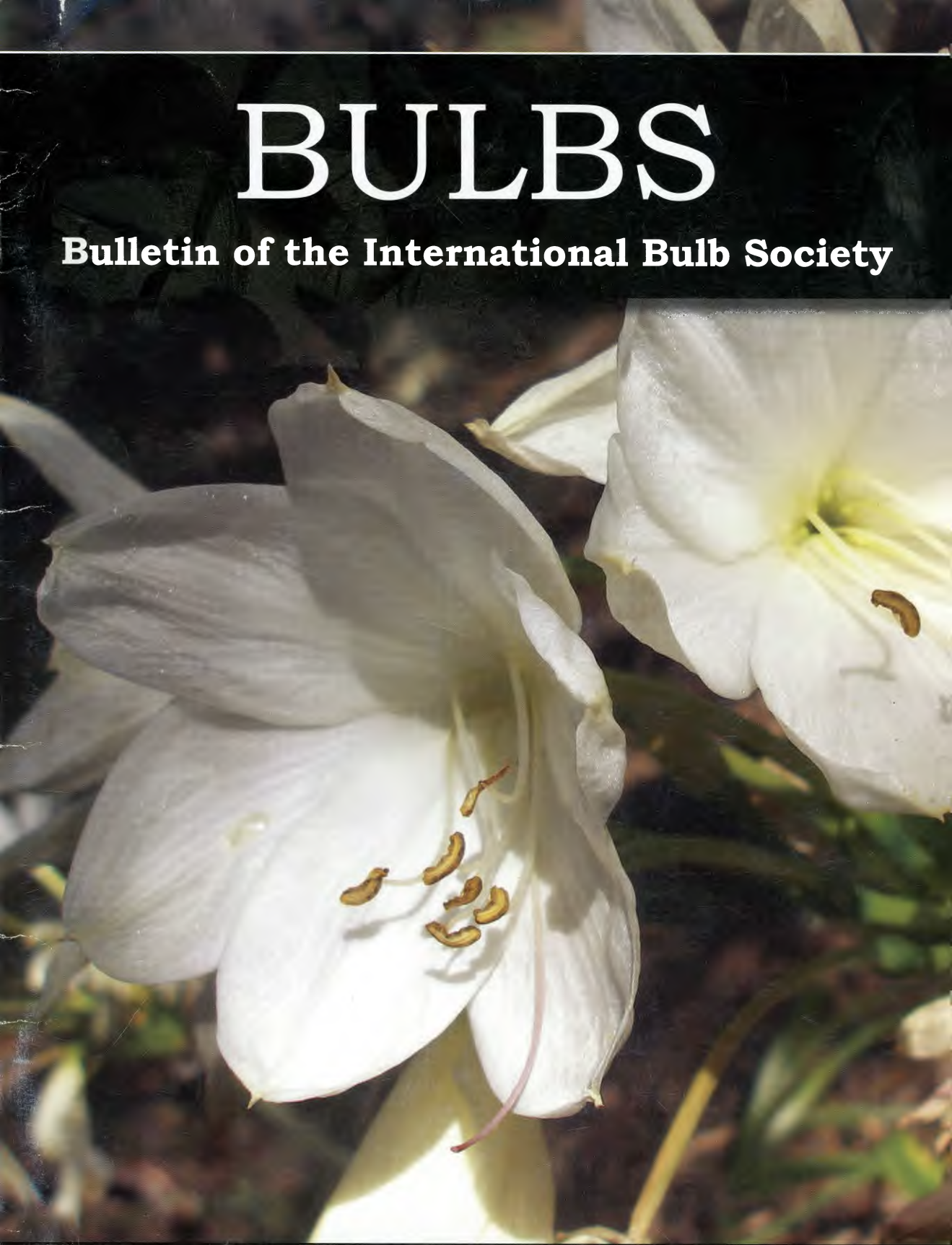
BULBS

Bulletin of the International Bulb Society



Volumes 8 & 9

2006/7

International Bulb Society

Bulbs

The Bulletin of the International Bulb Society

Editorial Staff

Editor ..... Tony Palmer Associate Editor ..... Dave Lehmiller

Do you have comments? We want to hear from you!

Send comments to: BULBS – Editor, 12 Kellys Road, Oratia, Waitakere 0604, New Zealand.

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Membership Information

Join the International Bulb Society! Member benefits: annual *Herbertia*, semi-annual *BULBS*, educational website, email "IBS Members Forum", Seed Exchange (SX) and Bulb Exchange (BX) (for members of the email "IBS Members Forum").

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BULBS

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A nice form of *Crinum flaccidum* by Robert Hamilton

First Words

Tony Palmer – Editor

We hoped that this would be a bigger issue than it is but unfortunately a feature article that was promised has not been received yet and we cannot delay publication any longer. We are absolutely determined to get back on track and then to stick to the timetable in future. I would like to thank all our contributors sincerely as without them the goal would be unachievable.

It is good to hear about plant hunting trips that you have been on and in this issue we have two of them – one from Jim Shields about trilliums in the Great Smoky Mountains National Park and environs and the other by Robert Hamilton about a journey he undertook in 2008 in search of crinums in New South Wales and Queensland, Australia, accompanied by Jim Lycos and Dave Lehmiller. They travelled 3950 kilometres (2454 miles) and have, as you will see, some fascinating tales to tell. Keep these trip accounts coming everyone!

If you haven't had your fill of crinums yet on the forum, we have an article from Dave Lehmiller on *Crinum kirkii*.

For a bit of balance I'm delighted to say that Rod Leeds tells us all about large flowered colchicums for autumn, with some excellent illustrations. Where I live it is too mild to grow colchicums well and I'm sure the same also applies to a lot of you, but hey, we're allowed to drool!

Then Kevin Vaughn reveals the beauty of Louisiana irises which he says seem to have been a well-kept secret among gardeners and even iris specialists for many years. Once again accompanied by some lovely pictures.

Our review this time is of Graham Duncan's book 'Grow Clivias' which is the second, and hugely expanded, edition of a booklet first published in 1999. The review is written by Dr Keith Hammett.

Finally for some light relief we have an account by Dave Lehmiller and his wife Nancy of a vacation they spent in Canada, including a visit to the famous Butchart Gardens in Victoria.

I have been completely blown away by the amazing pictures that members have been sending to the IBS online forum this year – particularly of crinums, *Hymenocallis* and clivias. The quality and quantity of these beautiful photographs make the Forum an exciting place to be at the moment. My interest was also aroused by the lovely pictures of *Kaempferia* species and hybrids. This is a genus I know very little about and I am very pleased to say that Tim Chapman has kindly agreed to write a comprehensive article about them for the next issue.

Importation of seeds and plants

I have received the following from Joyce Fingerut of the North American Rock Garden Society, outlining the latest developments in the saga of new seed and plant trading regulations, and her suggestions on how we should respond. I am pleased to see that hopefully you will be trying to avoid the mistakes in New Zealand, where a pretty shoddy job was done by the authorities when drawing up the original database of existing plants.

"Once the latest standard from NAPPO (RSPM No. 32) is published in October, it will require that the participating countries of Canada, Mexico, and the United States establish a screening process for all new plant taxa, which will effectively act as an import barrier into those countries.

Eventually, this RSPM will be the basis of a similar international standard, under the IPPC and will affect all countries (or at least those that are signatories to the IPPC, close to 200 nations).

The standard demands that countries enact new regulations/legislation requiring screening on all future introductions for potential invasiveness. The screening process would be a form of Weed Risk Assessment which would have to be completed on any taxon that is not already present in the country before it will be permitted to enter (be imported).

If horticultural societies are to continue to operate seed exchanges, they must be capable of importing seeds from donors in other countries, as well as distributing their seeds to members in other countries. Therefore, it is crucial that we make certain that each

country has the largest possible database of plants as already existing within its borders. Every specialist plant society must work to see that all its taxa are considered to be "already present" in its own, and possibly other, countries. National governmental plant protection organizations (like APHIS in the US, DEFRA in the UK, CFIA in Canada.....) must be persuaded that although these plants are not present in commercial Big Box quantities, they are being grown in both private and public gardens and offered by the endless array of small specialist nurseries. (Handling the proposed screening of new items will be another problem, for another day)

In the United States, a new project to write a comprehensive "Flora of Cultivated Plants" is beginning, and is headed by Dr. Tom Elias, Director of the National Arboretum. Fortunately, he sees the point of including plants listed in seed exchanges. He is interested in the seed database that NARGS currently operates, and my guess is that he would also include the taxa from other organizations' databases, so that as many genera could be covered in as great a depth as possible. If other US-based societies would be interested in having the plants in their seed exchange databases included in the Flora, please contact me.

My personal feeling is also that, since so many societies based in other countries have US members, there is a fair chance that the taxa listed in their exchanges have made their way into US gardens and nurseries. Therefore, taxa listed on almost any seedlist should be considered as being cultivated in the US.

If I can move the Flora's committee to this way of thinking about the globalness of horticulture, would other societies, in other countries (especially Canada and the UK), be interested in having their databases included?

I am on the contact list for this project and will attend its next meeting (not yet scheduled). It would ultimately be helpful to everyone if I can take a complete record of ALL the plants that we assume are being grown in the US.....from all sources. Let me hear your thoughts on this issue. Please contact me with questions – and, especially offers."

Joyce Fingerut
Government Liaison,
North American Rock Garden Society
http://www.nargs.org
Member organization:
International Horticultural Seed Exchange
Advocacy (IHSEA)

I hope you enjoy this issue and would ask you to please send me any contributions you may have for the next issue as soon as possible so that it won't be too far behind this one.

The IBS Bulb & Seed Exchange

The IBS Bulb & Seed Exchange is a Members ONLY service.

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Bulbs, corms, tubers, seed, etc., are shipped fresh to members as they are received throughout the year. This is one of the finest sources available for rare and unusual bulbs and seeds from around the world. Many of these treasures are unobtainable elsewhere, and members may obtain them for a donation to IBS, as they are offered.
For more information please contact:

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INTERNATIONAL BULB SOCIETY
PO BOX 336, SANGER, CA 93657-0336

Become a donor:

You can send bulbs and *freshly harvested* seeds at any time, in any quantity, to the above address. Do not package them. This will be done by the IBS Director of the Bulb & Seed Exchange. Send all pertinent information about items donated, describing the items sent, with email address and phone number for contact purposes, and who sent them, to the Director of the IBS BX & SX. Do not send a posting (email to the IBS Forum). Send bulbs and fleshy seeds in a box or other container, and all thin seeds such as Habranthus and Zephyranthes in padded envelopes marked "Hand Cancel" or "Hand Stamp". Do not send any seed in ordinary paper envelopes as these are being crushed in the post office canceling machines. Please label all seed or bulbs with the proper name. Please do not send plant material without identification. Items must be clean and free of injurious pests and diseases.

continued overleaf /

The IBS Bulb & Seed Exchange (continued)

Dear IBS Members:

First, let me explain, that many of the offerings IBS provides through its BX & SX are extremely rare, elusive, and unobtainable anywhere else in the country. Twenty to thirty years ago, these botanical treasures were only available to a select few. We have made it convenient for the amateur as well as the professional botanist, to obtain these items at one convenient location. Without this service, obtaining these treasures would come with a prohibitive cost. Listed below are Guidelines to help you use the IBS, BX & SX, successfully.

