CROSSWORDS

THE GESNERIAD HYBRIDIZERS ASSOCIATION

NEWSLETTER

Volume 3, Issue 1, Spring 1979

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Well, here we are! You now have in your hands the very first *CrossWords* issue produced by the "new regime". Peg and Art Belanger have passed on to us a thriving and pretty well established periodical. Our special thanks to them for their two years (and more) of dedicated effort, and our sincere hope that we can adequately continue what they began.

We now have a number of people doing what the Belangers did by themselves. Articles and other material are collected by us, edited and otherwise prepared. Ron then has it all typed, sets it up in its final form and sends it to Marty and Zelda Mines for printing and distribution. Meanwhile, membership person Jeanne Morton has been receiving memberships, sending out reminders and keeping an up-to-date record of addresses. She sends a mailing list to the Mines for distribution purposes and membership fees to Peg Connor who keeps tabs on the finances. All the while, Peter Shalit pulls the strings and writes the memos that keep the whole thing rolling along smoothly. It seems a wonder that you've really received this at all. Actually, there have been no significant problems, decisions are arrived at reasonably expeditiously, and we've all been functioning quite nicely as a collective.

We must, however, remind you all that the substance of this organization is the membership, and of this newsletter the collective experience of the membership. It would be unfortunate if *CrossWords* became simply a collection of articles solicited from the experts, although that will continue to be an important part of the publication. Rather, it must continue to be a forum for the exchange of information, the asking of questions, the presentation of projects and the reporting of results. In short, it will, we hope, remain an instrument of communication for our membership. So write that article or note you've been intending to do and send it on in. Inquiries have been made in this issue on how to set seed on *Episcia* and *Nematanthus* plants -- if you know how, let us know.

So we are grateful for the articles you have sent us, for the support you have shown through your membership and for the additional generous contributions made by some. Thanks for helping us now, and thank you for your consideration in the future.

Ron Myhr
Anne Crowley

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Peg Belanger
Warwick, RI.

AUTHOR

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QUESTIONS FROM MEMBERS

Russ White
Londonderry, NH.

Has anyone had any luck in crossing gesnerias? So far, I have had none. I am using *G. reticulata* as male, as it is sometimes hard to emasculate early enough. By the time it colors, some of mine have selfed.

At certain times of the day, *Gesneria* "Lemon Drop" and *G. reticulata* have a very sticky residue (sweet liquid). I have checked with a magnifying glass and there are no aphids or other pests. This only occurs during humid conditions. Could this be a very productive nectar gland?

Some of my *Sinningia* crosses are F1. I am interested in *S. pusilla* (tetraploid) x *S.* "Dollbaby" (tetraploid) in particular.

If *Sinningia concinna* was the pollen plant crossed with *Sinningia* "White Sprite" or *S.* "Snowflake", should the theoretical results be a spotted *S.* "Bright Eyes", a ligher *S.* "Bright Eyes", or something else?

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

I thought I had succeeded in *S.* "Snowflake" x *S. pusilla* but after 17 tries, no seed just a plump pod of chaff. Oh well.

Re Gibberillic acid -- I had used this at school to grow some 4'+ coleus. Didn't save any of the resulting seed but does acid affect future generations? Has anyone used it on miniature sinningias?

QUESTION from Peg Connor:

How can you tell if you have a spontaneous tetraploid? Is it simply a plant that will self-pollinate when all others from the same seed pod are sterile? Or do the chromosomes have to be checked by microscope? Or is there some other way?

ANSWER from Peter Shalit:

If a cross between two diploid plants yields mostly sterile offspring, but one is fertile, it's a good bet that it is a spontaneous tetraploid. Similarly, if a sterile diploid plant produces a shoot that is self-fertile, that shoot is likely to be a spontaneous tetrapolid. The only way to confirm that you have a tetraploid is by counting the chromosomes under a microscope. That's no easy task; gesneriad chromosomes are miniscule, and a high-quality microscope and much skill, patience, and luck are required, to find and count a set of them. You can be pretty sure that your plant is a tetraploid, however, if it meets the following criteria:

a) It is fertile when, from other similar cases, you know it should be sterile;

b) leaves and flowers are larger than those of the sterile version

c) leaves are more brittle than those of the sterile version (not always the case).

In addition, the *stomata* (pores on the leaf undersurface) are larger in a tetraploid than in the corresponding diploid. A microscope is required in order to see the *stomata*, but it's much less tricky than chromosome counting.

QUESTION from Georgina Bull:

An inquiry regarding the identification of *Columnea linearis*.

