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# Clivia

## News



**Clivia News****NPO no. – 139-860 | SARS PBO Tax Exemption no. 930036393****THE CLIVIA SOCIETY MANAGEMENT**Website: [www.cliviasociety.com](http://www.cliviasociety.com)Information: [infocliviasociety@gmail.com](mailto:infocliviasociety@gmail.com)

POSTAL ADDRESS: P O BOX 1383, Roosevelt Park, 2129 Johannesburg

**MANAGEMENT COMMITTEE: 2021/2022**

<b>Chairman</b>	Glynn Middlewick: Mobile: +27 82-650-1463; e-mail: <a href="mailto:gcmidd@mweb.co.za">gcmidd@mweb.co.za</a>
<b>Vice-Chairman</b>	Dave Garriock: Mobile: +82-799-5206, e-mail: <a href="mailto:David.garriock@akzonobel.com">David.garriock@akzonobel.com</a>
<b>Secretary</b>	Joy Woodward: Mobile: +27 72-487-7933 or 021-671-7384; e-mail: <a href="mailto:capeclivia@ibox.co.za">capeclivia@ibox.co.za</a>
<b>Treasurer</b>	Clayton Jonkers: Mobile: +27 83-267-7206; email: <a href="mailto:clayton.jonkers@crowehorwath.co.za">clayton.jonkers@crowehorwath.co.za</a>
<b>Extra Member</b>	Hennie van der Mescht: Mobile: +27-79-493-1719; e-mail: <a href="mailto:hvdmescht@vodamail.co.za">hvdmescht@vodamail.co.za</a>
<b>Publications</b>	Glynn Middlewick: Mobile: +27 82-650-1463; e-mail: <a href="mailto:gcmidd@mweb.co.za">gcmidd@mweb.co.za</a>

**INTERNATIONAL CONTACT PERSONS**

<b>Australia</b>	Lisa Fox: Tel. +61 417 087 667; e-mail: <a href="mailto:lisa.fox@gmail.com">lisa.fox@gmail.com</a>
<b>New Zealand Clivia Club</b>	Alick Mc Leman <a href="mailto:clivia@xtra.co.nz">clivia@xtra.co.nz</a> >
<b>United Kingdom</b>	Steve Hickman: Riseholme, 54 Greenside Lane, Hoyland Nursery, Barnsley, South Yorkshire, S 74 9P Z, United Kingdom Tel: 044 0771 718 2169; e-mail: <a href="mailto:stevenhickman@btconnect.com">stevenhickman@btconnect.com</a>
<b>Europe</b>	Aart van Voorst: Tel: +031 25 252 9679; Frederik Hendriklaan 49, HillegomTE 2181, Netherlands; e-mail: <a href="mailto:a.vanvoorst@snelnet.net">a.vanvoorst@snelnet.net</a>
<b>USA</b>	David Loysen, 208 Shaw Hill Road, Stowe, Vermont, VT 05672, USA Tel. +1 802 253 2528; e-mail: <a href="mailto:shawhill208@gmail.com">shawhill208@gmail.com</a>

**PORTFOLIOS**

<b>Public Relations Officer</b>	Carrie Kruger: Mobile: +83-343-1288, e-mail: <a href="mailto:utopiACLIVIAS@gmail.com">utopiACLIVIAS@gmail.com</a>
<b>Judging Standards</b>	Hennie van der Mescht: +83-511-9519, email: <a href="mailto:hvdmescht@vodamail.co.za">hvdmescht@vodamail.co.za</a>
<b>Registrar of Clivia names</b>	Lisa Fox: Tel. +61 417 087 667; e-mail: <a href="mailto:lisa.fox@gmail.com">lisa.fox@gmail.com</a>
<b>Research</b>	Felix Middleton: Mobile: +27 84 701 9915; e-mail: <a href="mailto:felix.middleton6352@gmail.com">felix.middleton6352@gmail.com</a>
<b>Website Administrator</b>	Lisa Fox: Tel. +61 417 087 667; e-mail: <a href="mailto:lisa.fox@gmail.com">lisa.fox@gmail.com</a>

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## INSIDE



## From the Editor

The publication of our Clivia News in the digital form has been accepted by most members, with a few unhappy voices. Joburg Clivia Club has printed their own copies for some members. David Loysen, the USA representative, has organised the printing of hard copies for their members.

Included in this edition are the images of the Virtual show 2021 – the second and third positions. To separate the second and third positions from the winners, using a single photograph, is not an easy task for the judges!

A previously published article on anthocyanin pigmentation is included as is short article on offset separation by Pieter le Roux. Glynn gives a review of the Amaryllis caterpillar – a common problem for all amaryllis growers in the summer months. A previously published update on photographing clivia by James Comstock is included. The classes for the Clivia Society Virtual Show were included in the previous Clivia News edition. Entries are open until the 15th of October 2022. The photographic competition closes at the end of September 2022. Details of the requirements are included in this edition. The winners of the photographic competition will be included in the Yearbook to be published at the end of November 2022. 🌸

*Glynn Middlewick*



FRONT COVER: Interspecific of Karel Stanz



BACK COVER: 'Aquarius'

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## From the Chair

The Annual General Meeting takes place on the 21st May at the Durban Botanical Gardens. The meeting is hosted by the KwaZulu-Natal Clivia Club.

We look forward to a good attendance at the meeting. The Covid pandemic is still a threat, but hopefully all sensible people have been vaccinated. The wearing of masks and social distancing is advisable

We were unfortunate to lose Marius Meyer as the Chairman of the Eastern Province Clivia Club. He was a willing helper and a competent chairman. Charl Coetzee has taken over as Chairman of the Club.

Paul Kloeck has taken over as Chairman of the Lowveld Clivia Club, replacing Roger Briggs.

