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CLIVIA NEWS

▼ QUARTERLY NEWSLETTER OF THE CLIVIA SOCIETY ▼



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Clivia 2010

CLIVIA NEWS

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.

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▼ Lowveld	Paul Kloeck
▼ New Zealand	Tony Barnes
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▼ Northern Free State	Hannes van Rooyen

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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

With a Conference Issue things change – This one had to go out sooner than the cycle – so here it is.

It is that time of year when everything-Clivia happens at once – shows, blooming, pollination, germination, potting and all the rest. Generous donors post me pollen and seed from around the globe and all needs attention. And somewhere there is a bit of Clivia word-smithing needed as well.

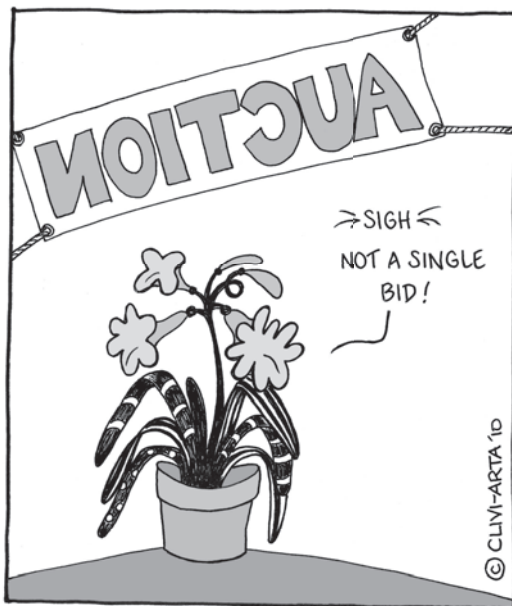
As hosts of the Clivia 2010 Conference the Western Cape is known for Kirstenbosch National Botanical Gardens and a small northerly population of *Clivia mirabilis*. We are featuring the famed National collection of the 'Appleblossom' strain and avoiding – by default I will add – *Clivia mirabilis* (although you will find some plants in the Auction Catalogue included in this issue of *Clivia News*).

The rest of the issue is dedicated to personalities rather than to plants, so that we can get a sense of what those who are addressing us at the Conference may be about.

With that, it's "Testing, testing, testing – Roger, over and out!" ▼

Regards, Roger Fisher

Editor – *Clivia News*



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CLIVIA PERSONALITIES**CS LIFE Membership Award**

Kevin Walters was awarded a lifelong honorary membership of the Clivia Society at the Clivia Society's 2010 annual general meeting.

As a follow-up to the Society's article on Kevin Walters Vol. 19, No. 2 on pages 4-6 of the April-June 2010 *Clivia News*, here is Kevin Walters being recently presented at the Toowoomba Clivia Society Inc. August meeting with his certificate of lifelong honorary membership of the Clivia Society. ▼



PHOTO - BRIAN STEVEN

Kevin being presented with his award in Toowoomba, Australia, by Scott Carter, the President of the Toowoomba Clivia Society Inc.

In Memoriam – Clive Graham

29.01.1940 – 05.06.2010

Clive and his wife Ebb joined the KZN Clivia Club in 2001. In the October of 2000 they had bought some seed at the Garden Show and from then on, like us all, got caught up in "Clivia Mania" They were extremely enthusiastic and over the years have built up a formidable collection. Ebb is the clivia botanist and Clive did all the spraying, shadehouse building etc – a very well oiled team.

Clive was a very modest man, despite having two doctorates. He had a Phd in Physics from the University of Natal and a Phd in Chemistry from the University of Cambridge. He was Professor of Physics at the University of Natal for many years. It was at Natal University that he met his wife, Ebb, who has a Phd in Physics and did research at the University until her retirement.

Clive was a man with many interests, all of which he embraced fully. He was vice-chairman of the Natal Numismatic Society and also had a large stamp collection. He was an avid mineralogist and had an impressive display of specimens. He loved his semi-precious stones which he sorted and polished and would make jewellery for his friends and family when he had the time (which was not often enough for his liking).

Photography was another passion of his and it was from this hobby that the KZN Clivia Club really benefited. Clive with the assistance of Ebb, was our official show photographer. He also took pictures of the *Clivia* collections of many of our members. In addition he managed the Club website. Being very computer literate, he was able to assist many of us.

Clive had celebrated his 70th birthday in January. He had been retired for 2 years and had a long "to do list", which sadly he was not able to complete. He was a family man, gentle and caring. He loved company and enjoyed intellectual banter. Right up until he died he read avidly on varied subjects.

The family, have received many letters of condolence and tributes from all over the world, lots in recognition of his written papers and research. A comment made in one letter is "It has been a great privilege to have known Clive. He was an inspiration and a true friend in my life "

We at the KZN Clivia Club echo this sentiment. Clive will be greatly missed in so many ways by all of us. He is survived by his wife Ebb son Roger, daughters Gwyneth and Jenny, their spouses and grandchildren. ▼

Brenda Nuss

CLIVIA PERSONALITIES

Honorary Club Lifelong Membership Johan Conradie – Honorary Membership of the Garden Route Clivia Club

The Garden Route Clivia Club Committee accepted on the 22nd May 2010 that honorary membership be granted to Johan Conradie

Citation

The dictionary defines honorary membership as: "Someone who has been granted membership because of special merit"

Johan Conradie is an 80 year old entomologist who lives with his wife Betty at Still Bay in the Western Cape. Still Bay is about 115 kilometers from George.

Having started collecting *Clivia* in September 1983, Johan visited Margo McNeil in the

mountains near Ofcolaco. Here, he extended his knowledge about Clivia. He purchased ten plants which were added to his collection. These included a yellow, a special red, orange and pastel colours.

In 1994, Johan and Betty moved to Still Bay. His collection expanded and he had 30 plants in his first shade house.

Johan joined the Cape Clivia Club and when the George clivia Interest group was established, he automatically became a member here, where he still retains membership.

In approximately 1999, Johan and Betty made the acquaintance of Henriette Ströh. Through her unique encouragement and special clivia plants, he obtained from her, his collection quickly multiplied.

In 2000, Johan visited Mrs. Frick in Swellendam and learnt about the history of Cynthia Giddy's plants. Apart from the Natal yellow Johan acquired another special yellow from her. Johan sent this yellow and other plants to Aart van Voorst. Aart van Voorst confirmed that the special yellow was in fact a tetraploid. Johan named this tetraploid 'Sleeping Beauty'.

An eye-catching pastel he acquired from Margo McNeil was named 'Satin Dream'. A photograph of the plant with a flower can be seen in *Clivia* 5 page 56.

Johan and Betty's selection of clivia has grown to an outstanding collection.

Johan believes that the exchange of plants and especially knowledge is a characteristic of *Clivia* people. This makes the collection, cultivation and growth of *Clivia* something special.

Johan is very modest about the role he has played in the protection of the genus *Clivia*. He has never



Johan Conradie 2007 Garden Route Clivia Club Show Best on Show. Gordon Fraser Runner-Up, Carrie Kruger Runner-Up.

wavered to use and share his knowledge and experience to preserve, expand and protect the genus. See Yearbook 4 page 69 to 80 where Henriette Ströh published an article on "Pests and Diseases affecting Clivia in South Africa". On page 80 Henriette Ströh acknowledged Johan's contributions to the article.

In 2004, Ida and I joined the Garden Route Clivia Club where Johan was already a member. What drew our attention was Johan and Betty's regular attendance of meetings and functions, despite their age and living far from George. Those of us who can speak from experience know that age is not for softies. This makes the attendance and participation in the club's operations, remarkable.