ANSWER from Art and Peg Belanger:

Description of *C. linearis* grown in greenhouse in RI.:
Flowers have magenta-pink (RHS color chart #54A) coloring, with non-descript yellow edges. Leaf top color is RHS #137A, bottom is #137C.

Georgina's plant seems to have stronger coloring than ours; perhaps it is grown under lights, possibly fertilized differently?

ANSWER from Bob Stewart:

For Georgina Bull: Your unknown plant is certainly not *Columnea linearis*. The colors for *C. linearis* on the Royal Horticultural Chart are:

Flower 54 B -- red with 155A -- white at the front corners of hood
Bud just before opening 163A -- grayed orange
Mature leaf -- 137A -- green

The flowers are small and rather straight-sided. The leaves are long and thin. Growth is generally upright.

QUESTION from Russel White:

What is the difference between *Sinningia* "Krishna" (spontaneous tetraploid) and *S.* "Pink Petite" (allo-tetraploid)? Both are listed as the hybrid *S. pusilla* x *S. canescens*. If a tetraploid *S. canescens* were crossed with a tetraploid *S. pusilla* would the same type of plants result? Does anyone know the background of *S.* "Maiden's Blush"?

ANSWER from Bill Saylor:

1. *S.* "Krishna" and *S.* "Pink Petite" are essentially different tetraploid clones of the same hybrid. The first came from Frances Batcheller via her diploid *S.* "Ramadeva" and the second from Carl Clayberg.

2. A cross between a tetraploid *S. canescens* and a tetraploid *S. pusilla* should produce substantially the same hybrids.

3. *S.* "Maiden's Blush" is a complex hybrid with only a partial pedigree. The pod parent was the result of crossing *S.* "Modesta" and an unidentified lavender pink miniature which was very fertile and surely a tetraploid. The male parent was *S.* "Innocent" x *S. eumorpha*.

AN EXPERIMENT IN CROSSING HYBRIDS OF *STREPTOCARPUS REXII*

Joni Hurley
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I have been doing my first experiments in crossing *Streptocarpus rexii* hybrids. I started out by crossing purple (pollen parent) with pink. In observing the ten offspring that resulted, I noticed the following points:

Flower color. Nine had a color midway between both parents indicating that two genes are responsible for color. One was red. None looked exactly like either parent.

Flower size. Eight had flowers comparable in size to both parents -- two to three inches in diameter. One had flowers over three inches, and the red one had flowers under two inches.

Leaf size. With the exception of the red plant, all the offspring had leaves wider and longer than the parents. Two extremes showed up; one with short really wide leaves, and one with extra long leaves. The red plant had leaves comparable to the parents.

Overall plant size. All but the red plant were bigger than the parents. While most are over a foot in diameter, the red one just passes six inches.

Blooming. All but the red plant are good bloomers, almost always with a few flowers. The red one tends to rest between flowers and has never had more than four at once. The others often have ten or more.

Unusual growth habits. One of the ten offsprings has a hanging tendency. Flower stalks develop leaves which keep growing until the stem is forced to hang because of the weight. Since so much strength is used up with these leaves, the center of the plant has very few leaves and tends to look ugly.

Fertility. All except the red plant set seeds readily. The red one has never set seeds because it fails to produce pollen.

Since the red plant stands out as an exception in almost every respect, I am trying to get it to set seeds by using pollen from the pollen parent (purple). This plant has the free-flowering characteristic and is also probably where the red color originated since it has sported red flowers.

I hope to encourage more flowering and still keep the small plant size. I would also like to keep the ruffled flowers characteristic of *Streptocarpus rexii*. The result would hopefully be just as compact and easy to live with as the Nymph varieties but with the showier *Streptocarpus rexii* flowers and the wider range of colors.

SINNINGIA EXPERIMENTING

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After seeing how easy it was to self *Sinningias*, I decided to try and cross different cultivars. This was about a year ago and, needless to say, I got hooked.

I joined the GHA this past summer and I must say the newsletter has helped me very much. For instance -- I am now using Peter Shalit's numbering system with great success. Thanks Pete!

Right now I am *only* working with *Sinningias*, but plan to try *Episcias* soon. I am sure someone else in the GHA has crossed some of the *Sinningia* cultivars that I have, but it's still satisfying to see your own (?) creation. Well, some of my crosses:

a) *S.*"DOLLBABY" x *S.*"RUBY" -- produced F-1 hybrids of intermediate blooms and a coloration of reddish pink blooms.