Please make an effort and enter images in the Clivia Society Virtual Show competition – include the icon '@', as well as in the photographic competition

The Clivia Conference takes place in 2023. The organiser, Andre Swart, has sent me an update which is included below.

## PROGRESS REPORT ON 2023 INTERNATIONAL CLIVIA CONFERENCE

Things are not always the way most people believe. The Clivia Society's quadrennial (i.e. 4-yearly) "Conference" is constitutionally a "Symposium", and the next one will be a quinquennial symposium in 2023 in Cape Town, the last one having been 5 years earlier in Johannesburg in 2018. The theme will be *Clivia* Myth Busters, designed to address questionable *Clivia* assumptions.

Covid-19 has necessitated some strategic adjustment of the date to enable the internationally dispersed Clivia Society membership to visit Clivia's homeland, attend the Conference, enjoy the rather special 'sideshowes' before and after Conference and return home hopefully without flight restrictions or quarantine.

Venue negotiations are currently taking place for excellent conference facilities in Cape Town's Tygerberg suburbs, north of the city centre, for probably Monday 2 October to Wednesday 4 October 2023. The preceding week (27 to 29 September) sees a short tour to Namaqualand (prior booking essential) of 3 days and 2 nights to see the end of the massed wildflowers, and endemic succulents (ranging from a few centimetres to a few metres tall), arriving back in Cape Town on Friday, 29 September, in time for the evening joint gala opening function of the International Clivia Conference and the Cape Clivia Club Show. This will be a smart affair with a guest of significant stature.

During the weekend between the gala opening and the Conference, visitors will be encouraged to attend the Cape Clivia Club Show (which opens on Saturday morning), see massed plantings of Clivia at Kirstenbosch, Stellenbosch Botanical Gardens and at the wine farm Babylonstoren. Visits are also available to local growers, as well as visits to Cape Point Nature Reserve, the Table Mountain Aerial Cableway and the West Coast National Park.

On conclusion of the Conference around lunchtime on Wednesday 4 October, a guided private tour (prior booking essential) will leave for the *Clivia mirabilis* habitat 300 km north of Cape Town, sleeping over on Wednesday night and visiting the accessible, wild *Clivia* population on a private farm (with uneven and rough terrain requiring stout walking shoes but no special fitness) on Thursday morning, and after a special lunch, returning to Cape Town on Thursday evening (6 October).

While firming up of these arrangements will be pursued with diligence, there are aspects that are beyond our control. At this early stage the way the pandemic's subsequent waves play out, is unpredictable. Facilities being booked are constrained by numbers, which this early have to be estimated. The weather will play a role in the pre-conference and post-conference excursions. There may be limited wildflowers to be seen as the planned visit is late in the flowering season, and while the *Clivia mirabilis* should already have produced flower spikes, it is probably too early to see fully open flowers. While the Convenor will facilitate bookings for accommodation and the two size-constrained tours, the actual reservations/bookings will be the responsibility of Conference attendees themselves, and no guarantees are offered as to availability.

In due course the Conference Programme will be announced, particulars of the Excursions advertised and a formal Invitation published, inviting attendance. This promises to be a truly memorable highlight on the *Clivia* lover's CV and deserves early consideration as a bucket-list event. 🌸

**André Swart**

## OBITUARIES

### Marius Meyer

**M**arius Meyer passed away on the 1st February 2022 after a three year battle against ill health. He was the serving Chairman of the Eastern Province Clivia Club and a long time clivia enthusiast. He remained optimistic with regards to his recovery until the end. On behalf of the Clivia Society we offer our condolences to his wife and son. 🌸



### Cynthia le Roux

#### Ronel and Zelda le Roux

**C**ynthia was born on 14 September 1940, in Port Elizabeth, South Africa. Cynthia attended school in Port Elizabeth. In her younger days Cynthia was a keen Netball player and also played Table Tennis in the Eastern Province League. She loved dancing and they partook in all the major dances in Port Elizabeth for many years.

On completion of her schooling, Cynthia worked for several companies in Port Elizabeth. Cynthia and Willie married 17th October 1959 and they had two daughters Ronel and Zelda. Following her retirement, Willie and Cynthia travelled locally and internationally.

Both Willie and Cynthia joined the Eastern Province Clivia Interest Group in 2000. When Willie was appointed as Chairman in 2001, Cynthia helped Willie out with some book work and then eventually took over as the Secretary of the Eastern Province Clivia Club.

Cynthia was involved in many aspects of the Eastern Province Clivia Club. In addition to the secretarial work, Cynthia together with Ronel developed a Letterhead for the Club. These were used for all special awards of the Club. Cynthia was readily available to fill vacant positions at the club and was soon the News Liaison Officer. Cynthia was actively involved in the Show preparations and volunteered in various positions at the show.

In 2012 an award of 'Certificate of Appreciation' was awarded by the Eastern Province Clivia Club to Willie and Cynthia. This was followed by an Honorary Life Membership from the Club in 2015. In 2016, the EPCC motivated for and received the award of Honorary Life Membership from the Clivia Society for Willie and Cynthia.

Cynthia had a keen sense of humour, laughed easily, was an excellent cook and enjoyed entertaining her family and friends. Cynthia had a special relationship with her family and enjoyed many long-lasting friendships. She passed away on 7 February, 2022 and will be missed by Willie, daughters, family and friends. 🌸



## Dr Piet Smit

### A tribute from Willem Smit, son of the late Piet Smit



**M**y father had a passion for clivia. We had no knowledge of the plants. This lack of interest in the clivia plants continued until that day, in early 2021, when my father passed away.

For some reason, probably sentimental, I could not get rid of the plants in his collection. I remember my father visiting us previously and remarking that clivias would look good under the oak, yellowwood and the stinkhout trees!

A friend spent five days travelling the 300 kilometres to my father's home to fetch all the plants from his shade house.

