The Fuchsia Breeders Initiative

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Issue 10, December 2017

A milestone has been reached

Contents of this issue:

Contributions for the next issue, which is scheduled for the end of July 2018, should be in the editor's possession ultimately on 10 July 2018.

Please send your contribution in Word, with the photographs attached separately. Large contributions can be transferred by uploading the file by e.g. WeTransfer.

Any new Fuchsia cultivars being released? Please provide a photograph and some descriptive information, and it will be seen and get attention all over the world!

Photograph on front page:
***Fuchsia* 'Phaenna' (De Cooker, 2016)**

This year The Fuchsia Breeders Initiative celebrates its first lustrum. Issue no. 1 was published in July 2013, and now after five years we have reached the milestone of the tenth issue in December 2017.

A multitude of topics has been addressed during these years. Extensive attention has been devoted to the backgrounds of Fuchsia hybridization such as pollen fertility, collecting and sowing of seeds and the inheritance of flower colours. Progress of new developments has been closely (and real time) followed, examples being the search for the white *F. triphylla* and the elucidation of the genome of *Fuchsia* 'Gottingen'. And attention has been paid to many new Fuchsia cultivars by means of photographs and short descriptions.

To keep the overview in the subjects that have been published, an index is provided in this issue covering the articles published, as well as specific topics and Fuchsia pictures.

It's somewhat difficult to conceive that only some five years ago many of the new Triphylla seedlings (although for a large part not yet distributed to a broader public) still had to be developed. A wealth of different near white *F. triphylla* specimens is now available for being used in hybridization. The number of white and purple Triphylla cultivars is growing rapidly. Development of bi-colour Triphyllas is still in its infancy, but undoubtedly new cultivars will emerge in the coming years. And insights as regards

Editor of The Fuchsia Breeders Initiative

Mario de Cooker

the backgrounds of Fuchsia hybridization have grown appreciably by use of techniques such as flow cytometry.

Therefore, in good spirits we enter the next period of The Fuchsia Breeders Initiative publications. Without your interest and good help this would however not have been possible. And there's without any doubt still much more material available at our readers, worthwhile for broader dissemination. So don't hesitate, don't be reluctant, but forward your contribution for being published!

I wish you and your family a Very Merry Christmas and all he best and happiness for the New Year 2018!

Mario de Cooker

Multi-flowering

By Edwin Goulding

Photographs by Edwin Goulding

1. Coin the term

Axillary This refers to the upper angle between a leaf stalk and its branch. The majority of cultivars are axillary flowering.

Racemes Perhaps the means by which we most easily recognize this characteristic is when the racemes of flowers are carried on *F. triphylla* and its hybrids. Racemes can appear on the branch ends of other species within Section *Fuchsia*. Sub-racemes also appear on some species in this Section but are less easily identified.

Corymbs These are best described as elongated racemes and are found in the scandent species within Section *Fuchsia*. Clusters of racemes form the next distinct flowering group. Corymbs are a bridge between the two types.

Panicles Another distinct flowering type is to be found in Section *Schuffia*. Blooms are displayed on branch ends but in clusters of racemes. Two species are involved. The first as its name suggests is *F. paniculata* and the second is *F. arborescens*.

Pollination in the racemes and corymbs is most likely to be by nectar sucking birds in the wild. The axillary and paniculate blooms are better suited to insect pollination in their natural environment. Darwinian pressures have created a chasm between the two types that is only breached by persistence on the part of creative hybridists.

Multi-flowering A term like this can mean different things to different people. Of course it means carrying lots of blooms but in some cases it means something much more specific. Let us look at 'Multi-flowering' in more detail as it relates to flowers in a leaf axil.

F. coccinea
Axillary

F. triphylla
Terminal raceme

F. boliviana
Terminal corymb or panicle

F. paniculata
Terminal panicle

2. Examples of single flowering types

It is easy to see why winter hardiness was considered so important in England in the past. Without this ability the second world-war (1939 – 1945) would have wiped the genus from our shores. Little red and violet flowers became recognisable along country lanes and cottage gardens even though 'Dig for Victory', and food production, was the order of the day. Key members of the British Fuchsia Society recognised that this one feature would mean the survival of Fuchsia through the lean years. It is much harder to justify this one feature as paramount in the times that have followed. The world changed and the requirements of modern gardeners altered with it. The world of mechanisation was about to be eclipsed by digitalisation and the current global information network. The majority of gardens would become much smaller, with patios, or yards, as an essential feature. Containers would proliferate and available time would shrink. After a brief period in which greenhouses increased in number we now find that very few people have the luxury of a heated glasshouse. Global warming has arrived.

On another level, too, specialist suppliers of one Genus of plants have declined in numbers and in the total volume of plants carried. Garden centres nearly always buy-in their plants but carry a wide range of gardening accessories and furniture. A silent revolution has taken place as Supermarkets have gained increasingly in the changing scene. Cut and pot flowers are mass produced but in fewer named specialities. The wholesale trade in *Fuchsia* cuttings concentrates on producing millions of mini-plants. These are usually in a limited range of cultivars, which change little, and have pretty labels.

Alongside these changes has come a general reduction in the level of gardening advice available. Those of you who are not avid book collectors will hardly have noticed that new monographs on *Fuchsia* are now rarities; books tend to be linked to the television programme current at the time and produced by a popular gardening pundit. Personality is the name of the 'in' game. Facts are much harder to come by.

