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# CLIVIA NEWS

& QUARTERLY NEWSLETTER OF THE CLIVIA SOCIETY &



VOLUME 20 NUMBER 2 & APRIL - JUNE 2011

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& THE CLIVIA SOCIETY	Inner Back Cover

## The Clivia Society [www.cliviasociety.org](http://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 Newsletters 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 above-mentioned objectives.

More information on the Clivia Society available on  
[www.cliviasociety.org](http://www.cliviasociety.org)

## ADVERTISEMENTS

WILL ANYONE WISHING TO ADVERTISE OR WHO KNOWS OF POTENTIAL SPONSORS OR ADVERTISERS PLEASE COMMUNICATE WITH SAKKIE NEL 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 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 has become practice to place the Editor's report to the Clivia Society Annual General Meeting – so here it is –

### Clivia News – Editor's Report to the Annual General Meeting of the Clivia Society 2011

*This report covers Volume 19 Number 2 through to Volume 20 Number 1*

The Issue Volume 19 Number 2 devoted to discussions of the phenomenon of Peaches and various groupings and cultivars was well received. The issue for the Clivia Conference, Volume 19 Number 3, with all the potential pitfalls, went off smoothly and contained the Auction Brochure as a bonus. The Christmas Issue, Volume 19 Number 3 was an unexpectedly plump number. The first of this Year, takes on a slightly altered appearance, having dropped much of the individual information relating to the constituent Clivia Clubs and interest Groups, aspects that presented problems reported upon to the previous AGM of being up to date and having the correct details and names of contact persons of the various Clubs. This information is now addressed by omitting these from the *Clivia News* as of Volume 20 Number 1 and rather having this information web-based and on the Clivia Society's webpage. There still exists a need for all Clubs to find sponsors and advertisers for the Newsletter. The 2011 Year Numbers will continue Lena van der Merwe's narrative of the Heritage of the Clivia Society, commenced in Volume 20 Number 1 as a build up to the 20th Anniversary of the Clivia Society.

Members are reminded that topics that members can address in communications or articles are:

- Clivia in habitat
- Personalities, the plants that they grow and their breeding achievements
- Reports from Clubs particularly as regards reports on talks or outreach

- Show pictures, particularly top plants and their growers/showers
- Named Clivia cultivars or clones and their characteristics
- Descriptive terms and botanical terminology
- Experiences in breeding and growing
- Prediction of trends or directions for breeding
- Pests and diseases.
- Technical developments in the marketplace
- Short reports on research outputs
- Heritage and heirloom plants
- Photo-essays any topics of interest to the Clivia circle.
- Anything related to collectable or memorabilia in the world of Clivia.

I wish to thank all those that made contributions to the issues of 2010-11, and in particular Greig Russell for editorial support and regular contributions.

Thanks as always to the Layout Artist, Fréda van Wyk, who helps maintain an artically presented quality publication. Thanks, as always, to Annetjie and her team at CPD printers for regularly getting *Clivia News* to press.

Helen Sanders of New Zealand is regular with her delightful contributions of 'Clivi-Arta' It is once more recommended that, as in the past, she receive copies of the publications of the Clivia Society. It is also suggested that the Clivia Society consider a special 52 week planner for Clivia Breeders and Growers which are illustrated with the 52 Clivi-Arta cartoons Helen Sanders has prepared to-date as a memento for the 20th Anniversary of the Clivia Society.

As always a big "Thank you" to Lena and especially to Sakkie who as members of the Executive take care the affairs and well-being of the Newsletter. &

Roger Fisher

Editor – *Clivia News*

EDITOR OF NEWSLETTER ROGER FISHER: PO Box 1039, White River, 1240, Republic of South Africa  
& Tel: +27 83 602 7736 & Fax: 086 515 0710 (RSA only) & E-mail: clivianews@cliviasociety.org

PUBLIC RELATIONS OFFICER SAKKIE NEL: PO Box 35235, Menlo Park, 0120  
& Tel: +27 12 361-6415 & E-mail: corgas@vodamail.co.za

YEARBOOK EDITORIAL ROGER FISHER: PO Box 1039, White River, 1240, Republic of South Africa  
& Tel: +27 83 602 7736 & Fax: 086 515 0710 (RSA only) & E-mail: clivianews@cliviasociety.org

& DESIGN & LAYOUT FRÉDA VAN WYK: +27 82 468 8485

& PRINTING CPD Graphics (Pty) Ltd., Pretoria Tel: +27 12-342 1978/9

## CLIVIA PERSONALITIES

## Honorary Member of the Clivia Society (2011)

[Claude Felbert is one of the founding members of the Cape Clivia Club in 1996. He has served the Clivia Society as Editor and Photo-Editor of the Clivia Society Yearbook, CLIVIA, and instituted and served as Convener of the Clivia Society Photographic Competition. He was awarded lifelong honorary membership of the Clivia Society at the 2011 CS AGM.]

## CLAUDE FELBERT – CITATION FOR HONORARY MEMBERSHIP OF THE CLIVIA SOCIETY (2011)

The Cape Clivia Club grew from a small interest group of people who assembled at Kirstenbosch on one Saturday morning in October 1996 in response to an invitation placed by John Winter in *Veld and Flora* to learn about pollinating Clivia. Claude was one of this group, and when John offered a then rare young yellow Clivia plant to all who had attended the meeting, Claude immediately offered to collect and deliver them to everyone personally. From that small beginning, not only The Cape Clivia Club but to an even greater extent, The Clivia Society has benefitted from his enthusiastic, generous, unselfish and helpful spirit.

Claude has always taken an active role in all activities of The Cape Clivia Club and The Clivia Society He has been on the Committee of The Cape Clivia Club from its inception and has been one of its Representatives on The Clivia Society since 2002.

The Cape Clivia Club hosted the Second Clivia International Conference of The Clivia Society in 1998. Claude was on the organizing Committee that helped to make this a memorable event. At the Conference he initiated and conducted an Auction of rare Clivia plants which was a great success.

Claude was an editor of the first Yearbook of The Clivia Society which was published in 1998. His knowledge and experience of photography, computers, graphic design and printing were vital to the publication of that Yearbook and of all the subsequent Yearbooks up to Yearbook 10. This involved very many hours of very careful monitoring of not only the preparation of the articles published, but also in the selection and

proper preparation of all the photographs and involvement in the printing process itself. Claude always attended the printing works to ensure that colours were correctly reproduced. He more often than not did this until two o'clock in the morning, as the work was usually done on the night shift.

He played a pivotal role in the improvement of The Clivia Society's Newsletters by prevailing upon the printers of the Yearbook to print covers with selected photographs of clivia in colour for the Newsletters at no additional cost, and provided descriptions of and comment on those photographs.

Beginning with *Yearbook 6* he also took over responsibility for the graphic design of the Yearbooks up to Yearbook 10. He charged a nominal fee for that service which bore no commercial comparison with the very many hours he devoted to it, especially the hours spent in preparing photographs for publication. There is no doubt that the improvement over the years in the 'quality' appearance of the Society's Yearbooks was entirely due to Claude's untiring and highly professional efforts. He set a standard that will be difficult to maintain.

He has given generously and freely of his time and expertise to everything else he has done for



Claude Felbert in receipt of his certificate of honorary lifelong membership of the Clivia Society at a meeting of the Cape Clivia Club.

the benefit of Clivia in general and the Society in particular. This included the very many hours spent on designing and making up the Cape Clivia Club's First Colour Chart, and many times that effort in designing and preparing its Second Colour Chart for printing and the monitoring of the printing itself, again deep into the night.

He has also initiated the photography competition for the Yearbook, which further improved its content and, with Ian Coates, was responsible

for organizing a photography workshop for those who attended the 2010 International Clivia Conference.

Claude has set an example for all by his unselfish, generous and tireless contribution of his talents and knowledge to the interest of Clivia over that period of 14 years and has always done so with commitment and enthusiasm.

In recognition of these services the Clivia Society awards CLAUDE FELBERT Honorary Life Membership of The Clivia Society. &

## ERRATA

In the last issue Piet Theron's story about his cross MP7 mis-identified the plants and missed the crucial photograph. Here they are:



MP7 = MP1 x MP2. A Cinnamon multipetal progeny.

MP2 is also a plant of the late Gert Wiese originating from Bertie Guillame.



MP1 'Rose' is a plant of the late Gert Wiese.



PHOTO GORDON FRASER

## CLIVIA CULTIVAR REGISTER

### Clivia Cultivar Names Checklist and Register now online

Ken Smith, Registrar, Australia <http://www.northamericancliviasociety.org/cultivar-home.php>

The site, the official online resource for the Checklist & Register of Clivia Cultivar Names, is hosted by The North American

Clivia Society on behalf of The Clivia Society and is maintained by the International Registrar, Kenneth R. Smith.

It is hoped that this online resource will encourage people to submit extra detail about any of the listed Clivia, as well as formally registering their named plants. Where there are images, they have been uploaded, and we ask for any other growers to submit their images of named forms so they can be included. This resource is a compilation of details about named Clivia from many sources. You can search the listings based on a number of traits.

Where the Clivia has been formally registered with the Clivia Society it will be noted in the description. This resource is continually

evolving as new information comes to hand. It must be noted that for a Clivia Cultivar name to be formally "Registered", it must appear in a dated, printed publication.

