CROSSWORDS

THE GESNERIAD HYBRIDIZERS ASSOCIATION

NEWSLETTER

Volume 3, Issue 2, Summer 1979

Circle on your calendar the rescheduled date of the annual GHA meeting at the AGGS Convention. We hope that you will join us on Friday, July 20 from 11:00 A.M. - 12:00 Noon. Please note that our meeting will not conflict with the program on tissue culture. Helen Beaufort-Murphy will be unable to present the program and the updated schedule lists the tissue culture talk 9:45 A.M. - 10:45 A.M. with GHA to follow.

Gesneriad people are not the only ones interested in hybridizing. The May 1979 issue of *Horticulture* features two articles on our favorite subject. Saintpaulia is the sole gesneriad mentioned in "A Hybridizing Primer" but the aspirations of growers in the search for the perfect plant are universal. Specially pleasing is the recognition given to the amateur hybridizer.

Jeanne Morton will be taking on the new post of Membership Secretary for AGGS. We thank her for past efforts and for her continuing support on behalf of GHA.

In the next breath, we welcome to the "new regime" our new membership person, Meg Stephenson. Please direct membership inquiries, address changes, etc. to Meg and note the new mailing address.

David Zaitlin has volunteered to coordinate a GHA seed exchange/fund, and we consequently seem on the verge of realizing what has been just a dream. Exchanging seed of new and speculative crosses, useful subspecies or variants, chemically treated or irradiated seed, etc., should provide much pleasure for us hybridizers. Details have yet to be worked out (look for them in future issues), but if you have ideas, seed you would like to share, or seed you would like to have, I am sure David would like to hear from you, although sending actual seed to him may be premature. Contact him at the address on the back page. Thank you David.

We think it would be nice for new commercial introductions to be formally described in these pages. Growers or hybridizers making such introductions are therefore invited to submit descriptions. It would be helpful if there were a volunteer from the membership to contact individually as many commercial growers as possible about this, and to keep up with the many catalogs.

As our membership continues to increase, we hope to hear more from more of you. In *CrossWords*, the membership is "the message". To continue the exchange of information, we must have your comments, questions and articles. In a recent letter, Frederick Parker said, "Please accept my thanks for keeping GHA alive until I, at least, realized that this is a team effort and not a spectator sport." Thank you.

Anne Crowley
Ron Myhr

TABLE OF CONTENTS

Bob Stewart
Stow, MA.

I have tried pollinating various nematanthus hybrids, with no luck at all. Bill Saylor says that he has no trouble (no surprise!) but also says that the Seed Fund gets very little nematanthus seed. Can anyone shed any light on this?

HELP!

The other day I was watching my columneas grow, admiring their subtle asymmetry. The leaves grow in pairs, with one leaf always (?) larger than the other, much larger in some varieties, slightly larger in others. As I looked closer I noticed that on my plants all the buds were forming in the axils of the larger leaf of the pairs.

1. Is this true of all columneas all the time?

2. Why? There must be some raw material in the other axil because if I pinch it I get two stems.

3. Any ideas how to get buds on both sides, for twice as many flowers per plant?

Art and Peg Belanger
Warwick, RI.

Questions to which we'd like to see answers given by members who have experimented with chemicals and had satisfactory (or un-satisfactory) results:

What strength solution should be used for Gibberillic acid when treating seeds to help germinating percentages? Can it be used as a mist to encourage re-sprouting of tubers?

Source: Sigma Chemical, P.O. Box 14508
St. Louis, MO. 63178
(free catalog of complete listing of chemicals)

The first seedlings from a cross of two trailing hybrid *Saintpaulias* ('Pixie Blue' x 'Violet Trail') bloomed during the past week. The ones which I would select to continue growing have foliage which strongly resembles 'VT' with its bronzy cast, but size closer to the more mini-size of 'PB', and the blossom is a small deep blue star. I am interested in knowing whether this cross has already been made and perhaps even introduced. Can any of the African Violet specialists who keep up with the new hybrids when they are registered share any knowledge they may have in regard to this particular cross?

QUESTIONS from Russ White (V. 3, #1)

Has anyone tried *Sinningia* 'White Sprite' x *S. canescens*?

Has anyone had any luck in crossing gesnerias?

Does giberellic acid affect subsequent generations of affected plants? Has it been used on miniature sinningias?

ANSWERS from Peg Belanger:

Sinningia 'Modesta' (Bernard) is listed in the Sinningia Register as a cross of *S.* 'White Sprite' x *S. canescens*.