All of which might sound a little gloomy if we were unaware of the internet and its benefits.

'Tom West' (Meillez, 1853)

'Tom West' is a foliage sport from 'Corallina'. Planted as a garden hardy it may revert to the green foliaged original.

'Carmel Blue' (Hodges, 1956)

'Flashlight' (Gadsby, 1968)

'Seventh Heaven' (Stubbs, 1981)

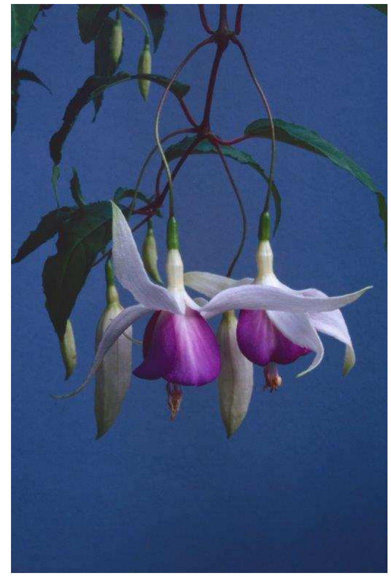
Perhaps, though, it is worth noting that a considerable part of available material is produced by people with inadequate levels of relevant knowledge. Their lack of experience, combined with a failure to research and reference facts, can invalidate many of these sites. A lot of time can be spent in assessing who provides the best information, both written and pictorial.

3. Examples of single-blooms held in each leaf axil.

It might be assumed that everyone looks closely at the beautiful details of their plants. This is rarely so. The majority of people absorb a general impression and rarely examine things like botanical details. This is partly through lack of time but also of inclination; it is how most of us go through life, absorbing general impressions rather than fine detail. Little children often have brilliant observational skills. With age our sight naturally tends to deteriorate. Demands on our time increase and we live less in the immediate moment.

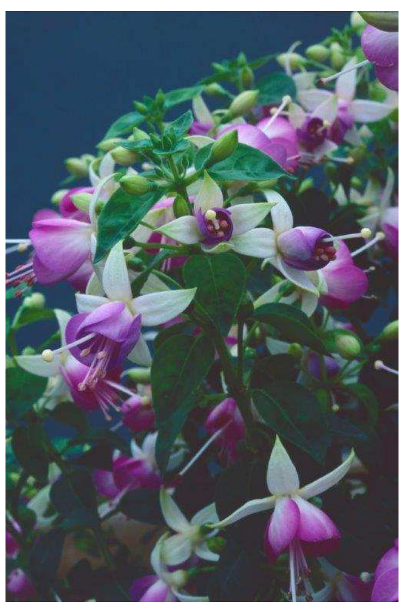
It goes without saying that a *Fuchsia* that produces occasional flowers, perhaps in flushes, is at a disadvantage. Just having a beautiful bloom is unlikely to 'cut it' in our modern competitive world. One flower held in a leaf axil is also of little benefit if it is hidden by the foliage. Even when flowers are carried near the branch ends old cultivars tend to be at a disadvantage as modern hybrids can often produce lots of blooms and buds in every peripheral axil.

'Chang'
(Hazard & Hazard, 1946)



'Windhapper'
(Moerman, 1991)

'Dollar Princess'
(Lemoine, 1912)



'Estelle Marie'
(Newton, 1973)

4. Examples of multi-flowering types.

Multi-flowering is easy to spot once we become aware of it. Examples have been around for many years but few hybridists have paid particular attention to it in their crosses; fewer still among their introductions. It has tended to assume an incidental role rather than become a key sought-after feature. Yet the benefits are there for all to see.

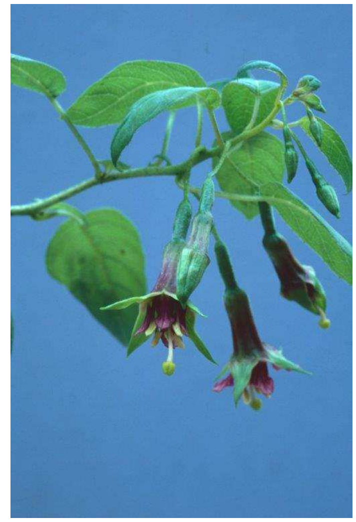
One key aspect of it is less obvious to the casual observer. Flowering becomes spread over a much longer period. Mature flowers die and drop to be replaced by the next tranche of opening buds in each leaf axil. Where large numbers of developing buds are present and plants are well cared for this continuity of flowering can be really impressive. In financial terms we can see that it offers us much more for our money; there are more rewards in terms of beauty for our efforts. This always pre-supposes that the habit of growth is good and that side shoots are numerous.

5. Jan de Boer & his introductions

Jan de Boer is one of a select band of hybridists that has been key in forming a creative and supportive caucus in Holland over the last thirty years. The nation's club was instrumental in supporting innovation. There developed a truly 'Golden Age' in which the ideas first suggested by John Wright were pushed to new levels. The age of the aubergine *Fuchsia* had also arrived.

One of the most noticeable features of Jan's hybridising is the broad range of different stock plants that he has incorporated into his programme over the years. The New Zealand species figured heavily in this. So, too, did a wide and unusual group of other cultivars, most notably large doubles. Perhaps oddly, from my perspective, many of his introductions over the years have been pink. A high proportion carry an unseen benefit for other hybridists in that they are also fertile.