Initially this website opens with the contents of Volume 1 of 'A Checklist & Register of Clivia Cultivar Names' published in 2009 and distributed by the Clivia Society to members. A lot of information had to be transcribed. If you see errors and want the data or photos of the plant that you submitted to the Registrar to be changed please contact the Registrar. All other enquiries about name registration are also encouraged. &

## Stop Press – Online Registration Form

Marilyn Paskert, NACS, USA

The Clivia Register and Checklist has had many photos added since it first went online. Thank you so much to everyone who has sent photos in. If you have photos that you have taken of any of the plants on the list and are willing to have them added, please send them to Ken Smith at [cliviasmith@idx.com.au](mailto:cliviasmith@idx.com.au). We can only accept photos from the photographer, not anonymous photos or ones taken off the internet.

The rose register also has photos from multiple

sources. Why is this a good idea? An interesting case is Andrew Gibson. There are 3 photos there. 2 taken by me of the same plant in different years... and what a color difference! It is interesting to see the color differences in these Clivia chameleons and the range of what to expect. There will soon be a new registration form than can be submitted online to register Clivias. Please be patient. Every new task has a learning curve and this one is steeper than anticipated. &

## COMMUNICATIONS

### Jeanne Marten's Clivia Display – Toowoomba

Di Matthews – Melbourne Clivia Club

An exhibition of flowering clivias will be on display at the Wilsonton Shopping centre, Bridge Street, Toowoomba.

This display will be on from Friday 17th September to Saturday 25th September.

There will be sales of clivia plants and a raffle, with the proceeds going to the Highfields Local Ambulance Committee, a volunteer organisation.

If you are in Toowoomba, come and view the wide variety of clivia blooms in creams, peaches, apricots and oranges, together with variegates and akebonos. &

### Highway Clivia Interest Group

Mike Callaghan – Chairperson, Highway Interest Group, KZN Clivia Club

A meeting was held at Mike Callaghan's home on Saturday 14th May 2011. Francois van

Rooyen kindly came to give a talk and slide show on the Heritage of *Gardenii*.

Francois focused his talk on four main groups:

- The Ngome group.
- The Midlands group – being extremely vast and varied.
- *Robusta* occurring from Port Shepstone southwards.
- Maxima from Port St. John's area.

We were encouraged to observe and feel our clivia plants to improve our understanding of the different species.

The "fan" shape of the Ngome clone is outstanding and the colours range from blood red to yellow. Flower count is normally in the 50+ range and Ngome plants form an onion shape at their base. For breeding purposes, Francois suggests not using *Gardenii* with less than 25 flowers on an umbel. The photos shown were outstanding.

In closing, the following points were raised about *Gardenii*:

- have vast colour range
- disease resistant
- often have double spikes
- different flowering season to *Miniata*
- offset readily

On Sunday 15th May 2011 Andy Forbes-Hardinge met a group of us at Port Edward and took us on a walk to see Robusta in their habitat. It was incredible to see the size of these plants growing in such a wet and muddy area.



We stumbled and clambered around the forest swamp floor, sinking deeply into the muddy river-course and came across a variety of colours, pink, cream, dark orange/red, pastels



and oranges, growing in amongst the Umdoni trees. A couple of different species of epiphytic orchids as well as ground orchids growing in the damp conditions were also pointed out. The group observed, in wonder, the giant specimens with huge round stems and tall long pale green leaves, some well over the height of some of our taller enthusiasts. It was also extremely encouraging to see the amazing amount of young seedling plants that were scattered in and around the parent plants, a good sign of the re-generation of the species in this particular colony. Many mature plants also bore a good number of last seasons' maturing seeds.

Let's keep it that way guys – don't destroy our heritage!

We even had the company of a very eager, energetic and enthusiastic member, Simon Chubb age 8 – the future generation of a clivia fanatic in our midst! A wonder experience was enjoyed by all who came.

[See also in this issue 'My first habitat visit' by Randal Payne – Ed] &

## Chromosome Morphology

Keith Hammett, New Zealand

When Dr Yidong Ran was undertaking his PhD study into the cytogenetics of the genus *Clivia*, amongst a batch of *C. nobilis* seedlings derived from an accession kindly given to me at Kirstenbosch, he identified one individual where the chromosome morphology indicated that that plant was a



hybrid between *C. nobilis* and *C. miniata*. That plant is now mature and has flowered for several seasons.

The image clearly illustrates the plant's hybridity and again demonstrates that chromosome morphology is a powerful means of identifying *Clivia* species and primary hybrids between them. The other seedlings in that accession were all *C. nobilis*. &

## Welland Cowley article response

Bill Morris, Australia

The article written by Welland Cowley in the *Clivia News* January – March 2011 issue on the confusing results of crossing *Clivia miniata* cultivars with pollen of *Clivia nobilis* is, in my opinion, much easier explained than the explanation offered by the author.

I suggest that when crossing two species it is not uncommon for the cross to be successful in only one direction. If the plants are not closely related (for example, in different genera) often the cross is incompatible in both directions.

In the case of Cowley's crosses it appears that certain *Clivia miniata* clones have accepted the pollen and produced interspecific hybrids, while in other cases the pollen has not fertilised the flowers and selfing or extraneous (perhaps wind blown) pollen has pollinated the plant. This is

really very similar to the incorrect reporting of pollinating *Clivia miniata* 'Natal Yellow' with its own pollen where the offspring produced was always orange. Finally it was realised that 'Natal Yellow' was self sterile and thus could not be selfed but would produce seed from extraneous pollen (usually orange).

The results from Cowley's article suggests something similar where, instead of being self sterile, some *C. miniata* clones accepted the *Clivia nobilis* pollen while others did not – but the latter freely selfed or accepted extraneous pollen (derived from numerous other *Clivia miniatas* in the vicinity). This explanation is based on the suggestion that plants and flowers which have "*Clivia miniata* floral and vegetative characteristics" are simply *Clivia miniatas* (Cowley made no comment about how they differed from *Clivia miniata*).

In the two groups of mother plants various were labelled Group 2. In the first group, two of the six were oranges while in the second group, one orange out of eight plants was so labelled. Now, only yellow plants can be labelled (by breeding results) and separated into Group 1 or Group 2 (or further) and oranges bred from a Group 1 or Group 2 (yellow) parent could be described as "carrying Group 1 or Group 2 genes" but not labelled Group 1 or Group 2.

From the results published I cannot see any reason why Cowley can say "it is clear to me that Group 2 plants will make the best berry plants when aiming at interspecific crosses when *Clivia miniata* is the berry parent".

My conclusion from his results would simply be "when putting *Clivia nobilis* pollen on to *Clivia miniata* plants, some will accept it and others will not. The results will be that the hybrid offspring will look somewhat intermediate in character and are interspecific hybrids – while those which look *C. miniata*-like will be *Clivia miniata*".

Fortunately, Cowley states that he has "selfed" the *C. miniata*-like F1 (?) plants and, if they are actually selfed, I suggest that no interspecifics will appear in the F2 generation – only *Clivia miniatas*.

So, as Cowley states, "time will tell".

(19 May 2011) &

## Mick Dower article response

Bill Morris, Australia

In the issue of the *Clivia News* January – March 2011, there is an article on the Umtamvuna Gorge clivias by Mick Dower, in which he states that the breeding of two yellow clivias from orange flowered Umtamvuna-collected plants (32C and 29B as described in the article) and tested by breeding to known Group 1 yellows “probably meaning that the whole Umtamvuna population is Group 1” is the same error as made in the Cowley article.

All that can be said is that these two clones (32C and 29B) carry Group 1 yellow genes.

As was said earlier in this article “we found no yellows and, as far as I know, no yellows have ever been reported there”. This suggests that yellow genes (Group 1) are rare in the orange population and it was by chance selection of paler colours etc that two yellow bearing clones were collected. Another possibility is that yellow natural seedlings in this population are weaker growers and do not survive (outgrown by oranges) under natural conditions.

However, the conclusion “that the whole Umtamvuna population is Group 1” is incorrect. The only comment that can be made is that, of the orange flowering plants of this population, some may carry Group 1 yellow genes. Many, if not most, may only carry orange genes.

‘Umtamvuna Pink Lipstick’ which flowered among four seedlings (three unflowered) is the kind of pale flower that I think could be carrying yellow genes. Yet again, the fact is that only yellows can be classed as Group 1 or Group 2 (or 3 or 4, or more) not oranges. Proven oranges can be stated to carry Group 1 or Group 2 etc yellow genes – and then, only those clones, not populations of untested orange plants (as in Cowley’s article). (19 May 2011). &

## Wild white clivias?

Greig Russell – Cape Clivia Club

My Neanderthal genes dictate that I collect things, amongst which sundy literature used to

feature highly (I now prefer this all in electronic form – you should see my hard-drives groaning under the weight of pure knowledge). Now and then I take a trip through a pile of my old literature; and this week it was the turn of copies of Veld & Flora dating to the eighties. In the March 1985 issue, labelled “Special Natal Issue”, I encountered a cluster of articles authored by A.T. Abbott and H.B. Nicholson. Nicholson is a name that interests me in a clivia context, as Bertram Nicholson (1875-1844), a high-ranking British Colonial official in Swaziland, imported a selection of clivia species for his garden in Mbabane, which later escaped into the veld and are now included in the Swaziland national plant list and described as ‘indigenous’ – including *C. nobilis*!

The first article of the cluster is penned by Hugh Barry Nicholson (1906-1998), an amateur botanist of great industry, who after his retirement to St. Michael’s-on-sea on the KwaZulu-Natal south coast, created an arboretum on his property and explored the vegetation of the surrounding area. He was essential a ‘tree-man’: so most of his article, entitled “Some indigenous plants of southern Natal”, deals with trees. Much of his study and specimen collecting was accomplished in the Umtamvuna Nature Reserve on the KZN side of the old Natal-Transkei border. However he also ranged as far north as the Oribi Gorge.