After many attempts of crossing the F-1 hybrids I did not have any success. I suspect that the pollen is sterile. I used pollen from *S.*"RUBY" on an F-1 and I got a *take*.

b) *S.*"DOLLBABY" x *S.*"CINDY-ELLA" -- got some strange results here in plant shape. A very very tight ground-hugging rosette of leaves. Blooms intermediate between both parents. Have not at this point attempted any F2 crosses. I will report on F2 crosses in the future.

c) *S.*SCARLET" x *S.*"MOD IMP" -- plants are still in the seedling stage.

I am very interested in obtaining any background on *Sinningias*. Is there any "family tree" for *Sinningia* cultivars?

I am also interested in obtaining seeds from other members. Do we have a seed bank? This will be a great savings in money. Like everything else, prices are going up. I'd be happy to send seeds of my plants (*Sinningias*) to anyone interested.

SPARKS

Lyndon Lyon
Dolgeville, N.Y.

A spark may change the course of your life. Who knows the spark that set Gregor Mendel on the road to discover the laws of genetics or that was later to inspire Dr. Sheldon Reed, genetist, to buy his wife a violet and many violets later to determine the genetic behavior of their genes. One African violet leaf in a glass of water was destined to change the direction of our efforts and our abode was to become the place of origin of many different varieties of African violets, other gesneriads, and miniature roses.

Seed of wild African violets (*Saintpaulia*) was first sent to Germany from East Africa by Walton von St. Paul in 1892. It wasn't until about the time the AVSA was formed in 1946 that violets were really coming into their own in this country. They were thinly but widely distributed and mutations to different colors and leaf forms were beginning to appear. Commercial growers began to grow and sell these new kinds and soon everybody seemed to be getting in the act. The plants were easy to cross and grow from seed, but nothing was known at that time about how the new colors, flowers, and leaf shapes, etc. were inherited. Dr. Sheldon Reed and I were becoming very involved in these inheritable characteristics at about the same time.

New double flowers in shades of purplish blue began appearing and as time went by people began asking why there were no double pink violets. We were wondering too! The one leaf that we had received in the fall of 1949 had expanded until the windows could no longer hold them. We had begun building benches, installing fluorescent lights, making crosses and growing them from seed as well as from leaves.

We had collected the latest new pinks, doubles, girl types, and others. Books on genetics supplied by our son Robert, who was taking a course in forestry, indicated that the odds were that it should not be too difficult to breed a double pink violet. At about this time I had charge of the night shift in the Cherry Burrows machine shop and one day after coming home from work I noticed a seed pod forming on Double Rainbow Rose, a purplish flowered variety with white mottling. I said to my wife Ruth, "Do you know anything about this?" She said, "Well, yes, I was just trying to see what I could do." "What did you put on it?" I asked. "Pink Cheer" she said. "Well, that is good." I answered. The pod was partly hidden beneath the leaves and quite well developed. The long expected double pinks had not yet appeared from the big growers, who I assumed were working like mad on it and I began to wonder if we still had a chance to be among the first. The pod ripened, seed was planted, but there was a nagging thought -- did she really make the cross she thought she did or was the plant accidentally selfed? The little seedlings finally blossomed. There were no pinks among them, but we didn't expect any on the first cross. We had plenty of doubles though and about half of them had white mottling in the flowers. We took pollen from one of the best mottled ones and put it on the pistils of several flowers of Pink Attraction. We were going to make sure that we had plenty of seed this time. The AVSA Show & Convention was in Nashville in 1953 and still no double pinks were seen there. Seedlings from the second cross to pinks were nearly ready to blossom. Things were really getting tense. Time seemed to stand still as we waited. They finally began blossoming. The first ones were singles and then it happened, double pinks began to appear -- about one-quarter of them were double pink. The word got around and people began coming from all over to see them. We had never been so popular before in our whole life. It was not the time to sell any. The climax came when we took four of them to the National AVSA Convention at St. Louis in 1954. Never before or since have any violets caused so much excitement. We just made it under the wire however, there were others in some of the commercial exhibits. We had no way to really exploit them, so sold one Double Bountiful (later named Ohio Bountiful) to Baxter Greenhouses for $1,000, and eventually received over $3,000 royalty from Fischer Greenhouses for Double Pink Cloud. We built our first greenhouse that same year.

The first meeting of the AVSA Society took place November 9, 1946. Plans were made for their first national show. All African violet growers were invited to exhibit. There were to be classes for all the main varieties and also for such novelties as doubles, albinos, etc. This shows that Double violets had been around more than eight years before the big event. Random crossing never turned up a double pink, but only two years of the right crosses were needed.