'Straat Agulhas' (2001)

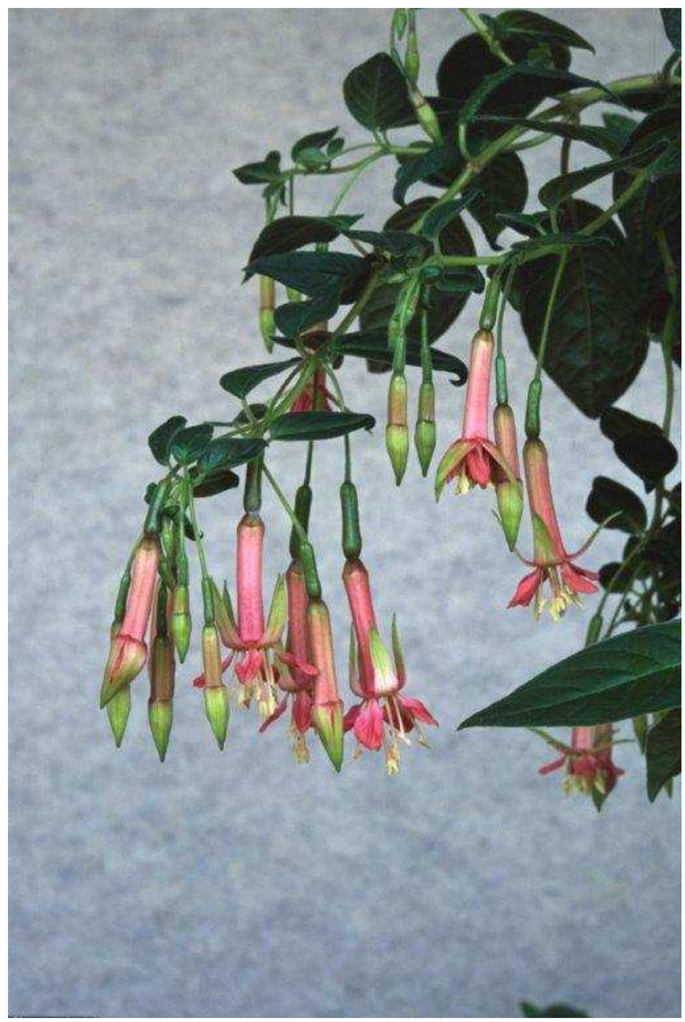


'Straat Cook' (1999)

6. Targets in *Fuchsia* breeding

We have seen before how some growers break new ground with their work. Usually, as in Jan's case, this is because their long term aims are different from other hybridists. Gradually, they refine their targets and become more adept at creating the results they desire. Multi-flowering has become a key feature in Jan's work. If we consider that many of his introductions carry an enormously varied genetic pool of characteristics and, yet, are still reasonably capable of passing these on in further crosses, these cultivars are critically important. This high value is not immediately obvious at a casual glance or to the ill-informed.

'Straat of Plenty' (2003)



'Straat Kobe' (2004)

7. Some early crosses have produced quite dramatic changes

In summary it is obvious that many of Jan de Boer's introductions are different from the 'run of the mill' cultivars seen in wholesale selections. Their multi-flowering characteristic is most dominant but many treasures lie hidden within their genetic library.

Thank goodness we have such independent minded and creative characters in our midst. It has been our good fortune to be given open and truthful access to the parentage in his seedlings. Through work such as his innovation thrives and terms, like 'Multi-flowering' take on new and richer meanings. Thank you Jan.

'Straat la Plata' (2005)

'Staat Bali' (2006)

'Straat Cumberland' (1988)

'Spray' (2017)

'Straat Final' (2017)

'Straat of Dover (2006)

List of illustrated introductions by Jan de Boer with full details of the parentage of each.

'Straat Cumberland', 1988: *F. paniculata* x *F. perscandens*.

'Straat Cook', 1999: 'Straat Florida' x ('Lechalade Chinaman' x *F. splendens*).

'Straat Agulhas', 2001: ((('WALZ Polka' x (*F. denticulata* x *F. decussata*)) x ('Whiteknight's Amethyst' x *F. procumbens*))) x *F. apetala*.

'Straat of Plenty', 2003: *F. obconica* x ((*F. procumbens* x *F. paniculata*) x 'Igloo Maid'.

'Straat Kobe', 2004: 'Sparkling Whisper' x *F. boliviana* var. *alba*.

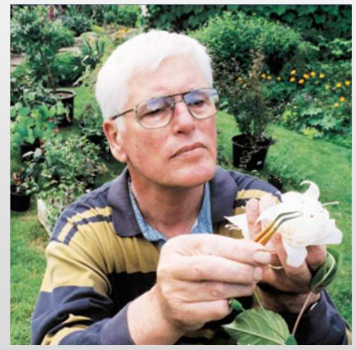
'Straat la Plata', 2005: (*F. procumbens* x *F. paniculata*) x *F. apetala*.

'Straat Bali', 2006: (*F. obconica* x *F. cylindracea*) x *F. boliviana* var. *boliviana*.

'Straat of Dover', 2006: 'Gerharda's Panache' x 'Straat Kobe'.