Towards the end of the article, he covers the smaller plants and says the following: “Another area where a floral spectacle worthy of note can be seen is in a small kloof on the escarpment facing Port Edward, just outside the reserve boundary.” And further on: “Two species of *Clivia* always draw attention when flowering and both occur in large groups under broken shade. *Clivia miniata* is the largest and most showy with its pink to almost white flower heads up to 22 cm in diameter. *Clivia gardenii* has orange and green flowers hanging in clusters.”

‘Almost white flower heads’? Yikes! I cannot believe that he misidentified some other species, such as a crinum, as a clivia. I imagine that his locality is in the gorge of the Zolwani River, a kilometre or so up the coast from the Umtamvuna River. Clones of clivias with ‘Umtamvuna’ in their name, and thus collected

in that region, include many pinkish forms (see M. Dower, *Clivia News* 20 (1): 8-10, 2011), but, so far, I have not heard of a ‘nearly white’ form. So I invite your comment on these clivias, this

Nicholson and even the other Nicholson, who does not, so far, seem to be closely related to the first; to grussell@telkomsa.net or these pages. &

## READER'S VIEWS

### When is 'Clivia' not a *Clivia*? 6 - Anne of Cleves

Greig Russell – Cape Clivia Club

Most of those of us who have heard of the English King, Henry VIII (1491 – 1547), can vaguely remember that one of his six wives bore the name ‘Anne of Cleves’; although I am not certain that those guys passing joints around in the back rows at a performance of Rick Wakeman’s *The Six Wives of Henry VIII* have any memories of this fact at all.

The concept of ‘wife’ as used here is a bit of a stretch; although married for six months (a marriage entered into purely for political reasons), Anne and filthy Henry didn’t like each other at all, never got down and dirty, and the marriage was finally annulled. That’s enough about this Germanic noblewoman, properly named Anna von Jülich-Cleve-Berg (1515 - 1557).



A map of Clivia Ducatus et Ravenstein dominium drawn and coloured by the cartographer Guiljelmus (Willem) Blaeu, in the mid-17th century.

I bet few people ever even wondered where this Cleves place might be. I certainly didn't. But it is what interests us most here. Cleves (Kleve - Ger., Cleve - Old Ger., Kleef - Dutch, Clèves - Fr. Cléveris - Sp.) is a town in North Rhine-Westphalia, Germany, virtually on the Dutch border, on the flatlands of the Rhine Valley. It is probably named for the promontory, partly surrounded by cliffs, upon which the Schwandenburg, the family seat of the Dukes of Cleves, was built. There is, however, some

question as to whether the word 'Cleve' was derived from cliff, or from the three clover leaves which are part of the heraldic symbols of the city (clover = *klee* - Ger.). In any case, the Latin name for this town/city was 'Clivia'. This Latin name was apparently in use when the Roman Armies were stomping around Europe, smacking everyone into submission; and was widely used in the Latin literature of the Middle Ages and onward, often as *Clivia Ducatus* (the Duchy of Cleves), when referring to this interesting place. © 2010. &

## HABITAT CLIVIA

### My first habitat visit

*Randal Payne - Highway Clivia Interest Group, KZN Clivia Club*

It had been suggested, then discussed and planned and now it was a reality. This was the day a group of members from the Highway Clivia Interest Group were off on their first habitat visit.

We had arranged to meet at an agreed spot in Port Edward KZN at 9 am and then we would all drive together to the venue, park our cars and proceed on foot to the area where the *Clivia robusta* were to be found and admired.

The Highway Clivia Interest Group was formed early in 2009 and is open to folk in the Highway area of Durban to share ideas and learn more about our common interest or passion as it is for some. We are fortunate to have some of the most experienced South African Clivia breeders in our group and they are always willing to share their knowledge with those of us who know very little and want to learn more about these wonderful plants.

But back to our field trip. It was a glorious sunny May morning and the temperature was mild – just perfect for our excursion. After we had all arrived at the meeting point, it wasn't long before the convoy set off, following Andy Forbes-Hardinge who was our "guide" for the day. After a relatively short drive we turned on to a gravel road and soon reached the spot where we would leave our cars under the supervision of a guard.

The organizers had advised us all what to bring,



how to dress and what to expect, but some of us city-slickers were not adequately prepared for what was to come. As I looked around I noticed, with a certain amount of apprehension I must add, that the more experienced clivia-lovers were all kitted out as had been suggested. But they were in the minority so I felt a little better. (I've never owned a pair of gum boots in my life and wasn't going to buy any just for this excursion). Soon we were ready to explore.

After Andy explained what we should expect and look out for, we began a leisurely walk



through a banana plantation and then along a path between the banana plantation and a patch of indigenous bush or forest. It wasn't long before we turned into the forest and very quickly found out why the instructions we had received were so precise.

You may be forgiven if, like me, you had been advised that *Clivia* don't like wet feet! But another name for the *Clivia robusta* species is "swamp gardenii" and suffice it to say that there was more than one of the group that ended up with jeans muddied to the knees! With feet

stuck in the mud it was easy to leave one's footwear behind.

This *Clivia* colony was in a small, relatively flat forested valley through which a small stream meandered. Because of the flatness and the extensive plant growth, there were places where the stream split and widened, creating areas of marshy swamp, particularly where the root growth was sparse or non-existent.

But the inconvenience of muddied jeans and boots was soon forgotten as we saw the clivia plants – many, many more than I had expected. Plants of all sizes and attractive colours from the most common orange to the less common yellow all flowering in the dappled sunlight filtering through the leafy canopy provided by the Umdoni (*Syzgium cordata*) and wild banana trees (*Strelitzia nicolae*).

What we observed were mature *C. robusta* plants as tall as a man, plants that had the "trunk" characteristic of a *C. caulescens*, flowers ranging through a broad spectrum of colours, bright multicoloured seed pods hanging on arched peduncles, seeds on the ground where the peduncles had withered, seeds germinating and lots of small two leafed seedlings growing just where the seeds had fallen, ensuring that without interference this colony would regenerate





and survive. A surprising observation to me was the close proximity of different the coloured flowers to each other – although different plants, at times it seemed as if they were all growing in the same clump.

Soon the group of twenty had broken up into much smaller groups of folk wandering through this indigenous Eden. It wasn't a walk in the park, but the undergrowth was forgiving and fairly easily negotiated. *Clivia* plants were to be found in abundance in all directions and often one could hear exclamations of excitement and wonder from a small group even though they were out of sight. Many photographs were taken, much searching done for plants with yellow or pink or dark red flowers, picture trophies to remind us of this awesome experience.

Often I have read of colonies being raided and totally destroyed by muti gatherers and although I can't claim to have traversed every meter of the area of this colony, there was thankfully little evidence of what we would call wanton destruction by herbalists. Twice I noted



small batches of leaves remaining where plants had obviously been harvested and stripped.

While driving home and contemplating the day's experiences, I realized how privileged I was to have been able to enjoy untouched nature and more importantly, *Clivia* as they probably grew in their thousands before South Africa had been colonized, before a growing demand for arable land resulted in deforestation and more latterly, the growing population requiring more and more muti from a rapidly diminishing resource.

This was part of one small valley similar to thousands of others. Questions flitted through my







mind – What treasures remain undiscovered? Or already discovered? And destroyed? Would my grandchildren be as fortunate as I had been? What can our generation do to preserve this and other colonies in the wild from extinction?

Can this national treasure be preserved from extinction in their natural habitats? One thing is obvious – it is up to us all, collectively. And now we look forward to our next field trip. can't wait! &



## PHOTOGRAPHIC COMPETITION

The Editorial Board of the 2011 Clivia Society Yearbook 13 announces the Clivia Society Photographic Competition. It is open to all and the objective is to encourage Clivia enthusiasts from around the world to submit photographs. Photographs of plants that flower outside of the normal Clivia Show dates and therefore are not seen by many people are of particular interest.

This is an annual event that brings entries of photographs of attractive, as well as some unusual, Clivia flowers and plants. Prominent space will be allocated in the Yearbook to all winners and other suitable photos. The name of the Photographer and Grower, where submitted, will be published along with any other relevant information. The Best Photograph and Runners-up will be selected for each category and will then not be eligible to win other categories other than overall placing in the competition.

It is envisaged that the photography competition will also serve to illustrate registered or proposed named hybrids.

Categories are as follows:

- 1 Open Flowers - *Clivia miniata*-like
- 2 All Pendulous Flower Forms (hybrids/species)
- 3 Single Flowers
- 4 Habitat (Locality and Species)
- 5 Plant/ Leaf Form (Without Flowers)
- 6 Umbels/ Berries
- 7 Novelty plant/ flowers (Unusual Flower / Plant / Foliage Forms)
- 8 Art Photographs (Artistic representation / re-imaged photographs)

The conditions and rules of entry are:

1. The completed attached entry form must accompany submissions.
2. All entries are welcome, but due to publishing deadlines must be received by the last day of September 2011, to be eligible.
3. Publication rights for entries will be rested in the Clivia Society.
4. Entries are limited to six per class per person.
5. Photographs may be mailed to Clivia Photographic Competition, P O Box 1039 White River 1240 or emailed to: [clivia.news@artefacts.co.za](mailto:clivia.news@artefacts.co.za)
6. Photos must be submitted in one of the following formats:
  - i. On CD-R where the image is recorded in a tiff or jpeg format. The pixel size should be a minimum of 1600 x1200 pixels (2 Mb) as that should give a printable picture of approximately 14 x 10cm. The resolution of the image would be preferred at 300 dpi or greater.
  - ii Photographs must be on their own and not embedded in another program. e.g. MS Word.
  - iii. email in jpeg format at 72 dpi with min. picture size 10 x 14 cm.