Dr. Sheldon Reed's first article "Abide by Mendel" appears in the June 1953 issue of the *African Violet Magazine* and explains far better than I can how each cell of the African violet plant has pairs of genes controlling its colors, flower forms, leaf shapes, and everything else. There are two genes for each purpose in each cell, all organized into 15 pairs of chromosomes except in the specialized sex cells in the pollen grains and egg cells. In these cells the paired genes have been reduced to single genes for colors, flower forms and everything else. In this reduction process, called meiosis, there has been a random shuffling of the cards, as it were, so that the 15 single chromosomes in these sex cells have a mix of genes from each of their parents. When plants are crossed the single chromosomes in each sex cell combine and the resulting seedlings will again have pairs of chromosomes in each cell, with a pair of genes for each color and everything else. Some genes will be dominant (only one needed to show its effect), some recessive (two needed). When a dominant gene is paired with a recessive, the characteristic controlled by the dominant one will be expressed. It is most important to know the dominance or recessiveness of the genes controlling the characteristics you wish to combine so you can plan and predict the outcome of your crosses as in the following pedigree (small letters used for recessive genes; capital letters dominant):

SEEDLINGS	*PARENTS*	*GRANDPARENTS*
Double Pink Cloud *Dd pp mm*	Pink Attraction *dd pp mm*	? ?
Double Bountiful *Dd pp mm*		
Double Pink Puff *Dd pp mm*	Double Purple & White *Dd PP Mm*	Double Rainbow Rose *Dd PP Mm*
Double Honey Bud *Dd pp Mm*		Pink Cheer *dd pp mm*

D - dominant gene for doubleness	*P* - dominant gene for purple color	*M* - Dominant gene for mottled color
d - recessive gene for singleness	*p* - recessive gene for pink color	*m* - recessive gene for plain color

In the above pedigree, Pink Cheer has two recessive pink genes, *pp*. Its pollen cells are all single *p*. Rainbow Rose has two dominant genes for purple *PP*. Therefore, its sex cells are all single *P*. The cells of Dbl. purple and white are all *Pp* and when mated with Pink Attraction, we get a 1:1 ratio, one-half *pp* and one-half *Pp*, one-half pink, one-half purple, as the gene *P* is being expressed. Doubleness in Rainbow Rose was dominant (*Dd*) so we again get a 1:1 ration, with one-half singles and one-half doubles. In the final cross, we get a 1:1 - 1:1 ratio, one one-half pink, one-half purple and one-half double, one-half single. One-quarter were what we were after --*Double Pinks*! There was one other characteristic involved. Rainbow Rose has one dominant gene for mottling (*M*), which blots out the color in varying patterns in the flowers. This is shown as *Mm*, the small *m* representing the plain color that it is dominant over. This also followed through in a 1:1 ratio. Although the purple gene was dominant over pink, the *M* gene was dominant over both.

At the time the first Double Pink appeared, there were many girl violets on the scene in fancy dress and many colors. The original girl was a sport of the very popular Blue Boy. It has short stemmed scalloped roundish leaves with a white spot at the base. *G* is the symbol given for its dominant gene. We crossed All Aglow (*Gg-pp*) x one of the first double pink and white seedlings (*Dd-pp-Mm*) and what do you know -- one-quarter double pink girls! Easy as falling off a log. One-quarter had to be doubles and one-half of the doubles had to be girls and as both parents were pure for pink, so one-quarter double pink girls. One was named Evelyn Johnson for the wife of Floyd Johnson. President of the AVSA and another Frilled Roset with boy leaves won Best New *Saintpaulia* Commercial Exhibit at Pittsburg in 1955. That was '55 this is '79, want to know what happened in between? We will see in the next installment, if there is one.

INTRASPECIFIC VARIATION -- AND HOW TO EXPLOIT IT

Peter Shalit
Seattle, WA.

We usually think of a species as invariant. But a species, if considered simply as a group of plants which freely interbreed in the wild, can contain much variation. We are unaccustomed to variation within individual gesneriad species, largely because many cultivated species are represented by a single collection from the wild. But recently, Hans Wiehler's studies of New World gesneriads, and Hilliard and Burtt's study of *Streptocarpus*, have brought to light much variation *within gesneriad species*. (To read about this variation, see Hans Wiehler's writings in *Selbyana*, his press release "A Century of Gesneriads New to Cultivation", and Hilliard and Burtt's book *Streptocarpus: An African Plant Study*.)