1. You must be a paid member of IBS, to participate in any BX OR SX offerings, so make sure that your membership is kept up to date.
2. Please watch the IBS forum to see if a particular BX OR SX is closed, before making your request.
3. Please reply to me privately at herbk76@aol.com, not to ibsmembers@yahoogroups.com
4. Send your requests with the ORIGINAL POSTING THAT I'VE SENT TO THE IBS FORUM (FOR EACH BX OR SX), EACH TIME. Not doing so creates more paper work for me. (Send this to me privately, NOT TO the IBS Forum.)
5. Please send your mailing address with every request. Phone number would be appreciated also. All requests will be denied if an address is not included.
6. DO NOT SEND YOUR DONATION, UNTIL YOUR REQUEST HAS BEEN CONFIRMED.
7. All donations must be sent to,

   INTERNATIONAL BULB SOCIETY
   PO BOX 336, SANGER CALIFORNIA 93657-0336

8. Please mark your remittance, with the specific BX OR SX number (or numbers), each time before sending to IBS TREASURER.
9. All IBS MEMBERS PARTICIPATING IN THE BX & SX MUST KEEP THEIR ACCOUNTS PAID IN FULL, EVERY 30 DAYS, OR PRIVILEGES WILL BE SUSPENDED UNTIL BROUGHT CURRENT. Payment can be made by Check, Money order or Cashiers check. Master card or Visa can be used, by contacting IBS Treasurer, Pam Kelly, at (559) 240-6055 or pkelly1668@aol.com PayPal is now available. On your personal PayPal account, send your payment to pkelly1668@aol.com This is the IBS payment address with PayPal. Please state exactly what you are paying for each time, (item, shipping, taxes, etc)
10. Many rare seeds and bulbs offered are in short supply, so unfortunately we cannot supply all wants each time something is offered. We cannot list Bulb and Seed availability at convenient times to please everyone, (as much as we try), in all time zones. Try to keep a watchful eye on the IBS Forum postings. First come first served.
11. All material is shipped from us in fresh condition. Once it is delivered to the shipper, it becomes your property. We cannot be responsible for loss or damage. Donations are due, once package is shipped. There are no warranties expressed or implied. It is the responsibility of each individual to make certain the requested items will clear customs. **PLEASE DON'T ASK TO HAVE FALSE INFORMATION SENT, TO ALLOW RESTRICTED ITEMS THROUGH CUSTOMS.**
12. **IF IBS BX & SX Guidelines are not followed, your request will not be acknowledged. Please keep a copy of this email for future reference.**

If you have any questions, or need help, email me at the address below.

HERB KELLY Jr., DIRECTOR IBS BX & SX, HERBK76@AOL.COM

Outback Chronicle

A JOURNEY THROUGH NORTHERN NEW SOUTH WALES AND SOUTHERN QUEENSLAND

by Robert Hamilton

With above average rainfall in New South Wales and Queensland from December 2007 to early February 2008, it looked to be the right time to visit these areas to catch the late summer flowering *Crinum flaccidum* in bloom. I had travelled to South Australia one year earlier with Jim Lycos, on a very successful *Crinum* search, so we formulated plans to join up again for a *Crinum* hunt. We were delighted to learn that Dave Lehmiller was able to join us. Jim and Dave had a fairly futile search of a dry South Australia in 2006 after which I joined them to visit the site of the type *Crinum flaccidum* at Wellington in central New South Wales (NSW). This would be the first site we would visit in 2008.

Our aim on this trip was to study the variations in *Crinum flaccidum* in the northern slopes and plains of NSW and southern flood plains of Queensland, and hopefully also find *Crinum angustifolium* in Southern Queensland. We were also likely to be travelling through the habitat of another Australian amaryllid – *Calostemma*, so we would be on the lookout for these as well. For myself there was an added bonus, as we would be travelling through the Pilliga forests of central NSW which are the home of five species of our native Cycads, in the genus *Macrozamia*.

Whilst we would be visiting one or two sites which we had learned of by "word of mouth", the majority of our trip was planned by searching the publicly available herbarium records on the internet. Sometimes these records merely state a locality such as a district or a town, but others include more specific details, such as 10 kilometres south of a town and others also include some co-ordinates, which we concluded in retrospect were probably map co-ordinates, as we were rarely able to get within a kilometre or two of such populations using the co-ordinates in our GPS. In some cases the descriptions were very accurate taking us straight to plant populations. In other cases they took us into the right areas to find the plants even though they were quite a distance from where we expected to find them. On other occasions we found undocumented populations by chance en route from one place to another.

I left Hobart at 7am on Sunday 24th, February 2008 to fly to Sydney, arriving just before 9am. I was kindly picked up from Sydney airport by Jim's wife Anne, who drove me the 65 km or so to their home at Springwood in the foothills of the Blue Mountains, west of Sydney. Dave had arrived the day before and joined Jim and I in his garden shortly after my arrival. Jim's garden is an amaryllid enthusiasts dream. There were large numbers of cultivars of *Amaryllis belladonna* in bloom and *Crinum flaccidum* and *moorei* were also making a lovely display. There was also a spectacular line of *Lycoris aurea* beside a garden path. Clumps of a robust growing *Hymenocallis* of whose identity we were not sure were present in a couple of different areas. Many other winter growing amaryllids were just starting into growth. Around every corner there was an interesting plant to see.

After morning tea we set off on the 300 km journey to Wellington in central NSW which would be our first stop to look at plants. The travelling gave us a great opportunity to quiz Dave on the culture of African and Madagascan *Crinum* species on which he had done extensive field studies. We very much enjoyed the stories of his travels throughout these countries and his sharing of knowledge.

The herbarium specimen for *Crinum flaccidum*

A nice form of *Crinum flaccidum* from the type site at Wellington, NSW

Herb. was described by Herbert from a specimen collected in the Wellington district. Having visited this site before, we knew that plants would be found

both on Mt Arthur and the lowland areas below this mountain. We were dismayed to find that despite reports of good rainfall to this site it was very dry on the mountain. There were very few plants in growth and only minimal evidence of flowering. The caterpillar which eats *Crinum* plants and seed was also in evidence. The lowland sites at Wellington were in much better condition with plenty of plants in growth, with flowering and well advanced seed production. The population here is predominately white flowered but an occasional pale pink flowering plant can be found. More commonly it looks distinctly pink in bud, but opens to a white flower. The maturing capsules of these plants have a reddish tinge to them compared to the plain green capsules of white flowered plants. The *Crinum* here have a perfume which is difficult to describe. Slightly sweet but not pleasant is the best I can suggest.

While exploring along the road which leads through the lowland population we discovered a small dry gutter-like creek bed running down from the mountain with several flowering *Crinum* at its base near the road. Exploration further up this dry creek showed scattered groups of *Crinum* suggesting that this was the likely source of the established plants in the lowland population. We spoke to a local resident who passed us by, and with her help were able to find several paddocks with many *Crinum* overlooking the local horse racecourse much closer to the town than those we had been observing.

From Wellington we headed north a further 50 km to the provincial city of Dubbo where we spent our first night in motel accommodation. That evening we dined at the local Returned Serviceman's League or RSL club, a feature of almost every town and city throughout Australia.

Our plan for the next morning was to head east to the town of Quirindi where it had been mooted in the past that there existed some rose coloured *Crinum* flowers. There was no direct route between Dubbo and Quirindi so the 250 km journey first travelled east, then north and finally NNE. About 20 km and 25 km east of Dubbo we found populations of *Crinum flaccidum* which appeared slightly more robust than those at Wellington. Flowers were mostly white but there were plants with the same pink buds as the type site and we saw one plant with an old flower which had alternate petals of quite a dark pink externally, giving a harlequin like appearance. This population was having a second wave of flowering as many plants had flowers and mature seed on the ground beside them.

After completing the northerly leg of our journey we turned east to travel towards the small town of

A more typical form of *Crinum flaccidum* in one of the populations east of Dubbo, NSW.

Premer which was one of the herbarium sites for *Macrozamia diplomera*. After a few kilometres we spotted cycads in the bushland beside the road. *Macrozamia diplomera* is a small plant approximately 90 cm tall and 90 cm wide. It was an old population with no evidence of coning or small seedlings. The cycads of central NSW can reproduce as infrequently as every 5 years or longer. It grew in association with a very handsome *Xanthorrhoea* species or grass tree as they are commonly known.

About 25 km before Quirindi, while passing through the small town of Caroona, we saw a small population of *Crinum flaccidum*, some of which were untouched, in a paddock with grazing horses.

Jim had visited the Quirindi site a few weeks earlier so we had no trouble finding it. While there were large numbers of plants in growth only a few were flowering. We saw the pink buds which had been present in other *Crinum flaccidum* sites but we will have to wait until a better year to determine whether there truly are rose coloured flowers at this site. It seems likely that this population had suffered from the extended drought and would take some good rainfall years to recover.

From Quirindi we travelled in a north-westerly direction heading to Narrabri where we intended to spend our second night. About half way on the 175 km journey was the large town of Gunnedah which was a recorded *Crinum* site without any specific details. We were unable to locate any so continued our journey. The farming in this area is mainly grain production so we passed many large crops this day, mainly of the colourful sorghum.

Pure yellow form of *Calostemma luteum* at Baan Baa, NSW

We had a *Calostemma* site to investigate after a small town called Baan Baa but several kilometres before this town we found *Crinum flaccidum* again. We continued on to locate the *Calostemma luteum*. The site description was accurate but they were difficult to locate as they were growing in tall grasses and lignum. We found a group of pure yellow flowers but the majority were heavily flushed with red externally. They were growing in very heavy clay soil under water in the wettest places.

We returned to the small town to look at the *Crinum* we had seen in paddocks behind it. In doing this we located more *Calostemma* growing in association with *Crinum*. When we had just about finished a "back road" circuit of the small town we came to a piece of road covered by water and unfortunately Jim's car became bogged to the axles.

We were only about 100 metres from the local hotel, which appeared to be the only business in the town. We struck up a conversation in the bar with a local chap called Tim, and he agreed to pull us out, with no less than the local fire engine. Once rescued we returned to the bar and over another drink we learned a little about the town of Baan Baa. It mainly exists because of its grain storage and train transport facilities. Its name is Australian Aboriginal meaning to "swim away'. Its population at the time of our visit was thought to be about 85. The rest of our trip to Narrabri was thankfully uneventful !

We were on the road again by 8 am the next morning with our first aim to investigate a *Crinum flaccidum* herbarium record "a few kilometres East of Narrabri". This happened to be the road to Mount Kaputar which is the home of a population of another cycad *Macrozamia stenomera*, so we hoped to find them both. Masses of *Crinum* were found flowering as described, in paddocks beside the road, once again with grazing horses. We continued along the road for another 10 or so kilometres seeing occasional small groups of *Crinum* in flower in paddocks and along the roadside. We stopped to investigate a population growing on the roadside and in the adjacent light bushland. They appeared to be typical *Crinum flaccidum*, some with clusters of pink buds. We continued on the road up the side of

Dave (left) watches as Jim (2nd from right) and Tim, the Fire Engine driver, prepare to pull out Jim's bogged vehicle at Baan Baa, NSW

***Calostemma luteum* with a red throat and flushed red externally at Baan Baa, NSW**

Mount Kaputar and eventually found a population of *Macrozamia stenomera* at 1037 metres above sea level. This was quite a small cycad perhaps 60 cm wide and high in the largest specimens, with fine almost fern like foliage. There were one or two old cones and a number of small seedlings suggesting it had reproduced in the previous year.

We returned to Narrabri and then headed south on the Newell Highway towards Coonabarabran, with plans to try and find more cycads. After about 35 km we turned into a forest road and after a few kilometres we spotted cycads. We drove on looking for a place to turn and shortly after crossing a large dry creek bed we spotted *Crinum* in bloom, just 500 metres from the cycads. We investigated and found *Crinum flaccidum* growing in almost pure sand. Seedlings were even growing on the edge of the road where vehicular traffic had pushed the sandy surface of the road aside. Once again some of these had pink buds but no pink flowers were found.

***Macrozamia glaucophylla* off a forestry road, south of Narrabri, NSW**

We returned to the cycads and the beautiful bluish foliage confirmed we had found the very attractive *Macrozamia glaucophylla*, also growing in pure sand and in association with *Xanthorrhoea* species. Mature plants were 70 to 80 cm in height and width. There was a moderate amount of coning and two plants found with mature seed. No small seedlings were present suggesting it had been several years since seed production. After returning to the Newell Highway and travelling a further 40 km or so we spotted more cycads in the roadside bushland. This was *Macrozamia polymorpha* with huge numbers of plants also growing in association with a *Xanthorrhoea* species. Many plants were in the early stages of coning and there were many quite small plants suggesting it had only been a couple of years since last seed production.

After having lunch at Coonabarabran we explored Dandy Road where we found another population of *Macrozamia polymorpha* and then headed for Baradine. While travelling near the small town of Bugaldie we saw more *Macrozamia diplomera.* From Baradine we took another forest road back towards the Newell Highway where a third population of *Macrozamia polyphylla* was found. These were the largest plants we had found with no evidence of recent coning or young seedlings. The tedious passage on an unsealed road was interrupted by a wide, recently flooded, but dry creek bed covered in a deep layer of loose sand. We walked across it and dug into it, to thankfully find a solid road base under the sand and with good momentum Jim managed to get us across without getting bogged. We returned to Narrabri for a second night where we dined at the local lawn bowls club where we were entertained by a twilight bowling competition. I was delighted to have found 4 of the 5 *Macrozamia* species growing in the Pilliga state forests of central NSW.