N.B. The type of submission must be available on a CD as all emailed photos that reach the final selection of 12, or on request, will have to be submitted to the specifications above to remain eligible.
8. The decision of the Editorial Board on the Winners of the Competition is final and no correspondence will be entered into.
9. The winners' names will be published in Year Book number 13.
10. Entry into the photographic competition gives the rights to the Clivia Society to use the material in all their official publications

CLOSING DATE: 30 SEPTEMBER 2011

## Clivia Club Shows &amp; Markets for 2011

NAME OF CLUB	DATES 2011	TIMES	VENUE	ENTRANCE FEES	CONTACT PERSON / S
Lowveld Clivia Club Nelspruit	16 July 2011 Interspecific Show	Saturday: 11:00 – 16:00	Lowveld Botanical Garden- Environ. Educ. Centre – on R40 road to White River	No Charge	Maria G: 083 457 1176 Paul K: 082 578 5289 Greg J: 083 702 3452
Northern Clivia Club Pretoria	23 July 2011 Interspecific Show	Saturday: 10:00 – 13:00	SA Police Forensic Lapa Pretoria Road, Silverton	No Charge	Sarel N: 071895 7737
KwaZulu Natal Clivia Club Pietermaritzburg	23 July 2011 Interspecific Clivia Show & Plant Sales	Saturday: 08:00 – 15:30	Assagay Hotel Shongweni Hillcrest (Old Polo Pony Hotel)	R10,00 per person over 12 years old	Val T: 031 763 5736 072 464 5212 Francois v R: 076 487 0300
Northern KZN Interest Group Newcastle	3 September 2011 Show & Stalls	Saturday :09:00 – 15:00	Micabella Nursery New Castle	No Charge	Hottie H: 082 290 6332
Northern Clivia Club Pretoria	3 – 4 September 2011 – Show, Clivia Market & Auction	Saturday: 08:00 – 17:00 Sunday: 09:00 – 15:00	Anton van Wouw Primary School, c/o Dey & Lange Streets, New Muckleneuk	R15,00 per person over 12 years old	Christo T: 082 497 5879
Lowveld Clivia Club Nelspruit	3 – 4 September 2011 – Show & Clivia Market	Saturday: 09:00 – 17:00 Sunday: 09:00 – 15:00	Lowveld Botanical Garden – Environ. Educ. Centre-on R40 road to White River	R10,00 per person over 12 years old	Maria G: 083 457 1176 Paul K: 082 578 5289 Greg J: 083 702 3452
Northern Free State Clivia Club Welkom	9 – 11 September 2011 – Show & Clivia Market	Weekdays: 08:00 – 17:00 Saturday: 08:00 – 16:00 Sunday: 09:00 – 13:00	Technical College, Welkom	R10,00 per person over 12 years old	Hannes v R: 083 367 7113 057 388 1562
Cape Clivia Club Cape Town	9 – 11 September 2011 – Display	Saturday: 9:00 – 17:00	Sanlam Hall, Kirstenbosch Botanical Garden, Newlands	Fee of Kirstenbosch	John W: 082 575 7202 Ian B: 021 689 3901
Joburg Clivia Club Johannesburg	10 – 11 September 2011 – Show and Sales	Saturday: 08:30 – 16:30 Sunday: 08:30 – 16:00	Garden World Nursery, M5 Beyers Naude Drive, Muldersdrift	R10,00 per person over 12 years old	Braam: 011 475 2586 Glynn M: 082 650 1463 Glynn Even: 011 476 1463
KwaZulu Natal Clivia Club Pietermaritzburg	10 – 11 September 2011 – Clivia Show & Plant Sales	Saturday: 09:00 – 15:30 Sunday: 09:00 – 15:00	Pelham School Pietermaritzburg	R10,00 per person over 12years old	Val T: 031 763 5736 072 464 5212 Francois v R: 076 487 0300
Free State Clivia Club Bloemfontein	17 September 2011 – Show, Stalls & Tea Garden	Saturday: 8:00 – 15:00	Sand du Plessis Secondary School, Curie Avenue, Bloemfontein.	R10,00 per person: Children R5,00	Piet L: 051 522 8963 Hennie: 051 522 9530 083 511 9519
Overberg Clivia Interest Group Hermanus	16 – 17 September 2011 – Show	Friday: 09:00 – 17:00 Saturday: 09:00 – 13:00	Round Hall, Dutch Reform Church, Hermanus, Central – Opposite Absa Bank	R10,00 per person over 12 years old	Felicity W: 078 710 9485 Felicity W: 028 316 3092
Cape Clivia Club Cape Town	24 – 25 September 2011 – Show, Auction & Market	Daily: 09:00 – 17:00	Bellville Civic Centre, Voortrekker Road, Bellville	R10,00 per person over 12 years old	Joy W: 021 671 7384 Gerrit v W: 021 976 8924
New Zealand Clivia Club Tauranga	25 September 2011 Show & Stalls	Sunday: 13:00 – 16:00	Plant Struck Nursery Te Puna Road, Te Puna	No Charge	Jude Shapland: 07 552 0661
New Zealand Clivia Club Auckland	1 October 2011 Show & Stalls	Saturday: 09:00 -16:00	Auckland Botanic Gardens Hill Road Manurewa	Gold Coin	Terry Hatch: 09 238 9129
Garden Route Clivia Club George	1 – 2 October 2011 – Show	Saturday: 09:00 – 17:00 Sunday: 09:00 – 13:00	Outeniqua Primary School, c/o Cradock & Cathedral St. George	R10,00 per person School pupils free	Ida E: 072 613 6066
Eastern Province Clivia Club Port Elizabeth	1 – 2 October 2011 – Show, Stalls, Auction & Tea Garden	Saturday: 08:30 – 17:00 Sunday: 08:30 – 14:00	D F Malherbe School Hall, 14 th Avenue, Walmer, Port Elizabeth	R10,00 per person over 12 years old	Gideon B: 079 490 0550 André F: 083 386 6803
KwaZulu Natal Clivia Club Highway Interest Group Kloof	8 October 2011 Clivia miniata Show & Plant Sales	Saturday: 08:00 – 15:30	Assagay Hotel Shongweni Hillcrest(Old Polo Pony Hotel)	R10,00 per person over 12 years old	Val T: 031 763 5736 Mike: 083 651 0937
Border Clivia Interest Group East-London	8 – 9 October 2011 – Show, Auction & Clivia Market	Saturday: 08:00 – 17:00 Sunday: 08:00 – 12:00	Pioneer Nursery, Gonubie	No Charge	Glenn M: 071 421 7812 Peter M: 083 463 6229
Cape Clivia Club Cape Town	30 Oct – 4 Nov 2011 – Display	Daily: 09:00 – 17:00	Sanlam Hall, Kirstenbosch Botanical Garden, Newlands	Fee of Kirstenbosch	John W: 082 575 7202 Ian B: 021 689 3901

# CLIVIA SOCIETY PHOTOGRAPHIC COMPETITION ENTRY FORM

## ESSENTIAL ENTRY DETAILS

FULL NAME OF ENTRANT:		
ADDRESS & CONTACT DETAILS:		
PHONE:	AND / OR EMAIL:	
NAME OF PHOTOGRAPHER:		
DATE PHOTO TAKEN:		
NAME OF GROWER:		
ENTRY NUMBER (1 to 8):		
CATEGORY ENTERED:	(X relevant box)	File no. of image
1 Open Flowers - <i>Clivia miniata</i> -like		
2 All Pendulous Flower Forms (hybrids / species)		
3 Single Flowers		
4 Habitat (Locality and Species)		
5 Plant/ Leaf Form (Without Flowers)		
6 Umbels / Berries		
7 Novelty plant / flowers (Unusual Flower / Plant / Foliage Forms)		
8 Art Photographs (Artistic representation / re-imaged photographs)		

## OPTIONAL ENTRY DETAILS

REGISTERED/PROPOSED* PLANT NAME: * DELETE WHERE NOT APPLICABLE	
NAME OF BREEDER:	
PARENTAGE OF PLANT:	BERRY PARENT
	POLLEN PARENT
BRIEF DESCRIPTION OF PLANT:	
SUGGESTED PHOTO CAPTION:	
PHOTOGRAPHIC DETAILS: CAMERA TYPE:	
EXPOSURE DETAILS:	
OTHER COMMENTS:	

CLOSING DATE: 30 SEPTEMBER 2011

## GROWERS' NOTES

### Sphagnum moss survival strategy

*Kelly & Cheryl Fry - Silver Ridge Clivias, Toowoomba, Queensland, Australia*

This is a photo of a *Clivia* which could have been destined for the rubbish bin due to crown rot infection, had it not been for information supplied to us by Toowoomba (Australia) growers Jeanne and Lionel Marten, hence its thriving survival.

The method used is to remove any rotting loose material and wash the area. Allow to dry and then coat the raw area with a paste of Mancozeb. Dry before planting.

We ourselves clean and wash the base as above and after drying for a day or so, dip the basal section into dry Copper Oxochloride powder and have had the same excellent results, so much that we have designated a small section of our garden as "the Lazarus Area".

The method never fails and works just as well on small seedlings, as long as the basal stub is still viable.

After following the method of applying the fungicide, place a couple of inches [some few cms]

of wet sphagnum in bottom of 6" [150 mm] pot then place the *Clivia* plant in and continue to fill the pot. The plant may need to be supported with sticks or something similar.

The picture shown took about four months to produce these lovely healthy roots.

