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CLIVIA NEWS

Quarterly Newsletter of the Clivia Society

VOLUME 22 - NUMBER 3 | JULY – SEPTEMBER 2013

CLIVIA NEWS

The Clivia Society www.cliviasociety.org

The Clivia Society caters for Clivia enthusiasts throughout the world. It is the umbrella body for a number of constituent Clivia Clubs and Interest Groups which meet regularly in South Africa and elsewhere around the world. In addition, the Society has individual members in many countries, some of which also have their own Clivia Clubs. An annual yearbook and quarterly wewsletters are published by the Society. For information on becoming a member and / or for details of Clivia Clubs and Interest Groups contact the Clivia Society secretary or where appropriate, the International Contacts, at the addresses listed in the inside back cover.

The objectives of the Clivia Society

1. To coordinate the interests, activities and objectives of constituent Clivia Clubs and associate members;
2. To participate in activities for the protection and conservation of the genus Clivia in its natural habitat, thereby advance the protection of the natural habitats and naturally occurring populations of the genus Clivia in accordance with the laws and practices of conservation;
3. To promote the cultivation, conservation and improvement of the genus Clivia by:
   - 3.1 The exchange and mutual dissemination of information amongst Constituent Clivia Clubs and associate members;
   - 3.2 Where possible, the mutual exchange of plants, seed and pollen amongst Constituent Clivia Clubs and associate members; and
   - 3.3 The mutual distribution of specialised knowledge and expertise amongst Constituent Clivia Clubs and associate members;
4. To promote the progress of and increase in knowledge of the genus Clivia and to advance it by enabling research to be done and by the accumulation of data and dissemination thereof amongst constituent Clivia Clubs and associate members;
5. To promote interest in and knowledge of the genus Clivia amongst the general public; and
6. To do all such things as may be necessary and appropriate for the promotion of the abovementioned objectives.

More information on the Clivia Society available on
www.cliviasociety.org

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ADVERTISEMENTS

WILL ANYONE WISHING TO ADVERTISE OR WHO KNOWS OF POTENTIAL SPONSORS OR ADVERTISERS PLEASE COMMUNICATE WITH COMMUNICATE WITH CLAYTON JONKERS IN THIS REGARD - SEE INNER COVER FOR CONTACT DETAILS.

The Clivia Society Newsletter started as a black on white news-sheet dated July 1992, numbered Volume 1 number 1, called 'Clivia Club'. It formed a means of communication for people interested in the plant genus *Clivia*. It was edited/written by the late Nick Primich with a frequency of 3, 5, 8 & 5 during the first 4 years, using the publication month in the volume.
The frequency was fixed on four annually with Vol. 5 No 1 of March 1996.
The date changed to the southern hemisphere seasons with Vol. 8 No 1 of Autumn 1999. The first three used yellow paper as cover. The name changed to 'CLIVIA CLUB NEWSLETTER' with Vol. 9 No 1 Autumn 2000 with full colour photos on the cover pages. Another name change to 'CLIVIA SOCIETY NEWSLETTER' came with Vol. 10 No 4 Summer 2000, and in 2005 reverted to a quarterly number.
CLIVIA NEWS is the continuation of this series.

EDITORIAL

It is with great sadness that as we were going to press we learnt about the passing of Oom Pat. Our condolences go out to his family and all his clivia friends.

It is also with great sadness that we heard of the passing of Ansie Viljoen, the wife of Naas Viljoen. It was always good seeing her at the Society AGM or at NCC meetings and shows. Our thoughts are with their family.

We have had an interesting flowering season in South Africa this year, stretching over a slightly longer period than usual; various growers associate it with the warmer than usual winter we have had. I noticed that a lower number of my plants flowered and that there were slightly fewer plants on show this year in comparison with last year. The potential upside is that next year could be a bumper flower season, with many plants having had a good rest this year, which would add significantly to the excitement surrounding the Society's quadrennial international conference in 2014.

In the past few months I have been wondering a lot about the value of collections. The financial value is conceptually the easier part: the value of an asset in today's terms is equal to the discounted future earnings capacity of the asset. In other words, the income you can derive from breeding with the plant in the future (i.e. selling seed / seedlings / eventually adult plants) as well as income generated from selling the plant and offsets produced by it. The price of a plant and its offsets is influenced by factors such as desirability and scarcity. The price of seed etc., on the other hand, is influenced by the same but also the uniqueness of the specific cross and, as such, its future unique breeding potential plays a major part in determining its perceived value. The reality is, however, that there are not that many people in our community who can, with a high level of confidence, predict the outcomes of particular crosses. This brings me to another aspect of the value of a breeder's collection: the engagement with the subject with the objective of trying to get to know your plants and their breeding characteristics. This may be a task that is never complete but the challenge for generations to come. Different people seek different things from their collections but part of the opportunity is using the "addiction" to get to know and understand oneself better. In my opinion, the latter understanding gives meaning and is of infinite value.

'WC Pondo Plum' by Wayne Haselau

Thank you for all the great articles you have sent me. I look forward to receiving pictures from the various shows around the southern hemisphere so that we can share them with one another and to use all opportunities to develop and expand our community. ▼

Joubert van Wyk

Editor – Clivia News

P.S. Cut-off date for submissions for the next Clivia News: 10 December 2013.

Erratum: Heidi Nerurkar took the picture on the front cover of Clivia News 22-02. It was part of the article on her tour to Japan. It is a plant from Mr. Nakayama. Please see another picture taken by Heidi in the same row of plants – back cover.

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CLIVIA PERSONALITIES

Marguerite Blaser

By Joy Woodward, the Secretary of the Cape Clivia Club

Marguerite Blaser passed away early on Sunday morning at the age of 108, two months short of her 109th birthday. Marguerite joined our Club in 1997, soon after its inception. She lived in Lansdowne Road for over 60 years and remembered when it was still a gravel road used by horse-drawn carriages. She lived there alone growing her Clivia, herbs and other plants until 2011 when she moved to Nazareth House in Oranjezicht. In 2004 when she turned 100, she was granted Honorary Membership of the Cape Clivia Club and in her honour a beautiful silver trophy was introduced to be awarded to the "Best Peach" at the annual Show – this was Marguerite's choice because she loved the peaches. On her 106th birthday, Helen Zille [then Mayor of Cape Town – JvdL] visited her and Marguerite proudly showed her the cream *Clivia miniata* that was flowering for the first time, the result of her own cross-pollination and propagation from seed when she was 101 years old.

Marguerite's secret to longevity, she said, is that she believed in a healthy diet, free of red meat, no alcohol or smoking, and never to be idle – she filled her life with dressmaking, crocheting, cooking, gardening and demonstrating the making and cooking of pasta. At the age of 100, she started to crochet a bedspread which would take three years. [She apologised for not attending a Saturday morning Club meeting because she was busy giving pasta-making lessons. She was then over 100! – John van der Linde]

Blaser trophy for best peach

She believed that honesty, religion and strong family values are essential to a good life. She was married for 47 years and spoke of her late husband, John, as a wonderful husband and father and "the greatest joy" in her life; they had two sons and two daughters. She was a devout Catholic and worked tirelessly to raise funds in support of her eldest son's work – he is a Priest. Amongst her treasures was a special commendation from the Pope for fifty years of devoted work for Catholic Welfare.

Marguerite Blaser was a great inspiration to us. We bid her fond farewell.

No doubt her record of being the oldest member of the Clivia Society will remain uncontested! ▼

Eastern Cape Clivia People

By Felicity Weeden

I was charmed to read Charl Malan's very human article in *Clivia News* Vol. 22 No.1. I was also surprised and delighted to discover that his family lived in the same part of the Eastern Cape as mine did, his at Patensie and mine in the Uitenhage district. (My grandparents were known as the "Uitlanders" because they came from France and they never learned to speak Afrikaans).

My mother, a very keen gardener, also grew some clivia and when I walked into a garden here in the Overberg, I immediately recognised a certain plant. My immediate query was "Where did you get that one?" And the reply

of course was Port Elizabeth. I don't know whether it was from the same nursery or the same plant, but I still have that plant from my mother's garden, and it is named "Mom Dot" (Sentimental or what!).

I liked Charl's easy approach and his enthusiasm and do I ever empathise with him about selecting and disposing of plants. This is so hard! You can be sure that at least one of the unflowered plants you discard will produce that special plant you have so eagerly awaited. *Verdriet en trane*! I think that space becomes a problem for most clivia collectors, but for hybridisers it becomes a nightmare!

I remember when I started with Clivia, "Charl Malan" was recommended as a source of quality material. I believe that this is directly due to his connection with Yoshi Nakamura. Proof of this is surely his many Best On Show awards and the many other accolades he has achieved over the years.

I think Charl's advice regarding Clivia hybridising is excellent. I believe that as a beginner one should purchase the best seed or offsets that one can afford. Most beginners are willing to accept any and every seed that comes their way, I did too! The more the merrier. Big mistake, especially if you have limited space.

It has often come to my notice that people want to replicate successful crosses and in pursuit of this end, will purchase both parent plants. I see no point in this as no progress is being made. I think that taking the beautiful progeny of a particular cross and making different crosses with that plant is the way to go. ▼

CONFERENCE AND RELATED

2014 Clivia Society Conference dates

16 September 2014 (Tuesday)	–	Habitat tours
17 September 2014 (Wednesday)	–	Habitat tours; Registration for Conference late afternoon. Function early evening.
18 September 2014 (Thursday)	–	Registration (early); Conference; Preview of International Clivia Show and function (Evening)
19 September 2014 (Friday)	–	International Clivia Show in conjunction with Sunday Tribune Garden Show. Visits to Growers. International Clivia Auction (3pm starting time)
20 September 2014 (Saturday)	–	International Clivia Show in conjunction with Sunday Tribune Garden Show. Visits to Growers.
21 September 2014 (Sunday)	–	International Clivia Show in conjunction with Sunday Tribune Garden Show. Visits to Growers. ▼

Caulescens "Immersion" Tour 2014

By Connie and James Abel

Contact details: +27-72-1162672, jcabel@absamail.co.za

The clivia activity that we enjoy most is visiting clivias in their natural habitats of climate, topography and soils and seeing their association with other plants in the forest. A bonus is being in the midst of some of the most beautiful South African scenery and the "Immersion" in the heading refers to the cream on top – being in the company of a large group of fellow enthusiasts for several days, enjoying the company of old friends and making new ones from around the world. We have arranged 10 tours since the first in 1993, the last three being full bus tours in 2002 (25 enthusiasts), 2006 (43 - photo I Coates) and 2007 (44). We have enjoyed them all, and were delighted when this contribution resulted in a Clivia Society award.

The 2014 tour to caulescens country on the Eastern Escarpment of the Northern Drakensberg will first visit sites with names that will resonate with any enthusiast – The Pinnacle, God's Window, Wonder View (where in 2002 we saw a *caulescens* with a 2.2m stem) and Mariepskop. Although a bit early for caulescens flowering, there are always a few early in bloom. These sites are shown in the Google photo above (T Pearton). Top right is the much drier Lowveld, home to the Kruger National Park.

The tour will finish with a visit to Barberton and Bearded Man mountain, site of the only described natural hybrid Nimbicola. To whet appetites the first two photos (on the next page) are from Mariepskop showing the sheer eastern escarpment face and roadside clivias, and the third is from God's Window (G Gers).

The next photo has Bearded Man on the skyline (T Pearton), reclining with face to the left. It also shows a typical escarpment scene of rolling grassland with sub-tropical forest (and clivias)

on the southerly aspects. The SA/Swaziland boundary runs horizontally across the photo. The map below shows the proposed 2014 tour route.