When I repeated that same cross in early 1978, two seedlings resulted, which bloomed in July of that year. Both were sterile during the first blooming and would not back-cross to either parent or self-pollinate. When they resprout this year, I will test again for fertility, since sometimes maturity is necessary before reproduction is possible. In the plant world "Better the Second Time Around" is sometimes true. However, our crossing of the same two plants which produced *S.* 'Modesta' was inferior to the previously registered plant, with rather nondescript small tubular blossoms of washed out pink color, and also with a very short flowering period.

A successful crossing of *Gesneria reticulata* 'El Yunque' x *G. pumila* first bloomed in January of 1977, and has bloomed intermittently ever since. The flowers show a perfect halving of the blossom characteristics of the parents since they are a soft watermelon pink, fringed, with a creamy throat and red anthers. Although it produced many suckers which would form plants when removed and planted individually, it was reluctant to form pods which would hold for more than a month before folding. After two years of attempts and disappointing failures, we seem to have succeeded at last, for a pod "selfed" in January of this year is now fat and plump, and still holding (in May). Since *G. pumila* seeds take nine or ten months to ripen, I am resigned to a long wait before I find out about a second generation of this hybrid.

ANSWER from David Zaitlin:

Gibberillic acid (GA_3) belongs to a group of naturally occuring compounds known as gibberillins, all of which share a common structural nucleus. Isolated in the 1920's in Japan from a fungal disease of rice, gibberillins are found to induce artificial elongation or 'bolting' when applied to plant shoots. The exact biochemical effects of gibberillins are unclear, but it is known that they produce marked effects at very low concentrations. Internodal extension and an increase in meristematic mitotic events can occur in applications of 10^{-7} to 10^{-3} Molar (.000035 to .35 milligrams per ml. H_2O). As gibberillins are an applied, non-mutagenic substance, their effects would not be expected to be transmitted to the next generation by genetic means (i.e. seed).

With reference to miniature sinningias I have never heard of anyone using it on these plants, and it would probably be fruitless, as to do so would probably result in a long, stringy, unattractive plant. However, the pre-treatment of gesneriad *seed* could be beneficial, as it has been demonstrated that gibberillins can mimic the effects of light and greatly shorten the time required for the onset of germination. As I do have access to GA_3

and a great deal of hybrid sinningia seed, I am presently treating seed for various lengths of time and at several concentrations to determine the optimal combination for reducing germination time. If this proceeds as planned, I will report on my progress in the next issue of *CrossWords*.

QUESTION from O'Neill Ferriolo

Why hasn't *Columnea erythrophaea* appeared once in the Columnea Stud List as a seed parent?

ANSWER from Anne Crowley

Such crosses have been made but the dominant characteristics of *C. erythrophaea* are greatly expressed when used as the seed parent. The result is lots of *C. erythrophaea* lookalikes. Bill Richardson's *C.* 'Cannonball' is a larger, more vigorous, "super" *C. erythrophaea*.

QUESTION from Margaret Waguespack

Last year, because the blooms were so beautiful, I bought an unlabeled columnea, which I have not been able to identify. The flowers were so laden with pollen that if you touched them you were virtually showered with it. I selfed the plant, thinking I could, at least, determine whether the plant was a species.

I have about twenty seedlings, the others were discarded because of a lack of growing space. The plants have not bloomed yet but thus far, the leaves appear to be identical with the parent. If the bloom is identical, also, I presume I have a species, and my search for a name can be narrowed considerably. If the original plant (selfed) is a hybrid, is there usually a great deal of variation in the first generation (F1), both in blossom and in leaf forms?

ANSWER from Ron Myhr

Species, when selfed, generally produce offspring similar to the parent plant. This occurs because the genetic range of the species is relatively restricted; genes in both types of sex cells (male and female *gametes*) will be very similar to each other, and all possible combinations will not produce a particularly great range of variation (some variation will undoubtedly occur -- see Peter Shalit's article "Intraspecific Variation -- And How to Exploit It", *CrossWords*, V. 3, #1).

When two species are crossed, the first (F1) generation will be relatively uniform. This occurs because all the pollen cells (the male gametes) are very similar to one another, as are all the female gametes in the ovary of the other parent. Therefore any possible combination of male and female gametes will be very similar to any other combination, with differences only to the extent of the genetic variability of the parents. In the second (F2) generation, the genetic material is spread around, and individual plants may exhibit any combination of characteristics from the original two species.

A hybridizer may, however, wish to develop a seed-line which produces uniform plants. From an F2 generation, he or she may select the plant or plants which most closely approximate the ideal, self or cross these, select once again from these offspring, and so on. Eventually, all or most of the undesired characteristics will have been eliminated, and selfing of the plants

will produce offspring very similar or identical to the parent, just as does selfing of species. This phenomenon may be observed in such hybrids as Lyndon Lyon's *Sinningia* 'Rex'.