'Straat Final', 2017: *F. encliandra* x (*F. fulgens* {tetraploid}x 'Alaska').

'Spray', 2017: 'Straat Final' x (*F. encliandra* x *F. fulgens* {tetraploid}).



Jan de Boer

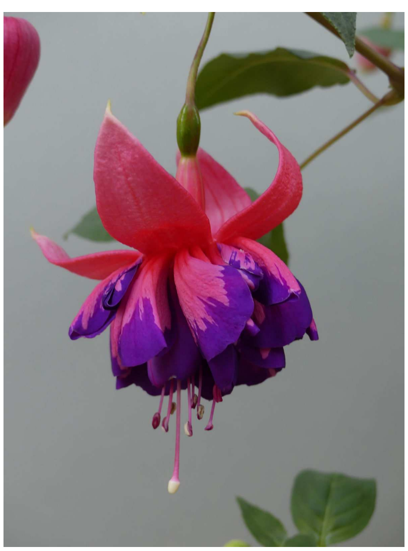
New fuchsia from Gerrit Kreijkes

***Fuchsia* 'Eric Vos'**

The trailing fuchsia 'Eric Vos' (Kreijkes, 2017) is named after the hybridizer's grandson Eric Vos.

It orginates from the crossing 'Amélie Vos' x 'Swingtime'.

The plant has big double flowers and has best bloom and foliage in limited light.



Some polyploidization and interspecific hybridization aspects in Fuchsia species.

By Henk Waldenmaier *Photographs by Henk Waldenmaier*

Taxonomy

About 110 Fuchsia species are known worldwide, mostly originating from the Andes, Mexico and some from New Zealand and Tahiti. They are divided into 12 sections based on their taxonomy.

Some of these species are naturally polyploids (tetraploids and two octaploids). Most of them are diploid (2n = 22).

Interspecific hybridization

If hybrids can be produced, it is generally assumed that the parental species are closely related or at least have enough systems or processes in common to allow seed formation, germination and growth. It seems that interspecific hybridization in Fuchsia nearly always is possible even between not closely related species., be it that sometimes 'sudden infant death syndrome' will occur.

This is especially true for the F1-genereation. Making the F2 is more difficult. Rarely this will succeed.

An example of successful F2 progenitor is the cross *F. fulgens* (diploid) x *F. splendens* (diploid) resulting in cultivar 'Speciosa' (diploid). The parents of 'Speciosa' are closely related. 'Speciosa' can be hybridized with a lot of species and/or cultivars both as mother or as father, but nearly all the descendants are infertile.|

Possible, but much more difficult is for example 'Whiteknigths Ruby' [triploid?] (parents: F. triphylla [tetraploid] x F. procumbens [diploid]). These species are not closely related and also differ in ploidy level. Probably one of the parents delivered an unreduced gamete, resulting in 'Whiteknights Ruby' to be most likely tetraploid or pentaploid.

The same counts for the cultivar 'B83-5' (one of my own crosses, not yet registered). Parents are *F. magdalenae* (tetra) x *F. fulgens rubra grandiflora* (diploid). Due to meiotic nondisjunction (FDR = First Division Restitution or SDR = Second Division Restitution) in the gamete produced by *F. magdalenae*, this cultivar is pentaploid. The relationship between parents is not too far and not too close. The cultivar is both as mother and as father moderately fertile and also next generations produces more or less fertile descendants. Many of my cultivars having a music instrument in their name, have 'B83-5' as one of their parents. This cultivar was used to produce the first orange double flowered fuchsia cultivar and many of the long tube flower cultivars.

Left: tetraploid *F. magdalenae.*

Right: pentaploid cultivar 'B 83-5'

Crosses with diploid species revealed that gametes produced by 'B83-5' are mostly diploid (22x), but also gametes with 11, 33 and 44 chromosomes were formed. A considerable part of the gametes are aneuploid.

Orange colored flowers are common in fuchsia, as are double flowered cultivars. Probably due to the use of non-suitable species parents there are practically no cultivars with the combination of these two characters: orange colored with double flowers. Using a sister seedling of 'B83-5' (also pentaploid) as one of the parents (strong orange flower), crossed with the double flowered cultivar 'Bicentennial' that possesses some orange colored petals besides lilac petals, resulted in 'WALZ Mandoline', **one of the first orange double cultivars**.

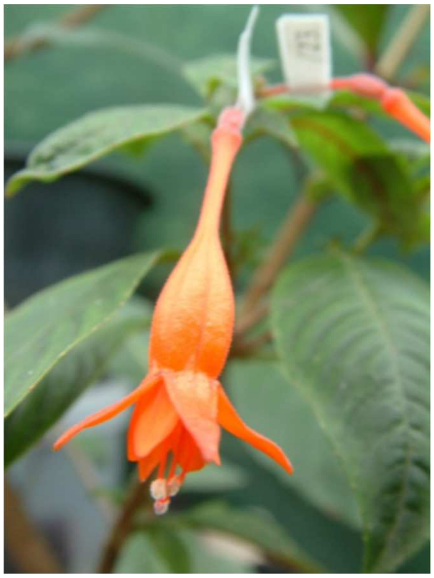
WALZ Mandoline (1988)

Crossing a lot with polyploid species and cultivars I discovered soon that inheritance of most characters in polyploid cultivars can be described effectively in terms of **quantitative** contrast to qualitative inheritance, where the number of alleles is the quantitative factor. And that was the trick in producing an orange colored double flower: using species gametes with the double number of alleles containing genes for the orange flower.