A more open *Crinum flaccidum* with pink stamens growing in long grass north of Moree, NSW

The next morning we headed north again. The 100 km trip north to the next major town of Moree was uneventful as we passed through many large crops of cotton and sorghum. About 15 km north of Moree we spotted flowering *Crinum* again in very tall grass. The flowers were white but with more open petals than the *Crinum flaccidum* we had been seeing, and the stamens were coloured pink. There was a pleasant perfume to the flowers. They were growing in heavy clayish soil with a cracked surface suggesting there had been standing water for a time. This was a second flowering as many plants had mature seed lying around them.

***Calostemma luteum* at Maynes Lagoon south of Boggabilla, NSW with some advanced seed formation. This form shows how it gets the common name of "native jonquil"**

We then continued in a north-easterly direction and were now just under 100 km from the NSW-Queensland border. We were on the lookout for Maynes Lagoon which is south of the small town of Boggabilla just 9 km below the border. This site had both *Crinum* and *Calostemma* herbarium specimens. We started seeing yellow *Calostemma* flowers about 8 km before Maynes Lagoon and soon after they were joined by *Crinum* with scattered small populations until we found quite a large population just before the sign indicating Maynes Lagoon. The *Calostemma* were yellow with a small amount of red in the throat. The *Crinum* were similar in form to those we had seen North of Moree. Once again the *Calostemma* were in quite boggy soil, with *Crinum* also happy away from the really wet soil.

We crossed the border as we entered the Queensland town of Goondiwindi. After asking directions from a worker cutting roadside grass we found Cemetery Road and more yellow *Calostemma* as herbarium records had promised. While it had obviously been wet here, these plants were in soil which had already almost dried out. They were growing in association with a few *Crinum* past their flowering.

A few kilometres northwest of Goondiwindi we joined the Leichhardt Highway which headed almost due north. After about 30 km we began to see an occasional *Crinum* or two in flower. At 65 km north of the town we found larger populations growing in sandy loam in light bushland at Glasser Bridge Weir River. They had much more open flowers with pink stamens, and pleasant perfume that we had seen at Moree and Maynes Lagoon and resembled the descriptions of *C. brisbanicum*. We continued north for another 190 km through the town of Moonie, to Condamine where we turned east, then northeast and after 60 more kilometres reached Chinchilla. We had a herbarium record for *Crinum flaccidum* at Surcingle Creek approximately 10 km north of the town. On the way to this site we passed flowering plants – just two of them in light *Callitris* bushland on one side of the road and another on the other side of the road.

One of the typical habitats showing under small *Casuarina* trees north of Goondawindi, Queensland. Another example of a more open flower with pink stamens

Crinum venosum **north of Chinchilla, Queensland**

The three of us arrived at the flowering plants together and simultaneously let out an excited gasp as we realised that we were looking at *Crinum venosum* with its 3mm to 5mm long stamens and a stigma that stayed within the tepal tube. There was quite a reason-

able population of non flowering plants growing in very sandy loam. Apart from an apparently disjunct population of *Crinum venosum* in South Australia this population was probably more southerly than any other recorded in the Queensland Herbarium. We didn't locate Surcingle Creek although there was a Rocky Creek which we eventually found. Perhaps there had been a name change but there were no *Crinum* at the creek. After our exciting find we headed in a westerly direction to Miles where we spent the night. Our motel host recommended the restaurant at a local hotel which was every bit as good as they had suggested.

The next day our plan was to head in a general south-westerly direction to investigate a site north of Surat where friends of Jim, several weeks earlier, had photographed a large population of *Calostemma luteum*, with an intense red throat. After a southerly leg back to Condamine we headed west on the Roma-Condamine Road – a 114 km journey to reach the Carnarvon Highway, which would take us south towards Surat. Along this road near the sign for Snake Creek we discovered a population of *Crinum*. Some were in flower and there was a lot of germinating seed scattered around. This was a white Stenaster-like flower with long narrow segments, radially symmetrical with pink stamens. Examination also showed there were rough scale like projections on the edge of the leaves differing from *C. brisbanicum* as described in Bailey in his Flora of Queenland 1902.

The *Crinum* populations that we had seen that day for the most part seemed to be intermediates between *brisbanicum* and *angustifolium*. We also found a few groups of *Crinum* in flower similar in most respects to *Crinum angustifolium* R.Br. This *Crinum* was usually growing in sandy loam in open woodland in floodplain areas.

We now recognised a pattern with *Crinum flaccidum* in central NSW – a "transitional" *Crinum* at Moree, Maynes Lagoon north of Goondiwindi, probably *C. brisbanicum*, while we started to see an intermediate form of *C. angustifolium* at Snake Creek.

We continued on, to look for *Calostemma* north of Surat. We had a GPS location which was fortunate because the plants had all gone into dormancy. We found large amounts of swelling seed suggesting germination was imminent. Examination showed that some of the *Calostemma* were starting to grow new leaves. These *Calostemma* were growing in heavy boggy soil. While investigating the population we were joined by a shire council worker who seemed encouraged by our interest in the local flora. He directed us to another population some kilometres further north which he thought were still in flower. We found this

What is probably *Crinum angustifolium* on the Carnarvon Highway roadside between Surat and St George, Queensland

population which was still in leaf but not in flower. Plants were not plentiful but were growing in standing water. We had lunch at Surat then headed south-westerly on the Carnarvon Highway on a 100 km journey to St George.

On this journey quite a distance apart we found 2 groups of 2 or 3 plants which we took to be a southern variant of *Crinum angustifolium*, growing in built up rich red soil on the road side verge. We wondered if both groups of plants had been relocated by roadworks. The first population was flowering for a second time and had a small amount of germinating seed laying around On this leg of our journey we passed a few handsome specimens of *Brachychiton rupestris*, the Queensland bottle tree. As we came closer to St George the sky darkened with red streaks through the darker area. We met heavy rain for a time while passing the town and after this cleared we passed through a short dust storm. By the time we had passed this storm we had started on the 290 km journey west to Cunnamulla where we planned to spend the night. We had several herbarium sites near Cunnamulla which we would investigate on the way. There were no plant sightings on the way but we saw an occasional sheep and some feral goats. As we came closer to Cunnamulla, there was a lot of standing water and small lagoons, and the bird life became very interesting. Earlier in our travels we had seen groups of emus and an occasional wedge-tailed eagle and now started to frequently see black falcons. In wet areas ducks were plentiful, as were straw-necked ibis and on one occasion we saw two large grey birds which I later realise were brolgas, also known as the dancing crane because of its flamboyant mating rituals. Apostle birds, flocks of budgerigars and other small parrots, galahs and corellas were plentiful, as were the ever suicidal crested pigeons feeding on the roadside.

Jim (left) and Dave collect seeds at a roadside habitat south of Cunnamulla, Queensland

We had entered one of the *Crinum* co-ordinates into our GPS and about 30 km before Cunnamulla we realised it was about 12 km south of the main road. We headed south along a one lane, sealed road which appeared to service a number of large stations. After about 10 km we once again started to move away from the site. We turned back then headed west along a very rough unsealed road which appeared to be taking us directly to the site. Then 500 metres from the site we arrived at a dilapidated old homestead with a yard surrounded by open empty refrigerator containers, old vehicles, a kangaroo in a small enclosure and a barking dog. It was apparent that the homestead was a base for Kangaroo shooters. I called out in case someone was nearby, to explain our presence, but there was no answer. We returned to the car and headed back the way we had come in, all feeling a little less anxious the further away from the old house we journeyed. We were probably within a kilometre or two of *Crinum* that day as there were 3 herbarium records for the same general site, but I am sure we will never know how close.

We finished our journey to Cunnamulla, found a motel and settled in. Our room had a colourful tourist guide for the area with a *Calostemma* pictured on the front cover. On further reading we discovered they are locally known as the "native jonquil". We spoke with our motel host the next morning who told us that when she had driven into Cunnamulla about 2 weeks earlier, the roadside had been generously decorated with the little yellow flowers. It seems that we were a couple of weeks late here to see the *Calostemma* at their best.

On the next day the first leg of our journey was a 250 km drive south to the NSW outback town of Bourke. After 1 kilometre of our journey, in a clearing beside the road we spotted a group of *Crinum* in leaf. They were growing in sticky clay, which had obviously been standing water until a few days earlier. A few seeds from an earlier flowering were spread around the edge of the muddy area, having floated away from the parent plant before the water dried up. Mud had set like concrete on the exposed part of one of the couple of seeds I picked up. The identity of this *Crinum* will remain a mystery for some years.

The bird life of the previous afternoon continued especially the black falcons which appeared in groups of 2's and 3's almost every kilometre or two along the way. They were occasionally eating carrion but more often hunting in the grass. At one stage I saw a quail run across the road and we heard what we suspected to be quail moving in the long grass at a roadside stop. Later I read that black falcons are plentiful in the lightly timbered plains around waterholes and often follow the nomadic migration of button quails. Straw neck ibis were also plentiful and I saw one stately white egret standing in water.

After about half an hour of driving south I became more alert after I thought I saw a couple of yellow flowers. This paid off as within a few hundred metres I spotted *Calostemma* flowers with certainty. There were only a few remaining flowers once again growing in heavy wet soil. Some quite mature seed was lying around from earlier flowering. A GPS reading showed us to be about 48 km south of Cunnamulla. After travelling about another 3 kilometres we spotted *Crinum* near the entrance to Mirage Plains station. Only one old flower remained and it showed an open flower with lanceolate shaped petals, but little else reliable could be gleaned from it. The plants were growing in sand and there was abundant seed production. Another 18 km further south we encountered yet another *Crinum* population growing in sand. One or two old flowers had an open form and white stamens. They had the unpleasant perfume of central NSW *Crinum flaccidum*. There was again abundant seed production.

We continued south, and just before the Queensland – NSW border, about 100 km south of Cunnamulla we found *Crinum* and *Calostemma* growing in standing water. To hold the water this must have been a heavy clay soil. Most of the *Crinum* were in seed production but there was an occasional flower which

had fairly open segments similar to the more northerly *Crinum* and a less pleasant perfume. There was an occasional yellow *Calostemma* but most were past their best.

The next 150 km south to the town of Bourke was uneventful after an exciting morning. The results of years of drought were never more evident than over the last few kilometres into this town. Rain had been good this year but vineyards showed many rows of dead vines while several rows away the survivors were covered in lush new growth. Citrus orchards showed similar patterns with many trees cut back to stumps just above the ground in the hope that they might regrow. Bourke is the ultimate outback town and is the source of the Aussie term "back o 'bourke" meaning you are really a long way from anywhere.

From Bourke we headed southwest following the line of the Darling river towards the town of Louth and then travelled a further 27 km in the same direction. We had 3 *Crinum* and 3 *Calostemma* sites to investigate and would return on a different route to spend the night in Cobar. After travelling about 20 km we began to lose the lush countryside we had been seeing over the previous days. Sadly this far western part of NSW was still in drought. We found a site supposed to have *Calostemma* which surely would have been a bog in years of rainfall. It was dry and covered in cattle hoof holes having been heavily grazed, with snippets of green grass scattered across the bog. Similarly what was likely a *Crinum* site beside a dry creek bed showed no signs of life. It was a stark contrast to our morning travelling through lush fertile land full of bird life. We saw very few birds, a few feral goats and two goannas! Over this uneventful afternoon we travelled 280 km on mainly unsealed roads. Cobar had enjoyed its best rainfall for many years and its gardens and lawns were a pleasant sight. At our motel there was a photo displayed of a large reservoir which had water in it for the first time in many years. We dined well that evening in the restaurant at our motel.

A *Calostemma luteum* with a distinct greenish tone south of Nyngan, NSW

We were on the road soon after 7.30am the next morning travelling in an almost easterly direction to Nyngan, a journey of about 130 km. This trip was uneventful, but our plan was to investigate a *Crinum* herbarium site about 40 km south of Nyngan. About 1 km south of this town we spotted *Crinum* in flower. It was a group of only 3 plants and a thorough search of the area failed to find any others. The flowers were of a typical *Crinum flaccidum*.