The tour is timed to fit in with the international conference, with a packed 16 days of three clivia shows, the caulescens tour, the clivia conference, show, auction and KZN habitat tours. A major flower show will be held in conjunction with the KZN clivia show. Other clivia shows precede and follow the three-week period. (See schedule on page 7.)

We will travel in a luxury bus, with local transport for the final 10 km at Bearded Man. The only mildly strenuous portion (all are optional) will be the uphill walk from the parking area to the rain forest at God's Window.

Planning will be on a break-even basis and funds will be under the control of the Clivia Society. The cost per person including transport, accommodation and meals from Tuesday lunch to Thursday breakfast is estimated to be between R1600 and R2300 depending on the bus size and utilisation.

We request interested enthusiasts to e-mail us sooner rather than later, absolutely without commitment at this stage. Please indicate whether you are "probable" or "possible" participants. We will keep everyone informed with updates while firming up the numbers, and it will be "first come first served". Final details will be circulated in May/June with a request for commitment and payment.

Perhaps a few previous participants would like to e-mail their comments (con as well as pro) to us for the guidance of others. ▼

Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	2	3	4	5	6 NCC clivia show Pretoria	7 NCC clivia show Pretoria
Sep 2014 >>>						
8	9 Caul tour > GWindow > Graskop	10 Caul tour > Mariepskop > Barberton	11 Caul tour > Bearded Man > Pretoria	12	13 JCC clivia show Johannesburg	14 JCC clivia show Johannesburg
15	16	17 Habitat tours, visits, Pietermaritzburg	18 CS Clivia International Conference	19 KZN Clivia Show and auction 15.00	20 KZNCC Clivia show, visits	21 KZNCC Clivia show, visits

Managing Hybrid Vigour in Clivia Breeding

By Felix Middleton

Plant breeding is regarded as the art and science of sorting and directing variation. The success of our efforts can be improved by awareness of patterns and boundaries in natural organisation. The art in breeding is defined by the creative ways in which we can use this information to organise variation through selection. Hybrid vigour is one of those attributes that confound breeding and selection, especially if the breeder is unaware of its effect.

The following should not be regarded as a purist scholarly article on genetics in clivias. The content is based on sentiment, own opinion, and limited experience with a large helping of educated guessing. Furthermore, genetic terminology has been applied loosely in order to make reading easier.

Classifying variation

Any observable variation between plants of the same type is due to the action and interaction of genotype and environment – dubbed the nature vs. nurture effect. Consider two similar looking bonsai oak trees. Transplant cuttings from both into well fertilised garden soil, discontinue the relentless mutilation and the trees will grow into mighty oaks. If the bonsai trees originated from seedlings, they will be genetically dissimilar. By providing an optimal growing condition, one liberated tree might grow faster than the other while the other may be quicker to produce acorns. The genotype determines the potential to perform; the environment determines to what extent this potential is realised.

Genetic variation

The genotypic component of variation can be partitioned into two elements. One, the additive effect, is easy to manipulate. The other, variation due to dominance, is not well understood, is unpredictable and generally not easy to manage.

One way to demonstrate these components is to examine the phenomenon of hybrid vigour. The aim of a commercial hybrid breeding programme is to produce a plant or animal that outperforms the genetic contributions of its parents. When we cross two diverse true

Blush form of a midlands *C. gardenii*. Note the low floret count.

Defined by Wikipedia:

Genotype refers to the total genetic variation. This includes not only the effects of nuclear genes, but also the effects of mitochondrial genes and the interactions between genes. Genotypic variation can be partitioned into additive and dominance variation:

- Additive variation represents the cumulative effect of individual loci, therefore the overall mean is equal to the summed contribution of these loci.
- Dominance variation represents interaction between alleles. If a trait is controlled by a dominant allele, then both homozygous and heterozygous individuals will display the same phenotypic value.

Blush form of Ngome *C. gardenii*. Note floret count and flaring of petal tips.

Ngome *C. gardenii* Minigard interspec F1

breeding varieties, the offspring does not always necessarily only display the combination of traits from the individual parents. We often find that the progeny grows faster, matures earlier, has larger flowers and produces more seed than either of its parents. These unexpected qualities are classed as dominance variation. Traits that we observed in the parents and which are then inherited by the progeny are termed additive variation. Hybrid vigour is also expressed when different species are hybridised.

Consider, for example, a cross between *Clivia gardenii* and *C. miniata*. (Clivia Minigard). "The Gem" nursery in Greytown KZN breeds many Ngome *C. gardenii* x *C. miniata* interspecifics. Most are fast growing robust plants with large umbels sporting multi-coloured florets. Although the Ngome *C. gardenii* is inherently a large plant, the robustness of the Minigard outperforms that of either parent. This hybrid vigour is part of the dominance component of variation. The flaring floret tip which is typical of the Ngome *C. gardenii* parent is noticeable in, and therefore transferrable to the progeny. It is classed as an additive component of variation. Similarly, the floret count on an Ngome *C. gardenii* is usually greater than its "Midlands" *C. gardenii* counterpart. This difference is obvious between the two Minigards and in this example can also be classed as additive variation. We occasionally find that the floret count of a *C. miniata* x *C. miniata* hybrid is much higher than either of the parents. This suggests that variation in floret count can be the result of both additive as well as dominance elements.

Midlands *C. gardenii* Minigard F1

Focus on the additive component

Partitioning variation into its environmental, dominance and additive components is not only for academic amusement. A plant propagator or breeder, by knowing which trait falls into which category, will be better equipped to manage the variation and be less frustrated by unpredictable results. As clivia growers we aim to manipulate the environment merely to maximise the plant's inherent genetic potential. Given the amount of variation within the clivia group, why should we even try to alter traits by modifying the environment? It is easier and more enjoyable to manipulate the genetic potential itself. The additive component of genetic variation is fixable while the dominance element is not. The genetic concept of fixing genes does not imply that something was broken. It describes a condition where trait variation can be stabilised. A simple example is the inheritance of yellow pigmented flowers in *C. miniata*. The F1 between a true breeding orange and a yellow will exhibit the colour of the orange parent, or at least a shade of orange. However a few plants from the next generation, after selfing or sib-pollination, will be yellows. These yellows will be true breeding in that selfing will result in only yellow flowering progeny. As the trait is recessive it is easy to fix or stabilise. This is also applicable to the more complex traits such as leaf size. However stabilising such traits is more challenging as there are many additive genes at work, and all need to be stabilised before a grower can claim that he or she has developed a true breeding strain.

C. miniata – 'Appoline', a superior yellow hybrid (The Gem Nursery)

C. miniata – An inferior Yellow *C. miniata* ex-habitat clone

Guiding variation

The ultimate aim of a breeding programme is to generate a product with a predictable attribute, be it yield or merely appearance. For clivia we can propagate a superior plant by taking offsets. Even with a highly heterogeneous genotype, each offset should be an identical clone and therefore harbour the genetic potential of the maternal plant. Exceptions do exist. Offsets taken from plants with leaf variegation, chimeric plants and plants where the genotype is unstable (unusual ploidy levels) are not always identical to that of the mother plant.

The disadvantage of propagating by way of offsets is that the multiplication rate is low. In vitro propagation is often pitched as an alternative. The cost, time and effort to establish a regenerating culture renders this practice feasible for only those highly valuable genotypes. Furthermore, the financial value of a clivia clone is determined by its availability and abundance. By releasing even a limited number of clones drastically reduce its value. In my opinion *In vitro* multiplication of clivia should at this stage rather be used to preserve some of our scarce clivia species and unique sub-populations of species.

Currently the best way to propagate clivia is through seed. It is easy to obtain seed via the internet, from nurseries and better still, directly from the breeder at a clivia exhibition or show.

Picture 7: Clivia Hybrid – Hirao: A candidate for propagation through tissue culture (The Gem nursery)

Some seeds are quite expensive, especially if a detailed parentage is supplied. In many instances the seed may not be true breeding. The outcome of a cross between two show winners is not predictable and buying such seed does not guarantee a specific type. Nevertheless, by understanding the inheritance of additive traits and buying from an honest breeder one can purchase seed that is sure to produce a plant with, for example, the type 1 yellow, green throat, peach or multi-petal trait. The more complex traits such as plant vigour, umbel size and flower shape are mostly governed by the dominance genetic component. Seedlings from a cross between two vigorous parents will not all grow into vigorous plants. As a rule, plant vigour is not fixable.

Line breeding

One way to produce seed with a predictable genotype is to make use of line breeding. Many such clivia lines or strains have been shaped by repeated selection over multiple breeding generations. One of the most renowned is the Daruma strain. This short-leaved compact plant typically produces a flower spike that seldom protrudes very high above the leaves. It was developed, and is still being improved, by repeated cycles of sibling crossing and selection. The sibbed or selfed progeny of the Daruma strain is normally true breeding as variation has been minimised due to extensive inbreeding.

The success of line breeding depends on a few basic principles:

1) When starting such an endeavour it is important for the breeder to have a clear type in mind. Altering this goal along the way will slow or even impede progress.
2) The founding population should not be too small but contain an adequate amount of variation to work from and direct.
3) Inbreeding should preferably be attained by sib-pollination over multiple generations.
4) Attempting to stabilise traits too quickly by selecting only a few progeny each cycle of inbreeding, or by merely selfing down a single plant will lead to the fixing of deleterious traits.
5) Only the additive component of the variation is fixable. When selecting within a cycle, a breeder should refrain from selecting the more robust plants as these are likely to harbour more variation.
6) A line or strain should be regarded as a population of plants. A single individual is the product of line breeding and should not be used on its own to propagate the strain.

A strain, although regarded as true breeding, will still produce offspring that are slightly different from the parents. Yet, a matured strain that has been properly maintained will always produce siblings of a predictable type.

Hybrid breeding

As noted earlier, the aim of a hybrid breeding programme is to produce a plant or animal that outperforms the genetic contributions of its parents. Furthermore, all the progeny from the cross needs to be identical with no genetic variation between individuals. The only way to obtain this predictable uniform product is to cross two highly inbred plants with each other.

Inbreeding is a long-term, tedious process. Most plant breeders agree that an acceptable degree

Hybrid Breeding Scheme

Step 1	Generate Variation	Create variation by crossing plants which contain desired traits
Step 2	Direct and order variation	Use recurrent cycles of selection and self-pollination to guide and fix variation in an inbred line
Step 3	Test for combining ability	Intercross and evaluate different sets of inbreds in order to find a combination which shows hybrid vigour
Step 4	Bulk up Inbreds	Maintain and increase the compatible set of inbreds by selfing
Step 5	Produce Hybrid	Large scale commercial production of hybrid. This is generally obtained by way of manual emasculation or by using self-sterility crossing techniques.

of inbreeding has been attained only after at least five generations of self-pollination. Given the lengthy generation cycle of clivia, this practice will be of interest to the younger members of the Clivia Society only. Alternatively, we can make use of partially inbred strains. To my knowledge, clivia breeding and propagation is only regulated by conservation based legislation in South Africa. Plant breeder rights have not been imposed and hopefully will not be implemented by breeders soon. This allows any person the freedom to purchase a plant (excluding ex-habitat *C. mirabilis*), propagate it and breed with it. Crossing two strains will produce progeny that will be similar to one another.

Furthermore, depending on the magnitude of genetic dissimilarity between the two strains, the progeny may also exhibit hybrid vigour. Traits such as faster growth, larger plant type, umbel size and the ability to produce multiple offsets can be exploited in this way. A commercial advantage of such a programme is that the buyer of this F1 hybrid will not be able to reproduce the type by seed.