This also counts for other characteristics, like flowering time. Normal flowering time is during the whole summer and autumn. Some species flower in early spring. Crosses with the tetraploid *F. excorticata* resulted in seedlings with early flowering times. The same was true for crosses with tetraploid *F. juntasensis*.

Recently Dr. Paul Berry provided us with new material from *F. triphylla* found in the wild. This species variety is much stronger and easier to grow than the *F. triphylla* already in our possession. Because this species is also tetraploid and orange in color, besides many other attractive characters, I am sure there will be produced very interesting cultivars with this parentage in the near future.

Herps Bazuin (2002)
('B83-5' x tetraploid *F. fulgens* var. *gesneriana*) with very long tube



Left: Tetraploid *F. triphylla* (raised from seeds provided by Dr. Paul Berry).

Right: Fertile cross between tetraploid *F. paniculata* and this tetraploid *F. triphylla* ; note the upstanding flower, inherited from *F. paniculata.*

Polyploidization.

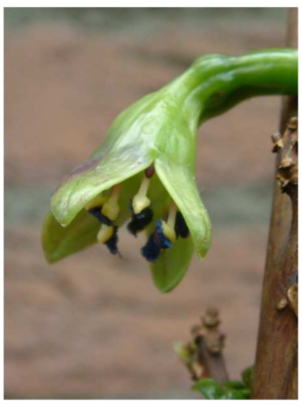
.In *Fuchsia* polyploids from tetraploids onwards have several advantages. Besides their different phenotypic outcome (larger flowers, thicker branches and leaves, vigorous growth) there may be repair of fertility (doubling triploids into hexaploids, alloploids containing two sets of each different genome in tetraploids), and a higher degree of heterozygoty (more alleles). Disadvantage may be triploidy (mostly sterile) and meiotic irregularities (decreased fertility).

In nature polyploids are mostly formed by **meiotic nondisjunction** FDR = First Division Restitution, or SDR = Second Division Restitution.

Some species produce FDR or SDR gametes rather frequently, while others don't at all. Large temperature swings also can produce higher FDR/SDR frequencies. FDR/SDR gametes can be identified using microscopical investigation of pollen cells, their diameter is at least two times larger compared to normal pollen.

Polyploidy can also be induced during mitosis using chemicals like colchicin or Oryzalin, by treatment of fast dividing cells (growth points). My own induced polyploid *Fuchsia* species were produced by treatment of seedlings in various stages of germination with colchicin or Oryzalin. Of course you should be alert on the possibility of mixed ploidy using the mitotic procedure.

There is an **optimum in ploidy** for characters like flower size. High ploidy levels like octaploidy might result in smaller flowers than present in tetraploids. Moreover they are difficult to propagate.



Left: Tetraploid *F. excorticata*. Right: F1 cultivar from *F. excorticata* (44x) x *F. denticulata* (22x); note the dark petal aubergine color of the cultivar inherited from *F. excorticata*.

Seedlings treated with colchicine. Note the thickening in the stem.

A: hexaploid cultivar 'B00-369' (tetraploid *F. magdalenae* x tetraploid *F. apetala*). Note that *F. magdalenae* delivered through FDR/SDR a tetraploid gamete.
B and C: offspring from 'B00-369' x tetraploid *F. juntasensis*. B is a pentaploid, C an octaploid seedling (FDR/SDR gamete from 'B00-369'). Note the smaller flower size of the octaploid cultivar.

Descendants of polyploid species crosses may vary in their **fertility**. For example the cross between tetraploid *F. paniculata* and tetraploid *F. excorticata* resulted in two seedlings, one of them fertile and the other one infertile.

F1 from tetraploid *F. paniculata* x tetraploid *F.excorticata.*
Left: unfertile cultivar 'Herps Panex tetra'. Right: fertile sister seedling (not registered).

Alloploids may have diploid inheritance (disomic), but also **polysomic inheritance**.

D: Tetraploid *F. cylindracea*.

E: Tetraploid *F. paniculata*.

F: tetraploid cultivar 'B 08-38' (alloploid seedling from tetraploid *F. cylindracea* x tetraploid *F. paniculata*; not registered).

Some F2 seedlings from F1 seedling F (see page 11) crossed with itself.
There is clearly polygenic outcome (much variety in flower size, flower color, flowering type).

A common example in plants is the observation of **heterosis**, whereby the offspring of two homozygotic progenitors is more vigorous and healthy than either of the two parents.

Heterosis effect.

Left: *Fuchsia fulgens* var. *gesneriana*.

Right: tetraploid *F. splendens*.

In between: cross between tetraploid *F. splendens* and tetraploid *F. fulgens* var. *gesneriana* with large heterosis effect.

Huge heterosis effect.

Left side on this photograph: tetraploid *F. paniculata.*

Right side the cross *F. cylindracea* x tetraploid *F. paniculata* with a large heterosis effect.

More material is available on my website:
http://members.home.nl/henkwaldenmaier

Corrigendum

By Mario de Cooker

In The Fuchsia Breeders Initiative Issue 5 (July 2015), p. 18-19, the presumable genome of *F.* 'Winter Charm' has been determined on basis of flow cytometry measurements and phenotype characteristics.