Why is there variation within a species? In an advanced family such as the *Gesneriaceae*, variation allows the species to adapt to a wide range of habitats and to habitats that may vary from year to year. Different members of a species may vary with respect to cold tolerance (adaptation to high altitudes), drought or moisture tolerance (adaptation to areas with different amounts of rainfall), and leaf and flower shape and color (precise reason unknown, though flower differences may reflect a different range of pollinators). The ecological variation influences the suitability of a clone as a houseplant. For example, a plant from equatorial mountainsides may have requirements closer to alpine than tropical, and may do poorly in our homes. That same species may extend into tropical lowlands, and plants collected from there are likely to do better in the home.

In the wild, intraspecific variation is maintained by insects, birds, or mammals, which go from flower to flower and cross pollinate members of the same species, even if the plants differ somewhat (in ways unimportant to the pollinator). Most gesneriads' flowers are designed to discourage self-pollination (e.g., by having pollen and ovaries mature at different times), though these methods do not usually forbid self-pollination absolutely.

Repeated cross-pollination between members of a species, as described above, maintains genetic variability in the form of *heterozygosity*: a situation where the two copies of a given gene are not identical. The opposite of heterozygosity is *homozygosity*, where the two copies of a gene *are* identical. Homozygosity occurs as a result of generations of self-fertilization.

A heterozygous plant serves as a storehouse of genetic variation. For example, supposed a new green-leaved species of *Episcia* is collected in the wild, but its green leaves are caused by a dominant gene (*G*) paired in heterozygous form with a recessive gene for bronze leaves *g*). If the plant were self-pollinated, some of the offspring would be (*gg*) and would have bronze leaves. Voila -- a recessive trait, hidden in the parent plant, is revealed!

If a cultivated plant is generally propagated vegetatively, the hidden recessive traits may *remain* hidden for years. Only when some adventursome soul finally self-pollinates a plant and grows up some seedlings, do the recessive traits show up. That is how *Codonanthe* sp. "Frances Batcheller" cv. "Moonglow", the dark-leaved form of the species, was discovered by Bill Saylor. Another example is *Dalbergaria asteroloma*, Seedlings grown from seed provided to me by Hans Wiehler varied considerably in leaf coloration. Most plants had red blotches under the leaves, a few had nearly solid green leaf undersurfaces, and one had solid blood-red leaf undersurfaces. The variation probably comes from heterozygosity in the parent plant. Such variation is an important consideration, both in considering choice of a clone for further propagation, and in choosing a plant as a parent in a hybridizing program.

Despite all the variation apparently available in the wild, many gesneriad species in cultivation are represented by a single clone. It might be profitable to self-pollinate some of these clones, to see what hidden variation is there. I am thinking of plants which might have primarily been propagated vegetatively since their introduction: e.g., some species of *Achimenes*, *Kohleria*, *Nematanthus*, *Aeschynanthus*, and others. In fact, if you are assembling a group of species for breeding purposes, you would do well to self each species, grow up some seedlings, and re-select before actually making crosses. An example from rhododendron breeding should serve to illustrate how one renowned plant breeder proceeds.

Guy Nearing, a Ramsey, NJ, grower and hybridizer of rhododendrons, exploits natural variation in cold-hardiness whenever he obtains a new collection of a species. He explained his method to me: when he receives material of a new species, he grows it under sheltered conditions until it blooms, at which time he self-pollinates it to obtain seed. He grows up about 100 seedlings, and when they are a year old, he exposes them to the full force of northern New Jersey winters. Usually a few seedlings survive, and these prove to be genetically cold-tolerant, a stable trait which is passed on to their offspring in crosses. I can attest to the success of Nearing's method, having grown his clones of *Rhododendron fortunei* and *R. discolor*, two semi-hardy Chinese species, in my parents' northern New Jersey yard. Both Nearing selections have proven perfectly hardy, though the species are not supposed to be reliably hardy that far North.

Such a selection procedure could be applied among gesneriads in numerous cases. For example, one could select for heat tolerance among *Streptocarpus*, many of which die in the heat of North American summers. Also, visible variation can be uncovered and selected using these methods; one could choose seedlings which are more than usually compact, floriferous, etc.

Finally, there is now a new source of variation among cultivated gesneriads: botanists are making new collections of species already in cultivation. The new collections are usually given variety or subspecies names to distinguish them from earlier collections. Hans Wiehler is doing a tremendous job collecting different clones of New World species. If you are working with New World gesneriads, you would do well to look through *Selbyana* to see what varities of each species have been collected. Alternative collections of Old World species are harder to come by, but several *Streptocarpus* subspecies are available, and the Northern Illinois chapter of AGGS has just distributed a new, more vigorous clone of *S. saxorum*. Usually, all the varities or subspecies of one species are 100% interfertile, so they are genetically equivalent in any breeding program.