This is theoretically also possible by crossing plants that were obtained from different wild populations. Here I should note that I am not an advocate of taking plants from the wild. Many breeders do maintain and sell clonal propagated stock from habitat plants that could be used to this extent. Wild clivias often exist as isolated interbreeding populations. Genetic variation between these populations tends to be higher than the variation within the population due to partial inbreeding. The smaller isolated populations can be regarded as naturally developed strains. Intercrossing individuals from different populations will produce seedlings with similar genetic potentials (i.e. repeatable and predictable). We can even exploit the advantages of hybrid vigour by intercrossing between two genetically diverse populations. Incidentally, as hybrid vigour is an indirect measure of genetic dissimilarity, we could use it as a measure of species development. Crossing a Midlands *C. gardenii* with an Ngome *C. gardenii* produces progeny that express high levels of hybrid vigour. Some of the facets that are considered when distinguishing species include morphological dissimilarities, geographic isolation, isolation due to flowering date and genetic dissimilarity. Hybrid vigour is an indirect measure of the latter. Should we regard the Ngome *C. gardenii* as a different species? A discussion for another time – we may have subdivided the genus into too many groups already.

Clivia robusta

Most wild clivia populations exist as naturally isolated pockets of similar looking individuals. Ecologically speaking, a specific plant type has been favoured by either selection or genetic drift and is now exploiting a niche in this isolated micro-environment. The *Clivia robusta* species seems to operate quite differently. Although also growing in ecologically isolated patches, variation within each sub-population tends to be surprisingly high. This is especially evident when considering the variation in flower shape and colour within relatively small patches of plants. There are many theories that might explain this discrepancy; the obvious is centred on the idea of early stage species development following a hybridisation event. Similar to what is currently transpiring with the *C. x Nimbicola* event at the Bearded Man mountain. In my opinion it is a little more complex than this. *C. robusta* inhabits marshy environments. Slow growing runty plants will not survive in these environments and only the fast growing robust plants will be able to populate these niche habitats. Self-pollination of a *C. robusta* plant is generally not possible due to genetic self-incompatibility barriers. Furthermore, seed collected from the wild produce a high frequency of weak seedlings. All of these observations points towards a species that utilises dominance variation and therefore hybrid vigour to survive. Inbreeding is detrimental; therefore self-incompatibility structures have been favoured and fixed through generations of natural selection.

Concluding remarks

The process of natural adaptation is founded on breeding (creating variation), selection (directing variation) and reproduction (multiplying a

specific type). In plant breeding we follow a similar process. We create large amounts of variation by crossing diverse genotypes, select for aesthetic value and then attempt to multiply these on a large scale. The success of a breeding programme is determined by the awareness and application of various basic genetic principles. One of these is the reduction of variation through controlled inbreeding. The objective of line breeding should be to produce a true breeding strain in as short a time as possible. By selecting the more robust plants a breeder will keep active a component of inheritance that cannot be maintained and therefore prolong the development of a true breeding strain. ▼

International Society for Horticultural Science

Commission for Nomenclature and Registration
ICRA Report for 2008-2012.
By Ken Smith

1. Report from the ICRA for the denomination class(es):

CLIVIA

2. Name of body appointed as ICRA:

The Clivia Society

3. Name, address and email contact of the International Registrar: Kenneth R. Smith
   593 Hawkesbury Road, Winmalee, NSW 2777 AUSTRALIA
   cliviasmith@idx.com.au
4. Number of new registrations in each year 2008-2012: 2008....25
   2009....sorry, don't have a reliable source of this data at the moment.
   2010.... sorry, don't have a reliable source of this data at the moment.
   2011... sorry, don't have a reliable source of this data at the moment.
   2012.... sorry, don't have a reliable source of this data at the moment.
5. How many names (whether registered or not) do you now have on record?
   1200 in the April 2009 publication.
6. Do you maintain a record of names that are or have been in use but which are not formally registered? If so how has this developed in the report period?
   This is true. Many Society member use names as "garden names" then deal with other members using those names, then sell them at shows (or even on eBay).
7. When was your last Register and/or Checklist published? Please give details
   April 2009.
8. Do you have plans to publish another Register and/or Checklist? Please give details.
   Yes, many members want it in hardcopy - it is time.
9. Are your records now held electronically? If so can others have access to these? Please give details
   Yes.

They are at.... http://www.cliviaregister.com/

10. Please list any hardcopy publications of Registers, Checklists and Supplements produced in the report period:

    Checklist and Register of Clivia Cultivars....April 2009

    Also the book Clivia: Nurture or Nature by Dirk Swanevelder & Roger Fisher

    Published by BRIZA publications, 2009

11. Are there any other relevant, purely electronic, publications that you would like to bring to our attention?

    The Register....see question 9

12. Have you undertaken any other activities to promote registration in this period (e.g. other publications, lectures etc.). Please give details.

    Newsletters....the Clivia Society Newsletter

    Lectures....I promote locally (and overseas) when I give lectures/talks on the genus.

13. Do you have an application form for a new registration available on line? If, so please give details.

    http://www.cliviaregister.com/

14. Do you liaise with any relevant Plant Breeders' Rights/Plant Patent Authorities?

    I am a Qualified Person with Biosecurity Australia (AQIS)...number QP ID: 1568

15. Do you have any arrangements with other specialist Societies in other parts of the world to gather registration data to be forwarded to you? If so, please give details.

    Yes, The Clivia Society PO Box 74868, Lynnwood Ridge,0040. Chairman: Christo Topham +27 82497 5879 e-mail: marleneto@telkomsa.net .....All associated Clubs and Societies have been asked to provide assistance. These are Clubs in South Africa, and Societies in New Zealand, Japan, the USA, and Australia.

16. Are you aware of significant gaps in your current or historical records? If so, please indicate how you hope to deal with them.

    Not aware of any major gaps, with the exception of the Chinese cultivar groups...this is a hard nut to crack. I have many texts in Chinese and can supply scans if required. An Australian member, Eddie Pang, is a great source of information on the Chinese connection.

17. Do you consider that there might be a demand in the group for which you are ICRA to have a horticultural category defined purely on parentage (i.e. some form of grex)? If so, please indicate its relevance.

    This has been put forward in the book by Harold Koopowitz..."CLIVIAS" published by Timber Press, 2002

18. Have you encountered problems associated either with nomenclatural or procedural issues during this period that you would like to bring to the attention of the Commission? If so, please give details.

    Yes, there are "problems" of the Clivia fraternity either not knowing or just disregarding the "rules". Perhaps this is not just a Clivia problem? The worldwide issue of localised "naming" is also another point to ponder....nothing new here.

19. Can you confirm that you wish to remain as ICRA for the denomination class(es) noted above?

    Yes please. ▼

CLIVIA BREEDING

Breeding 'Romulus' and 'Remus'

By Felicity Weeden

I have been told many times by experienced breeders that "You must have a goal when hybridising". I started out with the clear goal of breeding for large blooms. I have succeeded, but I seem to have developed a number of new goals along the way and I must admit, if something comes into bloom that takes my fancy, that "something" becomes my latest goal.

By pure luck I came by a most beautiful pastel. It is a large *robusta* plant with long narrow leaves, beautiful flowers and a spherical umbel, held well above the leaves. A truly beautiful and striking specimen, called 'Perfect Pastel'. During a visit to Suezette and Christo Lotter, I spotted a fine cral-coloured clivia of Nakamura breeding and duly acquired some pollen from Christo. Crossing this onto 'Perfect Pastel' produced 'Romulus' and 'Remus', so called because the coral-coloured pollen parent had fused pedicels. The interesting thing was that these two plants each had green throats, while the parents didn't exhibit any green that I was aware of. On investigation, I discovered that 'Perfect Pastel' exhibits a tiny amount of green when first opening.

'Remus' opened first and has lovely two-tone bronze flowers with a green throat on a beautiful round umbel. Whereas the parent plants are both large, this is a compact plant with neat shorter leaves and it suckers freely. Using this plant as a pod or pollen parent, excellent results have occurred, always with green throats and in shades of pink pastel. In fact, 'Remus' produces really lovely recurved green throats and seems to have the ability to cross successfully with many partners.

'Romulus', the second seedling to bloom, is really spectacular. It is the soft colour of old-weathered bricks with some green suffusion and a green throat. Again the fine umbel appeared. This plant, dare I say it, automatically wins Gold on show. However, to date I have not flowered any successful crosses from 'Romulus'. I have crossed it to its sibling, 'Remus', and pod parent, 'Perfect Pastel' and still await these results.

Gladys 'Blackbeard' x 'Remus'

'Perfect Pastel' is a most willing pollen parent. Crossed with 'Ansie's Delightsome', it produced 'Symphony of Angels', a large plant with a huge umbel of large, beautiful pink pastel florets. Quite outstanding, but it flowered too early for the show! Crossed with my Vico cell/tissue culture clone, it produced large pale peach coloured blooms.

While I tend to move on from the earlier parent plants, there are some such as 'Romulus', 'Remus' and 'Perfect

'Perfect Pastel'

'Remus Delight'

Pastel' that I feel still deserve further attention. I think the way forward with 'Remus' could be to try and retain its compact size. Because the whole plant, the umbel and florets are dainty and smaller in size, I think perhaps further breeding for colour variations is a good option. Possibly one could work towards bigger blooms, but I like the idea of the altogether smaller plant of good proportions.

'Remus' x 'Dooley'

One of the finest results I have had from a 'Remus' cross was called 'Remus Delight' which flowered in 2012 winning Gold at the Cape Clivia Show. In this case, the cross was made using 'Gladys Blackbeard' pollen and produced a large perfect umbel of palest pink/apricot with a green throat. Basically just 'Remus' in pale pastel, which is what I had hoped to achieve.

Where 'Romulus' is concerned, perhaps the right pollen parents still need to be found. However, the colour of this plant is so special that I don't know if one could improve upon it. Possibly the umbel could be improved, but I would hate to spoil that colour.

'Remus' x 'Perfect Pastel'

'Remus'

I often feel when a really beautiful seedling appears, that there is nothing further to do to improve it. Strangely enough, I feel that 'Romulus' needs further refining, so hopefully a suitable and successful partner will be found for it soon. ▼

'Romulus'

Nature's amazing results

By Tremaine Wesson

I was introduced to clivias in 2002 by our current chairman, Willie Le Roux of the Eastern Province Clivia Club. With great enthusiasm one started to purchase any available seed/seedling/offset/plant that one's budget could afford, or find some justification for why one needed that particular Clivia.

It was during one of these frenzies in 2003 that I purchased seeds from one of the stalwart Clivia growers, Tino Ferrero. In those days, his seeds were quoted in US Dollars and at that stage, one US dollar cost approximately seven Rand.

I purchased the following from Tino on 23 October 2003:

- No 7 - Yellow Green Girl Sibling x Yellow Green Girl @ US$5 per seed.
- No 8 - Bill Morris Yellow Green Throat x Yellow Green Girl @ US$4 per seed.
- No 12 - Pink x Pink @ US$3 per seed.
- No 9 - Best Chubb Peach x Best Chubb Peach @ US$5 per seed.

It cost me a handsome R404,60. In 2003, in my opinion, this was expensive for seeds. I planted these seed in a 2kg ice-cream plastic container with slightly damp pool sand (a Willie Le Roux method). The germination was successful and in 2007, the No 8 Yellow Green Throat (YGT) flowered for the first time.

This particular YGT was impressive and I instantly took a great liking to it. At that stage, I didn't know the difference between a Group 1 and Group 2 yellow. I later found out that this YGT is a Group 1 yellow. I started taking photographs of this particular YGT (No 8) from one year to the next.

It was quite amazing how this Yellow Green Throat (YGT) changed annually. I'm sure weather conditions/temperature has a lot to do with the differences in the green throat intensity and possibly, the shape of the flowers

YGT September 2007

YGT September 2009

YGT September 2011

YGT September 2009

YGT September 2012

(see photos). I kept the plant in the same position in the shade house and my fertilisation programme remained regular. I used multi-feed (high in Potassium), Bounce-Back, Calcium Nitrate and even Osmocote to try and enhance the green throat.