The flow cytometry measurements have been performed by the company Iribov (now Iribov SBW) in The Netherlands in the years 2000-2002. Client for these DAPI measurements was the Hybridists Group of the Dutch Circle of Fuchsia Friends.

By a communication error it was mistakenly assumed that the 2C-value as found in the measurements had to be multiplied by a factor 1.40 to arrive at the correct values. This however proved to be wrong.

It does however not affect the final conclusion, as all 2C-values are relative values as compared to the standard as used in the measurements.

So from the analysis the conclusion is still valid that the genome composition of the fertile *Fuchsia* 'Winter Charm' is very likely to be allotriploid JIM (= *F. juntasensis* + *F. inflata* + *F. magdalenae*).

***Fuchsia* 'Winter Charm'**

On the ploidy of Fuchsia 'Göttingen'

By Mario de Cooker

Introduction

Fuchsia 'Göttingen' is a Triphylla hybrid Fuchsia cultivar, bred by the German hybridist Carl Bonstedt, and introduced in 1906. It's still one of the most rewarding and floriferous Triphylla hybrid Fuchsias available.

In the July 2016 issue of The Fuchsia Breeders Initiative the most plausible genome for 'Göttingen' has been derived, based upon flow cytometry measurements and observations as regards the phenotypes of seedlings resulting from 'Göttingen' crossings.

From flow cytometry measurements it follows that it is very likely that 'Göttingen' has originated from an unreduced *F. triphylla* gamete in combination with a haploid *F. fulgens* gamete. As a final conclusion it was therefore assumed that, as a working hypothesis, 'Göttingen' can be represented by the pentaploid genome TTTTF, T and F representing single chromosome sets of *F. triphylla* and *F. fulgens,* respectively.

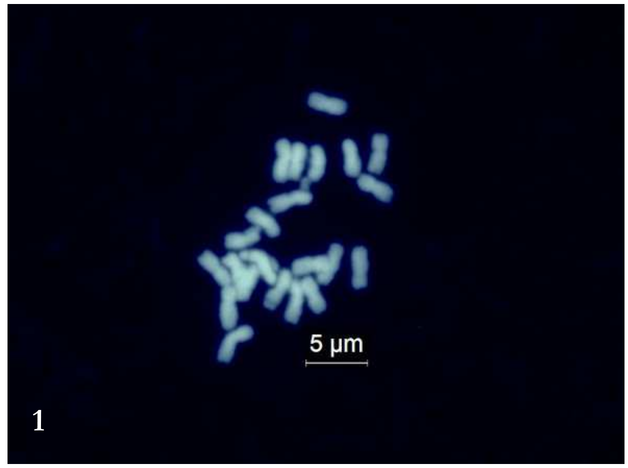
Chromosome counts

The ploidy of the 'Göttingen' genome has recently been confirmed by an actual root tip chromosome count. The chromosome counts have been performed by Mrs. Dr. ir. KatrijnVan Laere at the Plant Sciences Unit - Applied Genetics and Breeding of ILVO, the Belgian (Flemish) Institute for Agricultural and Fisheries Research. Chromosome counts have also been carried out for *F. triphylla* 'PB 7760#7' and *F. fulgens* var. *gesneriana.*

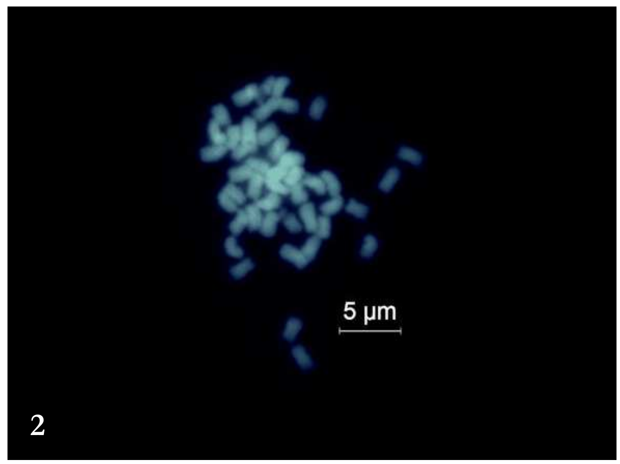
In Fig. 1-3 pictures of the chromosome counts are shown. It can be concluded that 'Göttingen' is a clear pentaploid cultivar.

Fuchsia 'Göttingen' is, without any doubt, a pentaploid cultivar

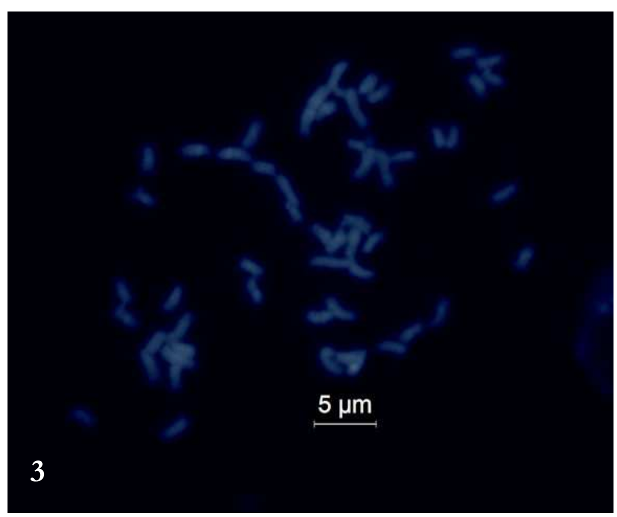
From the photographs it can also be concluded that the *F. fulgens* chromosomes are appreciably bigger than the *F. triphylla* chromosomes. This is in good agreement with the results of flow cytometry measurements. For *F. fulgens* a DNA value per set of chromosomes (n = 11) has been found which is about 50% higher than for *F. triphylla.*