We continued south and after another 9 km we came upon a mixed population of *Crinum* and *Calostemma* growing in heavy wet sticky clay. There were still quite a few *Crinum flaccidum* flowers and the few *Calostemma* flowers were yellow with a greenish tinge. There were masses of *Calostemma* seeds and a lot of mature *Crinum* seed. Once again on the dryer outer areas of this population the *Calostemma* disappeared while *Crinum* persisted. We continued another 30 km to the reported herbarium site but there were no plants to be found there.

We took an alternative route to return towards Nevertire which had a site to be investigated. About 7 km south of Nevertire on the Nevertire-Tottenham Road we found *Crinum* again. They were in heavy soil in a floodway, growing among long grass in full sun. Some were flowering for a second time as there was mature seed lying around. They had the "not so pleasant" perfume similar to the type population at Wellington. We continued on to Nevertire and headed north-westerly to investigate another site. After about 2 km we once again found *Crinum* over a large area in long grass beside a railway line. They were similar to those south of the town and included plants with pink buds. We continued on for another 20 km but didn't find evidence of plants at the expected site.

We headed north from Nevertire on a short journey to Warren. The only place we could find open to buy some lunch was one of the local hotels. While we were waiting for lunch Dave received an invitation to the "B & S Ball" where he was assured there would be "plenty of grog and wild chicks". The B & S is short for batchelor and spinsters and the annual ball is a rural youth event. We all had a good laugh but declined the invitation. Dave was asked where he was from and on replying "Texas" the reply came "Texas, Queensland" which gave us all another good laugh.

After lunch we headed in an easterly direction on an 85 km journey to Gilgandra on the Oxley Highway. We were hoping to find *Crinum* about 40 km from Warren, from a herbarium record. After about 10 km we came upon a mixed population of *Crinum flaccidum* and *Calostemma* growing in very boggy conditions in sandy clay rather than the very heavy clay at previous sites. The yellow *Calostemma* had a red throat. We continued on and at the turnoff to Bundemar 23 km east of Warren we found a further massive mixed population of about 10 acres with *Crinum* spread over the whole area and *Calostemma* in the wetter parts. It was an amazing spectacle. They were growing in heavy clay in full sun. We continued on, and for the next 17 km there were continued small and large populations of *Crinum* in bloom, on the roadside and in nearby paddocks. Cultivation of the land with crops seemed to bring an end to this massive display.

In what seemed a never ending *Crinum* spectacular we came upon yet another *Crinum* population beside the unusually named Marthaguy Creek. They were growing in sandy soil on the banks of a dry feeder channel to the creek, in the shade of some large eucalypt trees. The water in the creek was black from topsoil washed in after recent heavy rains. We continued on to Gilgandra, where because of time constraints, we planned to visit one final herbarium site north of the town.

North of Gilgandra on the Castlereagh Highway we started to see occasional *Crinum* flowers in small numbers and after 15 km came on a large population beside a railway line. They were typical *Crinum flaccidum* growing in sand in open and shaded situations with a number of plants showing pink buds. We returned to Gilgandra and continued south to Dubbo returning to the motel we had stayed in 6 days earlier, for our final night away, which we celebrated with a very nice dinner.

We had to return to Jim's home at Springwood on the final day to prepare for my departure on that evening, but we still had a little time to look for *Crinum*. Instead of taking a the direct route back to Wellington we decided to do this leg via some back roads west of the Mitchell Highway which we had used when we travelled north a week earlier. This would take us in a southerly direction for 65 km to Yoeval and then on a 41 km north-easterly leg to Wellington. We had heard that *Crinum flaccidum* grew within the boundaries of the Western Plains Zoo so were not really surprised to see *Crinum* in flower on the roadside outside the zoo fence, as we left Dubbo. We stopped to look and found the typical *Crinum flaccidum* we had seen throughout central NSW. They were growing in sandy loam under *Callitris* trees.

We continued on to Yoeval then turned into Curra Creek Road for the journey to Wellington. We fairly soon came on a population of *Crinum* beside the dry creek bed under some large eucalypts. They were growing in sandy loam and seemed to have a greater percentage of plants with pink buds and reddish cap-

sules than any of the other sites we had visited. There were several plants with pale pink open flowers. The road followed the dry creek bed and there were continuous flowering *Crinum* for the next 1.5 km. While not as prevalent there continued to be small and large scattered groups along the edge of the dry creek and in nearby paddocks for several more kilometres until the road and creek parted company.

After Wellington we took an alternative road to the east of the highway on the next leg of our return trip, to Orange. The Curra Creek population were our last *Crinum* for the trip and after lunch at Orange we continued on to Jim's home at Springwood arriving there around 2 pm in the afternoon.

The one aspect of the trip which caused us a lot of annoyance was grass seeds, burrs or buzzies. Whatever their name they stuck to socks, sand shoes, legs, in fact anything. After the first day I threw away the socks I had worn and de-seeded and put away my sand shoes in favour of slip on plastic "crocs" in the car. I replaced them with knee high gum boots when walking through grass. This also helped with my reptile phobia and was handy in several sites where there was standing water. Dave did a ritual de-seed after every stop and his sand shoes were discarded at the end of the trip. Jim was smart enough to wear jeans so didn't suffer quite so much. One particularly nasty little seed was round covered in sharp spikes, looking somewhat like a miniature Second World War sea mine. They stuck firmly in everything including my gum boots. I still have an unhealed wound as I write 2 weeks later, after one of these nasty spikes lodged in my right thumb and subsequently became infected.

This was a small price to pay for such a wonderful bulb adventure which saw us travel 3950 kilometres and see *Crinum* in flower at 25 sites and *Calostemma luteum* in flower at 8 sites as well as seeing 4 species of *Macrozamia* in habitat.

Crinum flaccidum **showing pink buds with some persisting pink in the flowers at Curra Creek, West of Wellington, NSW**

Jim's home town of Springwood is not marked on the map. It is just east of Katoomba, inland from Sydney

Crinum kirkii Baker

David J. Lehmiller, M.D.

ALL PHOTOS BY THE AUTHOR

Since 1989, I have cultivated two field-collected bulbs of *Crinum kirkii* Baker, courtesy of the Botany Department, University of Dar es Salaam, Tanzania. These bulbs have grown well in Southeast Texas and have repeatedly bloomed, providing ample opportunities to study this species. During the interim, I have reviewed the type material at Kew, and I have found the publications of Inger Nordal to be of great use, especially her description in Flora of Tropical East Africa (1982). The original description by Baker(1880) and the type material (Kirk, s.n.,1879, K) are somewhat nebulous, but Nordal has provided the specific characters for definitive identification.

Crinum kirkii has striped, trumpet shaped flowers (Figures 1-2), but three other important characters stand out in the delineation of this species. These latter characters are:

1) Spathe remains stiff and erect at anthesis, enveloping the ovaries and the proximal perianth tubes (Figure 3);
2) Leaves are undulate, and leaf margins are crispate – the latter being a wrinkling or crinkling of the leaf margins (Figure 4); and,
3) Fruit develop into large red globes with thick walls (Figure 5), bearing seeds that are smooth, oval, and light green. All fruiting structures develop on a scape. Even if flowers are not pollinated, large barren fruit still develop which is a phenomenon known as pseudocarpy.

A few F-1 interspecific hybrids have been produced with *C. kirkii* (Lehmiller, 2004). Several characters of *C. kirkii* are exhibited in these hybrids that are helpful in distinguishing the presence of *C. kirkii* in the parentage; although less pronounced in these hybrids, crispate leaf margins and pseudocarpy are evident. I have never observed the combination of these two features in any commercial *Crinum* hybrid.

Upon reviewing the Society's publications (American Amaryllis Society Year Book, Herbertia, Plant Life, and BULBS) since its inception in 1934, I identified 15 different articles where *C. kirkii* was mentioned or discussed. Apparently multiple individuals were convinced that *C. kirkii* existed within horticultural circles in the USA, going back into the late Nineteenth Century when supposedly it was introduced into Florida. Yet surprisingly, not a single report mentioned successful seed production or described the characteristic red fruit that this species forms. Hannibal (1964) reported that he cultivated *C. kirkii* but had never been able to obtain seeds, and he related that others had similar experiences. Hannibal also published a photograph of an alleged *C. kirkii*, but it resembled a *C. x herbertii* hybrid. Most likely all previous reports in the Society's publications referred to highly colored, seed sterile hybrids, rather than the true species, and it was even doubtful that *C. kirkii* could have been in the parentage of these hybrids.

Henry Nehrling was a world famous plants man residing in Florida at the turn of the Twentieth Century; the Society dedicated its first publication to him in 1934 (Stone; Meade). He published many articles on the plant life of Florida. Nehrling wrote a detailed summary about *Crinum* cultivated in Florida gardens for Bailey's Standard Cyclopedia of Horticulture which was published in 1912, and his article was republished in Bailey's 1950 Edition. Nehrling did not list *C. kirkii* as occurring in Florida gardens but instead remarked that often *C. zeylanicum* was sold as *C. kirkii*. He commented upon *Crinum* in cultivation: "There is great confusion in the nomenclature of these plants, scarcely half a dozen being correctly named in the various catalogues." (Citing early flower bulb catalogs as evidence for when a particular *Crinum* species was introduced into the USA may be problematic.)

In my opinion, *C. kirkii* was never cultivated in USA horticulture. Bulbs reputed to be *C. kirkii* in the past were misidentified.

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Fig 1


Fig. 2


Fig. 3

FIGURES

1. *Crinum kirkii* in bud.
2. Flowers of *Crinum kirkii.*
3. Flowering *Crinum kirkii.* Note the stiff and erect spathe enveloping the ovaries and proximal perianth tubes.
4. Leaves of *Crinum kirkii* exhibiting crispate margins.
5. Characteristic red fruit of *Crinum kirkii.*


Fig. 4

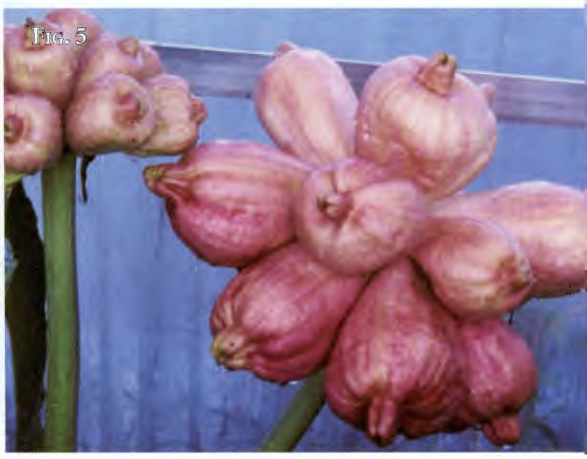
Fig. 5

Trillium in Great Smoky Mountains National Park and Environs

Jim Shields

I grew up in Indiana with a spring Wildflower Walk in the woods as a family tradition. I "knew" that there were two kinds of trilliums here: *Trillium erectum*, the "red one;" and *Trillium grandiflorum*, the "white one." I have since (sometime in the last 60 years or so) learned that the red one was not *erectum* and that there are a bunch of others in various parts of Indiana. Life was no longer simple.

I spent last weekend in the Smokies (Great Smoky Mountains National Park and environs), riding around with a local friend looking at trilliums in bloom. This guy can even spot trilliums NOT in bloom, from a pickup truck traveling 35 mph!

Still, we saw *Trillium*! Around Gatlinburg, Tennessee, just outside the park, *Trillium luteum* were as common as dandelions along roadsides, both outside the park as well as inside. We saw slopes covered with *Trillium grandiflorum* in some places, and with *T. erectum* var. *album* in others in the park. In the lower elevation areas around Gatlinburg, we saw *T. simile*, which is probably a subspecies or form of *T. erectum* var. *album*. In a very few places we saw a very few plants of T. *rugelii*, which is a white nodding trillium, and *T. vaseyi*, the red nodding trillium – not both in the same places. After almost two and a half days in Gatlinburg with my friend, I had at least a general idea of what such *Trillium* species as *simile*, *erectum* var. *album*, *rugelii*, *luteum*, and others such as *vaseyi* look like, not to mention *grandiflorum*.