I'm sure that even experienced growers have also found these anomalies. For those who might be wondering what the results of the other seeds were, I was pleasantly surprised at the out-comes. One seed of the no 7 (Yellow Green Girl Sibling X Yellow Green Girl) turned out to be outstanding. A no 9 (Pink X Pink) and a no 12 (Chubb Peach) had slightly green throats. ▼

YEAR BOOKS

The two missing yearbooks

Feedback from Exco

Although the AGM representatives instructed the two editors (Roger Fisher and Roger Dixon) to publish some of the best articles from previous newsletters in this "Revue 14 -edition", they decided to rather combine the six original botanical descriptions and sketches of the six species in one publication.

The Exco Committee members agreed that this will result in a rare and precious publication, which may become Africana in years to come.

Not in their wildest dreams did the two Rogers imagine that obtaining the consent of the authors and artists to re-publish their work would prove to be virtually impossible. It would have been best to have allowed five years for a project like this! Unfortunately the publication is not quite ready yet.

The problem being experienced with the finalisation of the Revue edition 14 yearbook is the photographs of the *C. robusta* species. The authors of the original *C. robusta* species require that the original photos accompany the description in our publication. Roger Fisher has been in contact with Dirk Swanevelder, who in turn referred him to Andy Forbes Hardinge, who supplied most of the photos, but he no longer has the files. We've tried to use the pdf version of the published online article, but Tersia van Rensen has said that the standard of their quality is not publishable. What we still need, however, is a good hard copy of the original article in order to scan these at highest resolution, but a hard copy of the journal has not been located. If anyone can help Roger Fisher in locating such an original article, he and all Exco members will be

most grateful.

The Exco Committee sincerely regrets this situation and hopes to supply all paid up members worldwide with two different yearbooks in 2014!

As such the species issue (14) is anticipated to be distributed sometime during 2014 and the Conference issue (15) in April 2014.

Yearbook 2013 (Yearbook 15)

For this edition the editor and publisher (Christo Topham) never received enough submissions.

All members will appreciate that if the AGM appoints a new publisher in May, it will be virtually impossible to produce a yearbook of 100 pages in August or early September of the same year.

The Exco Committee sincerely regrets to inform all members that no yearbook for the year 2013 will be published. To compensate members for this loss of the 2013 yearbook, the membership fees to The Society is reduced to 75 % of the normal membership fees.

This concession will be applicable only to the membership fees for 2014.

Yearbook 2014 (Yearbook 15)

Joubert van Wyk is the editor and publisher of this issue.

Exco would like to propose the publication of two yearbooks, during every four years, going forward:

That in conference years the club hosting the conference, and the clubs in the vicinity of such a club, contribute articles on the breeders and collectors in their area on their collections, current breeding, ideas for the future etc. And that the yearbooks in future,are published in April.

As such for the 2014 yearbook containing articles from Natal breeders on themselves (as in a BIO), their plants and what breeding is taking place now and ideas into the future, will be published in April 2014. These articles would be accompanied by photos.

As the quadrennial conference is being held in Natal in 2014 it will give all members an up-to-date guide to the different breeders in the area.

The idea is to have the articles with Joubert by 15 December 2013, which will help him to have the publication ready by April 2014. This will be accompanied with some 2013 show results and photos, provided that the clubs send these in timeously. This will hopefully encourage and motivate our local and international society members to attend the quadrennial conference in September.

A yearbook will then be published every four years in April, giving the host Club and neighbouring clubs and Interest Groups some exposure and recognition in the region where the quadrennial Conference will be held.

The papers delivered at the Conference will then be published in the next yearbook after the Conference (April 2015).

Since Joubert van Wyk took over as publisher of Clivia News we feel that every edition was "bigger and better" and hugely appreciated by all, with many compliments by individual members' worldwide.

The Exco Committee sincerely trusts that this suggestion meets everyone's expectations. ▼

On behalf of all Exco members

2013-10-30

REGULARS

Clivia over 12 months (3) Winter (June - August)

By Helen Marriott

Following on from May, *C. gardenii* (Figs. 1-2) continued to flower in Melbourne during the month of June, alongside the less commonly found *C. robusta*. Occasionally, a plant produced two flowering stems, one in May, followed by another in June, as did *C. gardenii*, 'Malachite'. Intraspecific as well as interspecific hybrids of the pendulous flowers also expand our collections these days.

From early to mid-winter, *C. miniata* x *C. gardenii* interspecific hybrids began to demand attention. For instance, two siblings from the late Mick Dower's cross of 'Goblin'/'Green Goblin' x Hirao just overlapped in their blooming time and

Fig. 1 'Malachite'

Fig. 2 'Harburg Blush'

showed slightly different flower shapes, one possessing more rounded inner tepals than the other (Fig. 3). John Winter's interspecific hybrid of 'Kirstenbosch Yellow' x 'Ngome Yellow' flowered impressively, with 26 flowers on this occasion (Fig. 4).

Also valuable for breeding purposes are the multitepal x interspecific hybrids emanating from Japan which flowered during this winter period. Showing much potential is Shigetaka Sasaki's multitepal x 'Day Tripper', a *C. miniata* x *C. caulescens* interspecific hybrid (Fig. 5). Similarly, his multitepal x *C. gardenii* also exhibits a multitepal tendency in its first F1 flowering (Fig. 6) and is thus a positive sign of its breeding potential. Even with the multitepal used as the pollen parent, the multitepal characteristic is already visible in the F1 shown in Fig. 7 of (*C. miniata* x *C. caulescens*) x 'Nakamura's Super Multipetal', though admittedly this multitepal is known as a strong parent for inheritance of that gene.

These three months have seen a continuation of *C. minata* x *C. caulescens* as well as *C. miniata* x *C. nobilis* interspecific hybrids (Figs. 8-10), and, of course, further interspecific hybrids based on the Australian forms of *C. x cyrtanthiflora*. Quite a few Australians are using this group of plants in their own breeding. Recently, one cross of *C.* x *cyrtanthiflora* x 'Aurea' produced an attractive fawn-coloured flower (Fig. 11) and another plant, when crossed with an orange pollen parent, produced a flower with contrasting colours on the inner and outer tepals (Fig. 12).

Interspecifics which are crossed again to *C. miniata* are increasing in number in many places, further expanding the range of these hybrids. Figs. 13-14 show one kind of bi-colour pattern found in 'Juliet', a (*C. minata* x *C. caulescens*) x yellow *C. miniata* interspecific hybrid. Here we can imagine that the *C. miniata* used in the primary cross was also yellow. Bred in Melbourne by Laurens Rijke is 'Madeline Rose', a multi-coloured flower which is also derived from (*C. minata* x *C. caulescens*) x 'Aurea' (Figs. 15-16). In this case, the two umbels which flowered in consecutive months on the same rhizome displayed rather different colouration patterns, not unsurprisingly because

Fig. 3 'Charity' ('Green Goblin' x Hirao)

Fig. 4 'Gypsy Queen' ('Kirstenbosch Yellow' x 'Ngome Yellow')

Fig. 5 Multitepal x 'Day Tripper'

Fig. 6 Multitepal x *C. gardenii*

Fig. 7 (*C. miniata* x *C. caulescens*) x 'Nakamura's Super multitepal'

Fig. 8 *C. miniata* x *C. caulescens*

Fig. 9 *C. miniata* x *C. nobilis*

Fig. 10 *C. miniata* x *C. nobilis*

Fig. 11 *C.* x *cyrtanthiflora* x 'Aurea'

Fig. 12 *C.* x *cyrtanthiflora* x *C. miniata orange*

Fig. 13 (left) 'Juliet' 2013

Fig. 14 'Juliet'

Fig. 15 'Madeline Rose'

Fig. 16 'Madeline Rose'

Fig. 17 (*C. miniata* orange x yellow) x 'Day Dream'

Fig. 18 (*C. miniata* x *C. caulescens*) x self

Fig. 19 Variegated *C. miniata* x *C. gardenii*

Fig. 20 Light of Buddha x (*C. miniata* x *C. caulescens*)

the second flower developed and bloomed inside, but also quite different flower sizes and shapes. Since there was only a relatively small difference in the number of flowers in the two umbels (23 and 20 flowers respectively), this was rather unexpected.

Winter is the main flowering period for interspecifics and some of them certainly take centre stage. A pot of Yoshikazu Nakamura's (*C. miniata* orange x yellow) x 'Day Dream', which now has seven rhizomes, each produced a flowering umbel this year (Fig. 17). On the other hand, there are also special flowers from recalcitrant plants which never seem to produce offsets, have few flowers, are not good seed setters and do not provide much, if any, viable pollen. I consider this greeny (*C. miniata* x *C. caulescens*) x self as one such example (Fig. 18), though it does produce a little pollen.

Interspecifics with variegated foliage add further interest. Fig. 19 shows an extremely vigorous *C. miniata* x *C. gardenii* which frequently produces new offsets. Since interspecifics with other than striata variegation remain unusual, deserving special attention was a first flower on Nakamura's Light of Buddha x (*C. miniata* x *C. caulescens*) hybrid (Figs. 20-21).

While winter is the prime time for seed preparation, it also provides an opportunity for the enjoyment and close observation of berries, particularly their colours, shapes and sizes. This year I have become more aware of the range of

Fig. 21 Close-up of Fig 20 flower

Fig. 22 Mixed berries

variation in berry colour among the "European Peaches" and even among orange-flowering *C. miniata*. Berries from five different plants are found in the vase arrangement shown in Fig. 22, and all of them have some 'Vico Yellow' in their heritage. For example, the darkish brown berries on the right come from an orange-flowering plant derived from 'Vico Yellow' as one of its parents. The pastel/green berries on the bottom left also followed an orange flower, similarly thought to include 'Vico Yellow' in its parentage.

Australia has just experienced the warmest 12 months since climate records commenced 150 years ago and furthermore, this winter has been the warmest one on record for the state of Victoria. This warmth seems to have promoted the rapid growth of buds on *C. miniata* as August progressed and, like other members of the Melbourne Clivia Group, I started to wonder which plants would be at their peak – if not passed their peak – on 21 September for our CLIVIA EXPO. As the official start of spring approached, a few *C. miniata* engaged in battle with the interspecifics for space inside the house and these included several Gladys Blackbeard hybrids, 'Original Green Girl' with its delicate first flower, and even a multitepal (Figs. 23-24), among others. Unexpected were two umbels on *C. nobilis* which flowered in late August, somewhat earlier than usual (Fig. 25).

As one's plants increase in size and require bigger pots and as new Clivia come into flower,

Fig. 23 'Original Green Girl'

Fig. 24 'Chibayae'

Fig. 25 *C. nobilis*

the problem of space is exacerbated for some of us "backyard hobbyists". Nakamura's recent advice was as follows: "In order to progress (in our breeding), we need to reduce, rather than increase the number of Clivia we grow. To make space, it's better to dispose of mature plants rather than seedlings". This advice seems easier said than done! ▼

The Lay Photographer

By James Haxton

One often sees published photographs that lack proper white balance and tone. Yellow flowers may look greenish while green leaves may have a blue tint. Incorrect colour not only conveys incorrect information of the subject, it also degrades the visual quality of the image. Clivia photographers should take care in ensuring that the colour of the final exhibited image is correct.

White balance (WB) is the purity reference for colours in an image. White is the preferred reference as it can easily be assessed to determine whether it is pure white or any shade of neutral grey without any colour being present. If the white reference looks right, one can assume that all the other colours will be correct.

