hours we stopped by a native house where something was cooking. Walter recommended we ask if the bill-of-fair was for sale. What a treat, potatoes and cheese with a new texture, chapangauchos, a fritter fried until brown.

After our lunch we headed up a steep fork and began climbing in altitude. In about 5 miles our lead-vehicle stopped. Climbing through the brush along the roadside was an unusual bomarea vine

in flower. It had umbels of white, gray speckled and brilliant red flowers. I have never seen this genus of flower before. Bomareas are impressive flowers. We looked around for some seed but the season was too early to find any. The seasons of the Andes are unusual as day lengths at the equator are always the same length. What changes are precipitation and to a lesser extent temperature. After photographing the bomarea we walked around and did some exploring. A short walk yielded *Masdevallia angulata* and *Dracula felix* growing on the vertical slopes of the road cuts. *Epidendrum porphyria*, with its pendant pink flowers was common.

Walter explained, "road cuts are evolutionary, ever changing. When a hillside is cut to make a road amongst the first plants to begin growing are orchids such as epidendrums, ellianthus and phragmapediums. Later, plants such as odonts and pleurothallids may be favored. In turn, these may eventually be overgrown by maxillarias, lycastes and taller plants such as sobralias. Finally, brush may overgrow all the orchids. A road cut has a changing life." I sat and looked over the geography to try and get a grasp.

When road engineers map out a road they must choose which side of the slopes of a valley they want to construct on. The face which is least steep is the obvious choice for ease of construction and stability. Also, farming and settlement are more likely on the less steep slope. Therefore, a typical Andean road is on one side of a mountain with a river at the bottom. That river will make crossing and settlement more difficult so it is common to find the steeper side covered in native forest. It is in this native forest, with trees high in epiphyte loads that the seed is produced and dispersed, some of it landing on the road cuts of the opposite slope. Plants high in the canopy of the trees which are virtually inaccessible germinate on the road banks. The supply of seed will last as long as there is native forest nearby. Road cuts can be thought of as petri dishes, good environments to culture flora and places with easily accessible to explorers where they can find large numbers of plants.

Sadly, plants that have taken hold on road cuts which produce seed pods have little chance of propagating. The roads below is unlikely spots for growth or survival.

It is axiomatic that wherever there is a road, there a people and wherever there are people, there is habitat destruction. Forests are cut for wood, charcoal production, farming and habitation. Saddest of all is damage that occurs from superstition. A common one is the need for setting fires. Significant numbers of hillsides are burned because of this superstition. Perhaps the origin of this superstition comes from the results of burning plants. Potash is yielded in the ashes. Potash is a source of potassium needed by all plants for growth. Regrettably, potassium is quickly exhausted, sometimes in a season or two. The loss of potassium makes the nutrient poor soils of the Andes good for only a few years of cultivation and then farmers move on, slashing and burning. This mechanism is the likely source of the superstition that the hills must be burned to make it rain.

Interesting ecology occurs at the interface here fire has stopped. An impenetrable forest of bamboo quickly grows and seals off access to the forest. Most cloud forest is open and fairly easily walked. One cannot walk even a few feet into this bamboo barrier. I also can't help but see an analogy between this bamboo and white blood cells forming at a wound sight. Since bamboo's grows only where there is sufficient light, it becomes a natural barrier at the edge of a wounded forest.

We continued on this road and continued to climb. Eventually we reached an altitude equivalent to Quito, 2800 meters. I had been warned that hiking at this altitude might be problematic until we adjusted but none of us had any detectable problems. The temperature outside was about 12 C, the mid fifties F. The atmosphere was misty. Another unique feature of the Andes of Ecuador is the weather. It can change from sunny to foggy or rainy in minutes. Such rapid weather changes do not occur in

Berkeley. Monica and Fernando had brought some breads and cheese. Ecuador has world class cheeses and our chapangauchos did not exactly stick to my bones! We sat down and had a snack. Juan and Alex disappeared immediately each to reappear with extraordinary plants. Alex had found a gorgeous plant of *Odontoglossum cristatum* while Juan a huge *dichea*. *Cyrtorchilums* were abundant, growing on fence posts and the sides of trees. Most common were *monachicum*. Steve Beckendorf, an odont species grower envied the fine *cristatum* Alex had found.

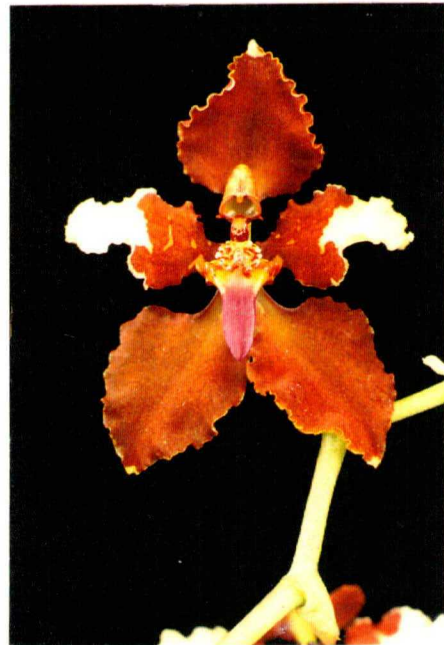
We headed on down the road for one more stop. The day was ending and soon there would be no light. Our friends saved the best for last. They had found a virgin slope near a power tower and led us into the forest. Transversing the slope was difficult and we soon developed a ballistics approach, let go and look for a tree to halt your decent. Steve and Walter headed straight down the hill while John, Moises and I hiked laterally. The quantity of forest litter was incredible. It was common to take a step and sink to you knees or deeper. Walking was a struggle. Every tree was covered in *scaphosepalums*, an exotic looking *pleurothallid*. There were tens of thousands of plants. Unfortunately, the orchid vegetation on this hill was monotypic, only a few species could be found.

The day was ending and we grouped and got into our vehicles for a ride back to Quito. This first day out ended in Euphoria. I looked back and wondered how long this sacred hill would survive the ravages of a growing population. I also learned how heavy my camera bag was going to be for the rest of our trip.

(to be continued)



Cyrtorchilum cuencaneum



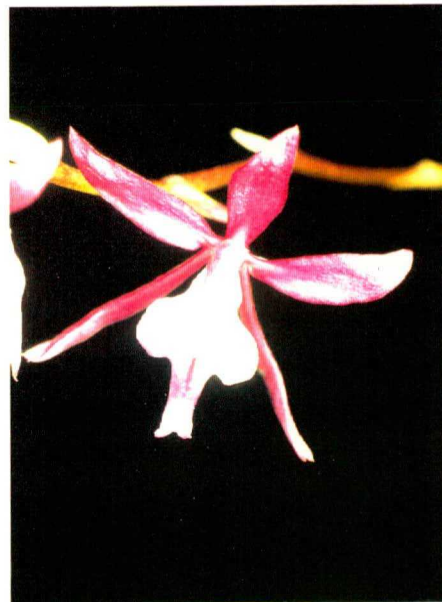
Cyrtorchilum carderi



Cyrtorchilum pastasae



Cochlioda noezliana



Cochlioda rosea