I also saw (imported from Kentucky and Missouri) *T. flexipes*, which looks to me like *T. rugelii*. The *flexipes* were planted in my friend's research nursery. He works under the All Taxa Biodiversity Inventory (ATBI) project in Great Smoky Mountains National Park, and he is the *Trillium* specialist in the project. The nursery is devoted to studying questions like how does *T. simile* relate to *T. erectum* var.*album* ? How does yellow *T. luteum* relate to red-brown *T. cuneatum* ? Are the occasional red-brown plants in colonies of *luteum* mutants or hybrids with the distant *cuneatum* ?

We did not see *T. undulatum*, which has not been found close enough to the road inside the park for two old men to get to it. We didn't see *T. catesbaei*, or *T. sulcatum*, either. Still, I don't think there are many places where you can spend one weekend, stay within a radius of about 20 miles, and see 6 species of *Trillium* in bloom. It was a great plant weekend! There were also *Claytonia caroliniana* and *Erythronium umbilicatum* in bloom at high elevations and *Sedum ternatum*, *Anemonella thalictroides*, *Geranium maculatum*, *Iris cristata*, and *Maianthemum racemosum* in bloom in abundance at lower elevations.

The differences between the various white species are sometimes subtle, but with enough coaching you can see them in most of the plants. The most difficult distinction is probably that between *simile* and *erectum* var. *album* at elevations below about 3000 ft.

***Trillium luteum* along a country road outside Pigeon Forge, Tennessee**

Here are my impressions, opinions, and hypotheses after just one long weekend in the Smokies with the trilliums and with a local expert. All my background information on these trilliums came from him.

Trillium simile vs. *Trillium erectum* var. *album*

Trillium simile occurs in a somewhat restricted area around Gatlinburg, while *Trillium erectum* var.*album* is a widespread northern species. *T. simile* occurs mostly in the lower elevations, while what is unambiguously *T. erectum* var.*album* is found only at the high elevations, perhaps above 3000 ft., at least on the west side of the mountains. There seem to be few to no individual specimens of *simile*-like plants in the higher elevations, but there are numerous examples of *erectum*-like plants in among the *simile* populations at low elevations. The question is, are there low elevation hybrids between *simile* and *erectum* var. *album*?

***Trillium rugelii*, one of the nodding trilliums. We saw very few *rugelii* anywhere**

The question of hybridization between *simile* and *erectum* var. *album* is intriguing. It is certainly possible where they overlap, if they are at all interfertile. This is a matter for some careful breeding experiments as well as for some DNA analyses. We need to see whether emasculated *simile* produce seeds that germinate when pollinated with pollen from definite plants of *erectum* var. *album*. Even before we make any crosses, the facts that *simile* seems to be absent from high elevations and that plants of the *erectum* var. *album* from higher elevations seem not to survive down at the level of Gatlinburg suggest that their hybrids would have reduced viabilities outside the narrow range of their overlaps, around roughly 2000-2500 ft.

Also interesting is the question of why *simile* has larger, showier flowers than *erectum* var. *album*. It takes more energy to produce a larger flower than to make a smaller flower. Why would a plant that looks so similar to *erectum* var. *album* make bigger flowers? Why do some *simile* plants down around Gatlinburg have blooms that look like the narrower petalled flowers of high altitude *erectum* var. *album*? Do they save energy at the expense of fewer visits from pollinators? In a spring like 2007 where there is a devastating late freeze, the plant that saves a bit on energy invested in making flowers might have more reserves to come back better the next year.

Most *simile* have a dark red ovary, and *erectum* var. *album* have an even darker ovary. Among the *simile* populations, there are occasional individual plants with light ovaries that are white or light pink. These could be mutants or they could represent introgression of genes from *rugelii* into the population of *simile*.

Sympatric species can coexist if there is some sort of barrier separating them. Such barriers can be any one of the following:

1. Fully infertile when crossed (the most obvious method)
2. Pollinated by different vectors
3. Bloom at different seasons or fertile at different times of day
4. Hybrids less viable than either of the pure parent species. This can be due to need for dry habitat vs. wet habitat, sun versus shade or different elevation requirements

Identifying such barriers is going to take a lot of work.

Red *Trillium simile* flower. This is the only red *simile* we saw in the wild

Red *Trillium luteum*

The occurrence of occasional darker colored forms in the midst of much larger numbers of the light colored forms, or vice versa, is normal for any plant species. One need not even invoke introgression from dark colored species to justify them. They are probably simple single-gene mutants. This seems likely for the red forms of *simile*, for instance; but all explanations are speculation until there has been some experimental work on the question.

Trillium luteum is said to be lemon-scented. *T. cuneatum* is supposed to be foul smelling. Even though there are rare mutant individuals with the red color occasionally found in populations of *luteum*, true *cuneatum* and regular *luteum* should usually be kept separate and distinct due to different pollinators. The differences in fragrances indicate that. Carrion or fecal odors attract flies and beetles. Sweet fragrances attract bees, butterflies, and moths; I wonder if the same applies to lemon scents? Here is another situation where breeding experiments would possibly give us some solid answers – in this case with plants of *luteum* and of *cuneatum*. Others have reported that fungus gnats are attracted to the blooms of *Trillium cuneatum*, but that the gnats had not been observed visiting the flowers of *T. luteum*. Can these two species hybridize? Probably. Would the hybrids get visits from pollinators? Maybe or maybe not.

My friend has enough of the red *luteum* specimens to do some crossing. I suspect the "bronze" plants are heterozygous for the red/yellow gene. I'd suggest crossing two "bronze" *luteum* clones and then having someone grow the seed to bloom size. If it's a simple one-gene red vs. yellow situation, the offspring of "bronze" x "bronze" should be 25% yellow, 50% bronze, and 25% red when they bloom. Richard and I are probably both too old to attempt this experiment ourselves, but Richard could maybe produce the seeds. Besides, it is very possible that the color control is anything but simple. Maybe I can check on that.

The bronze form is very uncommon in the *luteum* populations in the Gatlinburg area. What can we say about the nature of the red form from the frequency of red and of bronze forms in the general yellow population? Clearly, that it is very intensively discriminated against by nature! At equilibrium, with all other things being equal, I think a mixed population of red and yellow flowers would end up after 10,000

This is *Trillium simile* in habitat in the region around Gatlinburg, Tennessee and the Great Smoky Mountains National Park

years with 25% yellow, 25% red, and 50% bronze (one yellow gene and one red gene) plants. The situation in Gatlinburg is drastically different from that.

Controlled Hybridizing

Since we don't really know the pollinators for trilliums, we need to do hybridizations under carefully controlled conditions. This means potting the parent plants and growing them under wire screen cages and in areas where we can be sure snails, slugs, and beetles, for instance, can't get to the blooms by just crawling up from the ground. We also need to emasculate the prospective maternal (seed) parent before the anthers ripen.

Where Did They Come From?

The previous interglacial period reached its warmest point at 126,000 years ago. The last glacial age lasted from about 120,000 years ago up until about 12,000 years ago. The peak of ice formation was probably about 20,000 years ago. Where were all the *Trillium* species during that ca. 100,000 years of glaciers? I suspect that they were in today's coastal plains of Georgia, Florida, Alabama, and Mississippi; and the coastal plain species were out on the dry continental shelf areas now under up to 200 feet of sea water in the Gulf of Mexico.

One possibility for *simile*/*erectum* var. *album* is that they were separated from a single parent population about 120,000 years ago, and have just now (i.e., in the last 10,000 years) run into each other again. Are they going to merge back into a single species, or are they already on an irreversible path to separation? Hybridization studies might help answer this, but first we may need to get the DNA work done to clearly differentiate between *erectum* individuals and *simile*

individuals.

Maybe *erectum* survived the last glacial age in a cold, barren refuge where there were no important competitors for the pollinators it depended on. Maybe *simile* was a population of *erectum* that spent the last glacial age in a warm, mild region where there were many other kinds of white flowers competing for the attention of the available pollinators; maybe it had to work harder to get their attention. Maybe that's why today, many *simile* look like *erectum* var. *album* with bigger, more obvious flowers.

It will still take DNA work to sort things out.

Pink colored *Trillium simile*. We only saw one or two of these in two days and thousands of *Trillium* flowers

Close-up of *Trillium simile* flower

Large Flowered Colchicums for Autumn

by Rod Leeds

ALL PHOTOS BY THE AUTHOR

The large flowered colchicums have been a feature of autumn gardens for just over a century, with the cultivars being chosen more recently. They are easily grown in sunny or at least half sunny borders or grassland that is cut down and the grass removed in summer.

The only book at least partially devoted to the genus is '*A Handbook of Crocus and Colchicum for Gardeners*' by E. A. Bowles first published in 1924, with a revised edition in 1952. Here he starts with rather negative comments about the size of the leaves produced in spring and their 'readiness to fall outwards and sprawl over neater-growing plants.' I hope that with careful positioning most leaves can be enjoyed as quite architectural features until early summer by which time the abundance of the season can hide their decay. It is certainly detrimental to remove leaves with any green still visible. However the great gardener and writer does later extol the virtues describing them as 'among the most handsomest of bulbous plants and should be in every garden where room can be spared for the leaves in spring.'

The plants are really corms, with quite dark brown leathery tunics, which can reach 10cm in length by 5cm across when growing well. The corm in late summer or autumn begins to break the short summer dormancy by sending up from the foot at the base of the corm, a flower which is led to the surface by a tough brown tube which is part of the tunic. This enables the delicate flower bud to rise up from even dry hard ground to flower undamaged. At this stage they are relying on stored energy to grow with roots only emerging as the first moisture of autumn penetrates into the soil. Every year the corm is replaced by a new one forming next to the old as it dries up and looses its identity. Often a smaller corm or two is formed at the same time, thus ensuring multiplication. Although the cultivars are often of hybrid origin, they can still produce fertile seeds by late next spring. In itself this is not a problem, except I am sure that many cultivars have been accidentally corrupted by seedlings of greater vigour replacing the true cultivar in some collections.

These large flowered colchicums suffer from a great deal of misnaming and with this in mind the Royal Horticultural Society initiated an assessment of colchicums in 1996, which continued in 1997. The aim was to select the best for The Award of Garden Merit. Nearly one hundred selections were planted in Eastern England in ideal conditions in blocks some 1m square. It was then the problems with the naming really became apparent and the experience of the team assessing was tested to the full. As an aid to identification the leaves had been pressed in the preceding spring. Eventually a number were selected for the AGM (See plant description text).

Cultivation.

Cultivation of these plants is quite straightforward. They seem to thrive in a variety of soil types, from glacial sand to clay soils, although in heavy soils it seems good practice to add some coarse grit and humus. One perennial problem in England is the keeled slug which is a small dark creature that likes nothing better than to live between the corm and the tunic. It lives on corm tissue, so weakening the plant and more damagingly the emerging bud, thereby causing failure to flower, or at least damaged segments. The addition of coarse grit at planting may help deter them, as well as the removal of spent foliage in late spring. It is in this foliage that the slugs first find a home and then seem to move down the tube as the leaves decay.

Plant the dormant corms with the top of the tunic just visible at ground level in an open position with good light. Incorporate some fertiliser such as bone meal in the planting hole. Ideally every two or three years the corms need lifting and replanting in a reinvigorated soil mix. This is also a good opportunity to check for pests and to enlarge your colony. They are gross feeders and even if not lifted should have a feed incorporated in the adjacent ground each summer. If they fail to flower always lift immediately to find the reason.

Species and Cultivars.

The selection listed is just ones I have grown, which I believe to be correctly named. If possible buy in flower. Some small nurseries still pot up the corms

and sell in this fashion. Otherwise always check as the flowers emerge and do be sceptical until your doubts are proved wrong.

Nearly all colchicums fit very closely between two colour bandings in horticultural colour charts, so I have not tried to use these but have instead mentioned other features that make each one distinct. I have also rarely used the colour of the pollen as a useful clue to identity as this changes with many as they age.


C. autumnale 'Nancy Lindsay'

Colchicum agrippinum (AGM)

A very old selection thought to be a hybrid between *C. variegatum* and *C. autumnale*. Very easily distinguished by the relatively small tessellated segments which taper to a rather blunt point. The flowers rise to 15cm on white perianth tubes and have purple tips to the stigma. It seems never to set seed, but is very prolific with its offsets. The leaves are quite slim and rise up with slightly wavy edges. An early flowerer and widely available commercially.