The WB has to be adjusted before the photograph is taken. Most cameras offer a wide range of settings for WB and typically include Auto, Daylight, Cloudy, Shade, Tungsten light, Fluorescent light and Custom. The idea is that the photographer must assess the light and choose the appropriate setting. Most often Auto is chosen. In this mode, the camera will decide what the correct setting is and adjust the colour accordingly. Some cameras will assess the general colour of the light and pick one of the options, while others will average the scene and set the resulting colour to neutral grey.

Either method will produce a generally acceptable picture but, strictly speaking, neither is correct. The problem with automatically picking a setting is that it works only if the light is "easy". If the averaging method is used, the colours of the subject itself can shift the balance. It is therefore better to manually assess the condition under which the photo will be taken and then to set the camera accordingly. Most cameras are fairly accurate when the setting is matched correctly to the light condition prevailing at the time of the shot.

Choosing the correct setting is often more difficult than one expects. When we photograph flowers they are often in a shade house or under trees. The light cannot simply be set to Shade, because the trees have green leaves that colour the light and shade houses can have any colour netting, including yellow, red and green. This is a good time to set the camera's WB to Custom.

The Custom setting has to be measured first and then saved before it can be used. Fortunately the procedure is quite simple to carry out. One needs a white surface that can be placed over the subject. The white surface reflects the incident light back to the camera and because the camera expects it to be a white reference, the camera can adjust its compensation to suit. If the reference is not perfectly white, the result will be tinted with a colour opposite to that of the reference. The reference can be a sheet from a note pad or even a handkerchief or paper towel as long as it is pure white and thick enough not to pass light from the subject and large enough to completely fill the frame when one takes the WB measurement.

The camera's menu can be used to find the WB sequence. It will direct the user to aim the camera at the white surface and push a series of buttons. One has to make sure that only the white surface is visible in the frame. The white balance value is then saved and the reference removed from the subject before the picture is taken. The measurement has to be repeated when conditions change.

Advanced cameras that can store raw files have an advantage because raw files can be manipulated afterwards using advanced photo editing software. All one needs is a known neutral colour as a reference somewhere in the image. A single mouse click on the reference achieves correct WB and the WB value can be applied to other images taken in the same light.

Light is not always uniform in colour. When one works in the shadow of a tree or house, one has to be aware of different colours illuminating the subject, for example, blue from the sky, red from the bricks, and green from the nearby tree. There is no setting that will correct that, so it is best to shoot where the light is uniform and not too harsh. Typical problems are blue shadows or a colour cast.

The images shown above were taken under the following conditions with the WB setting in brackets:

Top row, left to right: Shade (Daylight), sunlight (Shade), sunlight through green shade net (Daylight) and sunlight through green shade net (Shade).

Bottom row, left to right: Shade (Shade), diffused sunlight (Daylight), sunlight through green shade net and flash (Flash) and sunlight through green shade net (Custom).

Each image in the top row illustrates an incorrect setting. The bottom row shows images each taken at the best setting relative to the conditions. The white T-marker was planted as a colour reference. The background is a light grey cloth. The colour cast (overall colour tint) is easily seen on the white marker. The image at the bottom left still shows blue in the leaves despite the correct WB setting. The reason is that the sky was cloudless and blue. The blue streaks are mirror-like reflections of the sky off shiny parts of the leaves. A partially cloudy sky would have provided much better reflected light even in the shade. The second image is as good as it gets. A diffuser was used to shade the subject and remove harsh shadows. The third has good colour despite the environment because the flash overpowered the ambient light. The flash tends to intensify the shadows as can be seen and the contrast is slightly higher. The last image is reasonably well balanced but a slight shift in hue is present on the background due to the unevenness of the green light in the shade house.

In summary, the best conditions to shoot in are diffused sunlight or a cloudy sky at the respective settings. More difficult conditions can be managed by controlling the illumination using a powerful flash or by controlling the camera's compensation with the Custom WB setting. ▼

CLIVIA STORIES

A Clivia Episode

By Roger Fisher

I have had the odd clivia plants in our family gardens for most of my life. My grandmother grew clivias in two pre-cast concrete pots that flanked her front doorway. If I recall correctly these containers were fashioned in the shape of large oak stumps, and on reflection, were probably casts from life. Her father-in-law – my great grandfather – manufactured fancy clay products in Observatory, Cape, and, as a sideline industry, cast decorative concrete pieces. Eventually the home and manufacturing yard was sold and demolished, and a domestic electric appliances factory erected there.

For myself, then much a past-fifty (now sixty) male stricken by the allure of the Clivia, I became more attentive of this genus and its wiles lured me, much like the crew of Odysseus, to its Siren shores.

While lunching at a staff gathering to take leave of a colleague, his wife – with whom I share plants-person intimacies – told me of a recent visit to her daughter's new abode in the Plettenberg Bay area, having delivered a boot-load of "ordinary" clivias from her Pretoria home for the garden down there. Popo, the Xhosa gardener there, took one look at these plants and later proudly produced another three which he had collected from the "bush". She, in turn, brought one back home with her to Pretoria because it was "different".

Well I was thunderstruck. I had been told a story some time ago by a senior colleague that his mother was once given a clivia "out of the Knysna forest" by a forester's wife. Having read the article on the role of fire in the distribution of *Clivia*, I knew this would be unlikely. That clivia plant was placed in the garden of a guest-house in Plettenberg Bay many years ago, and then she forgot to remove it before returning home to Hazyview where she had planted a carpet of clivia beneath the sprawl of the tree canopy. Its progeny must today exist in and about Plettenberg Bay.

Detail of leaf tip

I had by then pretty much committed to memory the distribution map of the genus *Clivia* which had been published in CLIVIA 5, and *C. miniata* was not meant to be found in the bush of the Plettenberg Bay area. I was determined to see the plant and went to scrutinise it at its Pretoria home the very next day. It is different. Its leaves are broadish and distinctly serrated along the entire margin, not dissimilar to those of *C. nobilis*. I phoned around the circle of knowledgeable clivia folk I had then recently met and their common

'Popo' - leaf base with first umbel bud

wisdom was that it was a garden escapee. The plant was also distinctly stressed, being chloritic and having the leaves stained whitish by salt residue. The borehole water available for the garden from where it had been planted and from which it had been taken is brackish, having high concentrations of calcium and magnesium carbonates.

I spoke to a botanist and asked what to make of this particular specimen. We needed to wait until it had bloomed and also to inspect the population in the wild. I was travelling down that way and put in a stop at the property to meet with Popo and ask him to stop removing plants, but keep an eye on them until I had time for a longer visit. It was dusk, an unseasonal thunderstorm was on the way, and I had still to negotiate those interminably long waits at the road-works on the way to George. On seeing the area, which is farmland remote from the developed area of Plett, although rapidly changing, the "garden escapee" explanation became less convincing.

I met with Popo, reached an understanding that he would accompany me to the spot where he'd found them the next time I visited, and would not remove any more plants.

In the meantime *Clivia* 'Popo' – it had now acquired a distinct personal identity – responded to care and greened and pushed an umbel. This flowering was sacrificed to science and samples were given to the Manie van der Schijff Herbarium for their records. The next blooming a year later marked that the time was auspicious and so arrangements were made for a trip back to Plettenberg Bay. I fetched Lucette, and much paraphernalia besides, since we were going to do "the rounds of Vader Cloete". Not that I mind. Nothing gives me as much pleasure as discovering the back-roads of my own country and her people. This trip took us past the Camdeboo to Beervlei where we were to deliver parakeets, cages and plants.

We travelled on to Plett through the magnificence of the old Prince Alfred's Pass, surveyed by Andrew Geddes Bain but built by his son Thomas. "Might there be clivia lurking here too?" I wondered.

On arrival, we negotiated with his employers to have Popo given time off from his gardening commitments to take us to the spot where the plant was found. He said that the plants that he had collected had been taken off a massive clump in the "bush", the veracity of which was attested to by the large cross-sectional cut of the stolon of the offset. He had discovered them along a route he jogged as part of his fitness campaign as player in the local rugby club.

We travelled the dirt roads which got bumpier and changed to tracks as we progressed, past the formal mass-housing of a past apartheid dispensation until we reached the shacks of the current economic-apartheid present. Suspicious people peered to see what we were up to and Africanis-type dogs barked their indignation at the intrusion.

And then there was the "bush". I was somewhat disappointed. It was not pristine and was uncomfortably close to civilization – correction – human habitation. There were also signs of a pine plantation that had been felled some years before. This was not what I wanted to find, since nothing conclusive could then be deduced about the plant.

'Popo' - leaf surface before recovery

'Popo' new leaf surface after recovery

Worse was to follow. Popo, with an expression of abject disbelief, took us to a recently erected electrical sub-station. The ground had been bulldozed out in order to create a level secured area for its foundation. That was the precise spot where the plants had been growing. I inspected the piles of tree stumps and soil in the hope of spotting something that might resemble a clivia clump but to no avail. Popo took the circumstance as a personal affront to his dignity and an insult to his credibility. He assured us in apologetic fashion, as if we held him responsible for its disappearance, that the plant had been there.

We wondered about trying to see if there might be any other clivia plants about, but the terrain was difficult since it was a tangle of thicket and dropped steeply to the sea to the south and a ravine to the east. We admitted defeat, in retrospect, perhaps a little too easily. But I felt thwarted by the circumstances.

We were obliged to continue our homeward journey, this time via Bloemfontein for the annual architectural Sophia Gray Memorial Lecture there, but none the wiser about Clivia 'Popo' and its definite status, be that as a habitat plant or garden escapee. And then, as if to compound the misfortune, there was a nasty accident on the way home, where fractions of seconds, degrees and meters separated us from a beheading beneath a tractor-drawn hay-wagon on the N10 - that all is a story in itself.

I had rescued yet another specimen from the garden and it too escaped the circumstances of the accident and has bloomed. I cross pollinated the two plants, since the other pushed a second umbel. I've also put pollen on a single clump of my own "ordinary" clivias in order to create a gene-bank of plants. But the mystery remains.

Here are my hypotheses. If it is a garden escapee then there are several possibilities:

1. The nearby community is of Griqua extraction. They arrived in the area in 1927. People from Elandsdrif (Cradock), Trompsburg, Louisvale, and elsewhere joined the trek led by Andrew Abraham Stockenström le Fleur "[The Reformer"] on the last trek of Griqua people from Kokstad. These people originally settled at Keurvlakte (Nature's Valley), where they established themselves as fishermen and farmers. In 1939 The Reformer started negotiations with a farmer, a certain Van Rooyen, for hiring parts of a farm, Kranshoek, for use by the Griqua people and a site at Robberg for his future burial. At that time, The Reformer lived on a farm called Jakkalskraal, close to Kranshoek. His son, Thomas le Fleur,

Clivia 'Popo' - Umbel

continued these negotiations after his death.

1.1 If the plant originates from this community then the one possibility is that it was brought by them, which means they trekked with plants – clivia plants in particular. While it is not likely that they travelled with decorative plants, they have 'Kanniedoods' on the local graves and as a symbol on the Grave of "The Reformer". The plant *Aloe variegata*, as with its vernacular name, has come to represent eternal life. It is endemic to the dry south western area from which the party trekked.

1.2 A second possibility within the above scenario is that it was brought into one of their gardens as a plant from one of the gardens of the nearby white community, in which some of them may have worked in more recent times, possibly as gardeners. In both cases the seeds would need to have been distributed by an agent, but because of the proximity this would have been relatively easy. One would need to examine the gardens of the community to see if one discovered similar plants. But even that would not be conclusive because they, like Popo, may have collected plants from the bush.