***F. fulgens* var. *gesneriana* 2n = 2x = 22**



***F. triphylla* 'PB7760#7' 2n = 4x = 44**

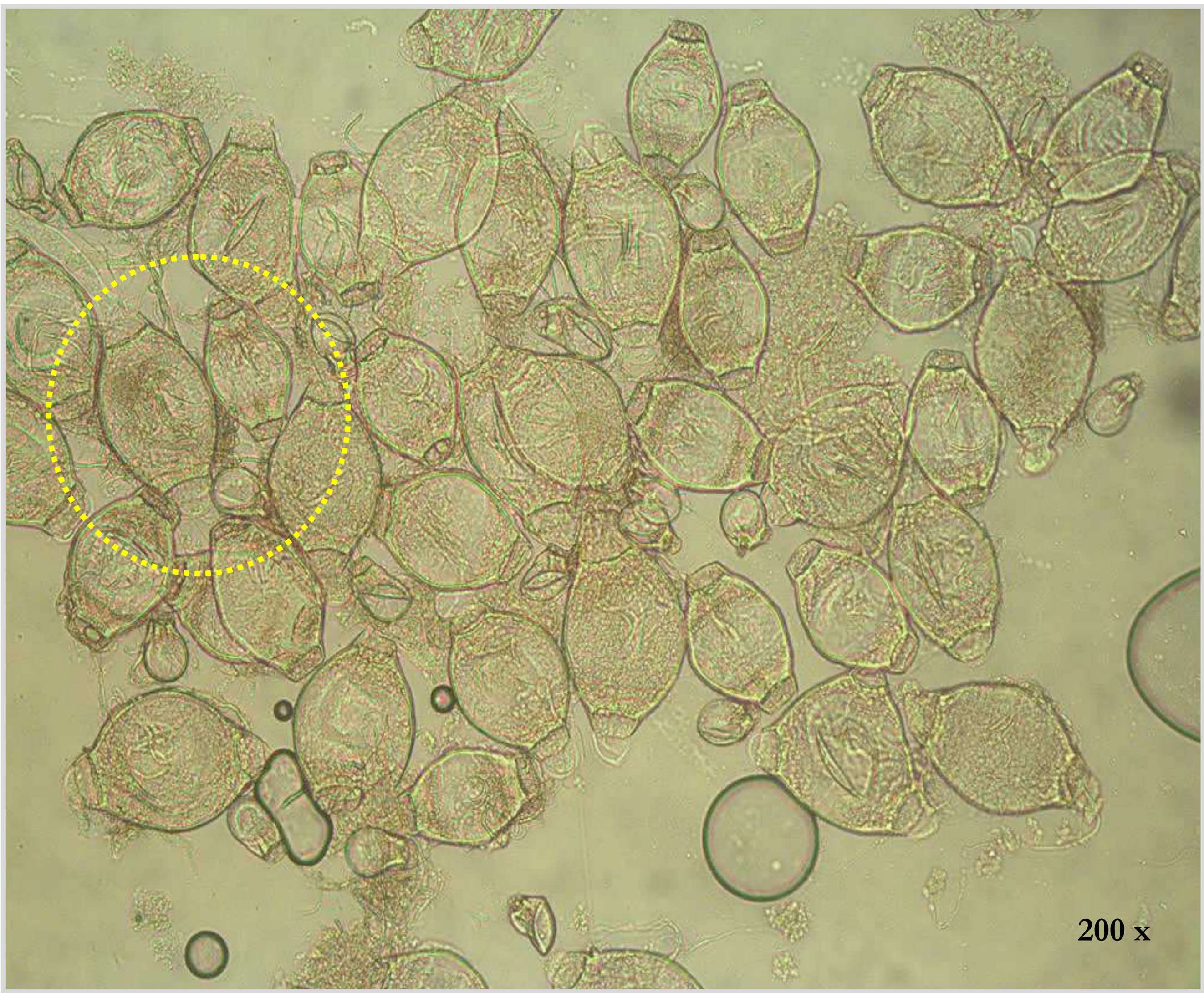


***F.* 'Göttingen' 2n = 5x = 55**

Fuchsia 'Göttingen' pollen

It is not clear what kind of gametes are produced by 'Göttingen'. On basis of the ''Göttingen' TTTTF genome, gametes represented by TT, TF, TTF, TTT etc. would be expected to be produced, albeit with strongly varying probability. The DNA value of such gametes would be very different.