C. autumnale

A widespread European species which quite naturally exhibits considerable variation in appearance and therefore suffers from a plethora of names depending upon its provenance. Certainly when these 'names' are grown from seed the resulting flowers will need the botanist to lump or split to sort out the confused position. The flowers are slim and pink, which can range from pale to quite dark. At least two have been given cultivar names. *C. autumnale* 'Elizabeth' is an early flowering selection found over eighty years ago by Dick Trotter in The Alpes Maritime and named after his daughter. It is a pale pink flower, 15cm tall, composed of open parallel sided segments which are noticeably striped and held on a white tube. The throat has a small white star and above are prominent yellow anthers. *C. autumnale* 'Nancy Lindsay' (*C. pannonicum* 'Nancy Lindsay') (AGM) is a prolific flowerer and is thought to have been collected from Eastern Europe. It is a dark purple in and out, with a small white star reaching half way up the inner segment surface. Together with a triangular light purple tube and prolific production of flowers this is a very easily recognised and easily grown selection. The stigma is hooked and also purple.

There are also two double selections of *C. autumnale* regularly offered by nurseries. The neat pink is pale in colour and the white the typical creamy white of the single.

C. autumnale 'Album'

The white selection of the widespread European species, which is usually pink. The usual commercial selection has a small flower which is produced profusely from each corm over a month. Even when the flower flops they retain their shape, adding to their effect. This is particularly so in meadowland. The off white flower has vertical veining in the translucent tube which can reach to 20cm when growing well. The stigma is also white, with a crooked tip and is longer than the anthers.

C. 'Autumn Queen'. ('Princess Astrid') ('Bowlesianum') (AGM)

Often the first to flower in late summer, with rosy purple tessellated flowers, with the tessellation visible from both inside and outside the segments. It is 25cm tall and distinctly scented. There is a white throat for about a third of the segment which diffuses into the purple. The tube is cream coloured and the stigma is purple and hooked at the tip.

In literature it has been called *C.* 'Princess Astrid' and commercially sold as *C.* 'Bowlesianum'. *C.* 'Bowlesianum' is a synonym of *C. bivoniae.*

C. 'Beaconsfield'

This old selection has medium funnel shaped flowers of a pink magenta which is strongly tessellated especially so in the inner face. The tube is dark purple near the flower but fades away to a pale green towards the soil. The stigma is long and hooked at the tip. Just over 20cm tall and a mid season flowerer.

C. 'Benton End' ('Cedric's Darkest')

A rich lustrous pink purple flower of good substance, similar to *C. speciosum* 'Atrorubens' but with more rounded segments and much earlier flowering. Benton End in Eastern England

was the home of Sir Cedric Morris a plantsman and artist of repute. There is a faint purple tinge to the tube and the white stigma is slightly bent and twice as long as the anthers.

C. byzantinum

A common and easy plant which flowers prolifically early in the season. The flower is small, mid pink with a white star spread half way up the inner segments. A diagnostic feature for recognition is the purple tip to each rounded topped segment. The crimson tipped hooked stigma is held clear of the anthers. *C. byzantinum* 'Innocence' is the name given by C.D.Brickell to the albino. It still exhibits the purple tip to the segment but otherwise it is a creamy white flower of similar dimensions.

C. cilicium

A very good species for the garden. It is quite distinct and long lasting in upright flower. The cup shaped flower can vary from mid to dark purple, but when the flower is open the white star in the throat extends

nearly to the tip of each segment making recognition an easy matter. The white, nearly straight stigma just protrudes above the anthers and the perianth tube is a contrasting white. This Turkish plant is prolific with its seed and can be brought to flower within four years.

C. 'Conquest'

It is over a century since this Dutch selection was named by Zocher and Co. It is a tall flower to 30cm, pale purple with a rich purple edge to each segment. The inner surface is tessellated and beneath is a white star. The white shading of the tube extends some way up the outer surface of each segment. The faint purple stigma is twice the length of the anthers.

C. 'Darwin'

From the same garden as *C.* 'Huxley' this selection by Mr. R. O. Backhouse of Herefordshire in England is one of the last, if not the last to flower in autumn. It is a medium sized quite dark purple globular flower, that because of the low light levels rarely seems to open fully. The leaves likewise follow very late in spring. Unfortunately here at least it is very slow to increase.

C. davisii (PD 26938)

A short flower to 20cm which grows from a very large and elongated corm. The pale pink flowers are tessellated and quite funnel shaped held on a white tube. There is no star in the inner segments, and the pink just fades into white at the base of the flower. The stigma is pale purple, slightly crooked and is held beneath the anthers. A Turkish plant which was grown for a number of years at the Royal Botanic Garden Edinburgh before being named.

C. davisii (PD 26938)

C. 'Dick Trotter'

This was found in the garden of Dick Trotter in Northern Scotland, where he had been broadcasting seed of *C. speciosum* 'Album'. This does seem the likely parent. It is an impressive bowl shaped flower of pinky-purple with segments that have parallel sides and rounded tops. It is a late season plant with a strong scent.

C. 'E.A. Bowles'

A cultivar of 25cm selected from the garden of E.A. Bowles by Dick Trotter. It has a very rich shiny purple cup shaped flowers with a contrasting white throat. It is not tessellated and is held on a pale purple tube with a white stigma held just above the anthers.

C. 'The Giant'

Another of Zocher and Co introductions from early in the 20th century. It was a cross between *C. giganteum* and *C. bornmuelleri.* It is tall to 30cm+ with pale pink slightly pleated and faintly tessellated flowers which are no bigger than many hybrids. The tube is a cream colour and the stigma is crooked and faintly purple. Unfortunately in England in 2007 there are many impostors of small stature and dark flower colour being sold under this name.

C. giganteum (C. speciosum var. *illyricum)*

Another of the Turkish large flowered species that has probably helped gardeners select many of the hybrids we have today. The one most usually seen in cultivation is the collection ACW 2337. This is early into flower and has pale funnel shaped flowers which are slightly twisted and supported by white perianth tubes.

C. 'Glory of Threave'

This was named following the assessment by the RHS of the large flowered Colchicums. It was sent to the trial from Threave House in SW Scotland as *C.* 'E.A. Bowles', but was seen to be different and worthy of being named. In fact I think it is one of the most attractive of the late flowered selections. The flowers are not large, but have a rich purple sheen which contrasts well with a large white throat held above a dark tube. The white stigma is held at about the same height as the anthers.

C. 'Harlequin.' ('Harlekijn')

A recent introduction with a truly bi-coloured flower. The base is rose purple and the top half of the segment a creamy white. It is unusual but lacks much grace as it often appears pinched.

C. 'Huxley'

A large flowered selection from the 1930's with a cupped flower that open with gaps between the segments. The white throat is a dominant feature of the inner face as it diffuses very gradually into a pink purple tip. There is a white line apparent through this colour change. Externally it is a faintly tessellated mid pink-purple colour and always in the latter half of the season.

C. 'Lilac Bedder'

A pale pink selection with slim segments above a green tube. It flowers early in the season and is scented of honey. The white throat occupies half the inner surface in which the long stigma is white and just arched at the tip and noticeably twice as long as the anthers.

C. 'Lilac Wonder'

An old selection of vigour. It has slim pointed segments of a mid pinky-purple to 20cm. It never opens fully; inside the white throat there is a vein of white fading out as it rises. The tube is white and quite weak and it is inclined to fall over quickly but remains in good condition in a prostrate position. This sounds dreadful, but as many more flowers are produced from the same corm the effect is quite pleasing and different. The white hooked stigma just overtops the anthers.

C. 'Little Woods'

A selection that may have some link with *C. byzantinum* and *C. autumnale*. It is quite a late flower and is mid-pink and plain, except for some vertical lines. In bud the tips of the segments are sharply rounded, a feature lost when it opens fully. The white throat reaches half way up the segments and there is a pale flush visible from the outside. It has a long white hooked stigma with a purple tip. A neat compact plant of 15–20cm.

C. macrophyllum

Quite early in the season the unmistakable highly tessellated rosy-purple and white funnel shaped flowers appear. The segments make quite an open star when viewed from above. The pale purple stigma protrudes from the flower and is well above the dark anthers, which make an attractive contrast above the white throat. Found around the Aegean Sea this species seems to need a hot dry position to flower well. As the name suggests it has huge pleated leaves that for some weeks are an interesting feature in spring.

C. 'Pink Goblet' (AGM)

A tall stately selection from the garden of Dick Trotter, where the selection was made from deliberately broadcast seed from *C. speciosum* 'Album'. The white throat occupies about one third of the inner segment and in some the pink staining runs down to the base. The flowers produced in the latter half of the season are a vibrant pink with darker pink vertical lines running down to the tube, which turns a bronze pink with age. The white stigma is shorter than the anthers.

C. 'Pink Star' (*laetum* hort.) (AGM)

This is an early vigorous selection of *C. byzantinum* with pale pink oblong segments rounded at the tips. The white throat tapers to reach the tips of the inner segments. The tube is white and the stigma a purple hook held just above the anthers.

C. 'Poseidon'

A new cultivar which is quite distinct, with substantial pointed segments of a strong pink held on thick tubes of a similar pink that is distinctly triangular in section. The inner star is quite small and the white is stained pink with a deep fold in the centre of each segment. It seems to come late in the season, but may not be fully acclimatised to the garden.

C. 'Rosy Dawn' (AGM)

A plant which is easily recognised by the configuration of the segments at the half open stage. When viewed from above the three inner segments form a distinct triangle, which seems unique. The mid rose purple segments are distinctly tessellated on the inner surface and reach to 30cm in height and are strongly scented of honey. This colouring fades into a white throat which always seems yellow with dropped pollen. The tube is pale green and there is a white stigma twice the length of the anthers. Unfortunately this very good selection is often traded under a variety of spurious names, too many to mention.

C. 'Rosy Dawn' (AGM)

C. speciosum

The large flowered species that is widespread in Turkey and the Caucasus and has given rise to many hybrids and fine unnamed selections in many gardens. This grows well in meadowland and can vary from a pale pinkish purple to a fine dark purple, with varying amounts of tessellation. The leaves are quite large up to 25cm long but not as broad as in var. *bornmuelleri.*

C. speciosum 'Album' (AGM)

The queen of colchicums, found in York at the famous Backhouse Nursery over one hundred years ago. The substantial white flower is held on a lime green perianth tube. It flowers prolifically in mid season thriving in many differing soils. There is a long pale slightly bent stigma which nearly reaches the top of the segments. The star in the throat is translucent and is matched by a diffusion of green from the tube outside.

C. speciosum 'Atrorubens'

When this plant first emerges from the ground it is very pale and it is easy to think the colony is misnamed, but it soon darkens with age. It is a dark pink purple and slightly tessellated with a distinct tip to each segment. The star shaped white throat takes about half of the inner segments, with a white line extending further. The tube is a slightly paler purple. The white barely hooked stigma just overtops the anthers. It appears to be unscented.

C. speciosum 'E.K. Balls Form' (*C. giganteum* E.K. Balls Form)

A late flowering very pale pink selection purported to have been collected by E.K. Balls when in Turkey in the last century. The white throat occupies about half the inner and outer surfaces of the segments and the pink is quite uniform and one of the palest seen. The stigma is white and barely crooked and held well above the anthers, all supported by a faintly green tube.

C. speciosum var. *bornmuelleri*

A Turkish plant that has been rather muddled in horticulture. There are two features that should aid identification. The anthers when young are either

purple or brown and in spring the leaves are half as wide as long. Otherwise it can easily be confused with *C. speciosum.* The often quoted diagnostic feature of a green perianth tube can be found in *C. speciosum.*

C. speciosum 'Maximum'

The name was first used in print by E. A. Bowles in his monograph. Unfortunately the plant around today does not fit his description. Today we have a candy pink small flower to 20cm, that can be very slightly tessellated, held on a faintly pink tube. The small white throat has a strong central crease in each segment reminiscent of *C. cilicium.* The long slightly hooked stigma turns purple with age.

C. speciosum 'Paul Furze Dwarf'

A strange name for an ordinary flower, except for the flowering period. This is often the first to flower vying with *C. tenorii* for the honour. The quite small mid pink flower is slightly tessellated with a white star in the throat. The tube is green and the plant stands between 20-25cm tall.