Sphagnum mixture is kept damp during this time. Roots will appear from the drainage holes when the revived plant is ready to pots on. Simply remove all sphagnum and pot on in the usual media of your choice. &



## STORIES BEHIND THE COVERS

All the species and forms of *Clivia* tend to have pale forms. The varietal epithet 'citrina' has been given to some of the species for these forms but this seems to be contentious.

### FRONT COVER

Gem's 'Golden Renaissance 2' Ngome type *C. gardenii* (photo Francois van Rooyen). Recent DNA analyses have located the Ngome forms closer to the species *C. caulescens* than *C. gardenii* as will be elucidated in the next Yearbook, CLIVIA 13.



### BACK COVER

*C. nobilis* ex habitat at Septhome (photo Wayne Hasselau).



Fred van Niekerk's  
*C. robusta* 'Maxima' citrina  
form (photo Roger Fisher).



Gem's *C. gardenii* yellow varietal (photo Francois van Rooyen).



Gerhard Faber's *C. mirabilis* 'Karen's Blush'.



*C. caulescens* 'Yellow Collies' (photo Ertjies Röhn), a single yellow blooming clone from about 2000 plants confiscated after being removed from the Pilgrim's Rest forests by muti collectors in about 2000 and replanted in the nurseries of the Mpumalanga Parks Board. This is only the second known yellow habitat form of the species, the other being that of Bertie Guillaume from the Zoutpansberg forests.

## BREEDERS' NOTES

### PLANT INTRODUCTIONS

*Robert J. Armstrong*

(Geneticist/Research Horticulturist at Longwood Gardens  
1967-1999) [<http://www.longwoodgardens.org/Plants&Horticulture/PlantIntroduction/Armstrong/PlantIntroductionHistory.htm> accessed 03 March 2010, 08:10:50 AM UMT +2]

#### Yellow Clivia

In the early 1970s Longwood Gardens was given a "pup" of a very large flowered orange clivia. Longwood also acquired a yellow-flowered clivia which had very small flowers. At the time having a yellow-flowered clivia of any sort was something to be proud of, but since this plant was also rather weak it did not readily lend itself to being put on display. The task at hand was to develop a strong plant with large yellow flowers. While there were no references on how the yellow and orange flowers were inherited, in plants it is often the case genetically that the yellow color would be recessive to the orange color. Therefore, crosses were made between the clivia with small yellow flowers and the clivia with very large orange flowers. The resulting F1s were all orange, which was as expected if yellow was indeed recessive to orange. In order to get yellow flowers back, it was then necessary to either cross the F1s among themselves or backcross the F1s back to the yellow flowered parent. This was done and the resulting F2 and BC1 generations yielded both yellow and orange flowers. The yellow flowers in this generation were much larger than the original, but they were rather floppy and did not have the desired habit.

In the meantime Longwood friend and neighbor Sir John Thouron gave the Gardens a yellow-flowered clivia that had a very upright, formal habit.

Clivia Sir John Thouron are descendants of an unusual yellow Clivia that was brought from Britain to Philadelphia in the 1950s by Sir John Thouron, a Scotsman and esteemed plantsman, whose private gardens and four green houses, in the Brandywine Valley, constitute one of the finest collections of rare and unusual plants in the USA. No one knows for sure where Sir John got the plant. (Sir John was very private,

and declined to be interviewed. It is a handsome plant: big, dark green strap-like leaves and sturdy stems that bloom, if not given too much sun, with a ball of buttery yellow flowers early in spring. [Inserted text – Ed]

This was then crossed with the clivias with large yellow flowers but a floppy habit. The resulting plants have large flowers and a very upright, formal habit. These are now being evaluated by the Research Division. The best will be named, propagated, and introduced.

#### 'Longwood Debutante' Ready for Debut

Reprinted from Longwood Gardens: Behind-the-Plants March 4, 2011 by Alan P <http://longwoodgardens.wordpress.com/2011/03/04/longwood-debutante-ready-for-debut/> accessed 10:30 UMT + 2



Clivia miniata 'Longwood Debutante'

After 35 years of clivia breeding, Longwood Gardens is releasing its first named clivia when the North American Clivia Society holds its International Symposium and Show at Longwood Gardens March 19 and 20, 2011. Clivia enthusiasts from around the world will be in attendance when 'Longwood Debutante' makes her debut into Clivia Society in the



Inside the research greenhouses.



Clivia berries containing seeds.



Clivia seeds removed from the berry.

elegant Longwood Ballroom. Scarlet O'Hara would be jealous!

Back in 1976 when the breeding program started, clivias were commonly orange. The yellow flowers existing at the time were not impressive and rare, so Longwood decided to initiate a breeding program to produce a superior yellow clivia. 'Longwood Debutante' has achieved the goal of the breeding program with its luminous yellow flowers that rise above the dark green foliage. Her flowers are slightly fragrant with petals that overlap to produce a beautiful floral display. This is the first release in a series of Longwood clivia cultivars.

Why did it take so long to release the first plant? Thirty five years is a long time to wait. A good number of current students and employees at Longwood were not even alive when the program started! One factor that slowed the program was the extended time it takes for a clivia seedling to mature. Seedlings can take up to eight years to bloom from the time the seed is planted, so patience is needed. Longwood speeds up the process in our research greenhouses by keeping the seedlings actively growing all year long, rather than allowing them to go dormant in the winter. The trick is to get the seedling to mature quickly—and maturity occurs when the plant produces 13 leaves. Once



Clivia miniata 'Longwood Debutante'

the plant has 13 leaves, it is ready to produce a flower. Then, when you finally have a blooming plant, the plants are slow to multiply. It can take years for the parent plant to produce offsets. Results are slow in clivia breeding!

While breeding for the superior yellow flower, interesting mutations began to occur. Both yellow and orange flowers began to exhibit a raised area, or keel, in some petals. The term "keeling" refers the shape of the keel of the boat. The keeling petals add extra depth and interest to the flowers. We decided that the breeding program would also focus on accentuating the keel, in hopes of producing a multi-petal flower. The normal number of petals on a clivia flower is six, but if the keel separates from the petals, a flower with nine petals can result. Keeling flowers are interesting by themselves even if they don't have extra petals. We now have some potential keeling cultivars in the works in our research greenhouses. &

## HOW MANY GROUPS OF ALBINO YELLOW CLIVIAS ARE THERE?

Bill Morris - Australia

We have known for over ten years that there are two types of albino yellow clivias.

These are plants with pure yellow flowers and yellow pods (botanically "berries") which are unable to produce anthocyanin pigments.

If there are any traces of orange/red or pink

pigments in a yellow clivia flower or berry, such plants are not albinos. Albinos, if they are self fertile (and many are not), will produce only other albinos.

When crossed with other albino yellows, sometimes they produce other pure yellow flowers and fruit and are said to be "compatible" (and belong to the same group) but at other times they produce anthocyanin-coloured flowers and fruit and are (genetically) stated to be "complementary". In this latter case they belong to different groups.

In 1990 I published, in *Herbertia* 46 (2) 95-96, an article entitled: "A true breeding strain of yellow Clivia" – in which I suggested that the breeding behaviour of yellow clivias was similar to Hurst's grouping of White Cattleyas into two types (groups) and in 1999 I published a "classification of the known varieties of yellow Clivias" (*Clivia Newsletter* 8 (1) 10-13) and called them Group 1 and Group 2 (after Hurst's two groups). This was the first listing of Group 1 and Group 2 Clivia types.

In the past year or so, another yellow was identified which was found to produce orange offspring when crossed with both Group 1 and Group 2 yellow plants but produces pure yellow flowers when crossed with F1 oranges bred from the mother plant - and these seedling yellows proceed to produce albino yellows when inter-crossed, selfed or crossed back to the original yellow. This original plant was named 'Ndwedwe Alpha Thurston' and was recognised by Sean Chubb as a new yellow group - which he termed 'Alpha Group'. To continue the original classification system it should be known a Group 3 – even though it has only one known member at this stage.

Sean has suggested that another yellow in his collection named 'Mvuma Yellow' may be a member of yet another new yellow group (perhaps Group 4) and I suggest (without conclusive evidence at this stage) that 'Ndwedwe Beta Yellow' may yet again be the first of another new group of albino yellow clivias.

These potential new yellow groups started me thinking about how many different yellow groups may be possible.

It has long been believed that all albino yellows are what are known as single gene

null mutations in the genes leading to the formation of anthocyanins. This means that one of the genes in the chemical pathway that manufactures the anthocyanin pigment (six, seven or eight genes – depending on what colour is finally produced) is totally unable to produce its specific enzyme which is necessary to carry out its single chemical step in the manufacturing pathway. Thus manufacture of the final pigment stops at this point and no pigment is produced, resulting in an albino.

Such a plant is a pure green as a seedling and never develops any other colour as a seedling, and only yellow flowers and berries as an adult plant.

The six, seven or eight genes that produce the six, seven or eight enzymes which are needed to produce the anthocyanin pigments are called the "structural" genes of the pathway and a null mutation in the pathway before a coloured pigment is produced will stop colour production.

The pathway to the orange and red pigments (Pelargonidins) in *Clivia miniata* consists of six main genes. Their names are the same as the enzymes they produce and because these names are long and difficult to remember they are usually abbreviated as (in order):

CHS, CHI, F3H, DFR, ANS and 3GT.

The pigment is actually put together by ANS and 3GT is responsible for adding various sugars to it and producing the two different pelargonidins (orange and red) in the case of clivias.

The six are known as the structural genes, with CHS, F3H, DFR and ANS generally considered to be the "colour producing genes".