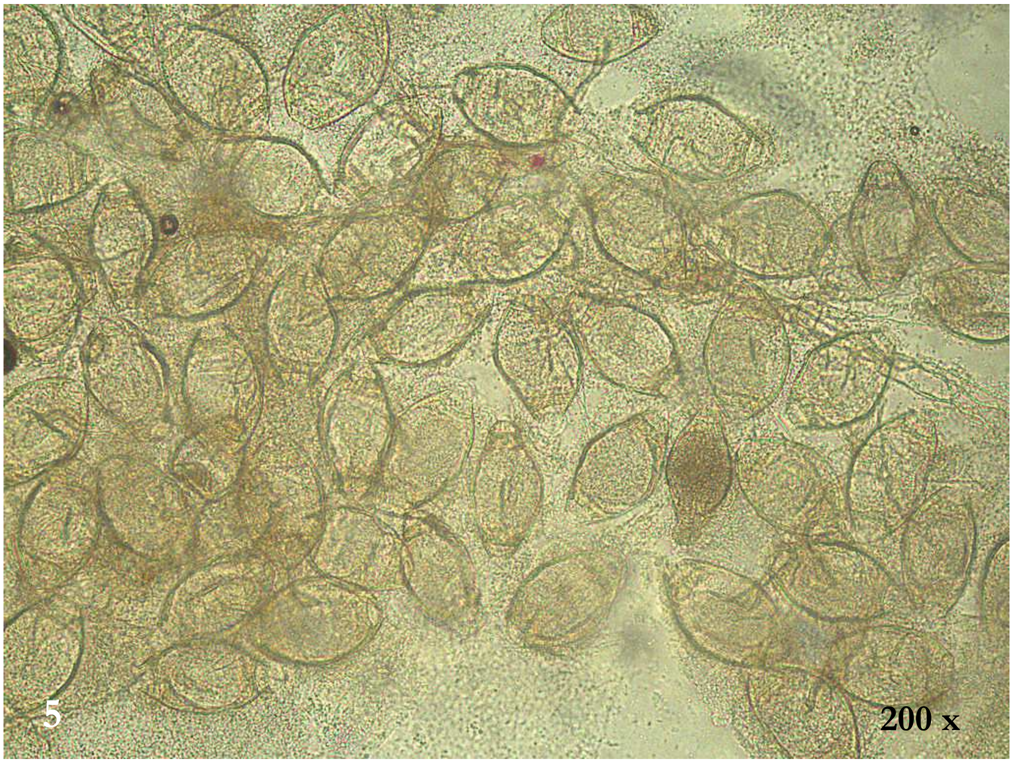
An indication of differences as regards pollen DNA content is provided by the pictures of 'Göttingen' pollen as shown in Fig. 4. As can be seen, the size of the (mainly two-aperturate) pollen grains shows large variation. This contrasts strongly with *F. triphylla* pollen grains, which are far more uniform (see Fig. 5, page 16).



***F.* 'Göttingen' pollen, dispersion in water .**

Note the large differences as regards size of the mainly two-aperturate pollen grains.

The pollen photographs have been made by
Mrs. Dr. Ir. Leen Leus from the ILVO Institute.



***F. triphylla* 'PB7760#7' pollen, dispersion in water .**

Two-aperturate grains, having uniform size.

The occurrence of different kinds of gametes can be further investigated by crossing 'Göttingen' with, for example, *F. fulgens,* thereby assuming a normal haploid gamete to be being delivered by *F. fulgens*.

Expected outcome of such crossing would be as shown in the table below.

'Göttingen'			
Gamete	**DNA (pg)**	**Gamete**	**DNA (pg)**
T	0.99	TTT	2.97
F	1.48	TTTF	4.45
TT	1.98	TTTT	3.96
TF	2.47	TTTTF	5.44
TTF	3.46		
'Göttingen'	**x *F. fulgens***	**crossing products**	
Genome	**DNA (pg)**	**Genome**	**DNA (pg)**
TF	2.47	TTTF	4.45
FF	2.96	TTTFF	5.93
TTF	3.46	TTTTF	5.44
TFF	3.95	TTTTFF	6.92
TTFF	4.94		

Such differences would easily show up in flow cytometry measurements of a series of crossing products. Formation of aneuploid gametes could of course disturb the results to some extent.

Photograph by Hans van Aspert

***Fuchsia* 'Göttingen'**

The Fuchsia breeders Initiative; Index to issues 1-10

Articles

‘Phaenna’

'Misha Charlotte'

'Jac Damen'

Photographs: Mario de Cooker

Granddad has made this Christmas stable over 50 years ago.
The nativity set and most of the decorations have survived all these years.
However, I have now eaten all the sheep! Yummie, yummie!

Aphaia

Have a Very Merry Christmas and a Happy New Year!

Contents of the next issue

The next issue is scheduled for the end of July 2018.

Apomixis - a rare case

(by Edwin Goulding)

Most of us know that greenfly can give birth without ever having had sex in the process known as parthenogenesis. Very few hybridists are aware a similar state called apomixis is to be found among *Fuchsia* species. It is the subject of our July article.

New ways of creating multi-flowering fuchsias

(by Mario de Cooker)

Following Edwin Goulding's article on multi-flowering in this issue, new ways of creating multi-flowering fuchsias will be explored.

Want to learn more about all this? Then stay connected!

Your contribution to the The Fuchsia Breeders Initiative is highly appreciated. Contributions for the next issue should be made available at the latest on 10 July 2018.

The Fuchsia Breeders Initiative

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