The Club's income is largely derived from the annual plant and flower show. It is said that the show is the "flagship" of the Garden Route Clivia Club. Therefore, year after year the members play a pivotal role in contributing to the success of the club.

Johan Conradie exhibits and receives awards annually. He comes from afar. Despite his age he travels long distances. He is forced to either overnight in George or travel back and forth to Still Bay. Everyone is aware how easily plants can be damaged whilst in transit.

Johan speaks with great love and enthusiasm of the plants which have won prizes such as the Red 'McNeil Galaxy' and others. It was a very special occasion when his 'Sleeping Beauty' was

awarded "Best on show" in 2007. Johan made some of his 'Sleeping Beauty's' pollen available for members to share in the gene pool of this unique plant.

During the time of Johan's involvement with *Clivia*, he unknowingly helped to achieve the objectives of the Clivia Society.

In conclusion we translate an extract from John van der Berg's book: *Ook die Klein Dingetjies*, from page 25:

Who are we anyway to measure and weigh the importance of a task?

Shall we look down upon a man and say: he can only lay the foundation but is unable or unfit to manufacture the graceful and sparkling dome. You judge a man not by what he has achieved, but by his honest and genuine endeavours. It is the striving that makes us strong, not the achievement thereof.

After a careful consideration of the above, we are of the opinion that there is exceptional merit arising from Johan's involvement with Clivia in general and the Garden Route Clivia Club in particular.

In view of the above, Ida and I request that the committee recommends the granting of honorary membership to Johan Conradie at the next club meeting. ▼

Kobus and Ida Esterhuizen

*Garden Route Clivia Club
6 May 2010*

JO ONDERSTALL, AN ICON IN THE WORLD OF INDIGENOUS FLORA

Jo was born and educated in Harrismith in a home surrounded by and full of flowers. Her mother had augmented the family budget by growing flowers for the cut-flower market. It was from a very early age that Jo learnt the term 'indigenous' at the time when her mother was chairman of the Eastern Free State Botanical Society.

After her marriage she and her family settled on their farm, "Ehlatini" outside Nelspruit where she created a truly indigenous garden. Shortly afterward she was welcomed by a friend,

Marie Doyer, who brought her a bougainvillea plant as a gift. She could not hide her disappointment. Despite sharing her intense dislike for bougainvillea, the friendship survived the ordeal. Marie, a founder member of the Lowveld Clivia Club, later presented her with a clivia in a pot. Jo was immediately so taken by the striking beauty of the flowers that she was convinced that she had to have clivias in her garden from then on.

Jo reminisced over her hiking trips in the early 1970s through the Makhonjwa Mountains

near Barberton where South Africa borders Swaziland, where she first saw *Clivia miniata* in its natural habitat and was later introduced to *C. caulescens* and *C. x nimbicola*. Her subsequent sightings of clivias in habitat, near God's Window and also on Mariepskop, have always had a special place in her heart. Both these clivia species are covered in Jo's indigenous flower books, *Wild flower Guide no 4: Transvaal Lowveld & Escarpment* which was published in 1984 and the *Sappi Wild Flower Guide* - published in 1996.

Jo, a founder and honorary life member of the Lowveld Botanical Society, has worked closely with its first recording officer, Elise Buitendag, a botanist who also translated Jo's first book into Afrikaans. Jo remembers the various curators of the Lowveld Gardens over the years. Also vivid in her memory was the planting of the impressive Belgian broad-leaf clivias and Coromandel clones located under the huge trees at the old entrance to the botanical garden, under the curatorship of Johan Kluge.

Jo, now an octogenarian, still bubbles with enthusiasm and drive and although she has moved into a townhouse complex in Nelspruit, she continues to be an avid gardener and had surrounded herself with clivias in her garden. She works as a subeditor for Lowveld Media and continues to promote the love and conservation of South Africa's natural floral heritage. In



PHOTO PAUL KLOECK

Jo Onderstall and Sue Kloeck in her garden with the Interspecific Clivia given to her by Paul Kloeck, chairman of the Lowveld Clivia Club.

her opinion the status of natural clivias in Mpumalanga does not appear to be threatened. Maybe this is partly due to the fact that most of the plants occur in terrain that is not easy to access. ▼

Sue Kloeck, PRO Lowveld Clivia Club

READER'S VIEWS

WHEN IS 'CLIVIA' NOT A CLIVIA? 3 - "CLIVIA LACCIFERA"

William Roxburgh (1751-1815) was a Scottish surgeon and botanist who studied at Edinburgh and went on to practice his arts in India as an employee of the East India Company. He was an accomplished artist and drew and coloured many portraits of Indian plants. Much of his early work was unfortunately lost in an 'inundation', but a portfolio of 25 drawings thought to belong to his 'early period' exists; it includes one painting labelled "Clivia laccifera".

It has been determined that this painting illustrates the tree now known as *Shorea*

talua Roxb. *Shorea* is a genus of about 196 species of mainly rainforest trees in the family Dipterocarpaceae. The genus is named after Sir John Shore, the Governor-General of the British East India Company from 1793-1798.

The "laccifera" is interesting - it means 'lacca-bearing'. 'Lacca' is a resinous substance produced mainly on the banyan tree, but to some extent on other trees, by *Laccifer lacca* (formerly *Coccus lacca*), a scale-shaped insect. Lacca is used to produce, amongst other things, lacquer and may also be known as 'shellac'. *Shorea* can tie up here, as it is one of the sources of 'dammar'.

Dammar gum is a resin collected from a variety of species of trees of the family Dipterocarpaceae from India and East Asia, principally those of the genera *Shorea*, *Balanocarpus* or *Hopea*. Most is produced by tapping trees. Dammar is used as a base for varnish or lacquer, much in the same way as lacca.

"*Clivia laccifera*" was never formally published, being only applied on the single occasion to the drawing, and thus it is neither necessary to include it in any list of species, nor to take it into consideration when examining the nomenclature of *Clivia* Lindl.

In 1820 and 1824 the two volumes of Dr.

William Roxburgh's *Flora Indica*; or *Descriptions of Indian Plants* were published posthumously, illustrated with Roxburgh's paintings.

The origin of the name "*Clivia*" as used here is not known for certain, but it was probably intended to honour Robert Clive of India, the father of the Empire of British India. He was, of course, the grandfather of the Duchess of Northumberland, Lady Charlotte Florentia Percy, in whose family's honour our clivias are named.

[Thanks to Roger Fisher for pointing this one out to me and supplying reference material.] ▼

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HABITAT CLIVIA [STORIES BEHIND THE COVERS]

APPLEBLOSSOM - A UNIQUE HABITAT STRAIN

We are told by modern botanists that what we call a "strain" must now be called a "cultivar group". That is self explanatory when we talk about plants, such as 'Cameron Peach', which have been artificially "line bred" i.e. by selecting plants with similar "morphological or physiological characters"; next crossing and selfing them and selecting the most similar of their seedlings then sibling crossing those, and repeating that procedure until a generation is achieved where all the offspring and their flowers are virtually the same, because they then have such similar genes that their progeny will breed true when selfed or crossed within the group.

But has anyone ever come across a group of plants in the habitat with more than one mutated gene that breed true when crossed or selfed without any artificial interference? We know of only one such unique group which we therefore prefer to call a 'strain'. That is the eight *Clivia miniata*, all with flowers of yellow suffused with pink of varying intensities, which John Winter collected in the habitat in the Transkei in 1996 with the necessary permit on behalf of the then National Botanical Institute (NBI) for the Living Clivia Collection at Kirstenbosch. They were code named Q1 to Q8, with Q2 specifically called 'Appleblossom'.