In the case of this unknown *Columnea*, one could be certain it was a hybrid if there was considerable variation of plant and flower form from one individual to another. If all the plants turn out to be more or less identical, one could be pretty sure the parent is a species, since there are certainly few, if any, stable hybrid seed lines in this genus.

One other situation might produce offspring similar or identical to a hybrid parent. If the parent is a tetraploid form of a diploid hybrid, one would expect the tetraploid offspring of a selfing to all be similar to the parent. *Sinningia* 'Cindy Ella' is the tetraploid form of the sterile diploid *S.* 'Cindy', and when selfed produces plants very similar to itself, with some minor variations. Again, this is unlikely to be the case with a *Columnea*.

IN SEARCH OF THE FIRST WHITE *S.* 'DOLLBABY'

Patrick Worley
Wilmington, MA.

A long time ago I decided that I would be the one to produce the world's first white *Sinningia* 'Dollbaby'. I believe that I have come the closest that anyone has -- so far.

I selected the whitest miniature, *Sinningia* 'Maiden's Blush', and crossed it onto *Sinningia* 'White Sprite'. After numerous failures, one pod yielded a half a dozen good seeds. The seed germinated very rapidly and the seedlings stopped growing when they were a little larger than *S. pusilla*. I transplanted them into fresh soil when they had not made any new growth for a two month period. They continued to grow on for the next two months. At this point I wasn't too hopeful. I had already put *S.* 'Dollbaby' pollen onto *S.* 'Tetra White Sprite' and gotten sterile plants (over 40 of them) that looked just like *S.* 'Poupee'. No whites, and no chance of F2.

The first flower opened pure white with a faint blush in the throat and a beautiful flat face. The flowers are held well above the foliage and are long lasting. The foliage is dark like *S. pusilla* and shows off the flowers well. Most of the others in the cross were similar but with less flat-faced flowers and had more blush in the throat. Alas, they are all sterile but I have redone the cross with *S.* 'Tetra White Sprite' to see if that will help. The plants from the first cross are probably sterile triploids and I don't want to bother with colchicine at this time. I have given the desirable first plant the name *Sinningia* 'Little Venus' and I will continue working to produce a fertile version. If I am unable to do this, I will work at vegetative reproduction because *S.* 'Little Venus' is so beautiful that it is worth the hassle.

I have been sorely disappointed by other 'first white' *Sinningias*. *Sinningia* 'Premier White', hybridized by Bartley Schwartz, has very large flowers but the red hairs on the tube give it a pink cast, not

unlike *S.* 'Maiden's Blush'. The flowers are trumpet-shaped and are so heavy that the stems cannot support them. Bartley is working to correct these problems and I am using this one for the same backcrossing onto *S.* 'White Sprite'.

A past GHA issue mentioned that someone wanted to cross *S. eumorpha* (white) with *S.* 'White Sprite' to get a white *S.* 'Dollbaby'. I got *S.* 'Diploid Dollbaby.' Other crosses produced the same results. The color chromosomes are mismatched and all you get is lavender.

I also have some crosses coming along of *S.* 'Snowflake' x *S.* 'Maiden's Blush' but whether the extra petaling will come out remains to be seen.

Next . . . the elusive double flowered, peloric, miniature yellow *Sinningia*. If I could only crack the sterility barrier . . .

Sinningia 'Little Venus' (*S.* 'White Sprite' x *S.* 'Maiden's Blush') forms a ground hugging flat rosette 9 cm. across (about 3½ inches). Leaves are almost round, about 3 cm. across, on short petioles, dark green above with darker veins as with *S. pusilla*. The veins show pink on the reverse of the leaf.

The nodding slipper flowers resemble *S.* 'White Sprite' but are much larger. The corolla tube being 2.5 cm. long and sparsely white haired. The limb is 2 cm. across with a faint pinkish cast deep in the throat. The flowers rise well above the foliage on stalks 4 cm. long. Plant is thus far sterile.

ANOTHER HYBRIDIZING EXPERIENCE WITH *SINNINGIA* SP. 'NEW ZEALAND'

David Zaitlin
Tucson, AZ.

I was intrigued by Peg Belanger's article in *CrossWords* vol. 2, #4 concerning the unidentified *Sinningia* species which has been temporarily named 'New Zealand'. Peg obviously found it to be a good seed parent, and hence dubbed it "Big Mother", which seems apt considering its mature size. I have performed some of her crosses, but in all cases have used 'New Zealand' as the pollen parent. At the present, I have seedlings of (*S.* 'Rex' *X S. eumorpha* 'Pink') X (*S.* sp. 'New Zealand') that are just getting their sixth pair of true leaves. Under Arizona greenhouse conditions, all of the seedlings so far produced (approximately 15) are displaying strong indications of inheriting the purple leaf coloration of the pollen parent. On rereading the previous article, I was surprised to see that none of Peg's hybrids showed this characteristic.