CODONANTHE CV. "MOONLIGHT"

W. R. Saylor
Brewster, MA.

Although *CrossWords* is a publication ostensibly by hybridizers for hybridizers and about hybrids it is sometimes valuable to call members' attention to the attributes and features, both desirable and undesirable, of species and selected cultivars which should make them worthy candidates for use in a breeding program. With that aim in view I propose to describe and extoll the virtues of one of the most satisfying of all the *Codonanthe* selections now in cultivation.

First of all a little background. The plant identified in 1973 by Dr. Harold Moore of the Bailey Hortorium as *Codonanthe carnosa*, and about two years later designated by Hans Wiehler as a still unidentified species to whom he assigned the provisional fancy name *Codonanthe* sp. "Frances Batcheller", is reported to have originated in a batch of mixed gesneriad seed grown by David Allen in San Francisco. Cuttings of this unknown vining gesneriad were sent to a number of gesneriad enthusiasts among whom were Frances Batcheller and yours truly. It didn't take Frances long to be convinced that it belonged in the genus *Codonanthe*. We selfed the first flowers to bloom and in a short time sutured berry-like orange fruits similar to those of *Codonanthe devosiana* were produced. Frances also pollinated this intriguing trailer using pollen from G-932 (now identified as *C. corniculata* Wiehler). This attempt at a cross proved to be a failure but was very fortuitous because a berry was produced, the seeds germinated, and the seedlings turned out to be identical with the pod parent except for one interesting deviant.

Codonanthe "Frances Batcheller" has been described in minute detail under the name *C. carnosa* in Moore's Codonanthe article which appeared in *Baileya*, Vol. 19, No. 1 on pp. 4-33. A description of the deviant seedling need then only enumerate the ways in which it differs from the typical population. That is easy because the one inescapable differentiating character is the wine-red color on the lower sides of the leaves. This is in marked contrast to the very pale green typical of the species as described by Moore. Probably because of the dark reverse to the leaves, the plant as a whole appears to have darker foilage. As a finishing touch the flowers are about 14 or 15 mm across as compared with about 10 mm for the flowers of the typical plant. The purple-banded antlers are distinguishing features in both forms.

Frances gave me a cutting of the deviant *Codonanthe* and I was so intrigued by it that I decided to see if it would come true from seed. It did, without exception, which leads me to the conclusion that the dark-leaved characteristics is governed by a recessive gene. It is therefore entirely possible that this character may appear again in populations of seedlings from parents which have the pale green undersides to their leaves.

I was so taken with this beautiful little plant that after a period of growing and enjoying it I asked and received Frances' permission to name it *C.* "Moonlight". Now with the species still to be properly identified the provisional complete name for this selection is presumably *Codonanthe* sp. "Frances Batcheller" cv. "Moonlight". By whatever name it is known though, I urge you to try it. The seed is available from the AGGS Seed Fund and the obliging little plant blooms from seed in six months.

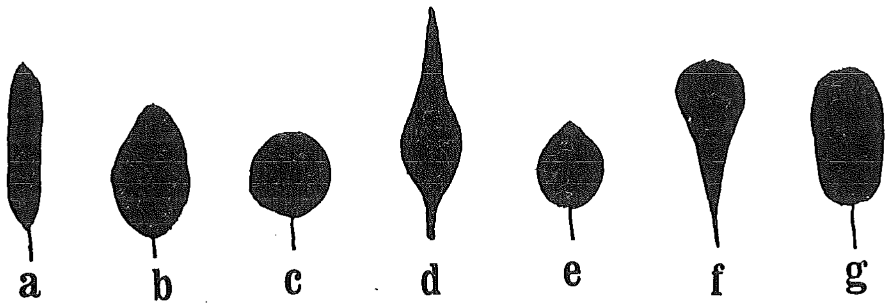
GLOSSARY FOR HYBRIDIZERS - PART IV: LEAVES