They were found widely scattered among a very large colony of thousands of orange flowered



'Appleblossom Q2' SANBI collection.

C. miniata associated with some *C. nobilis* growing towards one end of the colony, but with the absence of natural hybrids, although they were all flowering at the same time. The plants range from 600mm to 900mm in height with a leaf width of 40mm to 60mm. Their growth habit is upright and reflects the general form of *C. miniata* in their natural habitat.

We have visited that site since at different times of the year but have seen no others. A path had been built through the population by the nearby hotel owner as part of a Coastal Meander and



Appleblossom Q1, Q5, Q6, Q7 SANBI collection.

other "Q's" may have been collected but we have not heard of them.

It is just as well, therefore that they have been preserved at Kirstenbosch.

Once at Kirstenbosch, all flowers were removed before the plants were potted up so as to encourage rapid recovery. Two of these plants flowered at Kirstenbosch in 1997 and were displayed at the Cape Clivia Club Show which was held at Kirstenbosch. For the first couple of years they were interbred and the seed grown on and some seedlings sold.

By 2000 their seed was offered (described as seed from the "Transkei mutating population") on the Cape Clivia Club Seedlist and distributed

throughout South Africa.

From 2003 the first specific crosses were included by the NBI on that seedlist, which was also published to the Enthusiasts Group worldwide at nominal prices. At first there was limited interest in them but most of the seed was sold. We ourselves expected the seedlings to revert to the orange flowered plants amongst which they had been found.

Like all Transkei plants their seed is abnormally large and not easy to germinate. The seedlings are slow growing and it was only in 2003 that a plant, grown by Ian Brown from the first seedlings that had been made available, flowered with the same yellow suffused with

pink colouring. As explained there was no record of which particular cross it was.

By 2006 more reports were coming in that every flowering seedling had the same flower colouring in differing intensities. By 2008 buyers worldwide had become anxious to buy as much seed as possible, some wanting to buy it all, but it was rationed to be fair to all buyers.

When suckers became available they were offered on auction in South Africa in 2006 by the NBI on the condition that the plants sold would not be exported, though their produce could be. The prices achieved became the bench-mark prices for subsequent sales of offsets throughout South Africa on the same conditions. More have now been made available for the Auction at the International Clivia Convention this year, but with no restriction on buyers.

We have heard rumours of seed being offered elsewhere with same "Q" numbers. Buyers should take care to ensure they are genuine, meaning that such seed could only have been produced at Kirstenbosch or by those parties who have acquired offsets or seed from Kirstenbosch.

Breeding

The Appleblossom colouring is inherited by all their offspring, whatever cross is made within the strain, and is unaffected by which berry or pollen parent is used. Obviously some offspring have been better than others.

The extent of the unpredictability is well illustrated by the attached photos of Q7 and of a Q7 selfed, grown by Masami Uno.

Q2 and Q4 are probably the most attractive, Q1 and Q7 are the yellowest, Q6 the most vigorous and Q4 the least vigorous in offset production.

We are sure the purists would prefer to select the best of the F1 crosses made from the strain and line breed them as above to produce the best

flowers and umbels. In at least one F1, the leaves have also been broader.

However, various crosses have been made with other *C. miniata*. 'Q4' x 'Noyce's Sunburst' produced a beautiful orange inflorescence and 'Vico Yellow' x 'Q2' produced a pale pink with a white centre but no F1 has had the 'Appleblossom' colouring.

Some F1s have been selfed and sibling crossed in the hope that some of the F2s will have 'Appleblossom' colouring. We say "hope" because it seems with clivia, that as soon



Masami Uno Q7 selfed hybrid.



Q4 x 'Noyce's Sunburst' hybrid.



'Vico Yellow' x 'Q2'

as plants with more than one of the same mutation are mated the flower colour of their offspring becomes more unpredictable. It seems to us that this strain must have a multitude of nuclear genes controlling the intensity, extent and distribution of colour in its flowers, with maternal inheritance apparently playing no part, because it appears to make no difference to the result of the cross as to which is the berry and which is the pollen parent.

However, if this route is followed, pollinate

your other *C. miniata* with the best umbels and flower and plant forms, flower all their seed, select the best seedlings and sibling cross the most promising F1s in the hope that some of the F2s will have the 'Appleblossom' colouring with superior plant forms, flowers and umbels.

Growing

Because of our high winter rainfall, we in the Western Cape grow our clivia in well drained pots in a potting mix of 12mm bark chips with little fines. We have had no problem with growing 'Appleblossoms' in this mix, but have been told that in East London in the Eastern Cape and in KwaZulu Natal they have root rot problems with them – strange, because they are the natural home of clivia, so perhaps the answer lies in a very coarse potting mix (providing sharp drainage and aeration around the roots) and watering them sparingly.

They are, however, very slow growing so require even more than the usual clivia patience. ▼

John Winter and Mick Dower

Cape Town, August, 2010.

[There are offsets of most of the Q-numbered plants up for Auction – Ed]



Cliviamart offers seed and plants from a diversity of specially selected clivia hybrids sourced across South Africa and abroad as well as own bred strains.

Visit our web site at www.cliviamart.co.za to view our offerings and gallery.



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CLIVIA 2010 CAPE CONFERENCE**Diary of Events - Summary of Events**

Event	Date	Venue/Place	Starting Time	Closure (where applicable)
Conference Registration and Welcome Function	Monday 20th Sept.	Sanlam Auditorium	17:00 for 17:30	19:30 to 20:00
Visit to Hermanus	Monday 20th Sept.	Own Arrangements		
Conference Registration	Tuesday 21st Sept.	Sanlam Auditorium	8:00	9:30
An evening of camaraderie	Tuesday 21st Sept.	Ocean Basket and Sioux Spur, Glengarry	From 18:30	Reservations held until 20:00
Conference Registration	Wednesday 22nd Sept.	Sanlam Auditorium	8:00	9:30
Benching of Auction plants	Wednesday 22nd Sept.	Sanlam Conference Centre	8:00	8:45
National Auction (preceded by refreshments)	Wednesday 22nd Sept.	Sanlam Auditorium	15:30 for 16:00	Approximately 20:30
Benching of entries for South African Clivia Show	Wednesday 22nd Sept.	Bellville Civic Centre	16:00 19:00	19:00 12:00
Benching of entries for South African Clivia Show [Congress attendees only]	Thursday 23rd Sept.	Bellville Civic Centre	09:00	12:00
Judging	Thursday 23rd Sept.	Bellville Civic Centre	Afternoon	
Clivia Photography Workshop	Thursday 23rd Sept.	To be advised	9:00	12:00
Visits to Kirstenbosch	Thursday 23rd Sept.	Own Arrangements		
Clivia Show	Friday 24th Sept.	Bellville Civic Centre	09:00	17:00
Clivia Show	Saturday 25th Sept.	Bellville Civic Centre	09:00	17:00
Clivia Show	Sunday 26th Sept.	Bellville Civic Centre	09:00	17:00
Debenching of show plants	Sunday 26th Sept.	Bellville Civic Centre	17:00	
Mirabilis Tour departure	Sunday 26th Sept.	To be advised		
Mirabilis Tour return	Wednesday 29th Sept.		Evening	