As the female *S* 'Rex' X *S. eumorpha* 'Pink' parent used in this cross is quite small - about 10 cm. across - I expect the smallest of the hybrid progeny to be at least within the dwarf size range, and hopefully not too tall. Because the female parent is itself a complex hybrid, no predictions regarding flower size, shape or color can be made, though a range of diverse types is expected.

For those who are also interested in diploid hybrids of *Sinningia*, I have listed below some other hybrids that I have produced recently:

1) *S.* 'Rex' X *S.* 'Coral Belle': A selection from this cross, now approaching one year of age, has orange flowers otherwise identical in shape and throat markings to Lyndon Lyon's original 'Coral Belle'. This plant is more compact, has smaller leaves, and is more floriferous than the pollen parent. It is also quite fertile.

2) *S.* 'Alruth' (Ted Bona) X *S.* sp. 'New Zealand': produced a small amount of viable seed that germinated with low initial viability in 12 days.

3) *S.* sp. 'New Zealand' X *S. tubiflora*: seed pods maturing at present.

4) *S. eumorpha* 'Pink' X *S. magnifica*: A few viable seed resulted in four healthy seedlings. At the eight leaf stage, three resemble young *S. magnifica*, while the fourth looks like *S. eumorpha* with reddish backed leaves.

STREPTOCARPUS HYBRIDIZING - SOME OBSERVATIONS

Gary K. Hunter
Hunter's Greenhouses & Berry Farm
R.D.1 - Box 2A
Drumore, Pa. 17518

OBJECTIVES

When I pioneered the marketing of *Streptocarpus* over five years ago as a specialist propagator, I felt that durability was the essential characteristic needed for *Streptocarpus* to be a commercially grown plant. After growing the types of *Streptocarpus* available at that time, which were the Wiesmoor Hybrids and the 'Nymph' types, I chose *S.* 'Constant Nymph' and its mutants because of their durability. The larger-flowered Wiesmoor types are beautiful with a wide range of colors, but a commercial grower can not produce them and distribute them with their poor habit characteristics. They are brittle, they rot off easily and the flowers fall off too easily. The Nymphs, while having less showy, smaller flowers, are very durable with the flowers hanging on very well during distribution.

My objective in hybridizing *Streptocarpus* has been to develop a free-flowering, compact, rugged plant that will make a finished flowering house plant in a 4" pot. Notice I didn't mention flower color or size. These are important only after we have a tough plant. Also notice that the plant must grow to flowering in a 4" pot, the most commonly mass-produced production size. Although I am interested in the miniature *Streptocarpus* they will not be mass-produced at their present stage of development, so I have not worked much with them.

If I were to describe the ideal plant that meets my needs for the commercial market, I would have to show you my hybrid, *S.* 'Essue'. I would rather be more restrained and have someone else proclaim that *S.* 'Essue' is the best, but I have learned that confidence in selecting the best of the seedlings is the hybridizer's prerogative. In this case my wife picked the plant for its three tone bright flowers. In the past two years since she picked it and we have been producing it in quantity, it has proven to be the best flowering compact *Streptocarpus* we have seen. Comparing it to *S.* 'Constant Nymph', it has shorter leaves, shorter

flower spikes and slightly wider leaves which gives a fuller plant in the crown. If I had a full color range to go with blue *S.* 'Essue', I would have a very marketable *Streptocarpus* series.

CHARACTERISTICS AND SUBTLETIES

I have pointed to *S.* 'Essue' to show the characteristics that I want, but what are some of the variable characteristics available in *Streptocarpus* genes? The characteristics I have observed which are variable enough to discern are: leaf length, leaf width, leaf brittleness, flower size, flower shape, flower color, flower bud count, flower spike length, flower spike thickness, root strength, heat tolerance and mildew tolerance. I am sure there are hundreds more that I have not observed, but the point is that *Streptocarpus* has enough variability for the hybridizer to create a plant of any description he chooses. One subtlety which I feel is important is the tendency of the flower to self-pollinate. This is a variable characteristic dependent on the positioning of the anthers in relation to the stigma and on how tightly the anther sac is fused. The best example is *S.* 'Constant Nymph'; it rarely self-pollinates. Many large-flowered types do self when the anther sac easily breaks open thus causing the corolla to drop off due to the unwanted pollination.