In *Clivia News* (18 No.2 April-June 2009, p 6) under the heading "Research Committee, Annual report 2009", Professor Spies reported that his research team had isolated and studied "the four colour genes" and found that "no variation in these structural genes appear to be present in the different colour forms". This indicates that no major mutations are present in them. It follows therefore, that albino yellow forms (Group 1 and Group 2) must have mutations somewhere else. This brings us to "control genes" (technically called regulatory genes) which have been occasionally mentioned in clivia articles without any indication of what they do.

I will now quote from a 2008 article re regulation of colour production (Ref 1, Summary): "In all higher plants studied to date, the anthocyanin pathway is regulated by a suite of transcription factors that include Myb, bHLH, and WD repeat proteins". The literature suggests that these proteins act as a complex of all three and the absence of any one of them renders the gene it controls ineffective. So far there appear to be hundreds of slightly different Myb and bHLH proteins reported and it is not apparent (to me) whether they can vary within the one plant - although they certainly can vary between species or genera.

Variation within the one plant could allow each structural gene to have its own set of regulators and allow fine control of when and where the flavonoid pathway was activated.

The three transcription factors mentioned above have their own genes (regulatory genes) which are needed to produce these special proteins.

It is the mutations in these regulatory genes that control whether the transcription proteins are produced at all (a null mutation) or reduce the quantity which can then flow through, thus limiting the amount of pigment produced.

Without these transcription factors, the structural gene cannot be copied and this means the structural gene is non-functional - just as if it had a null mutation in this structural gene.

Markham's analyses of pigments (in Hammett's article in *Yearbook Clivia 8* and repeated in *Clivia News* - January/March 2010, p13) shows no difference between Group 1 and Group 2 yellows, that would suggest, perhaps, different gene mutations and thus supports the findings of Professor Spies' research group that the structural genes are normal.

However, Markham's results suggest to me that the CHS gene may be turned off in both types because both flavones and flavonols are absent and probably flavonones (unreported) as well. Thus the difference between the two groups could be due to mutations in two different regulatory genes (from the three transcription factors - say Myb in one group and bHLH in the other). This leaves WD-repeat protein as a possible cause of a third group.

In the article by van Niekerk in *Yearbook Clivia 7* on yellow clivias found in the wild (p.73)



Jeanne Marten's 'Di Mathews' (1) (Photo Di Matthews).



Fred Gibello's 'Juliana Webb' (photo Johann Schoombee).

he lists seventeen cultivars of which five are Group 1, four are Group 2 and 'Alpha Thurston' which is here placed in Group 3 - leaving seven ungrouped. With the suggestion that 'Mvuma Yellow' could belong to another group (Group 4 ?) and my suggestion that 'Beta Thurston' could be yet another (Group 5 ?) how many others are possible?

Well, if each of the four structural, colour-producing genes have their own three regulatory genes (producing the three transcription factors) this is four variables for each and with four x

four possible combinations - thus giving sixteen potential Groups. Of course, this is a theoretical total - in practice it could be less.

For example, mutations involving the WD-repeat protein gene seem to be much rarer than Myb or bHLH gene mutations. Similarly, in some plants structural gene mutations are considerably rarer than regulatory gene (transcription factors) mutations. So instead of four variables for each structural gene, in practice it could be three or even two, in which case, instead of sixteen Groups (for four variables) it could be twelve Groups (for three variables) or even eight Groups (for two variables).

Only time will tell.

I hope this article shows that there is no easy or simple explanation for predicting the colour which will result from crossing plants. Albino plants are the simplest to deal with because there are no anthocyanin pigments present. Where anthocyanins are present, only by publishing

the results of many crosses between particular cultivars and then grouping those which seem to be breeding the same, will prediction become possible.

Even then, predictions will only be accurate if the groupings are correctly ascribed.

Thus, whenever a new, pure yellow Clivia is found - with no trace of anthocyanin pigments and a pure yellow pod (berry) it has to be crossed with a named clone of pure yellow, belonging to each of the known groups (at that time - e.g. Group 1, 2, 3, etc.) to determine if it produces yellow (compatible with the same group) flowers etc or orange (complementary - a different group) when it may be another new group.

Ref. 1, Gonzales A., Zhao M. Leavitt J.M., Lilloyd A.M. (2008). Regulation of the anthocyanin biosynthetic pathway by the TTG1/bHLH/Myb transcriptional complex in Arabidopsis seedlings. *The Plant Journal* 53, pp. 814-827. &

## The quest for a double-flowered yellow *Clivia miniata* at Longwood Gardens

by Jim Harbage, Alan Petravich, Robert Armstrong & Matt Taylor

[reprinted with permission from Longwood Gardens 'The Gardens' <http://www.longwoodgardens.org/DoubleFloweredYellowClivia.html> accessed 10:30 UMT + 2]

In the mid 1970s, Longwood Gardens began a breeding program to develop improved forms of yellow-flowered *Clivia miniata*. At this time yellow-flowered forms of *Clivia* were quite rare and were generally weak plants with small flowers and poor habits. The breeding project began by crossing a *Clivia* with small yellow flowers and poor plant habit with an orange-flowered plant that had exceptionally large flowers. The resulting F1 hybrids were all orange-flowered, suggesting the yellow-flower phenotype was recessive. Therefore seedlings of the F1 generation were intercrossed and some were also backcrossed with the yellow-flowered parent. Both of these crosses resulted in plants with large yellow flowers but they were floppy and the plant habits were not significantly better than the original yellow-flowered parent.

At this time, Longwood was given a yellow-flowered *Clivia* that had a very upright formal

habit with flowers held above the foliage. This cultivar has since been named 'Sir John Thouron' after the individual that donated the plants. Crosses were quickly made between the best yellow seedlings from the F2 and backcross populations mentioned above and C. 'Sir John Thouron'. Many of the progeny had outstanding





flower size, number and form as well as excellent plant habit. These are currently being evaluated and some have been chosen for naming.

Three unusual seedlings emerged from the breeding program, which led to a new selection goal. These seedlings, one orange and two yellow-flowered, all had flower mutations affecting the petals referred to as "keeled" petals. The resulting effect produced flowers with a semi-double or ruffled appearance. The seedlings from crosses of plants with keeled petals varied with regard to keeling from individuals with no keeling to ones with much more pronounced keeling than even the parents. There were also individuals where the "keel" had actually separated from the petal to form an extra set of petals.

The next generation was intercrossed and selfed and the resulting seedlings are currently growing with first flowers expected shortly. A small proportion of this generation is expected to be yellow with significant keeling in the petals and possibly some with double flowers.

Anyone breeding *Clivia* knows that patience is a key requirement for success. Under typical container culture, *Clivia* require about 4–6 years from seed to flower and then will flower each successive year. The first flowers produced by a seedling are usually not representative of the plant's true genetic potential and proper evaluation of a seedling cannot be accomplished until the second or third flowering cycle. This means it can require a very long time to accomplish multiple generations of breeding.

We have been able to reduce the time to first flower of seedlings to less than three years by modifying our culture of the plants. Our approach is based on research showing that the time from seed sowing to first flower is strictly a function of the rate of leaf formation in the seedling.

Once the seedling has produced about 13 leaves it will then flower. The time it takes to produce 13 leaves is dependent primarily on temperature, as well as moisture and fertility. Typical container culture of *Clivia* follows a cycle of warm temperatures, keeping soil moist, and medium to high fertility during the late spring through early fall followed by cooler temperatures, dry soil, and low fertility during late fall through early spring. The rate of leaf production can be increased significantly by keeping warm, moist, fertile growing conditions all year. The light intensity and day-length do not seem to affect leaf production rate under normal greenhouse conditions. &

## HERITAGE & HISTORY

# THE HERITAGE OF THE CLIVIA SOCIETY - 1996 TO 2000

*Part 2 of an address delivered to the Fifth Quadrennial Clivia Conference, Bellville, Cape*

*Lena van der Merwe – Northern Clivia Club*

### CLIVIA CLUB MANAGEMENT COMMITTEE MEMBERS 1996 to 1998

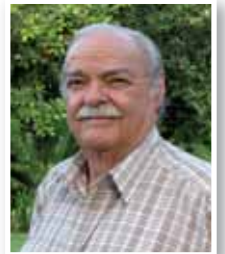
Position	1997/98
Chairman	James Abel
Chairman (KwaZulu-Natal)	Sean Chubb
Chairman (Western Cape)	John Winter
Treasurer	Koos Geldenhuys
Secretary (membership)	Adri Haxton
Public Relations	Elda de Witt
Show organiser	Frikkie Potgieter
Technical Advisor	Louisa Liebenberg
Editor	Meg Hart
Co-opted member (show)	Tino Ferero

Co-opted member (show) Renée Deschamps Clivia Club 6(2) of April 1997 on page 6 Theo & Judy Beukes wrote about a meeting held at Kirstenbosch on 5 October 1996 where John Winter gave a workshop to 29 people on cultivating clivias. The editorial on page 2 mentioned that this was the first meeting of the "Clivia Interest Group" in the Western Province. On the Western Province Clivia Interest Group meeting held on 22 January 1997 (page 19) attended by nine people, dates were set for future meetings and a show and Toy Jennings (who retired and moved to Fishhoek by end 1996) and Jim Holmes were co-opted onto the committee. On page 20 Toy Jennings wrote about an open meeting of the Western Province Interest Group held at Kirstenbosch on 1 March 1997.