What we inherited was an enormous number of pots, bags and seedling trays spread over our lawn. One fact I had learnt was that the plants did not tolerate the sun.

With one goal in mind, over a period of four weeks, our garden was remodelled. We wished to ensure a spectacular flowering display in September as a tribute to my late father! 🌸

Growers of rare and unusual Clivias for the collector

**CONTACT**  
Carrie Kruger  
Tel: 083 343 1288

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# Clivia – division of offsets

Pieter le Roux

**F**or all growers of clivia plants, a time will come when the plants need to be divided or replanted.

## Reasons for dividing a clivia plant

If your plant is in a pot, offsets form, some plants more often than others. With time the number of offsets may result in an overcrowded pot with no soil present, which cannot provide the roots with adequate nourishment. Most potted plants will need dividing every three to four years. Some growers replant their plants annually to provide nourishment with the fresh potting soil.

In the garden, the clivia plants form large clumps and the offsets are overcrowded, not allowing good air circulation between the offsets and they may be prone to developing mealie bug infestation. Dividing the large clumps provides an opportunity to transplant the plants to a new bed or spread them out over the existing bed. They also make a useful gift to friends!

Replanting the offsets, after careful division from the mother plant, provides the plants with new potting soil if in a pot or fresh soil, compost and fertilizer if planted in the garden.

Some growers prefer to remove the suitably mature offset and establish them in a separate pot. These offsets will then provide a flower when they have twelve or more leaves present.

What is the ideal offset size? This is usually determined by the number of leaves present on the offset. The offsets grow faster when they are attached to their parent plant. Once the offset has produced about ten leaves, most growers would consider this to be a suitable time to divide the offset from the mother plant.

When is the ideal time or season of the year to separate the offset from the parent plant? Many growers divide clivia plants and replant clivias at any time of the year. If the plant is in a bag, anytime of the year would be suitable for planting. When considering the division of a clivia plants, the best time is probably when the flowering time is over. This would be in

November in the Southern hemisphere. This timing allows the offset and the mother plant a full growing season to settle and establish new roots.

Dividing pollinated plants requires extra care or should be postponed if you do not want to lose the possible seed berries.

Dividing the offsets in February or later in the year, in the Southern hemisphere, will limit the time available for the re-establishment of the roots before the onset of autumn.

Preparation prior to the division of your clivia plant:

- a) Have a selection of various pot sizes available to accommodate the various offset root sizes.
- b) The newly planted offsets will need a support in their new potting medium until the soil firms with time. Metal or wooden stakes make suitable supports for your plant. Tie the plant to the stakes with cable ties or something similar.
- c) A good quality potting medium, well decomposed and usually bark based, from a reliable supplier is essential for the successful growth of your new offset.
- d) The raw cut surfaces of the offsets need to be protected. Some growers do not cover the cut surfaces and replant the offset directly in fresh potting soil. As there are fungal spores in the air and in the fresh potting soil, using an antifungal mixture or 'flowers of sulphur' applied to the raw surfaces. Another method used by some growers is to allow the cut surfaces to dry out for a few days before planting them in the potting soil. Allowing the raw surface to dry out will also result in the drying out of the sensitive roots of the plant. Healthy roots are essential for the uptake of water and nutrients once they are replanted in new potting soil.
- e) A sharp heavy-bladed knife should be used to divide the offsets. The knife should be clean and sterilized. A 10 percent bleach solution is a suitable choice to sterilize the knife. An



open flame is another method.

- f) The labeling of the offset is important as mixing up the offsets once placed in the shade house is a common problem. Use a good permanent marker, soft pencil or pen paint. Some use 'Tippex'.

### Dividing the plants

Thoroughly soak the potted plant in water. Remove the plant carefully from the pot and shake off as much soil as possible. Use a strong jet of water to remove the rest of the soil from the roots. Untangle the roots carefully and remove any dried out or unhealthy roots.

A successful separation of an offset would ensure that each offset has a good root supply. Some of the offsets are attached very closely to the main stem of the mother plant and may not have many roots present. Carefully study the roots and offsets before deciding where to divide them.

The offsets are sometimes well separated from the mother plant and can be separated by hand. Be careful of breaking the offset from the main plants as you may break the plant growth off the root base. If there is no root base present on the offset, there is no chance that the plants will grow new roots. If there is some evidence of the

root base being present on your broken offset, you may be able to grow new roots by placing the broken plant base in pure moss or washed pool filter sand.

Using a clean, sharp knife to separate the offset from the mother plant at a place as close to the mother plant as possible.

The offset needs to have at least twelve leaves present to be 'mature' and be able to flower.

Treat the cut surfaces of the offset and the mother plant with a suitable antifungal medium. Suitable products include: 'Flowers of Sulphur', 'Kumulus', 'Virikop' and 'Bravo'. Cinnamon powder is a natural fungicide and growth stimulant.

Place the offset in a suitably sized pot. The roots should fit into pot with some space to spare for potting soil. Place a fertilizer, such as 3:1:5, at the base of the plant.

Water the newly planted offsets well initially and then keep the plants on the dry side for a few weeks. Do not overwater once replanted as the roots of the offsets are not yet established and may rot.

Finally stake the plants, fix them with cable ties to the stake and label them. 🌸

**Plants 4 Sale**

**Michael Holt**  
 082 337 7920  
[www.plants4sale.co.za](http://www.plants4sale.co.za)  
[info@plants4sale.co.za](mailto:info@plants4sale.co.za)

Three circular images show different Clivia plants: a cluster of orange and yellow flowers, a large cluster of light pink flowers, and a cluster of light green flowers.

Social media icons for WhatsApp, Instagram, and Facebook are visible in the bottom left corner.