A trait which I have had to reevaluate is bud count versus spike count. When I first started hybridizing *Streptocarpus*, I was selecting for high bud count on a 'Nymph' type plant. I was able to get several seedlings with six flowers per spike on a small plant. Since then I have selections that get a flush of flower spikes at one time as opposed to the succession of spikes that the 'Nymphs' get. I now feel that this flush of flowers is more important than bud count. The sale of flowering plants and the ultimate satisfaction of the buyer are still based on the most show for the money, so therefore a flush of spikes is better.

FUTURE GOALS

The most important goal at present is to expand the color range on tough plants. There are few durable pinks to go with the many blues available. I had hoped that John Innes hybrids would give that pink equivalent to *S.* 'Constant Nymph', but none of their selections are as vigorous.

Going for yellow flowers would be an exciting long term project. Since we have yellow in the throat, it may be possible to select for more and more yellow on a white flower until the yellow creeps out into the petals.

Tetraploids are still unexplored as far as I know. We have *S.* 'Cobalt Nymph' and *S.* 'Albatross' plus I have two tetraploid selections that occurred in propagation, one similar to *S.* 'Constant Nymph' and one similar to *S.* 'Netta Nymph'. The flowers on tetraploid plants have more substance and are very classy, but the plants tend to be very brittle.

My professional plant breeding friend tells me that I should be going for a seed line. As I mentioned before, *Streptocarpus* is very variable and you get many "dogs" in the seedlings so I have always stayed with vegetative propagation of selected plants. However, with enough persistence and time, a seed line is very possible.

CROSSES AND SPECIES

S. 'Constant Nymph'. If you self or cross any blue 'Nymph' you will get blue seedlings, but somewhat variable in flower size and shape and in bud count.

S. 'White Nymph' (Maasens White). I've found 'White Nymph' to be a very good parent to give good compact, durable habit. It is pollen sterile.

S. 'Karen'. This pink will give pink offspring when selfed. A valuable link for creating more pinks.

S. 'White Nymph' x Wiesmoor Red, Pink, Blue. All the F1 will be blues, intermediate in size, some very nice plants.

S. 'Pink Blush' (Hunter). This one gets a flush of flowers and seems to pass it along to the F1.

S. insignis (primulifolius). I worked a lot with this species since it was the first I had, but I believe it was a waste of time. It gives low bud count (1 or 2) and heat sensitive plants.

S. prolixus. My friend made this cross with 'Purple Nymph'. A very exciting development, the F1 has 16" leaves but a branching flower spike with up to 36 flowers.

S. Johannis. This species used to create 'Constant Nymph' and the Innes hybrids has been a good one, but may not be worth going back to since the F1 and F2 are available.

S. candidus. There may be great potential here. I was amazed when I saw it in flower at Longwood Gardens. A compact plant with high bud count and a flush of spikes at one time. I would encourage every one to explore this one.

S. Rexii. I found this species which is dominant in the development of modern hybrids to bring down the bud count and to reduce flowering in the winter.

HOPE

Streptocarpus is a wide open genus with great variability. Consider the fact that *Streptocarpus* is in the same stage of development that *Saintpaulia* was in 40 years ago. What a great time in history to contribute to the development of flowering plants for the enjoyment of all.

HEREDITY VERSUS ENVIRONMENT

Peter Shalit
Seattle, WA.

As hybridizers, we are used to thinking about heredity. Genes. The biological blueprints which determine the entire, unique nature of every plant. Correct? *No.* The genes are only part of the story. The environment is the rest.

A useful word to learn is *phenotype*: the sum total of an individual's observable and measureable characteristics. A plant's phenotype is determined by a complex set of interactions between its genes (intrinsic factors, which bestow a potential) and the environment (extrinsic factors, which determine just how the genetic potential is expressed). To illustrate the principle, pick out a gesneriad plant and set it in front of you. Examine it. Of what you see, how much would have been different if you had given the plant more or less light, water, heat, humidity, nitrogen, music, love, pruning . . .? Think about it. Get used to thinking of the environment as an important influence on a plant's phenotype.

Even professional plant breeders fall into the trap of thinking too much about genes and not enough about how the genes interact with different environments. The rise and fall of the Green Revolution is a prime example. About twenty years ago, strains of crop plants with phenomenally high yields were developed. They promised to feed starving nations. Score one for genetics. But subsequent petrochemical shortages have pointed out that these high yields are not some magic property of the plants' genes. The yields are completely dependent on the plants' getting massive doses of artificial fertilizer and plentiful irrigation. In other words, the phenotype (high yields) is dependent both on the right genotype (providing the potential for good production) and the environment (the proper irrigation, temperatures, light, and fertilizer to support the high production). Now it's back to the drawing board, to develop strains which yield well under more realistic conditions.

Gesneriad breeders, too, need to become more aware of the joint importance of heredity and environment. We could take a cue from the Green Revolution's problems. Are we all excellent growers, with optimal conditions? Then perhaps the wonderful products of our breeding programs will not perform well outside of the pampered settings where we have developed and tested them.