CLIVIA 2010 CAPE CONFERENCE**CONFERENCE PROGRAMME****21 SEPTEMBER**

SESSION 1: CHAIRPERSON JOHN VAN DER LINDE

- 09:00 - 09:15 Welcome (Mickey Hocter - CCC)
- 09:15 - 09:30 Opening (Johan Spies - CS)
- 09:30 - 10:00 Haselau, Wayne: **The heritage of *Clivia nobilis*.**
- 10:00 - 10:30 Van Rooyen, Francois: **The heritage of *Clivia gardenii*.**
- 10:30 - 11:00 Winter, John: **The heritage of *Clivia miniata*.**
- 11:00 - 11:30 Tea

SESSION 2: CHAIRPERSON KEN SMITH

- 11:30 - 12:00 Van der Merwe, Lena: **The heritage of the *Clivia* Society.**
- 12:00 - 12:30 Coates, Ian: **The heritage of *Clivia mirabilis*.**
- 12:30 - 13:00 Discussion of the morning's talks
- 13:00 - 14:00 Lunch

SESSION 3: CHAIRPERSON CHRISTO TOTHAM

- 14:00 - 14:30 Russell, Greig: **The heritage of the Blackbeards.**
- 14:30 - 15:00 Chubb, Sean: **The heritage collection.**
- 15:00 - 15:30 De Coster, Pierre: **The heritage of *Clivia* in Europe.**
- 15:30 - 16:00 Tea

SESSION 4: CHAIRPERSON THYS GROENEWALD

- 16:00 - 17:00 Discussion of the afternoon's talks

22 SEPTEMBER

SESSION 5: CHAIRPERSON FRANCOIS VAN ROOYEN

- 09:00 - 09:30 Marriot, Helen: **The heritage of *Clivia* in Asia. CV**
- 09:30 - 10:00 Smith, Ken: **The heritage of *Clivia* in Australia.**
- 10:00 - 10:30 Maleka, Frank: **Colour formation in *Clivia*.**
- 10:30 - 11:00 Tea

SESSION 6: CHAIRPERSON HELEN MARRIOT

- 11:00 - 11:30 Conrad, Ferozah: **The evolution of the genus *Clivia*. CV**
- 11:30 - 12:00 Dixon, Roger: **Relationships in the genus *Clivia*.**
- 12:00 - 12:30 Spies, Paula: **Genetic variation in *Clivia*.**
- 13:00 - 14:00 Lunch

SESSION 7: CHAIRPERSON GLENN MIDDLEWICK

- 14:00 - 15:00 Spies, Johan *et al.*: **Implications of the research results for *Clivia* lovers.**
- 15:00 - 15:30 Discussion of the day's talks
- 15:30 - 16:00 Tea

CLIVIA 2010 CAPE CONFERENCE



PRESENTERS AT CLIVIA 2010

Haselau, Wayne: The heritage of *Clivia nobilis*

Born and raised in Cape Town, Wayne has been passionate about natural history since a very young age, when he attended South African College School (SACS) for boys. He matriculated from Camps Bay High in 1983 and after national service studied for and achieved a National Diploma in Nature Conservation at the Cape Technikon, whereafter he moved to East London to work at the Amalinda Fish Hatchery. Wayne quickly fell in love with the harsh raw wilderness beauty of the Eastern Cape and Transkei from which his father hails, and has spent thousands of hours scouring the forests and valleys and beaches for both work and pleasure. In doing so he has developed an in depth understanding of the ecology of the region.

Wayne has actively pursued his *Clivia* passion since 1998 when the *Clivia* bug bit him – really badly – and has built up a superb collection of hybrid and habitat material which includes specimen plants of all six described species and a number of natural hybrids. Wild Coast *Clivias* has a comprehensive collection of *C. nobilis* and this includes many rare colour forms. *Clivia robusta* are also well represented as are plants of the Ngome complex.

Wayne has over time developed a superb rapport with a number of other like minded cliviaphiles, especially Stella van Gass, his early mentor in East London.

Wayne has been researching a book on habitat *Clivia* for a number of years now and has built up a superb *Clivia* photo library over this time. Travelling throughout southern Africa he has visited the full range of *Clivia* habitat.

His a paper at the conference is on his favourite plant *C. nobilis*. He will redeem this magnificent and often maligned species and discuss its ecology and importance in breeding.



Wayne Haselau

PHOTO - FELICITY WEEDEEN

Van Rooyen, Francois: The heritage of *Clivia gardenii*



Francois van Rooyen

Francois van Rooyen is a fifth generation farmer in Greytown, a small town in the Kwa-Zulu Natal midlands. His main focus at present is timber cultivation and a growing indigenous nursery. The nursery was started 10 years ago and has grown and expanded with *Clivia* being at the forefront and where Francois' passion/obsession lies.

Francois was raised, in a family that have always cherished fauna and flora. His grandfather, Professor Leo van Rooyen had one of the largest cycad collections of its time and passed this love to Francois' father, Pieter van Rooyen. Pieter introduced Francois to everything wild and wonderful from an early age. Pieter has been a professional hunter and conservationist for over 50 years.

Francois attended boarding school at Grey College in Bloemfontein and did his military service which kept him away from the farm for some time. Long and much anticipated holidays being the only time spent on the farm. In 1991 Francois returned to The Gem Farm and joined his father farming. During the first few years he gained experience and knowledge of a variety of produce and was involved in a breeding program of their Brahman Stud. Also during this time his fixation of all things indigenous flourished. His affinity with Clivia grew to a point where he joined the KZN Clivia Club in 2000. This is when his journey with Clivia began. He shared and is supported on this journey by his lovely wife Ginny who is not indigenous to South Africa but a born and bred Texan. Francois and Ginny have been blessed by triplets Alexander, Isabella and Pieter who are now five years old. Even at their young age they enjoy planting and learning about Clivia from their father.

Francois and Pieter strive to breed, preserve and protect the enchanting *Clivia*. The Gem Wildflowers has one of the largest pendulous and habitat heritage collections. They have won numerous awards at *Clivia* shows, and continue to breed and acquire extraordinary and unusual *Clivia*.

Winter, John: The heritage of *Clivia miniata*

John Winter was born in Cape Town, educated at Grey College in Bloemfontein and Milton in Bulawayo, Zimbabwe. After completing his horticultural studies in Pretoria he continued at the Royal Botanic Gardens, Kew. In 1967 he was appointed as Assistant Curator at Kirstenbosch Botanic Garden rising to the position of Curator in 1978, a post he held until 1998 when he became Deputy Director, Horticulture for the South African National Botanic Institute.

Over the years John has had many enthusiastic or fervent relationships with plants – particularly *Erica*, *Disa*, *Strelitzia* (“Kirstenbosch Gold” or “Mandelas Gold”) and has two plants *Erica winterii* and *Leucospermum winterii* named after him. In the last 15 years *Clivia* have been his main focus, collecting widely throughout South Africa to improve the living collection of *Clivia* at Kirstenbosch for display. One of his legacies at Kirstenbosch is the development of the Garden’s infrastructure and the emphasis on the living collections. His special interest over the past few years has been the propagation and distribution of *C. mirabilis* to *Clivia* enthusiasts worldwide supporting Nature Conservation in the Northern Cape.

John is married with 5 children and 6 grandchildren and is thrilled that some of his offspring share his love of running and walking in the mountains.