# *Brithys crini*

**Synonyms – Amaryllis caterpillar, Lily Borer and Kew Archers**

**A Review – Glynn Middlewick**

A not uncommon site in our gardens is the destruction of the leaves of our *Crinum* lilies or *Clivia* leaves. On closer inspection we may find active larvae eating away under the transparent layer of epidermis of the leaves. If we forget to check for the presence of the lily borer, we may only find the end stages of the destroyed leaves and evidence of the excretions of the larvae without any larvae present. The larvae may at this stage have eaten their way down into the meristem or plant base and transformed into pupae.

*Brithys crini* was first described by Fabricius in 1775. Only one species has been described. Some descriptions of a subspecies of *pancratii* are evident in the literature. The Lily Borer has several synonyms which are listed below.

AMARYLLIS CATERPILLAR

**Scientific classification**

Kingdom: Animalia  
 Phylum: Arthropoda  
 Class: Insecta  
 Order: Lepidoptera  
 Family: Noctuidae  
 Genus: *Brithys*  
 Species: *B. crini*

**Binomial name:** *Brithys crini*  
 Fabricius, 1775

**Synonyms:**

- *Bombyx crini*
- *Phalaena dominica*
- *Noctua pancratii*
- *Noctua encausta*
- *Brithys vertenteni*
- *Brithys nipponica*
- *Brithys encausta*
- *Brithys pancratii*
- *Glottula pancratia*



Evidence of the Amaryllis caterpillar destruction.

The Lily Borer, *Amaryllis* caterpillar, or Kew Arches is widely distributed in the world. It is found along the coastal areas of the Mediterranean, southwards to South Africa. It is also found in Japan and in Australia.

The moth has a wingspan of about 40mm with dark brown wings and paler wingtips. These moths are active during the warmer seasons. Several generations per year are bred and the larvae may overwinter by boring into the bases of the host plants.

The larvae are described as having variations in colour, usually pale-yellow to white-zebra stripes – on blacks or browns. The larvae grow to approximately 40mm in length before they pupate.

These larvae feed on mainly poisonous plants and are thus unpalatable to most vertebrate predators. In Europe the main natural predators are the Carabid – ground beetle and the Darkling beetle. These are found in South Africa, but the distribution has not been well documented. Lacewings – Chrysopidae have larvae which are voracious feeders and will eat the eggs and larvae of Lepidoptera (butterflies and moths). These Lacewing larvae may also feed on their fellow larvae and on their parents! The adult Lacewings feed on pollen and nectar. These Lacewings would obviously be killed by insecticides in our gardens.

The parasitic wasps of the Pteromalidae and Braconidae families are natural predators.

The parasitic wasps are found wherever there are butterflies or moths. These wasps lay their eggs on larvae. The hatched larvae from the eggs of the parasitic wasps then feed on the host larvae.

### Parasitic wasps – Braconid

Small wasps usually less than 1,2cm long. Ant-like heads, appear black but many species have orange or red abdomens.

Benefits of the parasitic wasps: Adults lay eggs on or in soft-bodied caterpillars. They are attracted by the smell of the caterpillars munching on plant leaves. The braconid larvae hatch and then feed inside their living hosts, weakening or killing them. A female braconid wasp can lay up to 200 eggs a day in warm summer months

Broad spectrum insecticides kill these parasitic wasps.



Carabid beetle – Ground beetle.

The host plants of the *Amaryllis* caterpillar include the following: *Clivia*, *Amaryllis*, *Nerines*, *Crocus*, *Crinum*, *Haemanthus*, *Zephyranthus*, *Narcissus*, *Hippeastrum* and even *Agapanthus*. The cooler months usually see a decrease in the activity of the *Amaryllis* caterpillar but active larvae are also seen in some of the cooler months of the year.



Lily Borers under and on the epidermis of a *Clivia* leaf.



Braconid parasitic wasp



Amaryllis caterpillar larva



Amaryllis caterpillar moth

### Braconidae parasitic wasp

There are over 20000 species of wasps in the Braconidae Family

### Control of the Amaryllis worm infestations

The Amaryllis worms are known to be active during the warmer months of the year. Inspect your plants daily. The moths lay their eggs at night and until the larvae become active, no evidence will be seen on the leaf until the upper surface may show evidence of the mining worms. The larger larvae may be physically removed. Badly damaged leaves are best removed. You can also plant *Crinum moorei* between your *Clivia* and *Amaryllis* plants, which will serve as an indicator plant. The caterpillars should target the *Crinum* lily, which can make detection of

the larvae presence easier to notice. Natural pests include parasitic wasps of the families Pteromalidae and Braconidae, the ground beetle and the Lacewings – Chrysopidae.

### Biological Spray control of the Amaryllis worm

Should you prefer to use a safer spray for control of the Amaryllis caterpillar, consider using a biological spray. Ensure that both sides of the leaves are covered when using

contact sprays. A wetter/sticker added to the mixture will ensure a better cover and allow for a longer duration of action eg Makhro SK Eco Oil Spray or G49 or Latron B.

A safer control of pests with no secondary poisonings is the use of *Bacillus thuringiensis*, Neem Oil and the use of pyrethrum – the natural ingredient of chrysanthemums. Products having these ingredients which are available at nurseries are the Margaret Roberts – *Bacillus thuringiensis* – worm control – worms die after 4 or 5 days. This product would have to be re-applied after rain and watering. Neem oil is both a preventative and a treatment for the worm infestation. Makhro Organicide Plus has pyrethrum as the active ingredient together with garlic and oil.

Home remedies that help for the control of the caterpillars include:

- 1) Molasses solution – 1 tablespoon molasses, 1 teaspoon dish soap. 1 litre of warm water.
- 2) Garlic solution – 3 cloves of garlic, 1 tablespoon of vegetable oil, 1 teaspoon of dish soap and 1 litre of water
- 3) Diatomaceous earth (food grade). May be applied wet or dry, but is only effective once it has dried out.
- 4) Companion planting to discourage caterpillars.