So, if you are hybridizing gesneriads with practical goals in mind, you must remember the influence of environment. To be avoided are hybrids whose desireable features are expressed only under extreme conditions; and of course be wary of those misfits which occur in every plant breeding program, plants with some exciting new feature but which need everything this side of an intensive-care ward to be kept alive.

How can you incorporate practical goals into your gesneriad breeding, to ensure that any hybrid you release will perform for others the way it performs for you? One way is to do all or some of your breeding in an impoverished environment. A windowsill, for example. Elena Jordan of New York City, and Peg and Art Belanger of Warwick, RI., are using this method. In both cases, the object is to produce plants which will perform well on the windowsill. It seems logical that any plant which flourishes on a windowsill will also be growable under lights or in a greenhouse, even if the converse is not true: plants which do well in the greenhouse may not survive at all on a windowsill.

Another method of producing versatile, dependable hybrids is to test all prospective releases under a variety of conditions: windowsills, fluorescent lights, greenhouse; ranges of humidity, light, water, fertilizer, temperature. Obviously, no plant does well under all conditions. But a battery of growth trials will define the range of conditions which are acceptable to a given plant, and the informa-

tion can be distributed with the plant. Of course, the wider a plant's tolerances are, the more likely it is to be successful outside of your home or greenhouse.

You may also want to enlist the help of other growers in testing your hybrids prior to release. Every few years, one hears another proposal for a plant testing/evaluation committee within the AGGS. I hear there is one within the GSI, in which Vincent Flanders is involved. However, unless growers with a wider range of conditions join the GSI testing program, its usefulness will be limited. Flanders' determination of what is and what is not a good houseplant are completely opposite of mine. In any case, I doubt that any institutionalized gesneriad testing program will ever survive. It will continue to be the responsibility of the hybridizer to have his/her new cultivars tested before release. Should you want to test out a new hybrid, you can certainly get volunteers aplenty from your local chapter, a Round Robin, or the GHA (put a notice in *CrossWords*). Seek volunteers from across the continent and with a range of growing styles and aptitudes. Set conditions at the start: volunteers should agree not to propagate, exhibit, distribute, or write about your plant without your permission. They should promise to report back to you, candidly, their evaluation of your plant's performance, within a specified period of time (six months to a year?).

If more gesneriad hybridizers took the time and effort to test out their plants this way for release, far fewer look-alikes and misfits would be released. It would save us all a lot of time and trouble. All a matter of determining how the combination of genes you've put together in your hybrid reacts to various environments. Heredity and environemnt -- both are important.

MORE ON *xCodonatanthus*

W. R. Saylor
Brewster, MA.

One of the more interesting developments since the introduction of *xCodonatanthus* 'Fiesta' at the AGGS Convention in Hempstead, N.Y., has resulted directly from attempts to carry this breeding breakthrough into a second generation. *xCts.* 'Fiesta' so far has resisted all of my efforts at selfing, although two fairly plump fruits have been brought to maturity only to reveal nothing but chaff inside. Similarly numerous pollinations of *xCts.* 'Fiesta' by *Codonanthe* and *Nematanthus* cultivars have ended in failure.

Fortunately, one cross using *xCts.* 'Fiesta' as the pollen parent has at last been successful. The hybrid seedlings have not yet flowered but the story of what has happened so far will, I hope, make an interesting and perhaps useful report. The pod parent in this instance was *Codonanthe* cv. 'Moonlight' (described in *CrossWords*, 3(1)).

This *Codonanthe* is rather difficult to emasculate because the corollas are so small and separate so easily from their calyces. The procedured followed in this instance was therefore not in line with usually accepted practice. What I did was deliberately *pull off* the

corollas of the newly opened flowers that were to be used as pod parents. At this stage the stigmas for the most part had not expanded and become receptive (or so I hope) and the the anthers appeared to be intact.

Pollen from *xCts.* 'Fiesta' was applied to the stigmas of flowers prepared in the above way the same day and again a day or two later. About a dozen flowers were pollinated in this manner over a period of several weeks and nine soon showed signs of developing fruit. The berries though did not enlarge fast and when the orange color at last began to appear it was easy to rationalize that nine berries all treated the way I have described might be *expected* to be smaller than usual because only a few hybrid seeds had presumably been produced in each. Whatever the reason the mature berries were only half the size of the usual *C.* 'Moonlight' berry. They matured over a period of weeks and yielded a modest number of seeds (averaging perhaps about 20 seeds per berry).