Frances N. Batcheller
Durham, NH

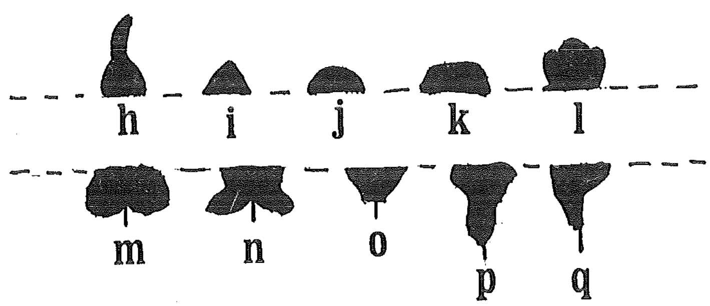
Leaves are a very important part of a plant. They are the food factory, not only for the plant, but for animals, including man. Gesneriad leaves are always *simple*, undivided, with only one blade per stalk; not *compound*, with several blades per stalk, as in the closely related *Bignoniaceae* family. Despite this simplicity in design, gesneriad leaves may be variegated in color (*Chirita sinensis*, *Nautilocalyx picturatus*, *Episcia cupreata*); bicolored (*Nematanthus fritschii*, *Aeschynanthus longicaulis*); or clothed with colored hairs (*Kohleria magnifica*, *K. eriantha*). The Latin word for leaf is *folium*, the Greek word, *phyllon*.

STRUCTURE: A leaf consists of two parts, the *lamina*, the expanded, flattened blade; and the *petiole* or stalk. The petiole varies in length. If it is absent, with the lamina directly attached to the stem, the leaf is *sessile*, sitting. The petiole may be *terete*, round; *compressed*, flattened; *sulcate*, grooved on the upper side; or *alate*, winged. The skeleton of the leaf is composed of *mid-vein* or mid-rib which is a continuation of the petiole, forming a thickened central axis, running through the lamina from base to apex. Smaller veins, ribs, or *costa* branch off from the mid-vein. In gesneriads the branching is *pinnate*, feather-veined, where the veins project at more or less right angles to the mid-vein. *Venation* is the term used for the pattern of veins. *Reticulate*, the usual gesneriad pattern, is like a fish-net. If the meshes are square, it is termed *tessellate*, tiled. The veins may be *impressed* into the leaf surface. Thick succulent leaves, like some *Aeschynanthus* and *Codonanthe*, have scarcely visible veins. *Prominent* veins are strongly raised above the surface of the lamina. Usually the veins are more prominent on the lower, *abaxial* surface than on the upper *adaxial* surface, on the umbrella principle with only fabric showing on top and the ribs visible below. The number of pairs of veins in a gesneriad leaf is sometimes a useful diagnostic character.

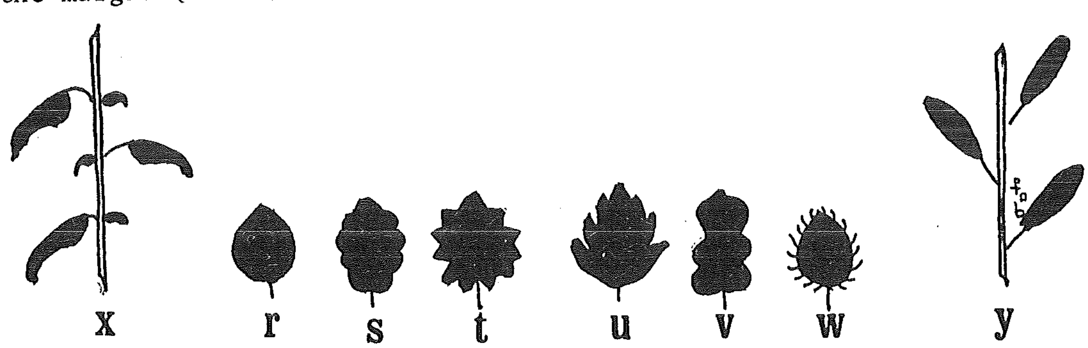
SHAPE: The shape of the lamina has been compared to standard geometric forms. A few types found in gesneriads are illustrated. *Linear* (a) ribbon-shaped, long and narrow, with parallel sides (*Columnea linearis*). *Elliptic* (b) oval, several times longer than wide, with curved sides (*Aeschynanthus ellipticus*). *Orbicular* (c) round, disk-shaped, length and width equal (*Saintpaulia orbicularis*). *Lanceolate* (d) lance-shaped, about three times longer than wide with a narrow apex and widest below the center (*Nautilocalyx lynchii*). *Ovate* (e) egg-shaped, about 1½ times longer than wide, wider below the center (*Streptocarpus saxorum*). *Spathulate* (f) spatula-shaped, narrow tapering base and broadly rounded apex (*Gesneria pulverulenta*). *Ob* is a prefix meaning inversion or reversal, as though the leaf was turned upside down, when applied to asymetric forms as *obvate oblanceolate*. *Oblong* (g) is wider than linear, with parallel sides, rounded ends. *Sub* is a modifying prefix meaning somewhat, less than, applied to many botanical terms.



