Coles, Codes & Lithops Cultivars

By Keith Green (2019)

Sometimes I wish I were a chemist because unlike biological taxonomy, the Periodic Table concisely fits every element into individual boxes. Alas, I am not a chemist or even a scientist. I am however the official International Cultivar Registrar for the Genus *Lithops* N.E.Br. as appointed by the International Society for Horticultural Science in 2013. The "N.E.Br." suffix is the accepted abbreviation for Dr. Nicholas Edward Brown who described the genus *Lithops*. My title is not as grand as it may appear, and my task is an unpaid labour of love fraught with blurred lines and differing opinions as to what exactly constitutes a cultivar. Be it animal, plant, fungi, protozoa or bacteria, no form of life ever evolved to be placed into a box, so my task was never going to be a straight forward one. I will continue with the cultivar theme shortly, but first I should explain how I stumbled into the role.

I never had a greenhouse, but like many others I always liked succulent plants. As I grew up, I researched and acquired several specimens of cacti and other succulents mostly from garden centres, and grew them to a reasonable standard on my windowsill. I liked *Lithops* from day one, as unlike most cacti, *Lithops* rarely outgrew their allotted space and had no spines with which to inflict pain or hook onto net curtains. Then one day I took the time to truly look into the face of a *L. dorotheae* and I was astounded by the beauty. Before me I saw a wonderful contrast between buff margins, a dark window and tiny flecks of bright red. The closer I looked the more I saw, and from that day to this my fascination has never waned.

Then I found the first edition of the book *Lithops–Flowering Stones* written by (the now late) Professor Desmond Cole that was published in 1988. Suddenly I had everything I wanted to know laid out in front of me, and much more. I never knew *Lithops* were so variable in form, let alone understood the way they were botanically classified into species, subspecies and varieties (the minor botanical rank of *forma* abbreviated to f. was not used in this work). Then a new species (we now know it as *L. coleorum*) was discovered in the Northern Transvaal, and a new cultivar 'Jackson's Jade' was described in the *Mesemb Study Group Bulletin* by none other than Professor Cole himself. I felt compelled to keep records of these and the "new" *Lithops* that followed, and gradually I amassed a file of names that mostly claimed to be cultivars. It was this file, something I called my "Lithops Scrapbook" that eventually my wife Debra encouraged me to send by way of a letter to Professor Cole. I was convinced he would not be interested in anything I had to offer, but he was and so began a relationship that led to a sincere friendship. The first lesson he taught me was one that I continue to uphold today, that at a botanical level no plant is valid until it has been correctly published according to the rules of the *International Code of Botanical Nomenclature* which became the *International Code of Nomenclature for algae, fungi and plants* in 2011, or at a cultivar level in accordance with *International Code of Nomenclature for Cultivated Plants* (often abbreviated to the *Cultivated Plant Code*). The two *codes* have differing rules, but go hand in hand.

Lithops–Flowering Stones also introduced me to the cultivated varieties we know better as cultivars. Unfortunately I soon discovered that some "cultivars" reported or advertised from other sources were often nothing of the sort, that ambiguity was ripe and that no official register existed. To my mind there was a need to clear up the ambiguity, but no one to do it. I hoped someone would eventually come forward and sort everything out, but when this did not happen I decided to have a go myself. When I learnt that the International Society for Horticultural Science appointed societies or occasionally individuals to compile and maintain registers of specific groups of plants, I applied to become the registrar for the genus *Lithops*. It took a while, but eventually I was both surprised and slightly daunted when

I was appointed International Cultivar Registration Authority (ICRA) for the genus *Lithops*. My first task was to compile the on-line register, and this I put together using guidance from *Lithops–Flowering Stones* and the *Cultivated Plant Code*. Together with a modicum of common sense, I use these two publications to maintain the register to the best of my ability.

My first physical meeting with Professor Desmond Cole and his wife Naureen (Des & Naureen) was at Heathrow Airport, London in 2005, when they visited the UK as part of the book launch of their jointly written second edition of *Lithops-Flowering Stones*. Together with Debra we visited them the following year in Johannesburg, and subsequently I made return visits every year. Des and Naureen took me on several field trips through South Africa and Namibia, introduced me to new friends and amazed me with the places we visited and the plants and animals we saw. They also showed me first-hand the damage habitat poaching can do, and to this day I remain horrified by those who steal from nature. These days there is no need to collect *Lithops* plants or seed from habitat and whilst the advent of GPS has made it all too easy, it can never be excused. In nature *Lithops* look after themselves through the generations, whereas poached specimens are completely dependent on their human custodians. Seed collection for conservation purposes is another matter but needs to be properly co-ordinated and only undertaken by lawfully recognised authorities. Although ex-situ cultivation does much to lessen the pressure on habitat specimens, it can never excuse unlawful collecting.