The seeds were cleaned and dried and planted in four batches, the first on June 15 and the last on July 17, 1978. Along with these a small number of seeds from *C.* 'Moonlight' selfed were planted as a control. This incidentally is a very helpful procedure if you are impatient (as I am) and want early proof that you in fact have made a cross. There must be somewhere an unwritten rule that says young seedling gesneriads shall be deceptive and try to look like anything but their mature counterparts. What better to do than grow seedlings of the pod parent selfed right alongside that population of young hopefuls you have created. That way you can intercompare the young plants week by week as they develop and detect even the minutest hints that "papa's" alien genes are getting to work.

Well, in due course germination took place and plants developed from almost every seed planted. When transplanting time arrived the tiny seedlings, still without identifiable characteristics, were spaced 20 to a flat and soon started to show strong new growth. A large majority also developed red pigmentation typical of what might be expected of the offspring of *C.* 'Moonlight'. (The control seedlings *all* took on that color.)

Here's where the real excitement began. A sprinkling of plants in *each flat* stayed bright green and most of these developed larger than the others. There were also two dark-leaved seedlings with larger more elongated leaves. All of this meant one thing, and it came through loud and clear -- at least *some* of my seedlings were the result of crossing *xCodonatanthus* 'Fiesta' with *Codonanthe* 'Moonlight.' These then constituted a first F_2 population from *xCts.* 'Fiesta'.

The rest of the story to date is rather anti-climactic by comparison, but provides a little food for thought. There are 25 almost certain hybrid seedlings and there are innumerable little dark-leaved trailers, all alike and all the spitting images of the *C.* 'Moonlight' selfed control seedlings. After six months there are no buds on the confirmed hybrid plants, but at least half of the others are in bud and just days ago the first blossom opened -- positive evidence that the other seedlings are in fact the result of selfing 'Moonlight'.

Obvious conclusions are:

1. "Emasculation" by removing the corolla after opening of the flower failed to prevent self-pollination.

2. Prompt pollination by *xCts.* 'Fiesta' was successful even on flowers which had been selfed in error.

3. Since *xCts.* 'Fiesta' pollen had not "taken" in other attempted crosses, perhaps the *xC.* 'Moonlight' pollen provided a needed synergistic effect.

There's more to come of course after the hybrid seedlings bloom. I'll report on that in a future issue. Meanwhile thanks for putting up with a long story about so very little.

COMMENTS

Tim Ross
Walled Lake, MI.

In the Fall 1977 issue of *CrossWords* (V.1, #3) Art Belanger related Dr. Carl Clayberg's five suggestions for making wide gesneriad crosses easier. The suggestion that I found the most interesting was the one in which the style of one plant is cut and a drop of Easter lily exudate is applied for pollination. I have begun to use this method on some of my cross attempts where I found it necessary. However, it isn't often that I can get hold of some Easter lily exudate and have wondered for some time whether there was a chemical solution or another form of natural plant exudate that could be used in its place. A while back, I made an attempt using the nectar from a *Nematanthus* 'Black Magic' flower. That particular cross was unsuccessful but I don't know whether that was a result of using the nectar or just that the cross wouldn't have worked otherwise. If there is no satisfactory alternate, is there a way in which Easter lily exudate can be frozen or stored without damage so that it can be used months later?

Another thing that has been on my mind for about a year-and-a-half involves the use of the miniature Streptocarpus species *S. variabilis* in a cross. I have had the privilege of growing and blooming this beautiful little species and would love to see it used as a parent in a line of miniature hybrids. When I arrived at the 1978 Hempstead Convention of the AGGS, one of the first things I did was to ask two of my favorite gesneriad authorities whether they had ever used this species in crosses. Much to my chagrin, I was informed by both that they had tried and met failure. The trouble with this species seems to be its very unusual chromosome number of n=48. Since the base chromosome number of the subgenus *Streptocarpus* is n=16, I suppose that *S. variabilis* is called a hexaploid(?). The only way that I have been able to think of for overcoming this factor and getting some hybrids is to select several *Streptocarpus* plants to be used in the crosses. Treat leaves or seeds of these plants with colchicine to obtain tretraploids and octoploids. Choose the healthiest, most desirable treated plants and cross the tetraploid forms with the octoploid forms to get hexaploids. These in turn can be crossed with *S. variabilis*.

There are so many things that can go wrong in such plans and one may go through all the procedures only to find that the cross is still impossible. Perhaps, under artifical tetraploidy and octoploidy, the chromosomes will be so bungled up that the cross to reach hexaploidy itself would be impossible. Besides these factors, there is also a problem of determining whether or not your treated plants have actually become tetraploids or octoploids. All in all, such a project would probably involve far too

much of an expense for such a potentially low success rate.