C. tenorii. (C. lusitanicum)

One of the first to flower. It is has a starry rose purple compact flower which is tessellated and a white perianth tube. The slightly crooked stigma has a crimson tip and is held well above the anthers. Found in Italy and Spain.

C. 'William Dykes'

A very prolific flowering selection, said to come from the same seed bed as *C.* 'Lilac Wonder' and it certainly relaxes horizontally quite quickly in a similar fashion. Both make up for this trait by flowering profusely over many weeks. It has a slim mid pink flower, rather like a pointed oval with faint darker pink lines running down the segments and a white throat occupying nearly half. The stigma is long and bent outwards at the tip.

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C. speciosum 'Maximum'

A Northwest Adventure

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We own several time-share-vacation packages, which we generally use for trade so that we can travel to various resorts and vacation sites. In early May, we arranged to spend a week in Whistler, British Columbia, Canada. It is a famous ski resort that will host the upcoming Winter Olympics. Since neither of us are skiers, our intentions were predominately oriented toward sight-seeing, hiking, and adventure. Also, we had heard of the famous Butchart Gardens in Victoria, so the itinerary was to include a side trip to Victoria.

We flew to Vancouver, rented a car, and set off towards Whistler. We were warned that the trip would take at least a few hours, because the road north of Vancouver leading to Whistler was narrow and winding, and that there was considerable highway construction underway to widen the road to accommodate the anticipated traffic increase for the Olympics. Although driving was slow, it was definitely scenic.

It was cool and overcast most of the time during our stay at Whistler, and even a few times there were snow flurries. There were plenty of activities for non-skiers. After sizing up the available options, we chose to ride Excalibur Gondola up the side of Whistler Mountain, noting a black bear grousing in the bushes on the way. Then we transferred to a regular ski lift and were soon ankle deep in snow at a summit (Fig. 1). The view was breath-taking (Fig. 2). Around us were snow covered mountains, while below lay the valley and ski village. The numerous skiers did not pay any attention to the non-skiing, sight-seers.

Our next adventure was a Ziptrek Tour. Basically we went zipping through a temperate rainforest on a series of cables for circa 750 to 2000 ft at a stretch. The cables are suspended across valleys and streams several hundred feet above the ground (Fig. 3, 4). It was quite exciting, although each of the separate treks seemed to only last for seconds. On the last leg, everyone was instructed on how to twist in their harnesses so that the trek could be accomplished up-side-down. Even the old man was up to the task.

Fig 1

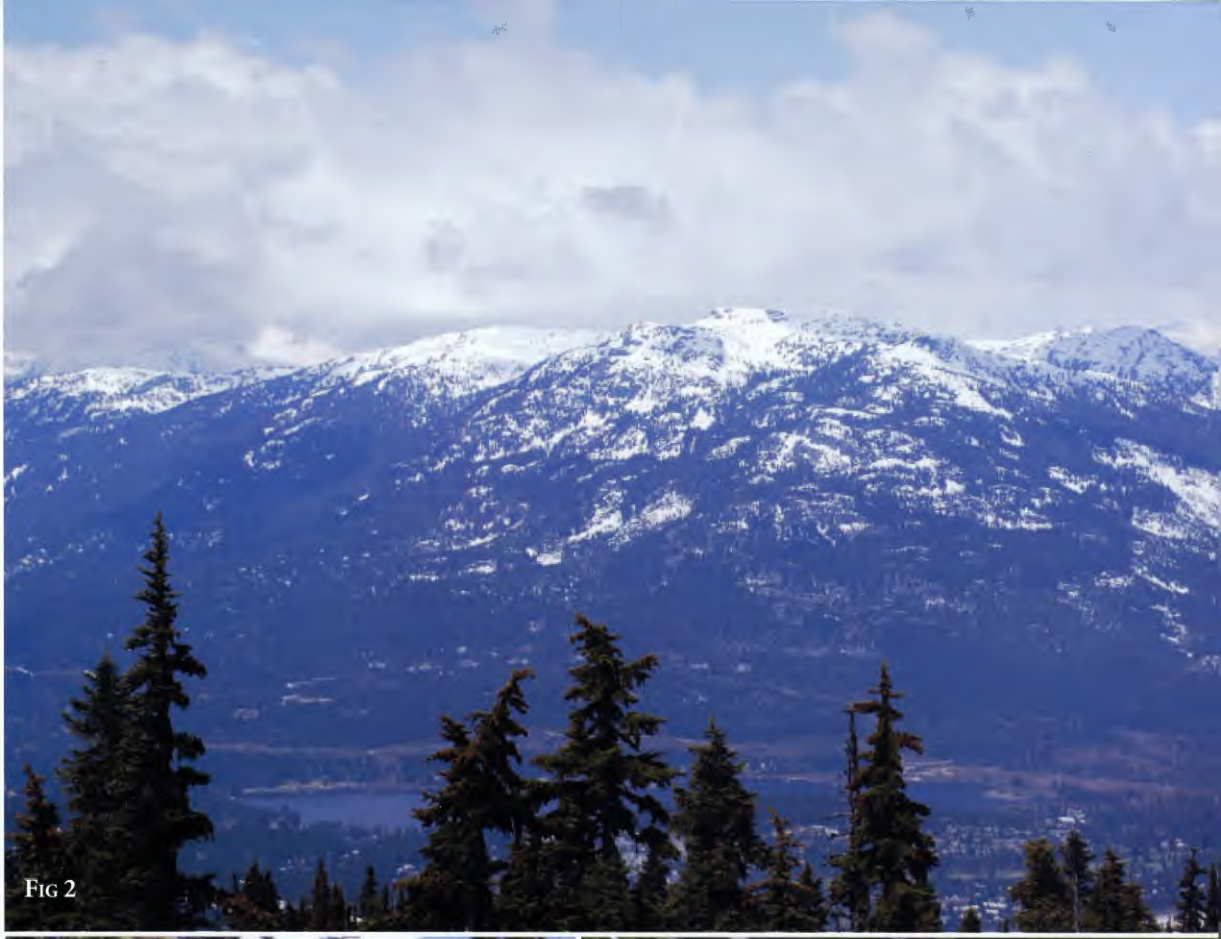

Fig 2

Fig 4

Fig 3

Fig 6

Fig 10

Fig 8


Fig 11

Then we decided to take advantage of the miles and miles of hiking trails, which somewhat to our dismay also served as mountain biking trails. However, pedestrians were afforded the right-of-way. Very soon we began to notice a large number of strange yellow flowering plants (Fig. 5), mostly in very wet and boggy locations, with occasional flowers pushing up through mounds of melting snow. They looked like something in the Arum Family. We inquired from a passing forest ranger as to what they were. He was prepared and gave us a short lecture on "Western Skunk Cabbage" or *Lysichiton americanus.* In addition to its flowers emitting an unpleasant odor, plants were eaten by bears and even by Native Americans during times of famine, and Native Americans also used them for medicinal purposes. (We were not hungry at the time.)

To go from Whistler to Victoria required crossing the Strait of Georgia in a ferry, which turned out to be a pleasant 90+ minute ride in a cruise type atmosphere on board the Queen of the Oaks. It was a scenic ride (Fig. 6) that morning. We then drove to Victoria, having made arrangements to spend two nights at an historic bed-and-breakfast home, Andersen House Bed & Breakfast. The home was originally constructed in 1891. The proprietors gave us directions on how to find Butchart Gardens, and they suggested that we take a scenic route circling the waterfront areas of Victoria on the way.


Fig 09


Fig 12


Fig 7

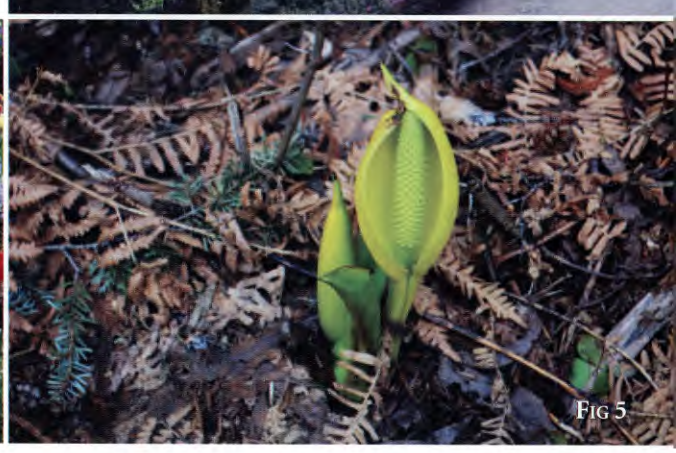
Fig 5

Fig 14

Fig 7

Fig 15

Fig 16

We were told to be certain to make a short detour to Mount Douglas where there was a spectacular view of the city. Indeed the latter did provide an outstanding view, but while there, we noted attractive bluish-purple flowers in bloom that appeared to be indigenous to the mountain top (Fig. 7). We inquired about their identity from several locals who were picnicking – one woman remarked that some of these flowers also grew naturally in her yard, but she could not remember their name, only that the Native Americans ground up the bulbs for food. (Again, we were not hungry at the time.) Later we learned that these flowers were *Camassia quamash.*

We arrived at Butchart Gardens about 4 pm, leaving us with 3 hours of sight-seeing before closure (Fig. 8). It was a brief but beautiful encounter. (In the summertime, the Gardens remain open at night, and during this time the fountains within the grounds are lit, which is apparently quite spectacular.)

The Gardens cover approximately 55 acres of land that was formerly an old limestone quarry. It has been in existence for over 100 years and has been designated a National Historic Site of Canada. The history of Butchart Gardens is very interesting, and readers are invited to its website www.butchartgardens.com for more detailed information as well as a listing of various activities during the year, including fireworks displays.

Butchart Gardens consists of a number of individual gardens – Sunken Garden, Japanese Garden, Rose Garden, Mediterranean Garden, and Italian Garden – and dispersed at strategic locations are fountains and bodies of water. A series of decorative trails connects the gardens and fountains. There are also several restaurants and a plant identification booth. Some planting areas are recycled during the year, moving in and out an assortment of flowering plants to coincide with various flowering times. Each visitor receives a pictorial brochure that shows individual photos with common and genus names for 60 of the more common bulbs, corms, tubers, shrubs, and trees found on the grounds.

A sampling of our photographs is displayed (Fig. 9-22).

That evening we enjoyed a seafood dinner at The Blue Crab Bar & Grill near Fisherman's Wharf in Victoria. We still had one day remaining before our airplane departed from Vancouver, so again we relied upon the proprietors of the bed and breakfast. They suggested that we go "whale watching", so we walked to the wharf area and inquired about such an adventure. There were two options: the

fast, open boat (guaranteed to become wet) and the slower and drier charter boat (The Orca Spirit); we chose the latter (Fig. 23). The big event was the opportunity to see killer whales up close. Unfortunately for us, no killer whales were to be found that day within circa 25 miles of Victoria, but we did see seals, sea lions, eagles, and porpoises. It was a fun day.

We departed early the following morning, having made a reservation on the 7 am ferry back to Vancouver. During the cruise, we enjoyed a leisurely breakfast in the ferry's cafeteria while peering out the windows at the gorgeous scenery. And thus ended our adventure.


FIG 17


FIG 18


FIG 19

FIGURE CAPTIONS

1. Ski lift summit at Whistler Mountain, British Columbia.
2. Panorama view at Whistler Mountain, British Columbia.
3. Nancy on Ziptrek.
4. Nancy on Ziptrek.
5. Lysichiton americanus at Whistler, British Columbia.
6. Strait of Georgia, view from the Queen of Oaks.
7. Camassia quamash at Douglas Mountain, Victoria, British Columbia.
8. Entrance to Butchart Gardens., Victoria, British Columbia.
9. Restaurant with surrounding floral display.
10. Sunken Garden.
11. Sunken Garden.
12. Decorative trail.
13. Tulips.
14. Landscape.
15. Rhododendron.
16. Fritillaria.
17. Showy color.
18. Narcissus.
19. Totem.
20. Sturgeon Fountain.
21. Star Pond.
22. Ross Fountain.
23. The Orca Spirit, Victoria Harbor, British Columbia.

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Fig 20

Fig 21

Fig 22

Fig 23

Louisiana Irises – a secret no more!

by Kevin C. Vaughn

Louisiana irises seem to have been a well-kept secret among gardeners and even iris specialists for many years. In the last ten years, however, they are being distributed by an increasing number of nurseries and many home gardeners have learned what a wonderful perennial they are. Recent improvements in form, patterns, colors and plant habit have made them justly popular.