Van der Merwe, Lena: The heritage of the *Clivia* Society

Lena was born on the farm Woest Alleen, district Middelburg, Mpumalanga. Her schooling was at Hendrina and she matriculated at the ‘Middelburg Hoërskool’. After finishing her schooling she worked at the CSIR in the administration section, enrolling at the University of Pretoria (UP) for the degree B.Sc. part-time with Chemistry and Mathematics as majors. She joined the Biochemistry Department, NCRL, still at the CSIR and completed the degree in 1966.

She later worked later at University of Pretoria, Wheat Board and at Nuclear Physics and Radioactivity, NFRL at the CSIR and obtain a M.Sc. (Inorganic Chemistry) part-time at UP with a thesis on “Chemical separations for the production of carrier-free cyclotron



Lena van der Merwe

radio-isotopes" under study leaders Dr. Rudi Neirinckx and Sarel Norval in 1971.

She obtained a diploma in Fashion Design end of 1973.

In January of 1973 she joined the staff of the CT for ATE, later Pretoria Technikon and now Tshwane University of Technology as lecturer in the subjects such as Chemistry I, Inorganic Chemistry, Physical Chemistry, Analytical Chemistry, Glass and Glazes, Cement Technology, Refractories, Solid State Inorganic Chemistry, Extractive Metallurgy and Extraction of non-ferrous metals for second, third and fourth year students.

She took 10 months sabbatical leave in 1982 and enrolled for a Ph D (Chemistry) at the Witwatersrand University, conferred in 1985 for a thesis titled 'Co-ordination Chemistry of cyclic triamines with pendent donor groups' with professors Jan Boeyens and Rob Hancock as promoters.

Her interests include: Handwork – sewing, knitting, embroidery and crocheting; Clivias (I did Botany at university and the Chemistry comes in very handy); Hiking (a pity my knees do not allow this any more); Travel, especially to the "bundoes" where there are no luxury amenities; Birding.

Coates, Ian: The heritage of *Clivia mirabilis*

Ian is a keen home gardener and developed an interest in *Clivia* after he was given a large plant group by a young lady in 1965. Plant sources were limited in those days but he slowly built up a collection including some long established *C. miniata* from English Stately Homes. He expanded his collection to include the other species, when he could obtain them, and started an interspecific breeding programme. He revels in the genus habitats and was thrilled to hear of the finding of *C. mirabilis*. He considers himself very fortunate to have visited these habitats several times including all known locations.

His profession was that of a creative and technical photographer and he lives in Southern England.



Ian Coates

Russell, Greig: The heritage of the Blackbeards

"Born 9th November 1952 in a part of southern Johannesburg, to a second generation British immigrant and an Anglophone Afrikaner mother. A year and a half of schooling at Greenside Extension School was followed by five and a half more at the newly opened Blairgowrie Primary School where I was the third pupil registered. Unfortunately, chronic, recurrent, asthmatic bronchitis kept me out of school for about 25% of the time, and my primary education was 'spotty' to say the least.

1970 saw me rocking up at the University of Pretoria for a general 1st year B.Sc. Staggering from year to year, I finally qualified as a Veterinarian in February 1975, more a duck than a *dux* student. I proceeded to become employed for a short period in a Johannesburg small-animal practice until I became a guest of the Minister of Defence; spending most of a year in the Caprivi Strip of South West Africa.

Around 1977 I got involved in the orchid scene in Johannesburg, devoting my spare time to learning everything about plants of the genus *Cymbidium* and a few other genera, as well as



Greig Russell

breeding and raising plants. I am still the only South African to have raised a hybrid that was best plant on show at a SA Orchid Council conference and show.

Meanwhile in 2004 or so, I had a relentless infection of *Colletotrichum* overrun my cymbidium collection, rendering it useless by virtue of the fact that the strain became systemic in cymbidiums, not just superficial as it did in most other genera. So much for my career in orchids.

My recent collision with clivias has allowed me to study something new in depth and to write up my findings at the best time, namely when it is still fresh in one's life and ennui has not yet set in. I initially assumed that my *Clivia* studies would be completed in a matter of months and I have thus been delighted to find that the field is much more extensive than I ever imagined and I have barely scratched the surface as yet.

I am also assisting with the editing of a book on the Cape Orchids. I write material on orchids which are published primarily in *Orchids South Africa* and the *MIOS Journal*, but also in the *CSA Journal*, *Orchid Review*, *Australian Orchid Review* and others.

My official job description at present is taking care of an 86 year old with Alzheimer's - and it is a full-time job at that."

Chubb, Sean: The heritage collection

Sean is a farmer by profession and concentrates his efforts on growing Sugar Cane, Citrus and commercial Timber plantations. He also runs a small herd of Nguni cattle, which have been bred as Stud since 1977, and is one of the oldest Nguni studs in South Africa. Above all Sean is a nature lover and conservationist with a wide interest in all living creatures and plants. Devoted to propagating only plants native to South Africa Sean concentrates his efforts on a few species namely; - *Clivia*, *Scadoxus*, *Velthemia*, *Kniphofia*, *Streptocarpus* and *Erythrina*.

The interest in *Clivia* started at an early age while attending high school at Hilton College. Sean would collect and grow *Clivia* seed found growing wild in the forest. The real passion for *Clivia* colour breeding began in 1987 with a peach coloured plant subsequently named 'Chubb Peach'.



Sean Chubb

With his taste for the unusual and uncommon Sean's efforts in breeding *Clivia* has concentrated on breeding and perpetuating rare colours and colour combinations. With a good grounding in Genetics and a practical approach to *Clivia* breeding Sean's passion for perpetuating rare colour forms has resulted in numerous pure breeding line bred families of rare *Clivia* colours being commercially available. Sean is also passionate about conserving *Clivia* history and has probably the most complete collection of Wild occurring *Clivia* mutations and colour forms. An important part of the *Clivia* collection at Thurlow Flora is 'The *Clivia* Heritage Collection', a living collection of rare historical plants. This is a conservation effort to preserve rare *Clivia* forms and thus *Clivia* History.

A visit to Thurlow Flora during August, September and October has left many visitors amazed by the diversity and variation to be found in the *C. miniata* collection at the nursery. With the enormous genetic gene pool that makes up the Thurlow Flora collection, variation and diversity are the norm. A full range of colour, form and size can be found in the collection.

DIVERSITY AT ITS BEST.

Although much effort has been invested into producing Pastel colour lines that breed true from seed, more recent breeding programs have concentrated on many new and exciting colours.

De Coster, Pierre: The heritage of *Clivia* in Europe

Pierre De Coster, born in 1950, is the fifth generation of De Coster grower's nurserymen in Melle by Ghent. After his studies in horticulture he learned the job by his father, Ernest De Coster, a grower of *Anthurium*, *Nidularium* and *Clivia*. At that time Ernest introduced the commercial *Clivia* in Europe. Beginning the eighties Pierre took over the nursery and renewed it, choosing for a monoculture of *Clivia*. He is founding member of the *Clivia* growers working group who reunite Belgian *Clivia* growers to discuss culture problems of *Clivia*. He is member of the board of administrators of the Royal association of agriculture and botany, better known as the organizers of the Floralties of Ghent. He will bring a historical overview of the introduction of the *Clivia* in Europe, evolution of the Belgian hybrid till the commercial *Clivia* today.

Marriot, Helen: The heritage of *Clivia* in Asia

Helen teaches at Monash University (Melbourne, Australia) in the Japanese Studies program of the School of Languages, Cultures and Linguistics, where she also serves as deputy head. She thus comes to *Clivia* as a lay person, having commenced to grow the plant in 1997. Little did she expect at that time to have to later shift house to accommodate her growing collection.