If, perchance, one of our GHA members has had experience in colchicine treatment and also has an abundance of faith and patience and would be interested in trying such an outrageous experiment, I would appreciate hearing from you. In the meantime, other members can continue to attempt crosses between diploid plants and *S. variabilis* in the hopes that someone will be fortunate enough to successfully make the cross.

HYBRIDIZING THE EPISCIEAE

Fred Parker
Rockford, MI.

Although many successful intergeneric hybrids have already been created within the tribe Episcieae, there are still literally hundreds of combinations yet to be tried.

Most of the better known genera of this group of gesneriads have a similar chromosome count. In these plants, n=9. Included here are *Episcia, Alloplectus, Columnea, Dalbergaria, Trichantha, Pentadenia, Neomortonia, Nautilocalyx, Drymonia, Paradrymonia, Rufodorsia,* and several other not so well known genera.*

Two well known genera which share the tribal name, but not the n=9 chromosome count, are *Codonanthe* and *Nematanthus*, which now includes the former genus *Hypocyrta*. In these, n=8.

Bill Saylor has done much with these two. You no doubt read of his success in producing an intergeneric cross (*xCodonatanthus* 'Fiesta') between *Codonanthe gracilis* and *Nematanthus* hybrid No. 3131B, in our Fall 1978 *CrossWords*.

Following is a list of known intergeneric crosses from within this group of gesneriads:

xColbergaria	*(Columnea X Dalbergaria)*
xColtrichantha	*(Columnea X Trichantha)*
xColtadenia	*(Columnea X Pentadenia)*
xDaltrichantha	*(Dalbergaria X Trichantha)*
xDaltadenia	*(Dalbergaria X Pentadenia)*
xTrichadenia	*(Trichantha X Pentadenia)*
xCodonatanthus	*(Codonanthe X Nematanthus)*

The four species in the first six crosses have been combined in every possible combination of themselves, indicating the ease with which the members of this tribe can be persuaded to ignore racial barriers. Many additional combinations of these and other genera may also be produced. Three or more genera may even be combined, although fertility may have to be improved first by use of colchicine (See *CrossWords*, Summer, 1978).

My choice for a starting point in this happy hunting ground of hybridizing is a cross between *Alloplectus nummularia* and *Neomortonia*

* Editors' Note: *Columnea, Dalbergaria, Tricantha* and *Pentadenia* are still considered by the AGGS to comprise the single genus *Columnea*.

rosea. Hans Weihler of the Marie Selby Botanical Gardens, Sarasota, Florida, has pointed out the many similarities in these two plants. Their growth habit is quite similar, that is, reddish purple, hairy, wiry stems made to order for hanging baskets. Their flowers, however show little similarity. The flower of *A. nummularia* looks somewhat like that of a pouch-type *Nematanthus* such as *N. gregarius*, but its flaming red color with deep purple and bright yellow around the small opening, set it apart from all *Nematanthus* species.

The flower of *Neomortonia rosea* looks much like that of *Episcia dianthiflora* with the addition of a brick red band across the top.

Both plants are from similar habitats, so I assume that *N. rosea* has the same unfortunate tendency toward semi-dormancy in fall as has *A. nummularia*, but perhaps "hybrid vigor" or sufficient domesticity will help this. At any rate, the possibilities are still endless in this fine group of plants, even though much has already been done. Why not try for your own intergeneric cross?

MORE NOTES ON *COLUMNEA LINEARIS*

Margaret Waguespack
Harahan, LA

I would like to comment on the description given for *Columnea linearis* (V.2, #4; V.3, #1).

All of the plants that I have seen in this country were at AGGS and GSI conventions. They all had light pink flowers. Plants growing freely in the OTS Station in Turrialba in Costa Rica have the same color blooms with the non-descript edge that Art and Peg Belanger mention.

The *Columnea Register* describes the blooms as rose-red but states that "a form of the species has flowers of deeper red color".

I have not seen a plant with red flowers, but in February at Hope Seed Farm (Costa Rica) I was shown a very attractive form with much darker pink blooms than the more commonly seen *linearis*. Leon Glicenstein, who called my attention to the plant, called it *Columnea linearis* variant. It has maroon calyces and maroon along the underside of the leaf along the spine. He said that plants had been sent to Kartuz.

CrossWords is published quarterly by the Gesneriad Hybridizers Association, a non-profit organization established to facilitate the sharing of information about the hybridizing of gesneriads and to further the appreciation of the results of that hybridizing. Subscription is by membership. Membership fees are $5.00 and applications, along with cheques, should be sent to Meg Stephenson at the address below, as should address changes and other subscription correspondence. Editorial correspondence may be sent to either of the editors. Editorial deadlines are February 1, May 1, August 1, and November 1 for publication two months later.

G.H.A.
1415 Goldsmith
Plymouth, MI
48170