There are a number of terms used to describe the *apex*, tip, the point farthest from the attachment of the lamina, and the *base*, the point nearest the attachment. *Acuminate* (h) slender, tapering (*Paradrymonia hypocyrta*). *Acute* (i) abruptly pointed (*Codonanthe corniculata*). *Rotund* (j) rounded *Saintpaulia brevipilosa*). *Obtuse* (k) blunt (*Streptocarpus kirkii*). *Lobulate* (l) with several shallow lobes at the apex (*Gesneria humilis*). *Cordate* (m) two symmetrical rounded enlargements on either side of mid-vein, like the heart in a pack of cards (*Smithiantha*). *Auriculate* (n) eared, base extended in two flaring projections (*Rhytidophyllum auriculatum*). *Cuneate* (o) wedge-shaped (*Gesneria cuneifolia*). *Decurrent* (p) running down, lamina extended down the petiole (*Paradrymonia decurrens*). *Oblique* (q) slanting, lop-sided, with the two sides of the lamina not reaching the same point on the petiole (*Rhynchoglossum notoianum*).



The *margin* or edge of the leaf can be described by the following terms. *Entire* (r) smooth, uncut, without indentations (*Codonanthe gracilis*). *Crenate* (s) scalloped, with rounded projections (*Sinningia cardinalis*). *Dentate* (t) sharp-toothed, with the teeth projecting at right angles to the mid-vein (*Niphaea oblonga*). *Serrate* (u) saw-toothed, with the teeth projecting upward, toward the aped (*Achimenes*). *Undulate* (v) wavy. *Ciliate* w) with hairs projecting from the margin (*Kohleria eriantha*).



PHYLLOTAXY is the arrangement of leaves on an *axis*, the branch or stem. The *axil* is the upper angle between the petiole and the stem to which it is attached. The *node*, joint, is the part of the stem where the leaf is attached. *Opposite* (x) arrangement has two leaves at each node on opposite sides of the stem. Succeeding pairs are usually arranged in a *decussate* manner, at right angles to each other, as the first pair would be directed north-south, the second pair, east-west. The majority of gesneriads have this opposite arrangement. *Alternate* (y) arrangement has one leaf at a node. Examples are *Gesneria, Rhtidophyllum, Reldia*. *Whorled, verticillate* arrangement is where three or more leaves are produced at a node (*Sinningia verticillata*). *Isophyllous* is the term for pairs of leaves of equal size; *anisophyllous* for pairs of leaves of unequal size. This is a very useful taxonomic character when applied to the *cotyledons*, seed leaves, the first leaves to appear. Old world gesneriads have anisophyllous, unequal, cotyledons. New world gesneriads have isophyllous, equal, cotyledons. There does not seem to be any correlation between equal or unequal cotyledons and subsequent opposite or alternate phyllotaxy, or equal or unequal leaf pairs in a mature plant.

Phyllomorph, leaf shape, is a term used to describe the peculiar composite structure of unifoliate, monophyllous, *Streptocarpus* which includes the lamina and the petiole above and below the inflorescence, comprising the entire vegetative plant. *Cauline*, stem leaves are those which arise along the main stem (*Kohleria, Columnea*). *Radical*, root, basal leaves grow out from the stem at or beneath the ground level. *Rosulate* leaves of this type are clustered to form a circular pattern or *rosette* (*Saintpaulia, Sinningia pusilla*). *Plurifoliate* is a term applied to *Streptocarpus* which have several leaves, with one much larger than the others, in contrast to rosulate forms, with a cluster of leaves more or less equal in size. *Bracts* are much reduced leaves, often scale-like, usually associated with inflorescence.

GHA AWARDS FOR NEW HYBRIDS

Ron Myhr

The GHA is giving an award at the AGGS Convention for best new hybrid. While I think this is wonderful and that we should perhaps do something similar at the GSI Convention, I have some concerns; we must recognize the limitations of such an award. Because the entries are necessarily judged only on the basis of characteristics perceivable at a given moment in time, hybridizing for floral flash is inevitably encouraged at the expense of other equally or even more desirable characteristics. Such factors as ease of cultivation, resistance to disease, durability, compactness and the time it takes to bloom all have considerable importance for any grower. It seems to me that someone should be considering new introductions over at least one growing season, and providing awards for those hybrids which best combine the greatest number of desirable characteristics. Who else but us?

A system similar to the All American Selections might be employed, whereby a variety entered would be distributed to a number of selected growers around the continent, who would then grow it over a season or two and rate it in comparison to a standard variety. Overall ratings would then be tabulated and awards given.

I would appreciate ideas anyone has on this matter; is such an approach desirable, have you alternate suggestions, are you willing to become involved in the process?

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