2. Another explanation for the presence of the plant is that it actually is related to the gardening activities of the settled white community in the vicinity, although they are remote from the spot where Popo found it. The seed would have had to be carried by a vector, either an agent such as a bird or fruit bat, or as part of refuse dumped in the vicinity. Not knowing the exact history of the site makes a reconstruction of possible

events difficult, but could be solved if one finds a series of aerial photographs of the area over the past decades.

3. A third possibility is that there had been a homestead on the spot, perhaps a woodcutter or ranger's cottage, and that the plant is a remnant of a garden. Again one would need to research the history of the site.
4. If the plant is a genuine habitat specimen then there are some possible explanations.
   4.1 The plant was seeded into the pine plantation from its habitat location by birds, fruit bats or another of the possible animal agents, such as rats or dassies.
   4.2 The plant is residue from vegetative material that was already there when the plantations were planted and regenerated itself. If it is a habitat plant, it is a new record for *Clivia miniata* in terms of habitat range. The fact is, however, that it is not the usual form of *C. miniata*, the leaf form in particular, displaying strong *C. nobilis* characteristics in being discernibly serrated. The flowers are those of the *C. miniata*, but pale and heavily scented with a characteristic azalea perfume.
5. The fifth possibility is that it is an unusual form of a *C. miniata* x *C. nobilis* hybrid, but it is far outside of its range. This could then only have occurred under artificial circumstances.
6. A sixth possibility is that it is a relictual form of a cross-over type from *C. nobilis* to *C. miniata*. I have often wondered if those plants from the wild regarded as natural hybrids between *Clivia* species are not in fact relictual intermediate forms of plants.

There are probably many more specimens of the genus *Clivia* in the wild yet to be discovered. The place under discussion here is at the periphery of the Albany Centre of Endemism, home to both *C. nobilis* and *C. miniata*, although some hundreds of kilometres outside of their documented range.

The only way this riddle will be solved is when we have available a sufficiently large database of genetic information so as to help identify the species and place such specimens in some sort of taxonomical relationship, or if other plants are found nearby, either in cultivation or in the wild, establish if they have genetic links.

But much has happened in clivia research since this episode.

There is another form of *Clivia miniata* in the Heritage collection that putatively comes from the Storm's River valley. The Mzamba habitat complex has shown the diversity of form that may be found within a restricted locality. Latest evidence from the research of the Spies team seems to indicate that at least three of the species – *C. miniata, C. gardenii* and *C. robusta* – do not have a clearly distinguishing DNA make-up, there seemingly having been ancestral bastardising between species, what Dr Keith Hammett terms "cloud speciation".

So we can consider even other points for debate. Up until Dr Dyer identified *C. caulescens* as a distinct species it was classified with the two other pendulous species – *C. nobilis* or *C. gardenii*. We, however, seem satisfied that there is only one distinct species of *C. miniata*, no matter where and in what habitat it is found and with what other forms or species of *Clivia* it is associated.

I think of the Bearded Man form – or as Roger Dixon has now terms these variants, 'ecotypes" – this ecotype having distinct *C. caulescens* – like growth habits, the *C. minitata* ecotypes associated with the Ngome area, for which Wayne Haselau has, in the most recent *Clivia News*, made a case that the pendulous forms found there be considered a distinct species. I consequently wonder why not the trumpet flowered forms as well?

What is certain, is that, the genus *Clivia* will never cease to amaze.

Postscript

Sadly, Popo was later to commit suicide after a disappointment in love. And as is the way with the more humble but essential actors in these tales, much like the Zulu cook of Saunders' *Clivia miniata* 'Flava' fame, he remains in the clivia annals without his actual birth names. ▼

Clivias beneath the Northern Lights

By Felipe Orlans (LCC Member)

Spending an increasing amount of time in Scandinavia, I couldn't help but wonder as to how clivias would respond to the midnight sun summer days and the "endless" winter night.

I started by planting a few seeds which I'd brought along as gifts and… well, you know how it goes. Soon I was running out of space, building a nursery – a hothouse would be a more accurate description – and bringing in plants from home in South Africa to stock it. What started as a simple experiment out of idle curiosity soon became a major project which, instead of providing simple answers, kept throwing up more and more questions: when is the best time to bring in plants? Does one bring them from winter to winter or summer to summer? Which plants suffer most and which handle the trans-equator crossing best? What is the best size/age for a plant to be shipped? What soil mixes to use? (Scandinavia seems to favour large amounts of peat in their potting mixes – not ideal for clivias, I found). How to handle the winter temperatures of minus 20 and lower, and what to do when the heaters fail due to a power outage? What to do about the "Järn Nätter" (Iron Nights) when, for a few nights in June, temperatures drop below freezing point, after the clivias have been moved to the unheated greenhouse, which has better ventilation.

It's been a steep learning curve and without a doubt, growing clivias never stops to fascinate. But now, at 60 degrees northern Latitude, South African clivias are growing under the Northern Lights. ▼

CLIVIA HISTORY

The Clivia Society - Early Years

By James Abel

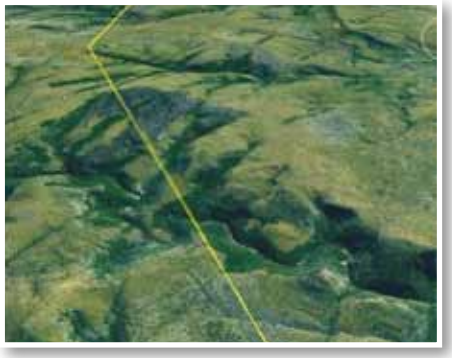
Connie and James Abel, Pretoria, kindly credited by Clivia Society founder Nick Primich with having taken "-- the Clivia Club out of an envelope and put it on the show bench" (*Clivia News*, 1995, 4.3.10).

Clivia enthusiasts nowadays are blessed with an extensive knowledge of their favourite genus, although there is still much more that is unknown. When Nick Primich started his newsletter at the beginning of 1992, mailing it to his three dozen bulb enthusiast friends around the world and advertising that new members were welcome, he tapped into a wealth of enthusiasm, with membership soon growing at an exponential rate.

Most new members had little background knowledge and they waited anxiously for the postman's delivery to immediately read each new issue from start to finish. Experienced members such as Nick himself and Wessel Lotter (SA), Bill Morris (Oz), Peter Smithers (UK/Switzerland) and Les Haniball (USA) contributed freely for the benefit of all.

Perhaps a few reminiscences about the early days will give current members some idea of the pent-up enthusiasm that was soon too great to be satisfied by the newsletter alone. The first clivia meeting was held at our home in January 1994 and a committee was elected. Within nine months of intensive fun-filled activity the first international conference was organised at the botanic gardens in Pretoria, and we were delighted to have Yoshi Nakamura, (Japan), Keith Hammett (NZ) and Pen Henry (Oz) join us. There was overwhelming public interest with a queue forming at the gate an hour or more before opening time. Besides the conference we arranged a show (Toy Jennings won Best on show with her 'Ella van Zijl'), sales, a photo exhibition (with international entries) and Nick took our overseas visitors on a tour from God's Window to the Eastern Cape.

One of the subjects that was of intense importance to the new members was to see clivias en masse, either in habitat or in planted beds. In the first case, local guidance would be needed to locate them so that one could see them under the natural environmental conditions within which they evolved. There was much emphasis on "leave only footprints and take only photos and memories", and this



is even more important now – facile reasons such as "preserving them for the future" hold no water. Habitat visits in our beautiful escarpment areas in the company of other enthusiasts became one of our favourite clivia activities. "In Habitat": Habitats reported ranged from reality to the most far-fetched claims. The most extreme of the latter was the story that there must be miniata in the Congo. It was based on "impeccable logic" – the impressive Belgian Hybrids (early-flowering, compact with dark orange flowers) were much admired, and

because of their name they 'obviously had to have originated in the Belgian Congo – QED!'

If it's in writing it must be true! There was much excitement in April 1995 when the authoritative travel magazine *Getaway* reported clivias in the beautiful Ruwenzori mountains on the border between Uganda and the Congo. After detailed sleuthing by Nick and Dries Bester, it was determined to be an incorrect identification of the attractive *Scadoxus cyrtanthiflorus*.

Then there are the clivia populations which are not indigenous but are escapees from domestic gardens, the original seed being dispersed by monkeys, birds, rodents and sometimes errant "enthusiasts". *Miniata* in Kenya were reported with certainty, and a few specimens were brought back to SA by a respected conservationist. It is now concluded that that the "wild" population must have been derived from seed dispersed from a home garden.

In the early newsletters there is a firm statement of the existence of several populations of *miniata* in the Soutpansberg mountains centred on Louis Trichardt in the Limpopo province of SA. These populations have not been seen since but if they existed they must have been escapees. The Soutpansberg are of course home to caulescens, the northernmost clivias, while the northernmost *miniata* are well south on the SA/Swaziland border.

We believe firmly that not two but three countries are home to clivias. SA has all six species and it shares with Swaziland the slopes of Bearded Man mountain where the only known natural hybrid is found, with its parents, *miniata* and *caulescens*. The two species appear further SW along the escarpment in Swaziland. Miniata are also found in the southern Lebombo mountains which are the eastern border between Swaziland/SA, and Mozambique.

The prevailing winds in this area are from the SE, carrying moisture from the Indian Ocean. There is a rain-shadow effect, and the Lebombos on the eastern Mozambique side have a higher rainfall than those on the western Swaziland/SA side, due to a rain shadow effect. There are numerous well wooded ravines on the border, and the second photo shows a valley on top of the Lebombos on the border just east of Siteki, a known habitat. There is more than enough sub-tropical forest to shelter clivia and we have no doubt that they will be discovered in their third country of origin: Mozambique. Whoever achieves that will be credited with being only the third person, after William Burchell (SA) and Mabel Smith (Swaziland), to first describe clivia in a new country.

The only habitat of which we are aware that is freely and easily accessible to enthusiasts is God's Window/The Pinnacle/Wonder View on the eastern escarpment. Massed *caulescens* may be seen there from paved pathways and look-out platforms, and a bonus is the lovely mountainous scenery with views over the low-veld. Fortunately most other populations are in secluded parts of the forests and are unlikely to be found without local guidance.

"In planted beds": In this case, we know of no freely accessible beds of clivias in South Africa, since unprotected populations are vulnerable to both the well-known "taking ways" of our citizens and to "harvesting" for traditional medicinal/spiritual use. Botanic gardens have magnificent displays of the various species, but only during restricted hours and with the payment of a moderate entrance fee.

Ironically, in striking contrast, on the opposite sides of the world clivias are freely accessible. In Santa Barbara, California, they may be seen in masses in open-access public spaces (photo Tom Wells). Many of the populations have grown through natural dispersion by animals or gravity from higher-lying gardens. They grow so easily there that some residents refer to them as weeds. Sacrilege to an enthusiast!

There are also massed plantings in Australia and New Zealand that are open to all, according to Ken Smith and Alick McLeman respectively, who have provided details and photos. For example, the photo above left shows *miniata* on campus at Richmond TAFE College where Ken is on the academic staff. Amongst the NZ populations is the bed on the right – full marks to the town officials for trying; their "sunshine" mistake is but the same as so many of us have made in our early years. ▼

RELATED

Northern Clivia Club's annual auction results

By Joubert van Wyk

Plant	Price
Lutea Shower	650
Christo Lotter peach x Meyer peach	900
Ruby Stewart F1 – blushed yellow	500
Hirao – grown from imported seed	2 250
Appleblossom Q2	7 000
Origin of Life	1 600
Hantie	2 500
Frans van Zyl Interspecific green brick	1 000
King Hamelin Yellow	500
Norscott Manor red tulip x Christo Lotter Miné	800
Emerald Dream – seedling of Bertie's Bronze (highest bid R3 200)	Not sold
Jade Eyed Chubb Pretty Pink	2600
Crown Prince	3 300
F2 split for Vico yellow and large white centred orange	500
Madiba Magic	1 200
Bertie's Bronze (highest bid R6 000)	Not sold
Belgian Green Green	2 000
Chiba pastel	1 400
Duchess	3 100
Declan	5 600
Keeled bronze	3 400

Christo Lotter peach x Meyer peach

F2 split for Vico Yellow and large white centred orange

Crown Prince offset

Q2

Clivia Club Membership – a few ideas to increase membership

By Connie and James Abel

Concern has been expressed that clivia club membership is generally static or dropping.