Louisiana irises, as the name implies, are descendants of five iris species that grew chiefly in the swamps and bayous of the state of Louisiana, although some Louisiana iris species grow as far north as Canada (Zone 4) and as far south as Florida (Zone 10). These species range in height from the dwarf 1' (30.5cm) *Iris fulva* and *I brevicaulis* to the appropriately named *I. giganticaerulea* that may reach 45" (114cm)

'Lime Zest' This shows the veins of green and a greener flower than 'Lemon Zest'.

'Ina Garten' This is a very blue flower with texture veins of deeper color and nice fluting of the petals.

tall. It is believed that seed from all three species (and possibly the more east-ranging *I. hexagona*) gathered in the swamps of Louisiana where in the spring time the bayous are covered with the blooms of these irises, prompting Small of the New York Botanical Garden to declare Louisiana "the iris center of the universe". This convergence of species also lead to the creation of a stabilized hybrid of *I. giganticaerulea, I. fulva* and *I. brevicaulis* called *I. nelsonii*, to honor Ike Nelson, a professor of horticulture at what is now *U. Louisiana Lafayette*. Ike was a great proponent of the use of these flowers and the huge red flowers of *I. nelsonii* are one of the most striking of the American wildflowers. Natural and man-made hybrids between these species range the gamut of these heights and the colors range from white to black includes clear reds that are not found in any other type of iris. Louisiana irises grow successfully in virtually every state in the US and are particularly well suited to the warm coastal climates of Australia although equally adapted to the cooler areas of New Zealand as well. Much of the interest and hybridizing of late has occurred in Australia and it is there that some of the revolutions in form have come about.

Louisiana irises are very successful plants for water gardens. Because of their heavy feeding nature they are able to capture extra nitrogen in koi and goldfish ponds that would encourage algal bloom. Plants are either planted in large pots or are planted right into the pond base. Larger cultivars are generally better for this planting regime. Some of our members plant individual cultivars in large barrels filled with soil and then flooded to provide 1–2" (2.5–5cm) of water on the top. This not only allows one to place Louisiana irises any place in the landscape but also is ideal in terms of culture as the plants grow lustily in this environment. This type of growing situation also greatly minimizes weeding and other care. However, despite the Louisiana's swamp home, they grow beautifully in normal perennial bed culture. In my own garden they receive essentially the same watering and planting conditions as the daylilies – from 0.5–1.0" of water per week during the growing season, although they do want more moisture than the more common bearded iris do and soil from neutral to mild acid. They also respond

'Lemon Zest'
This shows the importance of the styles in LA iris. In this case they are green and serve to cool down the flower color.

well to mulching (to retain moisture) and a generous application of well-balanced fertilizer in spring and fall, as these plants are heavy feeders. Although they are considered sun perennials, in my garden in Mississippi they grow very well in part shade or shade from deciduous trees, as much of their growth occurs in the winter months in this climate. Plants from nurseries are generally shipped in the fall and, in climates with colder weather, planting should occur at least a month before a frost to allow for the plant to be established. Keep the plant well watered until new growth is observed. Because some of the larger LA iris make long rhizomes up to 1' (30.5cm), space these larger plants ~3' (91.5cm) apart to allow for a clump to be formed. Smaller varieties may be planted ~2' (61cm) apart. Unlike many irises, if Louisiana irises are kept watered during the summer months their foliage remains as a pretty upright green accent. Unlike bearded irises, Louisiana irises are essentially immune to rhizome rot, although certain cultivars will show foliar rust in mild and wet seasons. Most modern cultivars are fairly resistant to this rust, however.

And the flowers! As mentioned above Louisiana irises have an incredible range of colors and only lack a true orange and an absolute black. Recently, advances have been made in the patterns in the blossoms as well so that both light edged, darker edged, and bicolors of various combinations occur. Louisianas are beardless iris (like the Siberian, spuria and Japanese iris) but they often have a signal of a different color that serves the same purpose as the beard in bearded iris. Oftentimes these signals are expanded into patterns of a light or darker color across the falls of the iris. The style arms are of more importance in Louisiana iris than in bearded iris as the flowers are almost always of a flat shape, so that all the blossom parts are exposed. Styles of contrasting colors to the petals add much to a flower's interest, such as white styles with dark purple petals('Delta Prince') or green on yellow (such as in 'Lemon Zest').

One of the biggest advances in the last two decades has come in flower form. Through the efforts of two Australian hybridizers John Taylor and Heather Pryor, very round and ruffled flowers have been introduced

'Style and Flair'
In this case the styles are very prominent and frilled.

to the market. Now hybridizers around the world are using this genetic material to produce irises with these elaborate ruffles and with a full range of colors. Substance is also improved in the newer hybrids and one of the author's flowers lasts 4–5 days in the garden compared to 1–2 days in some of the older cultivars. Branching and bud count have also been improved so that 8 flowers per stalk is becoming more common and Koorawatha of John Taylor's can have as many as 16.

The smaller irises have not been ignored either.

RED SEEDLING OF MINE WITH ELABORATE RUFFLES Unlike most irises, we can get good red colors in the LA iris.

Hybridizers Frank Chowning and Richard Morgan have utilized the dwarf species *I. fulva* and *I brevicaulis* in a number of crosses. Because these two species grow at the Northern range of the Louisiana species, their hybrids are particularly well suited to more Northern gardens. Because of their smaller size and compact growth habit, these hybrids are often preferred by growers who have limited space. In my garden I use these at the edge of beds of the taller cultivars or in smaller beds where a large plant would look inappropriate. Although in my garden I have good Louisiana iris bloom for 4–6 weeks in the spring, some hybrids are known to re-bloom, at least in favorable climates. Some, like my 'Red Velvet Elvis' will send up stalks at varying times during the season so that bloom even on a given cultivar can last a month or more.

Not all flowers are round and ruffled, however. Diversity of form is encouraged in the judging standards for Louisiana irises and luckily we have Louisiana iris in a variety of shapes from spider-like ('Black Widow'), to pendant falls, to fully upright standards like a bearded iris, to a more open species-like appearance. Each type has its proponents and

'Little Bit Country' Most LA's are large but this is ~2' tall and flowers less than 4" across.

'Red Velvet Elvis'
This is one of the darker red iris and was the '06 DeBaillon Medal Winner.

there are outstanding varieties of all types available in the nurseries.

For recommended cultivars, the Society for Louisiana Irises (SLI) conducts a popularity poll of members on the most popular cultivars and this can be examined on their web site. Most of these are cultivars that are readily available from a number of the nurseries that are listed as sources on the SLI web site. Many of these dealer members either publish catalogs with color and/or have web sites with color photographs of the irises to be chosen, making choices easier. My own personal favorites are 'Peaches in Wine' (bicolor of peach and purple), 'My Friend Dick' (brick red), 'Rivendell' (clear ruffled white), 'Edna Claunch' (ruffled lemon), 'Beale Street' (navy blue), 'Frenchmen Street' (dusky blend) and 'Red Velvet Elvis' (red black). All of these are of the taller flat type of flowers that are most favored by hybridizers at this time and all of these have performed reliably each season in my garden.

Aside from the popularity poll, SLI publishes the wonderful journal called *Fleur de Lis* that appears four times a year as well as sponsoring an annual convention which is many times near the epicenter

CARTWHEEL SEEDLING OF MINE
This shows the cartwheel pattern, with standards and falls all with a prominent signal.

of Louisiana iris diversity in Lafayette LA. A book *"Louisiana Irises: Taming of a Native American Wildflower"* is also available from the society and the American Iris Society through their bookstore. The latter is a particularly good source on all items on Louisiana irises, from culture to flower arranging.

I hope that many of you will think about giving Louisiana irises a try in your gardens this year. You won't be disappointed.

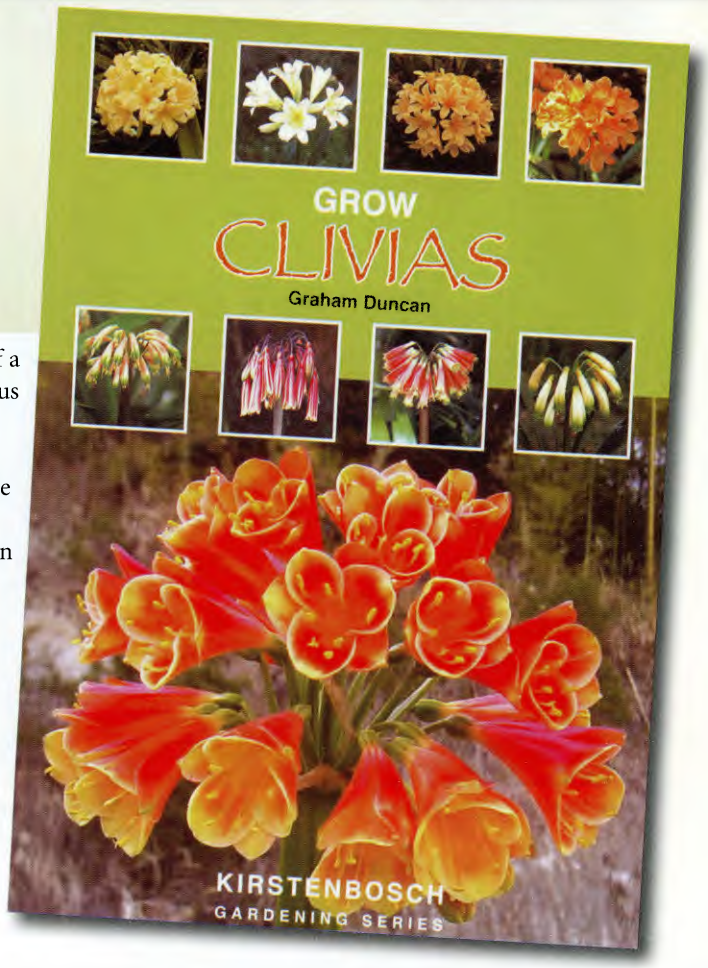
Book Review

Grow Clivias

A guide to the species, selected hybrids, cultivation and propagation of the genus *Clivia*.

Graham Duncan

Kirstenbosch Gardening Series, 2008



This is the second, and hugely expanded, edition of a booklet first published in 1999. Since then, the genus *Clivia* has been the subject of much enthusiasm in a number of countries. The advent of the Internet and email communication and the formation of the Clivia Society, based in South Africa, have greatly facilitated research and the exchange of information and images.

Much of this information has been admirably brought together by Graham Duncan. My first reaction on seeing the book was Wow ! The design and structure of the book immediately give comfort regarding its authority. The use and quality of images are outstanding. None are superfluous and each illustrates a specific point. Importantly, the book strikes a refreshing balance between botany and horticulture.

The book starts with a sound history, detailing in chronological order the establishment of the genus and its species. It is good to have illustrations of the inflorescences of each major taxon illustrated side by side on pages 22 and 23. The botanical history is followed by an overview of the development of the genus in cultivation.

The next section, titled General Information, gives information on morphology, phylogeny, flowering times, pollination, distribution and habitat as well as a consideration of conservation issues.

The Chapter on Taxonomy is comprehensive, particularly well illustrated and is accompanied by useful distribution maps. My only minor reservation is that the author concentrates solely on gross morphology and fails to record that each of the species has a characteristic karyotype, which can help to resolve any ambiguity regarding identification.

Following consideration of the species, naturally occurring hybrids are dealt with before artificial hybrids are discussed. Personally, I am sorry that an attempt has been made to classify hybrids by group names. This is cumbersome and the names both inelegant and misleading. In the long run it will prove to be unworkable. While it is possible to identify the parentage of some hybrids from well kept records and primary hybrids by karyotype studies, there are already many hybrids that have contributions from four or more species in their genomes. The fact that this concept cannot be consistently applied, is unwittingly acknowledged in various places, by use of the epithet [Group unknown].

Cultivation and propagation are well covered, while pests and diseases of *Clivia* are dealt with more comprehensively than elsewhere, albeit with an understandable South African bias.

All in all, I can warmly recommend this book to newcomers and experienced *Clivia* growers alike. Grow Clivias is an outstanding contribution to horticultural literature.

Dr. Keith Hammett

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