Strong smelling herbs such as Peppermint, Lavender, Mugwort and Sage.

Rotate your crops for Caterpillar Control. Don't plant the same type of plants in the same place year after year. This gives moths and caterpillars a chance to establish themselves.

Notes on Neem Oil: Some aspects of the efficacy of pure Neem oil remain a mystery. There are a number of effective components in this natural oil, but the most active ingredient is Azadirachtin.

This ingredient is responsible for repelling and/or killing insect pests. Sometimes this component is extracted to make a highly concentrated product.

The many different components of the Neem pesticide works in multiple ways. Azadirachtin works as an insect repellent and reducing insect feeding.

Furthermore, it interferes with the insect hormone systems, so they do not mature correctly or lay

eggs. This prevents reproduction.

### Insecticide spray control – chemical

Contact pyrethroid insecticides are very effective for controlling the Lily Borer infestation. Pyrethroids are developed from pyrethrum but have more stability in sunlight.

Examples are cypermethrin, bifenthrin and deltamethrin. A wetter/sticker should be added to the spray and should be re-applied as per the instructions.

The effect of the contact insecticides is limited to the treatment of the worms on the outside of the epidermis of the leaves.

A good example of a systemic insecticide for the worm control is one of the neonicotinoids. The original one used was imidacloprid. The tradename of the original product was Confidor.

Several generic products are now available eg Kohinor, Bandit etc. One neonicotinoid product that claims to be less bee toxic is acetamiprid. This should not be used while there are blooms on which the bees are feeding.

An ideal combination of a contact and a systemic insecticide is Makhro Plant Care. This product has a pyrethroid contact insecticide – bifenthrin and a systemic insecticide – acetamiprid, a neonicotinoid product.

Regular inspection of your plants is the most important aspect of disease and pest control. Early detection and then effective control will ensure that your plants remain healthy. 🌸

**Vrijehof Clivia**  
www.vrijehof.co.za

**Antonie de Vry**  
**083 560 6492**  
clivia@devry.co.za

# Photographing clivia

Published previously

James Comstock

Firstly, I will describe what I do, then make some suggestions for you.

Lighting is very important. I have a studio strobe set up. I usually photograph several clivia flowers at a time. It is not practical for me to customise the lighting for each plant, but some adjustments are always necessary. For instance, I would illuminate a pendulous flower differently from an upright one. My basic set-up is two lights with photographic reflector umbrellas. This surrounds the flower with soft light which helps capture the subtle colours, delicate colour shadings of the floweres. Harsh light from a small point source (like the typical flash on the camera) frequently washes out the soft colours.

I place the umbrellas on either side of the flower. If the flowers are pendulous, I will position the umbrellas slightly below the level of the flower pointing up to illuminate the throat of the flower. If the flowers are mostly upright, I position the umbrellas slightly higher, aiming down.

By placing the lights to the sides, very soft shadows are created which help to define the shape of the flower or umbel. If you use a single point flash that's right on the camera, you either wash out shadows or get harsh unattractive ones.

I usually use a black background as it makes the flowers stand out. I take my meter reading off the flowers, as the black background tricks the meter. I try to shoot at f22. This gives me the most depth of field. With my studio strobes I have the ability to increase or decrease the light with the turn of a dial.

I have no idea what your photographic experience is or what equipment you have. I will make here some suggestions that might help if you.

- 1) You need to get close to the flower to show the unique characteristic of each flower. A good close-up lens is essential.
- 2) Keep the lighting soft, it's the best way to capture delicate colours and patterns. If you have no flash and are outside, do not shoot in direct sunlight. A lightly overcast day is ideal. Otherwise, move to light shade. If you use a flash, try putting some type of diffusion over it.
- 3) Keep the background simple. Move the plant if you can or use a portable board or fabric.
- 4) Try to shoot at a small aperture like f16 or f22 to get most of the flower in focus. This may mean shooting at a slow shutter speed, so you may need a tripod. If you are setting the camera manually, take the reading from the flower if the background is very light or very dark. If you are using a camera with an automatic exposure or with a built-in flash, use a background that is a medium shade, like grey (photographers use 18% grey as neutral). A medium grey background can be very beneficial for many reasons. If your camera is automatic, it will give you a more accurate exposure than if you had, say a pale-yellow flower in front of a dark background.
- 5) Shoot a couple of different exposures.
- 7) Practice, experiment, and enjoy your photography. 🌸

# Clivia Society 'Virtual' Competition 2021



CS 'Virtual' Show – Species – Orange – 2nd –  
Andre du Toit



CS 'Virtual'  
Show – 2nd –  
Species – yellow –  
Rex and  
Deidre Williams



CS 'Virtual'  
Show – Orange  
Interspecific non-  
recurved flower –  
Carrie Kruger



CS 'Virtual' Show – Peach Interspecific non-recurved flower – Mike and Angie Riska



CS 'Virtual' Show – Versicolour Interspecific non-recurved – 2nd Andrew and Pauline Kajewski





CS 'Virtual' Show – Pink Interspecific – recurved – 2nd Paul Kloeck



CS 'Virtual' Show – Bronze Interspecific – recurved – 2nd Sue Kloeck



CS 'Virtual' Show –  
Multicolour Interspecific  
– recurved –  
2nd Andre du Toit

CS 'Virtual' Show – Peach –  
Interspecific – non-recurved –  
3rd Jan Pohl



CS 'Virtual' Show – Apricot/Salmon – Interspecific recurved – 3rd Carrie Kruger



CS 'Virtual' Show – Versicolour Interspecific – Recurved – 3rd Carrie Kruger



CS 'Virtual' Show – Multicolour Interspecific – 3rd Place – Carrie Kruger



CS 'Virtual' Show – Versicolour Interspecific – non-recurred – 3rd Place Rex and Deidre Williams