*John Winter*

Clivia Club 6(3) July 1997 page 4 James Abel wrote about a proposal - "we need to separate the Club as a whole from the Gauteng branch (and others)." Editing and finance would be club portfolios and the branches each responsible for their own finances, shows and other activities. He mentioned Kees Sahin's proposal of developing a top quality colour illustrated magazine. The committee intends to publish a coloured supplement annually and an appeal was made to members to supply photographs of their prize plants towards this project.



*Tino Ferero*

Clivia Club 6(4) October 1997 in the chairman's report mention is made that there are now three active branches in South Africa, namely Western Cape, Kwa-Zulu/Natal and Gauteng. At the AGM on 6 September 1997 a new committee was elected for 1997/98. New names appeared on the committee.



*Elda de Witt*

The editorial (6(4) page 3) made mention of the fact that the Clivia Club "is now five years old and there are about 30 founder members who are still subscribers".

At the meeting of the Western Cape Clivia Club meeting of 13 September 1997 (6(4) page 21) it was proposed that the second Clivia Club International Conference scheduled



The Clivia Review Jan 1998

to be held in Pretoria, be held in Cape Town instead to coincide with the Botanical Gardens Conservation Congress at Kirstenbosch. This proposal was accepted as announced in Clivia Club 7(1) page 3 and on page 5 John Winter wrote that Clivia 98 conference would take place on 19 and 20 September 1998 and the theme would be "Growing Clivia."

With Clivia Club 7(1) January 1998 an eight-page supplement "The Clivia Review '98" with Renè Dechamps as coordinator was posted to members. This was the forerunner of the yearbook we know today.

In news of the committee, Clivia Club 7(2) page 4, mention was made of the future format of the Yearbook.

Clivia Club 7(2) April 1998 page 4 the chairman mentioned that the Club had outgrown its original constitution and various committees are reviewing it. He requested members to participate in this process by sending in their suggestions on any aspect at all.

Clivia Club 7(2) page 20 reported on the change of name from "Gauteng" to "Northern" branch.

It was announced in Clivia Club 7(3) July 1998 page 4 that a research grant of R 3 000 was made to Craig Honiball towards his M. Sc. studies at University Pretoria and a further R 1 000 from the Northern branch. This then was the first funding of research on Clivia in South Africa by the Clivia Club.

Koos Geldenhuys, as acting Chairman, announced the future separation of the Northern branch committee from the Clivia Club committee and that an election would take place on 5 September 1998 and this would be the last election governed by the old constitution. Tino Ferero was co-opted onto a sub-committee drafting the new constitution – "a lengthy 22 page document" – that was then circulated to the branches and interesting parties.

On page 20 in Cape Province branch news Gert Wiese wrote: "The Western Cape branch has incorporated the Eastern Cape Branch with their approval and we are now known as the CAPE PROVINCE BRANCH." He also said they have their own constitution.

Clivia Club 7(4) November 1998 reported on new committees elected at various meetings. James Abel was transferred to Zimbabwe and was not available for re-election. On 5 September 1998 in Pretoria the new Clivia Club committee (first separate committee from the Northern branch) was elected.

The Northern Branch elected on 31 October 1998 their first committee separate from the Clivia Club and left it to the elected members to decide on the portfolios of each member. On page 25 Chris Vlok [28 Chris Vlok] listed the new committee of the Northern Branch with himself as chairman. He was instrumental to the publishing of the first "Hints on Growing Clivia". [29 First Hints on Growing Clivias]

In the Cape Province Clivia Club report on page 23, John Winter reported that the Clivia '98, the second international conference of the Clivia Club, was a great success.



Gert Wiese



First Hints on Growing Clivias.

In the editorial of Clivia Club 8(1) autumn 1999 Meg Hart wrote that the Clivia Review, which should have been issued with this edition of the newsletter, was to be replaced with a "Yearbook" of about 60 pages and would be available towards the middle of the year. John

Winter mentioned on page 19 of Clivia Club 8(2) that the Yearbook would be posted soon. In the spring 1999 issue (Clivia Club 8(3)) Tino Ferero, on behalf of all the members congratulated the yearbook committee for the superb publication. He also announced that four managing committee members had decided not to be available for re-election.

The first meeting of the George Clivia Interest Group took place on 31 July 1999 (Clivia Club 8(3) page 19).

The first AGM not held in Pretoria (Clivia Club 8(4) page 7) took place on 17 September 1999 in Cape Town. The proposed members were unanimously elected to the Central Committee. Joy Woodward was not elected, but, as private assistant of John Winter at Kirstenbosch National Biodiversity Institute, available as secretary.

With the autumn 2000 issue we see a name



Chris Vlok



Sarel Naude

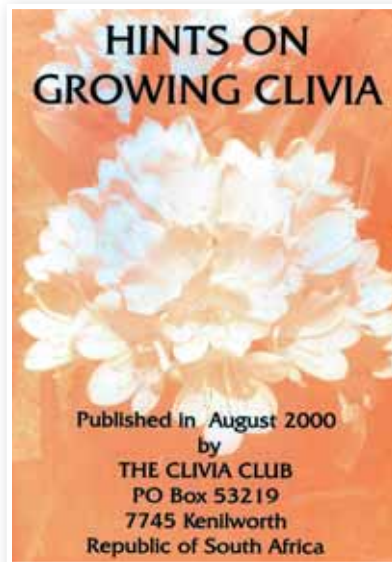
CLIVIA CLUB MANAGEMENT COMMITTEE MEMBERS 1998 to 2000

	1998/99	1999/2000
Chairman	Tino Ferero	John Winter
Vice-Chairman	-	Sean Chubb
Treasurer	Koos Geldenhuys	Ian Brown.
Secretary (not elected)	-	Joy Woodward
Public relations	Elda de Witt	Chris Vlok
Membership administrator/secretary	Adri Haxton	Sarel Naude
Newsletter Editor	Meg Hart	Meg Hart
Additional member	-	BrianTarr
<b>BRANCH CHAIRMEN</b>		
Chairman (Western Cape)	John Winter	John Winter
Chairman (Northern)	Chris Vlok	Tino Ferero
Chairman (KwaZulu-Natal)	Sean Chubb	Sean Chubb





Covers of Yearbooks from 1999 to 2008.



Hints on Growing Clivia.

In this issue (9(1) p 21) Fred Gibello announced the meeting in Port Elizabeth on 13 November 1999 with the purpose of starting The Eastern Cape Clivia Interest Group. They elected Charl Coetzee as chairman. Stella van Gas wrote of the formation of the Border Clivia Interest Group on 9 April 2000 with Stella as chairperson.

Clivia Club Newsletter 9(2) listed the two newly formed interest Groups with Stella van Gas (Border) and Wilma Blake (Eastern Cape) as contact persons. Chris Vlok (page 4), as Public Relations Officer, appealed to all members to assist the investigation of a web page for the Clivia Club. He also mentioned a booklet " Hints on Growing Clivia" that would be available in September.

Clivia Club Newsletter 9(3) reported on new interest groups in Newcastle (page 14) and South Cape (page 22), previously known as the George Clivia Interest Group.

Clivia Club Newsletter 9(4) summer 2000 page 20 wrote of yet another new interest group, namely Metro Interest Group in Johannesburg.

Clivia Club Newsletter 10(1) autumn 2001 mentioned the AGM held on 2 December 2000 in Pietermaritzburg. The Clivia Club Committee elected was the last committee under the first constitution of the Clivia Club.

change from Clivia Club to Clivia Club Newsletter volume 9(1). This was the first newsletter with a coloured gloss cover. The Clivia Club committee members were listed on page 3.

**LAST CLIVIA CLUB MANAGEMENT COMMITTEE MEMBERS 2000/2001 ELECTED 2 DECEMBER 2000**

Chairman	John Winter
Secretary (not elected)	Joy Woodward
Vice-Chairman	Sean Chubb
Treasurer	Ian Brown
Additional Member	Brian Tarr
Membership Secretary	vacant
<b>BRANCHES</b>	
Cape	John Winter
Northern	Tino Ferero
KwaZulu/Natal	Sean Chubb
<b>INTEREST GROUPS</b>	
Border	Stella van Gass (Chairperson)
Eastern Cape	Willie van Rensburg (Secretary)
Southern Cape	Ian Vermaak (Chairman)
Northern KwaZulu/Natal	Dries Olivier (Chairman)
Metro	Nick Primich
<b>OTHER</b>	
Public Relations	Chris Vlok
Newsletter Editor	Meg Hart

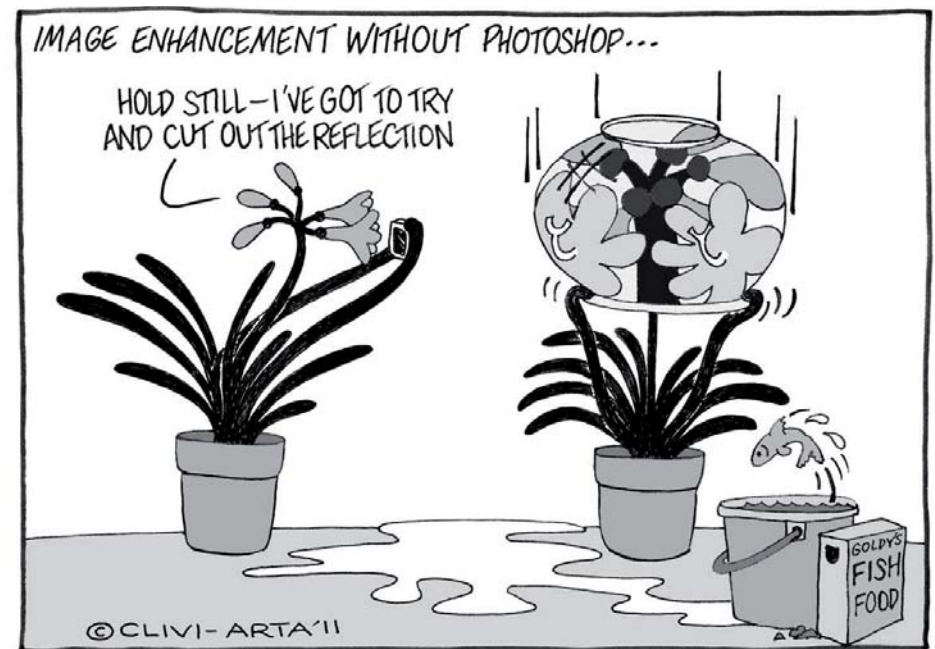
**References**

Newsletters of the Clivia Society from volume 6 to volume 10.  
E-mails of the Executive committee.  
Conference proceedings of 1998.