She first came into contact with Japanese breeders in 2003 and has visited most of the Japanese specialists mentioned in her presentation at least once or twice. While keeping in regular contact with Yoshikazu Nakamura, the Nakamura-bred plants hold pride of place in her own collection, and she eagerly awaits more seedlings to flower. She was elected as the inaugural president of the newly-formed Melbourne *Clivia* Group in late 2008-9.

Retrospectively, Helen is extremely grateful to have had the opportunity to become involved in growing and learning about *Clivia* (despite, from time to time, the problems that accompany growing them), for the friendships that she has made through this hobby, and for the immense satisfaction gained from growing the plants and commencing some hybridization herself. Like some others, she thinks, "if only I had started younger".

Clivias in China is not an area in which she possesses any expertise, but she will draw upon the help of several other *Clivia* Society members for her presentation.



Helen Marriot



Ken Smith

Smith, Kenneth R.: The heritage of *Clivia* in Australia

Head Teacher of Horticulture at Richmond TAFE College, NSW Australia. I have been a teacher for 32 years and have been growing plants since childhood. I collect most plant types, particularly variegated foliage and variegated flower forms. Major interest in *Clivia* collecting and breeding (I did a thesis on *Clivia* for university studies in 1988) and I have been involved with the *Clivia* Society since 1992. I am the Contact Person for Australian members. I was appointed the International Registrar for the Genus *Clivia* in 2002, as the Society is the recognized International

Cultivar Registration Authority (ICRA).

Married to Yasmin, and we have one son – Daniel, and one daughter – Simone

I am a member of worldwide *Clivia* Societies and Groups, plus various other plant societies. I am currently interested in collecting and breeding dwarf *Watsonia*, as well as growing variegated and unusual foliage forms of *Camellia*. I also breed Chinese Laceneck Doves and Diamond Doves. I collect antique botanical prints of *Clivia* and other flowers.

Conrad, Ferozah: The evolution of the genus *Clivia*

I was born and educated in South Africa, graduating with an M.Sc. degree from the University of Stellenbosch and a Post Graduate Diploma in Organisation and Management with the School of Management Studies, University of Cape Town. In 1998, I joined the South African National Biodiversity Institute (then National Botanical Institute), tasked with setting up a database of the herbarium records at the Compton herbarium. I subsequently changed positions in SANBI and was responsible (together with my supervisor) for purchasing equipment and setting up the facilities for the Leslie Hill Molecular Systematics Laboratory, and once set up I managed the laboratory. I also managed the Plant DNA Banking programme and co-ordinated the research on plant taxa in the Molecular Ecology and Evolution Research Programme. In January 2008, I joined the Applied Biodiversity Research Division at SANBI as a deputy director for research operations co-ordinating activities for all the internally funded programmes. In addition I manage post graduate student and intern programmes at the Kirstenbosch Research Centre and co-ordinate NORAD funded threatened species projects. In 2008, I graduated with a Ph.D. in Molecular Systematics from the University of Cape Town. My Ph.D. thesis was titled 'Generic and species-level relationships within the tribe Haemantheae (Amaryllidaceae)'.

I am interested in research which contributes to conservation of biodiversity and my own research has focused on carrying out a molecular systematic and biogeographic study of the Haemantheae, a tribe belonging to the bulbous family Amaryllidaceae and also a phylogeographic study of one genus *Clivia*.

Dixon, Roger: Relationships in the genus *Clivia*

For half a century I have always been curious about the world, especially the natural one, and have always tried to find out the why of it. Qualified as a geologist and chemist, I have also dabbled in botany, history and environmental science. After working as a mineralogist (Geological Survey), I ran a museum for a while (Geological Museum), then became a forensic scientist (Forensic Science Laboratory). During this time I wrote a few books, and published others. In my spare time I have grown plants for many years, especially trees, orchids, succulents and *clivias*. Stability in all things leads to boredom, and I have found that the unpredictableness of *Clivia* has sparked my imagination. Also, they are living things, and this leads to travel, exploration, experiment and meeting people. In finding out the why of *Clivia*, I have had to learn about many new things, and also learn many incorrect things as well, as assumptions and dogma lurk everywhere. However, *Clivia* have been an interest of mine for more than twenty years, and I have been able to disprove most of the assumptions and dogma, and feel that I am much closer to understanding this fascinating genus.

My career started out as a scientist, trying analyse things to find out what they were made of. I then became a museum curator, and learned about the variety and extent of such things. As a forensic scientist, I learned how to combine the fine detail with the variety, to determine how things were interrelated and what they meant. As a grower of plants, I learned to observe how

things change according to situation and conditions over time. In more than two decades of exposure to *Clivia* I have put together various disparate strands of information and observation which I think accounts for the variety in the genus.

Spies, Paula; Van der Westhuizen, Hesmari; Stegmann, Suzanne; Watson, Marli; Spies, Johan: Genetic variation in *Clivia*

Paula Spies was born in Pretoria on 28th November 1975. She completed her secondary education at 'Hoërskool Menlopark', Pretoria in 1993. After secondary school, she started her B.Sc studies at the University of the Free State, where she obtained her B.Sc. (1998), B.Sc. Hons. (Cum laude) (1999) and M.Sc. (Cum laude) (2004) degrees in Genetics. She is currently a full time lecturer at the University of the Free State, but is also working part time on her Ph.D. study on the genetics of the genus *Clivia*. She married Johan Spies in 2002 and they have two children, Elné (7) and Herman (6). She received two rewards during her studies. The first was for the best honours student in 1999, and she also received the SABI travel bursary to present a talk at the Monocot conference in Denmark in 2008. She also worked as a laboratory assistant in Jodrell Laboratories for a month during 2010. She has published 7 scientific papers, 2 popular scientific papers and has 13 conference contributions.

Maleka, M. Frank; Mafofo, J; Rees, D.J.G.; Albertyn, Koos, J.; Spies, Johan: Identifying genes involved in colour formation in *Clivia*

Mathabatha Frank Maleka was born in Seshego, a small township outside Polokwane in the Limpopo province. Frankie, as referred to by some, attended local primary schools and matriculated at the Harry Oppenheimer Agricultural High School in 1997. In 2002, he obtained a B.Sc. (Genetics) degree from the University of Pretoria. He further obtained B.Sc. (Hons) and M.Sc. (Genetics) degrees from the same university in 2003 and 2007, respectively. Due to the vast academic experience obtained during the M.Sc. studies, Frankie was inspired to consider a career as an academic with focus on molecular biology research. In March 2007, he



Johann Spies and research students 2007

was appointed as lecturer in the Department of Genetics, University of the Free State (UFS). The following year he enrolled for a doctoral degree in genetics under the supervision of Prof JJ Spies. Further, during 2008 he was awarded an NRF research grant to fund the research project that forms part of the doctoral studies. The project is focused on the discovery and characterization of genes involved in flower pigmentation in *Clivia*. To date, the major project outputs include the sequencing of the *Clivia* flower transcriptome using a next-generation sequencing platform and the creation of a *Clivia* sequence database that contains more than 37 000 gene sequences. Currently, gene sequences are still being comprehensively analyzed to identify those involved in flower pigmentation. As a researcher, Frankie has made a total of nine contributions to national and international conferences.