# Photographic Competition of the Clivia Society 2022

**All members of the Clivia Society are invited to submit entries into the six categories of the Photographic competition. The photographs you enter may be published in the Yearbook 23 of 2022. The closing dates for entries is the 30th September 2022.**

## CONDITIONS FOR ENTRY OF IMAGES INTO THE COMPETITION

1. Complete the entry form. An entry form should be included with each submission of photographs. One form is sufficient if several photographs are submitted at the same time.
2. Submit entries by the 30th September 2022.
3. There are six categories. The number of entries per category is limited to three.
4. Photographs should be submitted to Clivia Society Photographic competition, gcmidd@mweb.co.za If the size of the images is large use 'WeTransfer' – free of charge!
5. Format of photographs: jpeg file not larger than 2Mb per photograph. The resolution to be 300 dpi. The images should be submitted without being embedded in another programme. No evidence should be present that may identify the image as belonging to a specific person.
6. If you submit photos for entry into the Society competition you accept that your photograph may be used in Society publications with full recognition of you as photographer.
7. The decision of the judges is final and must be accepted by all entrants.

Hints: The photographs are judged on their

photographic quality. The prettiest photograph may not be the best in quality in terms of photographic assessment. Aspects such as sharpness of the image, true colour, absence of distractions in the photograph, composition, lighting, cropping, background choice and white balance are all important considerations for the photographer.

## CATEGORIES FOR THE COMPETITION – maximum of three entries per category

1. Any photograph of a Clivia *miniata* umbel.
2. Any photograph of any pendulous species.
3. Any photograph of any interspecific clivia plant. Owing to the ongoing problem of separating some of the interspecific flowers from the *miniata* flowers, consider carefully into which class you wish to enter the flower image.
4. Any photograph of any habitat plants. These must be photographed in their natural state in habitat.
5. Any photograph of any single flower of any Clivia species. This class refers to a single flower, so you should have a single flower as the main feature.
6. Any photograph of Clivia related subjects such as buds, berries, foliage and floral art.

## CLIVIA SOCIETY PHOTOGRAPHIC COMPETITION ENTRY FORM 2022

Name of Entrant	
Contact Address or e-mail	
Telephone	
Date photographs taken	
Number of Entries	

Indicate number of entries in each class below:

<i>C. miniata</i>		Pendulous species		Interspecific plants	
Habitat		Single flower		Clivia related: buds, berries, foliage, floral art	
Submission		e-mail		WeTransfer	

# Pigment Surprise

Keith Hammett, New Zealand (Previously published)

**Both Harold Koopowitz in his book *Clivias* (2002 Timber Press) and Rudo Lötter in a Power Point presentation have explained and illustrated very well the current paradigm of flower colouration in the genus *Clivia*.**

In essence three separate pigment systems interact. These involve both pigment chemistry and the architectural juxtaposition of these pigments. Bear in mind that the current model is based on very limited research. Pigment analyses have been relatively few; little has been done with species other than *C. miniata*, while detailed anatomical/histological studies are even scarcer. Further, no detailed pigment analyses have been carried out in association with any genetic experiments. Oil soluble carotenoid pigments provide yellow

colouration. These pigments are contained in discrete plastids in each cell and tend to occur in deeper cell layers in the tepals (petals and sepals). In contrast, the red anthocyanin pigments are water-soluble, occur in cell vacuoles and are more conspicuous in the epidermal and adjacent surface cell layers. The third pigment is chlorophyll which, in the leaves, is responsible for photosynthesis. This occurs to varying degrees in the flowers and is most easily seen in green-throated selections of *C. miniata* and on the tips of the tubes of some



Nakamura bronze



Nakamura crimson

of the pendulous species. Like the carotenoid pigments, chlorophyll is contained in plastids, which are consequently known as chloroplasts. The presence of these has a modifying effect on the expression of the other two pigment systems and is most clearly seen in the bronze red flowers of *C. miniata*. There are two major problems when discussing flower colouration. The first is that most people tend to think back to early childhood when paints were mixed and slopped around with gay abandon to produce interesting aesthetic creations, or perhaps more recently when tinting paints when decorating their homes. Oil and water do not mix and, as we have discussed, the carotenoid pigments and chlorophyll are contained within the little balloons we call plastids within each cell. In addition if we look at a petal of any flower with a microscope we will find that cells immediately adjacent to each other can be completely different colours. The nature of colour in flowers is therefore particulate.

In the case of flower colour, the colour of

individual cells represents pixels, but remember that these are not a single layer as in a newspaper picture, but are three dimensional with light passing through and being reflected from many layers of cells. This is why it is so difficult to match the solid colour of a colour chart with the colour of a flower petal. The second problem is that Mendelian genetics as taught at many schools around the world gives the impression that major traits like flower colour are controlled by single genes, whereas this is a rare phenomenon. This is made worse in the case of *Clivia*, because in the early 1980s, Japanese scientists showed that yellow *C. miniata* resulted from one of the pairs of genes that contributes to the production of the red anthocyanin pigments having become inoperative. Orange *Clivia* owe their colour to the underlying yellow carotenoid pigments being viewed through the red filter of anthocyanins in the surface cells. When anthocyanin ceases to be produced, only the yellow carotenoid pigments can be seen.



Chubb Peach'

Only in this instance, can yellow colour be thought of as being controlled by the function or malfunction of a single gene or gene pair. It is important not to think in terms of this malfunctioning gene as coding to produce Nakamura bronze 40 yellow pigment. Remember also that the concept of Group 1 and Group II yellows relies on the paradigm of different gene pairs having become inoperative.

**The process**

Tepals were removed from fully opened mature, but fresh flowers at a comparable stage of development. It was important to standardise samples, as the colour of tepals is known to change as they age.