Current members

Apart from normal attrition, members usually stay on for an extended period, happily enjoying themselves and making varied contributions to the clubs and society. Others drift away and committee and other members should be continuously aware that if dissatisfied most people will simply "vote with their feet", leaving everyone blissfully unaware of the reasons for their loss of interest. Not only should committees conduct exit interviews but they should be constantly encouraging current members to be vocal about their needs.

New members

Shows are the best recruiting opportunity for members of the public to be exposed to the allure of clivias, and the information tables sign on a welcome number of new members. Members manning the information tables and others should recruit actively and not simply wait for visitors to express interest. Distressingly, many of the newcomers allow their membership to lapse after a year or two and every effort needs to be made to find out why.

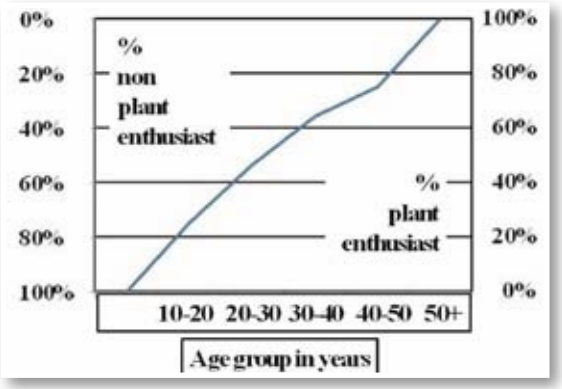
Age groups

Most members of both orchid and clivia societies fall into the "mature" group, with only a few young members. Over the years there have been a number of proposals that recruiting should be aimed at young age groups, including scholars. In contrast, some time ago Joubert van Wyk, our editor, remarked that our natural source of membership was older folk.

We decided to do a small survey, asking members at what age they became plant enthusiasts, specifically excluding young children's brief infatuations "with gran and her vegetable garden' and so on. Members of the Northern Clivia Club were asked the question at their meeting held on 2013-01-26, and responses were obtained from 28 members. The results are given in the graph.

It can be argued that the greatest (2/3) potential lies with the untapped youth where the proportion of enthusiasts is small. However, in their spare time they are most interested in sports and other social activities rather than the often solitary 'pottering' around with plants. From the graph it is obvious that an increasing proportion of people are naturally attracted to gardening and plants as they mature and become householders.

However, while most people like plants, the vast majority at any age cannot be called enthusiasts. While all, young and old, are most welcome, we agree with Joubert that specific recruitment effort and cost should be aimed at the much more receptive mature group. ▼



CLIVIA SPECIES

My marvellous *C. mirabilis*

By Margaret Matthews

As a member of the New Zealand Clivia Club, in April 2008 I purchased three seeds of *Clivia mirabilis* that the club had imported into New Zealand for members. At $10.00 each for seeds, which were reportedly difficult to propagate, I decided three were my limit.

On 24th April 2008 I sowed the seed with great expectations. I used CAN fines as the base of the mix, larger pieces of mix sieved out, and Pumice 1-7 grade at 1/1 ratio. This gave me a fairly open mix which was free draining but with some moisture retention. I place Clivia seeds, generally, keel down on the surface of the mix, and then press down until top of the seed is level with the mix. I put all three in the one pot.

I placed the container where I usually put my seeds to germinate on a plank 30 cm above ground level, against the wall of the house, under the eaves, facing SSE. This means a shaded position, by the house and under the eaves, with no direct sun except late afternoon in the middle of summer but with no reduction in light levels. I watered the seeds sparingly keeping the mix just moist and the seeds germinated readily. They were potted into individual pots November 2010 when the plants were 19 months old using mixture of:

- 2 parts Just Potting Mix from the Warehouse (it has no wetting agent and minimal fertilizer)
- 3 parts 2" milled bark (Orchid Bark)
- 3 parts Pumice 1-7
- Fertilizer (9mth slow release) Nutricote.

It was evident by this stage at the discrepancy in size between the three plants. The largest of the three plants had a greater root system and a higher number of leaves, although they were the same size and length of the other two plants, one of which was also larger than the other.

By 16 January 2012 they were repotted when they were 3 3/4 years old, using the same mix as above and situated in the same place outside as previously. Each plant now required

Matthew's C. *mirabilis* 1

Matthew's C. *mirabilis* 2

a different sized pot. The middle-sized plant had grown much longer leaves than the other two plants but had less leaves.

The largest and smallest plants had similar dark green leaves, some of which had a grey stripe down the centre. The middle-sized plant had paler green leaves with only a very faint grey stripe. The difference was quite noticeable.

By October 2012, Clivia Club Show time, the largest and most marvellous of the plants now had two small offsets emerging some distance from the main stem and it was also apparent there was some growth activity at the base of the main stem. There was much lively discussion and mirth at the show as to the outcome. It subsequently grew rapidly, emerging as leaves the same width as the main plant and is growing rapidly. Unfortunately, one the other side rotted after becoming too wet as it was slightly covered with the potting mix.

February 2013. It would seem this plant is in a great hurry to mature and is now using another strategy to increase its size by dividing also at the apex of the main plant which means there are now two growing points producing new leaves. There is great speculation as to when this plant will flower. Will it be November 2013?

At present it has totally filled the pot it is in with some of the roots bursting out of the mix. I have been reluctant to repot the plant while it has been actively growing almost continuously. I will need to do so soon.

Meanwhile the other two plants continue to grow well, both are quite different in respect to the length of their leaves, the second largest having leaves now much longer than the "marvellous one" but the plants overall still only have one growing point and are nowhere near the size of the "marvellous one".

All have heavily pigmented bases, so I expect orange flowers.

I have tried to give my plants conditions similar to those found in habitat, very good drainage, high light concentration, and watering only when the potting mix seems to be drying out as *C. mirabilis* have very thick velamen-like covered water storage roots as well as some enlarged fleshy roots. They are found in a dry summer and winter rainfall habitat similar to ours (sometimes).

It is difficult to understand why one plant seems to be growing exponentially compared to its siblings, all grown under the same conditions, but I think nature must surely be winning as it is obvious the "MARVELLOUS MIRABILIS" has it "all in the genes". ▼

Colour compatibility between the clivia species

By Alick McLeman

I was pleasantly surprised a few years back to find that my yellow Zoutpansberg caulescens was compatible with group 1 yellow miniata. That is, when the two are cross pollinated, 100% of the progeny have unpigmented bases and flower yellow in the first generation.

C. gardenii – 'Bell Bird'

Presumably, the two species have common genes giving rise to the chemical process which produces the red anthocyanin pigments, and the same genetic defect has occurred in both, resulting in the failure to produce anthocyanins. Unfortunately, we know little about the chemical process related to the production of pigments, but there appears to be a complete absence of anthocyanins in both plants ("anthocyanin-free").

C. caulescens - 'Zoutpansberg'

In the case of *C. miniata*, we draw a distinction between group 1 yellow and group 2 and other non-group yellows, the difference being that the former are "anthocyanin-free" whereas in the latter, the anthocyanins are present, but blocked, this blocking being evidenced by the bleeding of red pigments where flower tepals are damaged.

So if group 1 yellow *miniata* and the yellow *caulescens* are both group 1 and "anthocyanin-free" resulting in compatibility between the two species, is there a similar compatibility with any yellow clivia of other species?

I thought this might be the case with the whitish *C. robusta* 'Caroline's Pride', but crossing with both group 1 and 2 yellow *miniata* has resulted in seedlings with pigmented bases. Yet 'Caroline's Pride' appears to the eye to be "anthocyanin-free".

Then what about *C. gardenii*? Rex Williams has a yellow *gardenii*, 'Bell Bird', which exhibits the same traits as group 1 yellow *miniata*. Its breeding is Gem's 'Ivory Jade' selfed. A sister

C. gardenii – 'Kea'

C. nobilis – Yellow variety

C. robusta – F1 'Caroline's Pride'

C. gardenii var. Citrina

plant, 'Kea', supposedly also the same selfing but obviously pollinated with stray pollen, flowers orange but is split (heterozygous) for the yellow. The crossing of the two plants results in 50% unpigmented and 50% pigmented progeny, exactly what one would expect in a similar group 1 *miniata* crossing. But Rex hasn't done the cross with group 1 yellow *miniata*. So here in New Zealand we are experimenting to see if crossing 'Bell Bird' with group 1 yellow miniata will produce yellow progeny in the F1 cross.

And then what about crosses with yellow nobilis? My specimen appears to be ever so slightly pigmented, but when selfed it has produced unpigmented progeny (May I live long enough to see them flower). Similarly, my F1 *C. gardenii* var. citrina has a strongly pigmented red peduncle.

Unfortunately, here in New Zealand we only have limited access to yellow clivia of species other than miniata, but South Africa is

Interspecific *miniata* X *caulescens*

obviously richly blessed in this regard. It would be interesting to know if any crosses between yellow miniata and yellow of the other species have resulted in unpigmented seedlings, or is the Zoutpansberg yellow *caulescens* the only example? ▼

Group 1 yellow *C. miniata* flower

Rare clones of *C. robusta* and further notes on the ecology of this new species

By Wayne Haselau

During the 1980s and 1990s I worked for Cape Nature Conservation as an inland fisheries officer and spent a great deal of time surveying and exploring the estuaries and rivers of the Eastern Cape. It is important to remember that for many years the Transkei was an independent country, being a proclaimed Bantustan State, under the old apartheid regime in South Africa. Consequently, I could not work in this region officially until Transkei became reincorporated in the greater South Africa post-independence in 1994. The Transkei is a magnificent wild land and is renowned for its lovely coastline, for its grasslands and beautiful forests and deep river valleys which are especially numerous in this region. The climate of the Kei, as it is so affectionately called, is mainly warm-temperate to subtropical with typically warm moist summers and cool dry winters. South of the Mzimvubu river is the home of the majority of Xhosa speaking tribes and north of the Mzimvubu river is home to the proud and famously never-conquered Xhosa-speaking AmaPondo Tribe.

Sadly, this wonderful enviroment is changing rapidly though as an ugly pernicious Rural Sprawl spreads unchecked over the landscape. The once lush-moist environment of the region is giving way to desertification (especially inland of the coast) on a grand scale as the rapidly burgeoning local population gobbles up what's left of the meagre natural resources. Human overpopulation and huge numbers of uncontrolled livestock are leading to widespread forest destruction and overgrazing. Habitat destruction is the order of the day and the final straw is the constant burning of what little grassland remains for livestock. Environmental Education is key in preventing this, however the current Government seems determined not to educate its rural youth properly. This does not bode well for the region's fabulous habitat Clivias.

Since I can remember I have had a fascination for natural history, however it is fish and fishing that really get my blood pumping. For many years pre and post-independence, I investigated the angling potential of estuaries in the Transkei, some very remote. During these travels I discovered Pondoland, which is

'Green'2 Cream'

'Jana's Choice'

'Jane's Delight'

undoubtedly my favourite place in Southern Africa. It was inevitable that I would bump into the then undescribed Pondoland Endemic *Clivia* species, growing as they do on the local sandstones associated with water, in this unique wild region. *Clivia robusta* was the first *Clivia* I noticed flowering in habitat circa 1998 and from the very outset I was struck by the affinity of the species for water. This is a very unusual trait for a *Clivia* species, as noteworthy as say the supposed sun-tolerance of *Clivia mirabilis*. These first memories are of plants with generally large broad light green leaves and attractive orangey-red, pendulous flowers, which grew in large colonies in remote areas close to, or in water.