Spies, Johan; Spies, Paula; Van der Westhuizen, Hesmari; Stegmann, Suzanne; Watson, Marli: Implications of the research results for Clivia lovers

Born in Harrismith on 24/1/52. Attended Driedeel Farm School until Standard 4. Matriculated from Harrismith Secondary School and obtained a B.Sc. degree (majors: Genetics and Zoology) from U.O.F.S. in 1973. Worked in Tygerberg Hospital and obtained a B.Med. Sc.Hons. in human cytogenetics from the U.S. in 1975. Worked as sorghum breeder for SENSAGO in Lichtenburg and obtain M.Sc. (Genetics) from the UOFS. Worked at the Botanical Research Institute (Pretoria) since 1981 and obtain a Ph.D. (Genetics) from the U.O.F.S. Employed by the U.F.S since 1989 and progress to Professor in 1996. Established an independent Department of Genetics at the U.F.S. in 2007. Published 85 papers in accredited journals, 13 popular scientific papers and was involved in more than 100 presentations at congresses. Study leader for 19 completed M.Sc. theses and promoter for 8 completed Ph.D. dissertations. Member of various national and international societies; was president of the South African Genetics Society and is currently chairperson of the *Clivia* Society. ▼

CLIVIA NOTES AND OBSERVATIONS

‘Wittig's Pink’ and the origin of pink in Clivias

This article has come out of my decision in 2009 to closely examine the two sets of analytical results of pigment analyses carried out previously (References 1 and 2). This was aimed at determining whether they agreed or disagreed - and if they disagreed to understand why. As this is a quite technical examination, I am putting it here in a separate section so that enthusiasts who are less interested in these aspects can skip it and go immediately results and conclusions section.

Technical discussion

There have been two articles published dealing with the chemical analyses of the pigments in clivia flowers. The first by Koopowitz, Griesbach and Comstock (in the *Clivia Yearbook* No.5, p.23-31) and the second by Hammett with the analyses by Markham (in the *Clivia Yearbook* No.8, p39-49).

These two articles had different aims and the analyses were carried out by Griesbach and Markham – two different, highly qualified and highly regarded pigment chemists and were conducted in two different laboratories using two different methods (HPLC and Paper Chromatography).

The analyses were reported differently: one by a set of graphs, the other in a table of numerical results – quantitative in part and relative in others - using pluses and sometimes letters (++,w etc).

Also, both articles were written by different authors (who were not the analysts) and commented on by them. One article has a much fuller experimental section which gives the technical details whereas the other is only generally described by the author.

The different aims of the articles were, in the first instance, to identify the anthocyanins present in a few *Clivia miniata* plants – in their flowers, berries and stems and then somewhat similarly, *Clivia nobilis* and *Clivia caulescens*.

In the second article the aim was to survey a larger number of named *Clivia miniata* cultivars with a broad colour range (no examination of berries or stems) and included *Clivia nobilis* and *Clivia caulescens* flowers. Because of this broad-brush approach, the chemical identification of the anthocyanins was less and they were reported as "pelargonidin like" or "delphinidin like" and the sugar substituents only described as mono or diglycosides.

Thus the anthocyanins really require further analyses. In general, the second analysis set could have been constrained by a lack of funds, however they also looked at some co-pigments and acyl substituents – all of which yielded valuable results.

Results and conclusions

What conclusions can be drawn from comparing the two articles and what can be taken from them as a whole?

Not in order of importance, the following is apparent:

From the total anthocyanin concentration results in the second paper, it is obvious that

the anthocyanins present decrease fairly rapidly from red to orange to pastel to peach to finally zero in Group 1 and Group 2 yellows. Contrary to this, the carotenoid concentrations show no regular change within the anthocyanin pigmented plants and only in the cases of deep yellow to pale yellow flowers is there an apparent relationship.

This again suggests that orange in clivias is not due to orange being a combination of red plus yellow. In contrast, the graphs of the first paper show the relationship between pelargonidin-3-glucoside and pelargonidin-3-rutinoside (p-3-g orange and p-3-r red) as the control of whether a flower is orange (when p-3-g predominates) or red (when p-3-r predominates). They also show that reds have much more total anthocyanin than orange – which is supported by the quantitative values in the second paper.

The important difference between the two papers is that the earlier paper found only two anthocyanins present in the red, orange and (one) peach flowers examined - whereas in the second paper three anthocyanins were found, labelled as Anthocyanin 1 and 2 (reported as "pelargonidin like" and present +++). Anthocyanin 3 was present in Nakamura Crimson (++) and (+ or w) in three others. It is here where I think that more work (analysis) is needed.

From the naming of the anthocyanins in the later paper I believe that Anthocyanin 1 is the same as pelargonidin-3-glucoside. Anthocyanin 2 is probably pelargonidin-3-rutinoside, but I do not believe that Anthocyanin 3 is a delphinidin pigment.

It may be "delphinidin-like" – probably because it gave a bluish or blue-purple spot on the paper chromatography sheet, but I suggest that Anthocyanin 3 is probably cyanidin-3-rutinoside (c-3-r). This is the anthocyanin that the earlier paper reported in *Clivia caulescens* (flowers and berries), *Clivia nobilis* (flowers) and *Clivia miniata* (berries and stem). As c-3-r is capable of being present in all these *Clivia* species, I suggest it is also present in some *Clivia miniata* flowers (particularly in the darker flowers) – e.g. 'Nakamura Crimson' as reported

(++) in the second paper as Anthocyanin 3. As well as this, of the three major pigment types, pelargonidin types are usually an orange red, delphinidin types are usually purple/blue, while cyanidin types have a wide range from red to pink to mauve to blue- so are capable of mimicking both the other types.

However, pelargonidin orange red is called scarlet – while cyanidin red is usually called crimson (so note that the Anthocyanin 3 (++) plant above is called 'Nakamura Crimson').

So where do pink flowers come from?

They come from dilute Anthocyanin 3.

All the peaches, apricots, pale pastels, pinks etc are simply dilute mixtures of three anthocyanin pigments, plus carotenoids (responsible for yellow) and even green - which is another pigment (chlorophyll) which can vary independently of the other four and which can give rise to green flowers when all the other pigments are absent or extra low amounts and the green pigment is present in a more than

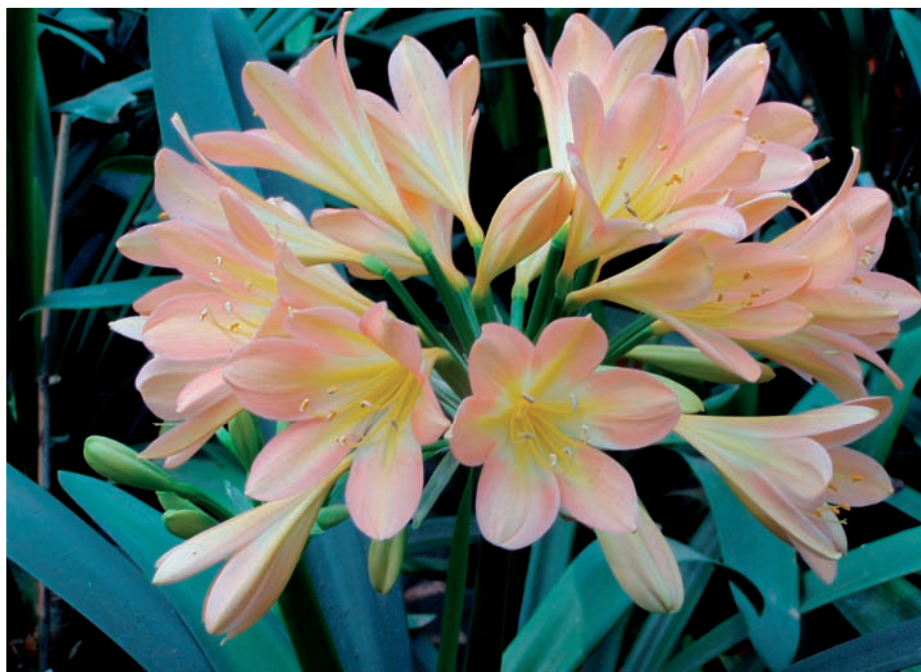
the usual amount.