**Photographs**

A hearty thank you goes to members making photos available. (James & Connie Abel; Pat Gore, James and Adri Haxton, Peter Lambert and others). &

**CLIVI-ARTA - HELEN SANDERS**



**REPRESENTATIVES OF CLIVIA ENTHUSIASTS**

- & Netherlands Aart van Voorst: Tel: +31 252529679; e-mail: [a.vanvoorst@snelnet.net](mailto:a.vanvoorst@snelnet.net)  
 & United Kingdom Sakkie Nel: Tel: +27 12 361 6415, e-mail: [corgas@vodamail.co.za](mailto:corgas@vodamail.co.za)  
 & USA & CANADA Jim Shields: Cell: 317-506-4726; e-mail: [jshields@indy.net](mailto:jshields@indy.net)

**OTHER OVERSEAS CONTACT PERSONS FOR MEMBERSHIP APPLICATION**

- & Australia Ken Smith: Tel: +61 247543287; e-mail: [cliviasmith@idx.com.au](mailto:cliviasmith@idx.com.au)  
 & USA & CANADA William McClelland: Tel: 1-805-484 1484;  
 e-mail: [william\\_g\\_mcclelland@yahoo.com](mailto:william_g_mcclelland@yahoo.com)

**CONTACT DETAILS FOR CLIVIA CLUBS AND INTEREST GROUPS**

- & Cape Clivia Club Joy Woodward: Cell: +27 72 487 7933; e-mail: [capeclivia@ibox.co.za](mailto:capeclivia@ibox.co.za)  
 & Eastern Province Clivia Club André Fourie: Cell: +27 83 386 6803; e-mail: [andre.fourie@eveready.co.za](mailto:andre.fourie@eveready.co.za)  
 & Free State Clivia Club Piet Laubscher: Cell: +27 73 234 5759/ +27 83 610 2249,  
 e-mail: [laubscmp1@telkomsa.net](mailto:laubscmp1@telkomsa.net)  
 & Garden Route Clivia Club Ida Esterhuizen: Tel: +2744-871 2214; e-mail: [kobuse1@telkomsa.net](mailto:kobuse1@telkomsa.net)  
 & Joburg Clivia Club Glynn Middlewick: Tel: +27 11 4761463; e-mail: [gcmidd@mweb.co.za](mailto:gcmidd@mweb.co.za)  
 & KwaZulu-Natal Clivia Club Ginny van Rooyen: Cell: +27 82 820 0633; e-mail: [ginny@umvoti.co.za](mailto:ginny@umvoti.co.za)  
 & Lowveld Clivia Club Maria Grové: Tel: +27 83 475 1176 Fax: +27 86 531 8724(RSA only).  
 e-mail: [eddie@coolverkoeling.co.za](mailto:eddie@coolverkoeling.co.za)  
 & New Zealand Clivia Club Alick McLeman: Tel: 64-9-5213062; e-mail: [clivia@xtra.co.nz](mailto:clivia@xtra.co.nz)  
 & Northern Clivia Club Marlene Topham: Tel: + 27 12 542 3693; e-mail: [marleneto@telkomsa.net](mailto:marleneto@telkomsa.net)  
 & Northern Free State Clivia Club Hannes van Rooyen: Tel: +2757 388 1562; Cell: +27 83 367 7113;  
 e-mail: [dewmar@mweb.co.za](mailto:dewmar@mweb.co.za) (De Waal Maree)  
 & Border Interest Group Interest Group Glenn Miles: Tel: +27714217812; Fax: 0866577892 (RSA only);  
 e-mail: [gmiles@live.co.za](mailto:gmiles@live.co.za)  
 & Northern KwaZulu-Natal Mrs Joey Dovey: Tel: +2734-3184179/+27 83 344 0572;  
 e-mail: [doveyw@telkomsa.net](mailto:doveyw@telkomsa.net)  
 & Overberg Clivia Interest Group Felicity Weeden: Tel: + 27 84 5898 297; e-mail: [fillylilly@telkomsa.net](mailto:fillylilly@telkomsa.net)  
 & Waterberg Clivia Interest Group Erenst Ferreira: Tel. & Fax: +27 14 715 2497; Cell: +27 82 343 7287.  
 e-mail: [ferror@absamail.co.za](mailto:ferror@absamail.co.za)  
 & Highway Interest Group Mike Callaghan: Cell: 083 651 093  
 & Ngome Vryheid Interest Group Louis Lotter: Cell: 078 100 4883  
 & Newcastle Interest Group Hottie Human: Cell: 034 318 1327

**The Clivia Society: Management details**[www.cliviasociety.org](http://www.cliviasociety.org)**MANAGEMENT COMMITTEE: 2010**

- Chairman: Christo Topham: Mobile: +27 82497 5879 e-mail: [christoto@absa.co.za](mailto:christoto@absa.co.za)  
 Secretary: Lena van der Merwe: PO Box 74868, Lynnwood Ridge, 0040  
 Tel & Fax: +27 12 804 8892, e-mail: [cliviasoc@mweb.co.za](mailto:cliviasoc@mweb.co.za)  
 Vice-Chairman: Francois van Rooyen: Mobile: +27 76 487 0300; e-mail: [thegem@gom.co.za](mailto:thegem@gom.co.za)  
 Treasurer: Sakkie Nel: Tel: +27 12 361 6415, e-mail: [corgas@vodamail.co.za](mailto:corgas@vodamail.co.za)  
 Member: Johan Spies: Mobile: +27 83 652 6130, e-mail: [SpiesJJ@ufs.ac.za](mailto:SpiesJJ@ufs.ac.za)

**INTERNATIONAL CONTACT PERSONS**

- Australia: Ken Smith: 593 Hawkesbury Rd., Winmalee. NSW 2777.  
 Tel: +61 24 754 3287, e-mail: [cliviasmith@idx.com.au](mailto:cliviasmith@idx.com.au)  
 New Zealand: Tony Barnes (Representative): e-mail: [tony.john@xtra.co.nz](mailto:tony.john@xtra.co.nz)  
 Alick McLeman: (Correspondence) e-mail: [clivia@xtra.co.nz](mailto:clivia@xtra.co.nz)  
 United Kingdom: Jaco Nel: 46 Atney Road, Putney, London UK. SW152PS  
 Tel: +44 (0) 208 789 2229, e-mail: [uk\\_clivia@yahoo.co.uk](mailto:uk_clivia@yahoo.co.uk)  
 Europe: Aart van Voorst: Tel: +031 25 252 9679, Frederik Hendriklaan 49,  
 HillegomTE 2181, Netherlands. e-mail: [a.vanvoorst@snelnet.net](mailto:a.vanvoorst@snelnet.net)  
 USA & Canada: Tom Wells (Representative): e-mail: [ernestwells@earthlink.net](mailto:ernestwells@earthlink.net)  
 William McClelland (Correspondence): Bolin Ave., Camarillo,  
 Ca93010-4708, USA, Tel: 1 805 484 1484 1048,  
 e-mail: [william\\_g\\_mcclelland@yahoo.com](mailto:william_g_mcclelland@yahoo.com)  
 Gloria Weir (Treasurer): e-mail: [gweir@mickelsonmarketing.com](mailto:gweir@mickelsonmarketing.com)

**PORTFOLIOS**

- Newsletter & Yearbook Roger Fisher: Mobile: +27 83 602 7736  
 Lead Editor: e-mail: [clivianews@cliviasociety.org](mailto:clivianews@cliviasociety.org)  
 Yearbook Editor: Roger Dixon: Mobile: +27 824575174  
 e-mail: [alchemy@global.co.za](mailto:alchemy@global.co.za) or [dixonr@saps.org.za](mailto:dixonr@saps.org.za)  
 Public Relations Officer: Sakkie Nel: Tel: +27 12 361 6415  
 e-mail: [corgas@vodamail.co.za](mailto:corgas@vodamail.co.za)  
 Standards and Judging: Koos Geldenhuys: Mobile: +27 83 442 4487  
 e-mail: [koos@cliviabreeders.co.za](mailto:koos@cliviabreeders.co.za)  
 Registrar for named Clivia cultivars: Ken Smith: Tel: +61 24 754 3287  
 e-mail: [cliviasmith@idx.com.au](mailto:cliviasmith@idx.com.au)  
 Research: Prof. Johan Spies: e-mail: [SpiesJJ@ufs.ac.za](mailto:SpiesJJ@ufs.ac.za)  
 Mobile: +27 83 652 6130, P O Box 17195, Bainsvlei, 9338 RSA  
 Webmaster: Gideon Scheepers: e-mail: [admin@cliviaforum.co.za](mailto:admin@cliviaforum.co.za)

**CLIVIA CLUBS**

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

**INTEREST GROUPS**

Northern KwaZulu-Natal, Overberg and Waterberg