Broad leaf yellow (Bly), grown by Peggy Pike out of mixed seed from Jim Holmes and others





A *C. caulescens* x *C. miniata* interspecific

There are very few, if any, *Clivia* where pigment is uniformly distributed across an individual tepal. In most tepals there is an unpigmented area at the base of each tepal that gives each flower throat colour. In a longer- term study it would be

desirable to cut out each area of pigmentation and carry out analyses of these individually. Here, as a compromise, simple diagrams were sketched to record colour distribution of each sample. This involved distinguishing between petals and



'Alick's Peach' shown with 'Chubb Peach'



The Interspecific 'Armani'

sepals and both inner and outer surfaces of both. Recordings were made using the Cape Clivia Club chart (CCC) and the Royal Horticultural Society (RHS) colour fan 1966 edition. In many cases the range of colours on the CCC chart was inadequate to make a recording.

### The results

It is interesting to note that while the flowers of plants in some families owe their yellow colouring to water-soluble flavonoid pigments, these are absent from *Clivia*.

The first six samples represent a progression from the darkest red we had available to the palest dilute available. With the exception of Nakamura Bronze, there is a steady reduction in the level of anthocyanin pigments from the darkest to the palest. At the same time carotenoid pigments are seen to diminish, although in not as orderly a manner as the anthocyanins. The apparent bronze colour of Nakamura Bronze is almost certainly attributable to the presence of chlorophyll; this selection has a distinct green throat.

As might have been expected, the higher the level of pigments that a flower has the darker it will be. Clearly, traditional plant breeding strategies of crossing the darkest with the darkest and palest with the palest are most likely to lead to a widening of the colour range within *C. miniata*. The appearance of delphinidin-like anthocyanins in 'Nakamura Crimson' is also encouraging, as the presence of delphinidin, given an appropriate cell pH, leads to a bluer colouration.

Comparison of the analyses of 'Chubb Peach' and 'Alick's Peach' with Tony's Pastel suggests that there is no fundamental difference between what we call a pastel/dilute orange and what we call a peach. It seems simply a matter of reducing the anthocyanin levels to a point where they are still present, but have become so low that they can be barely seen on a paper chromatogram. The interaction of this very low-level anthocyanin component with the underlying carotenoid pigment clearly influences our perception of flower colour. 'Chubb's



Photographs courtesy of Keith Hammett

Peach', which has a higher carotenoid reading, appears darker than 'Alick's Peach', while 'Tony's Pastel', which has a very low level of carotenoid pigment, looks cold compared to the peaches.

When we look at the three yellow *C. miniata* samples, we can see that the hypothesis of anthocyanin pigment being absent from yellows is confirmed and, not surprisingly, the darkest yellow sample 'Bly' has a much higher level of carotenoid pigments than does the palest. From the data, we cannot distinguish between the two putative Type I yellows and the putative Type II yellow 'Natal Yellow'. As the colour in both types is due to the absence of anthocyanin pigments, we need to look for analyses that could determine at which point in the biosynthetic chain, which leads to production of the anthocyanins, that the process is interrupted. Without such analyses the nature of differences between Group I and Group II yellows remains speculative.

The two pendulous species analysed, namely *C. nobilis* and *C. caulescens*, show levels of anthocyanins that fall within the range seen in the *C. miniata* samples as do the two inter-specific hybrids.

Nakamura Bronze had always been assumed to

be a *C. miniata* cultivar. It has broadish leaves and has tulip shaped flowers with a green throat. It can be seen to have a carotenoid profile quite distinct from the *C. miniata* profiles.

*C. nobilis* also has a peak at 417nm, as does 'Armani', albeit at a lower amplitude. These data suggest that Nakamura Bronze has a *C. miniata* x *C. nobilis* ancestry. It is tempting to speculate that *C. x cyrtanthiflora* (*C. miniata* x *C. nobilis*) might be an ancestor, while also wondering if the tulip shape of flower found in many Belgian hybrids might be owed to some *C. nobilis* ancestry. It would be interesting to determine the karyotype (chromosome architecture) of Nakamura Bronze and 'Armani'. There is some indication that the carotenoid profile of *C. caulescens* is distinguishable from both those of *C. nobilis* and *C. miniata*, but as levels were low in the sample analysed, this needs to be further investigated by more extensive and detailed analyses.

As indicated earlier, this set of analyses is nothing more than a range finder for a desirable longer term, more intensive study. However, it is exciting to find strong evidence to suggest that *C. nobilis* has contributed pigment elements to at least part of the *C. miniata* complex. 🌸

# Yellow *Clivia* Groups – other possibilities

Glynn Middlewick

As the Editor, looking for articles for the *Clivia News*, I came across some interesting correspondence from Bill Morris.

Most recently the classification of the yellow *clivia* groups was made by Mann, Holt and Saayman. There are also previous classifications of the yellow flower Groups.

Group 1 and 2 are well recognised and are considered to be the result of a genetic mutation or an albino form of *clivia* flower. All the plants in these two groups, if selfed and fertile, produce green stemmed seedlings. The berries are yellow. We know that if we cross a Group 1 with a Group 2 yellow, we produce an orange flower. An anomaly is the red pigment produced in a Group 2 tepal and berry, when damaged. What explanation is there for the production of an orange pigmentation in an albino plant, which does not produce anthocyanin, to produce pigment when damaged? An explanation I have received that it is perhaps the result of a 'leaky gene'! Odd that trauma overcomes the genetic mutation?

The Group 3 Yellow class includes plants such as 'Oribi Gorge' and 'Greendale Blush Yellow'. These plants produce yellow flowers which with

age produce a light pink pigmentation on the tepals. The berries are coloured red and the seedlings have pigmentation present.