The flavonoid pathway is common to most pigments in most plants and gives rise to anthocyanin pigments as the last step in the process. However, anthocyanins are extremely variable from genus to genus and even within a genus. Also, detailed chemical analysis of plants, where 4,000 or more anthocyanins have been reported, probably does not reach 1% of the total number of flowering plants.

Again, of those done adequately, the great majority of analyses have been done on dicots with much fewer available on monocots. In fact, the most investigated monocots have been corn and other grasses (cereals) because of their value as crop plants - so one has to get information from wherever one can.

Other investigated monocots are orchids where cyaniding pigments far exceed the other two (96% to 3% delphinidin and 1% pelargonidin types), lilliums and a few more.

A recent paper on lilliums (Ref 3) was interesting



Wittig's Pink.

in that while often the situation is complex with numbers of pigments, in liliiums it appears quite simple.

The main pigment is simply c-3-r (the same as in clivias) and a minor pigment - a more complex form of c-3-r - is only present in the deeply coloured flowers. With those investigated (ten "Asiatic type" lilies, two "Oriental types" and *Lilium longiflorum* as a white (albino) the colours ranged from lavender red, to orange red to orange, to yellow, to pink to white – and these colours had less and less c-3-r , then decreasing finally to pink, in the absence of yellow.

I suggest this is also what is happening in clivias where c-3-r is not the major pigment (the pelargonidin 2 types are) but as these two go down in amount, c-3-r can vary independently of them and of the carotenoids, so in the the few flowers where these are fading out (becoming less and less) if c-3-r is still present you start to see not crimson red (when c-3-r is high) but pink.

This is where 'Wittig's Pink' comes in (source unknown).

We have the difficulty of flowering it pink - it is frequently peach and probably environmental and timing (developmental) conditions are important factors but its berry has been described as maroon which on my colour chart is a very marked purple-red (probably what in the liliium was described as lavender-red).

Remember Christo Lotter described his peaches, originally from an orange x yellow cross, as

first year flowering a pink then the following year an apricot and eventually he got his peach line from these plants. This is an example of developmental change as are green seedlings which are initially described as green but slowly pigment with time (again, a c-3-r time development) as a result of the anthocyanin pigment in the stem.

Once you get a pinkish flower, crossing it with another (preferably out of the same cross), line breeding will intensify the pink colour in subsequent offspring.

Conway reportedly was breeding 'bluish' flowers - which most of us assumed was just an 'ageing' flower effect - but it could easily have been a developmental appearance of c-3-r.

In conclusion, to ascertain the factors at play, I feel we must obtain an accurate analysis of Anthocyanin 3 from a 'Nakamura Crimson', a good pink flower and, if possible, a bluish fading flower.

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Bill Morris, Australia
7th May 2010

CLIVIA CULTIVARS

Clivia Concrete Cherry Blossom Cultivar Group: (all *C.miniata* x *C. x Minilescent* types)

First flowering in June 2010. Fairly lax umbel, held just above leaves, atop an erect dark green scape. On opening, the distinctly pendulous, spreading flowers are pale yellow, maturing to a deep yellow with deeper peach tones on the exterior of the individual flowers. Leaves narrow, fairly short. (see photo 5915).

This particular clone is 'Sir William Peach', with the following breeding history, ie. *C.miniata* var. *citrina* 'Tipperary Yellow ' x [*C. caulescens* - Ngodwana form x *C.miniata* 'Chubb Peach'] Clivia



Clivia Concrete Cherry Blossom Cultivar Group.



Clivia Afrique Nouveau Group.

Afrique Nouveau Group: (all *C. x* Minilescent x *C. x* Cynanthiflora types). First flowering in May 2008. Fairly dense umbel held above leaves. On opening, the distinctly tubular flowers with protruding stigmas are a bronze/pink colour with a deep green overlay, changing to an orange/bronze colour, with green tips. Leaves are fairly narrow and long. (see photo 5921). ▼

Jaco Truter

CLIVIA MEMORABILIA

Lowveld ceramicist shows love of clivias in her art

Many creative wizards derive their inspiration from the environment, especially our indigenous flora. One such artist, well-known countrywide for her eye-catching, yet useful ceramics, Esra Bosch, came back to live in the Lowveld, after qualifying as a veterinary nurse at Onderstepoort many years ago.

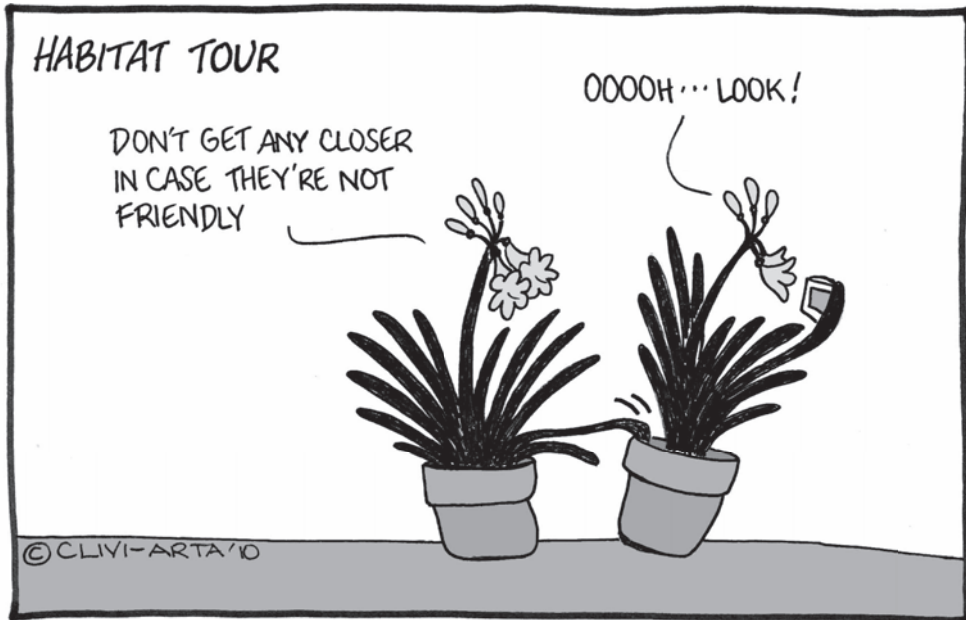
Esra has always been inclined to incorporate the natural colours of her surroundings in her work. The adage “Less is more” has influenced her stylish tiles, bowls, platters, plates and plaques. On a number of occasions, Esra has been commissioned by Lowveld Clivia Club members to create clivia-related art pieces. She even designed and created clivia-patterned platters which have been used as trophies for some of the sections at the Annual Clivia Show each year. She has also created a series of wall plaques each depicting a different species of *Clivia* for *Clivia* growers, Paul and Sue Kloeck, of Clivia Kingdom. ▼

Sue Kloeck – Lowveld Clivia Club



(From L to R) Esra Bosch and her personal assistant Zanele Ngoza holding clivia ‘trophies’/ platters with clivia plaques.

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