I did not know what they were initially (neither did the botanists who lumped them as *Gardenii*) but collected a few seeds nevertheless, which I gave to friends to grow on as I was travelling a lot for work at the time. Over the years I visited these areas as often as possible and continued to collect seed of this species, which were duly germinated and grown on. Over time I built up a fairly substantial collection of these plants and was amazed at the length of time it took them to flower. It was a good few years before the 'Clivia Bug' really bit terminally and in 2004 I made my first dedicated trip to Pondoland to investigate this then newly described species more closely *in situ*.

On my first serious *Clivia* habitat trip, I photographed what is undoutably the best form of *C. robusta* I have ever seen. It was a single plant growing in a deep drainage line (a small non-perennial waterfall) on a steep riverine cliff face close to the sea. I collected some ripe berries and the resulting seedlings have taken many years to flower. One of the resulting mature plants I have named 'WCC Pondo Pride' is an outstanding clone of the 'Maxima'-type (see photo). In June 2012 it was a very big plant and it pushed four flower spikes. It seems to willingly accept pollen from a wide range of *Clivia* species and hybrids, however what makes this clone so outstanding is its size and superb form, the flower shape,

'Pink Patience'

'White Wings'

short and very broad with a very high flower count (up with up to 72 recorded). Some of the wonderful clones Wild Coast Clivias breeding with are (refer to photos) 'WC Pondo plum',' WC Green2Cream', 'WC Pondo Pink Blush', 'WC Jane's Delight', 'WC White Wings', 'WC Jana's Choice' and 'WC Pink Patience' as well as 'Fred's Maximas'. Other wonderful clones like those mentioned below from other well-known pendulous breeders and collectors are also part of my breeding programme.

I am constantly amazed at the variation within wild clivia populations, so often isolated in deep river valleys and ravines, or in remote patches of swamp forest. In many cases these colonies have remained genetically isolated for a very long time. Due to the forced inbreeding of these populations some colonies have evolved unusual forms in what is ostensibly a very homogenous species morphologically. Typically flowers are orangey-red and plants are medium sized. In most localities other flower colour forms are either entirely absent or very rare. There are a few exceptions to this but this is the general pattern in the habitat. Leaves may vary a lot, some forms have long thin light (new Umtamvuna area) green leaves whereas in others, leaves may be short, broad and dark green or extremely large, as in some of the largest known forms such as the Clivia 'Maxima' so passionately bred and grown by the late Fred van Niekerk of Pretoria. Oom Fred and and his wife Cora popped in to visit me when I first started my collection seriously in 2005. Over time, Fred and I became firm friends and I spent many wonderful hours visiting them in Pretoria. Fred had some very old *Robusta* clones and he bred with them extensively. His now famous 'IMAX' was one of the first *Robusta* hybrids and Fred used his Maximas in various breeding programmes and crossed them with his extensive collection of Natal yellow *miniata*.

As far as I am aware these now famous clones originated on or near the Mtentu River in northern Pondoland where Fred's parents owned a trading station. The area is now a reserve and is famous for its catch and release fishing. I have been to the area that these plants originated from and it is a beautiful wild place close to the sea consisting of grassland interspersed with deep forested valleys and a number of spectacular waterfalls. Not all the plants in the area are this form and I suspect that Fred selected the largest and best forms when he collected these four clones so long ago. There definitely seems to be a gene for gigantism in this species as in many of the colonies I have visited, a percentage of the plants are very large indeed. It is quite possible that these oversized specimens represent a separate gene pool. (This is another question that could possibly be solved using DNA sampling?) I visited one colony where truly enormous plants grew at one time close to a major population centre, however as is so often the case, these plants have been all but

eliminated by forest destruction, over-collection by collectors and sangomas for the muti trade. Fortunately a number of these plants have ended up by various means in collections and so some of this material is now SAFE (*ex situ*) and available to breeders.

It is the huge morphological variation in *Clivia* in general that fascinates us all and it is this very unique genetic diversity that makes the species so interesting and this species is no exception. In *C.robusta*, small dwarf forms are known as are massive giant forms with leaves 8cm wide and almost 1.5 meters long. This variation is due largely to selective processes, influences acting locally over long periods of time resulting in the selection of the strongest most suitable plants for the locality concerned and all due to what is effectively inbreeding.

Pollination/Seed dispersal:

Pollination is a complex and fascinating aspect of *Clivia* ecology that has been discussed by numerous authors including myself, however the remote ruggedness of the Transkei presents unique problems for pollination. Many clivia are effectively selfed by movement of the flowers alone (i.e. wind) however to win the genetic lottery and first prize clivias need to cross-pollinate and to do this they need other organisms to assist them. Normally insects or birds are the main pollinators in *Clivia*. In Pondoland in 2006 while fishing near a river mouth, I witnessed an Olive Sunbird actively feeding on three different plant species, *Aloe arborecens*, *Clivia robusta* and *Dermatabotrys saundersii* which were all in flower on a riverine cliff at the same time. The bird moved from one species and back again without seeming to notice any difference in the plants, as they all have tubular red flowers. This is a remarkable example of co-evolution on the part of the plants.

Olive Sunbirds are large for a sunbird; they are strong, fast flyers and will travel long distances to forage at a nectar source. I believe they are the most important pollinators of *Clivia robusta*. Greater Double Collared Sunbirds and Black Sunbirds and possibly other sunbird spps (Collard Sunbirds) definitely also use *C. robusta* as a nectar source however they often bypass the long flower tubes of *C. robusta* as their beaks are too short. To access the plant's nectar, they are then forced to puncture the flowers close to the ovary. This possibly would assist the plant in selfing itself but by bypassing the tube means that they do not actively cross pollinate the species as they do not actively engage the pollinia.

This, then, is the only way isolated colonies stand any chance of outbreeding, however it is more difficult to explain the presence of *Clivia miniata* and *Clivia robusta* crosses in the wild. Although these plants are very rare as the two species have differing flowering seasons, I am aware of a number of such interspecific crosses from the habitat. Sunbirds do not pollinate *C. miniata* so the pollinators in these cases must be insects and I suspect that it is specimens of the small wasp genus I wrote about some time ago that are largely responsible for this type of interspecific pollination.

The flowering season of *Clivia robusta* thus coincides (May, June) with the flowering of certain other plants with similar flower types and colours in the habitat, such as aloes, *A. arborescens* and *Dermatabotrys Saundersii*, a rare epiphytic shrub that flowers at the same time. I believe that all these different species flowering together enhance the volume of available nectar sources. This would then ensure that the main pollinator remains active, even when the number of flowers of one species drops below what would be ideal i.e. productive foraging volumes. Seed dispersal is most likely carried out by birds such as Knysna (loeries) Turacos and species of Bulbuls. Monkeys are also important dispersal agents and Pondoland is the only place where I have observed both species of local monkey, Vervet and Samango, foraging happily for fruit in the same tree. I feel both species are therefore potentially seed dispersers of *Clivia robusta*. Clivia fruits float and this aids in their downstream dispersal as many *Clivia* colonies are found along river banks, however due to the close association of *C. robusta* with water, this form of dispersal is especially relevant in this species. *Clivia* fruits have a growth inhibitor in the seed coat and mice often play a role in eating this off

allowing the seeds to germinate. Recently, I observed a large forest millipede eating the soft part of the fruit of a clivia at night. It is therefore quite possible that millipedes are also important to clivia in the habitat.

Clivia robusta is called the swamp clivia due to its close association and coevolution with water. It is as such the most water tolerant clivia species although it is intolerant of stagnant water and is most commonly associated in the wild with running water in some form. *C.robusta* is most commonly found in swamp situations in the north of its range i.e. at Umtamvuna where water is at the surface and very marshy. One of these unique habitats, called simply the Banana farm, has been made famous by Andrew Forbes-Hardinge. Andy has led tours to this fabulous colony for years and has given many Cliviaphiles first-hand experience of these wonderful plants. This a very rare mutating colony and many colour forms including yellows (actually more cream) are found here. Many of the famous and awarded *C. robusta* clones such as Val Thurston's 'Marshmallow', Brian Tarr's 'Ice Giant', Andrew's 'Caroline's Pride' and Sean Chubb's 'Munster Peach' and 'Crystal Rose' originate from this locality. Recently, a distinctive new form which seems transitional between *C. robusta* and *C. gardenii* has popped up in Northern Pondoland and is restricted to a single river valley as far as I am aware. The leaves are dark green and very narrow but thick and quite strap-like. Flowers are larger than standard *Robusta* or *Gardenii* flowers. Flower colours are much more variable and lovely blush forms, pinks and dark bronzy forms are fairly common in these colonies. This unusual new form has great future potential in the breeding of new interspecifics.

It is my hope that this article stimulates more interest in the wonderful plant *Clivia robusta*, which quite obviously deserves so much more attention from us all. ▼

CLIVIA CLUBS & INTEREST GROUPS

Garden Route Clivia Club Mini Interspecific Show 2013

By Willie & Cynthia le Roux

The 2013 Interspecific Show of the Garden Route Clivia club was considered by our committee to be an important milestone in the journey to full maturity of a club event worthy of support similar to our September Show. It is of course still a "Work In Progress", but is gaining in stature as more and more members learn to appreciate the exceptionally beautiful hybrids that are emerging from the enthusiastic breeders who have already taken advantage of the potential. In order to encourage further this exciting avenue of development, some of the recognised breeders in the club offered flowering plants for sale at the Interspecific Show and three valuable hybrids formed part of the raffle.

The show was held on the 10th of August 2013 in George. There were some beautiful plants on display and it was a big success. Thank you to all the members who attended and to all who displayed their lovely flowers.

Best any other colour - Carrie Kruger

The following is a quotation from Willie le Roux, chairman of the Eastern Cape Clivia

Best any other species - Rod and Bridget Randall

Club and our guest judge 2013:

"In 2003 Cynthia and I had the opportunity to attend the very first Garden Route Clivia Club Show. Now 10 years on we were again privileged to attend your first Interspecific Show and what a pleasure. I was very honoured to act as a judge in the place of Koos Geldenhuys who unfortunately had an eye injury on his way to the show. The quality of the plants on show and variety of flower colours were exceptional and admired by all who attended. Added flavours were of course the presentation by Gerrie Brits rounded off by the very tasty refreshments served, all of which contributed to the success of a well organised event.

Piet and Yvonne and the trophy

Best on Interspecific Show 2013

Garden Route's oldest member admiring the flowers on display

Well done to all of you. I am positive that with the eagerness and friendly spirit projected by all, you will follow the same route as with your main show which has become a showcase for all. Good luck for the future and thank you for the opportunity to be part of it".

Congratulations to all the winners:

Best orange: Kobus and Ida Esterhuizen
Best red: Louis de Swart
Best yellow: Carrie Kruger
Best pastel: Carrie Kruger
Best any other colour: Carrie Kruger
Best first flower: Welland Cowley
Best own breeding: Piet Theron
Best other species in flower:
Bridget and rod randall
People's favourite: Piet Theron
Best on show: Piet Theron. ▼

CLIVI-ARTA BY HELEN SANDERS

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CLIVIA CLUBS

Cape, Eastern Province, Free State, Garden Route, Joburg, KwaZulu-Natal, Lowveld, New Zealand, Northern and Northern Free State

INTEREST GROUPS

Border, Bosveld, NKZ-N (Newcastle), Overberg, Highway (Durban area) and Vryheid

Picture taken by Heidi Nerurkar