Bill Morris explains that the normal 'anthocyanin spectrum' is continuous from red to yellow, varying with the amount of anthocyanin present. Thus, an orange may be so pale that the flowers appear pure yellow, but the berries are coloured red and the seedling stems are pigmented, indicating evidence that the flower is from the 'orange spectrum' of flowering plants.

The Group 4 plants include the 'Ndwedwe Alpha Thurston', 'Mvuma Yellow' and the 'Noble Yellow'.

The plants in this group have yellow flowers, yellow berries and unpigmented seedlings. The plants I understand are 'compatible' when crossed with each other and produce yellow berries and yellow flowers. The argument would be that this Group is a true mutant or albino yellow.

To summarise, the Groups of yellow *clivia* could be modified to include the above Group 4 plants to be Group 3 plants and the above. The current Group 3 yellow should not be included in the Yellow plant classification. 🌸

# Interspecific

Photos provided by George Mann



Briljant x self. Bred by Paul Kloeck

## *Incredible Plants*

**Clivia plants & seeds**

**George Mann**

082 414 4291

[gjmann2@gmail.com](mailto:gjmann2@gmail.com)



Own Breeding  
*Clivia gardenii* 'Ngome  
Blush Yellow' x  
*Clivia miniata* 'Vico  
Yellow' clone ex Peter  
Smithers.



'Solar Flair' (Nakamura Daruma x  
*C. gardenii*) x (Nakamura Daruma x  
*C. caulescens*)



Owned by me bred by Pieter Saayman  
and Michael Holt. Emma Charlotte x  
Love Child

# Interspecific

Photos provided by Hilton Atherstone



'Bronze' Interspecific –  
Hilton Atherstone







'Gem's Noble' x  
'Peach Strobe' –  
Hilton Atherstone







# Clivi-Arta

Helen Sanders



## 2022 Membership Fees of the Clivia Society

**Subscriptions are for a single calendar year – January to December.**

**The fees below include postage except where mentioned.**

Australia	Pay to Lisa Fox: lisa.fox@gmail.com	\$ USA 30.00
USA	Pay to North American Clivia Society www.northamericancliviasociety.org	\$ USA 35.00
New Zealand	Alick McLeman: clivia@xtra.co.nz>	\$ USA 30.00
United Kingdom	Steve Hickman: hickman.sss@btconnect.com	£ 25.00

### International – China, Europe, Japan

Only digital copies \$10 US

Pay Clivia Society – Paypal gcmidd@mweb.co.za

### South African Members

Pay local club membership fee to the treasurer (Varies)

**The club membership, includes a R250.00 affiliation fee to be paid to the Society by the club. The postage cost of publications sent to the clubs by the Society is an extra fee, to be paid by the clubs.**

## Advertisement Costs in Clivia News – 2022

**Three Editions per year: Artwork supplied by Advertiser**

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**Cliviamart**

Pikkie and Elize Strumpher

Email: [pikkies1@absamail.co.za](mailto:pikkies1@absamail.co.za)

Tel: 073-619-7356

[www.cliviamart.co.za](http://www.cliviamart.co.za)

## CONTACT DETAILS OF SOUTH AFRICAN CLUBS AND INTEREST GROUPS

Border Interest Group	<b>Peter Miles:</b> Cell: +27 83-463-6229; e-mail: <a href="mailto:petermalcommiles@gmail.com">petermalcommiles@gmail.com</a>
Cape Clivia Club	<b>Joy Woodward:</b> Cell: +27 72 487 7933; e-mail: <a href="mailto:capeclivia@ibox.co.za">capeclivia@ibox.co.za</a>
Eastern Province Clivia Club	<b>Charl Coetzee:</b> Tel: +27 82 851 2217; e-mail: <a href="mailto:charlcoetzee@lantic.net">charlcoetzee@lantic.net</a>
Free State Clivia Club	<b>David Fourie:</b> Cell: +27 72 614 3091; e-mail: <a href="mailto:fouriedm@telkomsa.net">fouriedm@telkomsa.net</a>
Garden Route	<b>Karl Rost:</b> Cell: +27 82 887 4429; e-mail: <a href="mailto:karlrost@lantic.net">karlrost@lantic.net</a>
Joburg Clivia Club	<b>Glynn Middlewick:</b> Cell: +27 82 650 1463; e-mail: <a href="mailto:gcmidd@mweb.co.za">gcmidd@mweb.co.za</a>
KwaZulu-Natal	<b>Jean-Luc Bestel:</b> Cell: +27 82 09 9048; e-mail: <a href="mailto:luke@btapipe.co.za">luke@btapipe.co.za</a>
Lowveld Clivia Club	Secretary: <b>Sue Kloeck:</b> Cell: +27 82-408-1922; e-mail: <a href="mailto:sue@cliviakingdom.com">sue@cliviakingdom.com</a>
Northern Clivia Club	<b>Johanita Snyman:</b> Cell: +27 84 656 1809, e-mail: <a href="mailto:johanita.snyman@gmail.com">johanita.snyman@gmail.com</a>
Northern Free State Clivia Club	<b>Jan Schmidt:</b> Tel: +27 83 407 5563, e-mail: <a href="mailto:jan.schmidt@absamail.co.za">jan.schmidt@absamail.co.za</a>
NKZ-N (Newcastle) Interest Group	<b>Jean-Luc Bestel:</b> Cell: +27 82 09 9048; e-mail: <a href="mailto:luke@btapipe.co.za">luke@btapipe.co.za</a>
Overberg Clivia Interest Group	<b>Willem Fourie;</b> e-mail: <a href="mailto:willem@exafrica.co.za">willem@exafrica.co.za</a>
Vryheid Interest Group	<b>Nico Grobbelaar:</b> Cell: +27 84 273 1632; e-mail: <a href="mailto:jannic5603@gmail.com">jannic5603@gmail.com</a>