Once you find them, *Lithops* in nature are a fantastic sight and of course they also make delightful pot plants. Much has been written about *Lithops* cultivation, so I'll only touch on the basics here. My advice is to keep them completely dry after they flower, which usually happens in late summer or autumn. Watering can commence again once the new growth has completely replaced the old, which will be around six months later in late spring. The new leaves grow at the expense of the old with zero human input. Indeed water at this time will result in a deformed plant, at least for one season. After the initial watering let the pots completely dry out and only do so again once the plants show their thirst by way of wrinkling. As severely withered *Lithops* somehow survive for extended periods in nature, there is no need to be alarmed by a wrinkle or two in cultivation. Ample daylight is important, although surprisingly to some *Lithops* can readily scorch if suddenly moved into direct sunlight. Common sense, a degree of shading and good ventilation is therefore important, and I would advise anyone new to *Lithops* to begin with the natural types before moving onto the cultivars. By their very nature the cultivars are "inbred" and somewhat more delicate.

Collected from habitat with the relevant permits, the Coles grew many *Lithops* in their famous "Lithoparium" and distributed the seed around the world using their famous C-number system. Although their focus was on the "natural" forms, they also highlighted a number of cultivars in *Lithops- Flowering Stones* and designated them according to type. These were direct mutations from the wild, rather than the "pattern bred" cultivars that have proliferated in recent years through selective breeding. In their jointly written second edition of *Lithops-Flowering Stones* the Coles caused a little controversy with their use of the term "a.c.f." which stands for "aberrant colour form", and although this term is not recognised by the *Cultivated Plant Code*, it remains a useful way to differentiate between different cultivar types. Indeed it was the "Cole" cultivars I began with when I started to compile the *Lithops* Cultivar Register.

Although many readers will be well versed in the rules of the *Cultivated Plant Code*, we should remember it governs all plant groups and not just *Lithops*. Just to be clear, a cultivar should be part of a reproducible group with one or more distinctive feature and be published (or established) in a dated scientific publication in hard format. The cultivar title or "epithet" must follow the *Latin* botanic name, be written in 'Roman Font' and be within

‘Single Speech Marks’ with each part beginning with a capital letter. The epithet can be in any language except Latin, although plants historically from botanic ranks that become widely known and accepted as cultivars can maintain their Latin name. One such example of this is *Lithops optica* ‘Rubra’, possibly the most famous *Lithops* cultivar of all. Publication must include a description, although this can be very short, and whilst a photograph is preferable, currently it is not obligatory. The cultivar epithet can follow any of the botanic ranks, so if the plant concerned is a cross between two taxa from the same genus, the cultivar epithet can directly follow the genus name, i.e. *Lithops* ‘Sunstone’. Where identical cultivars arise from completely different sources they share the same epithet, with the first correctly published taking priority. The latest edition of the *Cultivated Plant Code* is the ninth revision, and it is worth remembering that amendments may be made in future revisions.

In some respects I initially found *Lithops-Flowering Stones* to be at odds with the *Cultivated Plant Code*, as some of the cultivars had been cited by Professor Cole on the basis of single specimens. In fact he had first cited these in a 1985 article published in the journal *Aloe* and merely upheld them in the first edition of *Lithops-Flowering Stones*. I need not have worried however, because subsequent cultivation eventually resolved the issue. Largely thanks to seed produced by the Coles, more “mutations” survived in greenhouses around the world and were back crossed with the originals. In this way their particular traits were stabilised with true cultivars the result. When Steven Hammer wrote of them in his 1999 book *Lithops–Treasures of the Veld*, they truly were reproducible groups. The exception was and is *L. pseudotruncatella* subsp. *pseudotruncatella* var. *pseudotruncatella* *‘Albiflora’. Although a white flowering *L. pseudotruncatella* called ‘White Queen’ is known from *L. pseudotruncatella* subsp. *pseudotruncatella* var. *elisabethiae*, the original white flowering var. *pseudotruncatella* is no longer with us, and neither has a second specimen ever been reported. Therefore we have an anomaly with var. *pseudotruncatella* *‘Albiflora’ being recognised in both editions of *Lithops-Flowering Stones* (the Cole monographs), but not in the *Cultivated Plant Code*. This should not be confused with *Lithops lesliei* subsp. *lesliei* var. *lesliei* 'Albiflora' which is an altogether different plant that is recognised by the *Cultivated Plant Code*.

That aside, the Cole designations combined with what I term “pattern bred” cultivars, give us the *Lithops* cultivar register that exists at the point this article went to press. Whilst some cultivars have more than one distinctive feature, we can divide *Lithops* cultivars into five basic groups as below.

“G-“ form (or type) aberrations (written as “YG” in the first edition of *Lithops-Flowering Stones*).

These lack normal pigmentation and thus allow the green of the chlorophyll to show through. They are surprisingly common, are the equivalent of albinism in animals and present with similar sun sensitivity issues. It is therefore wise to give plenty of ventilation and perhaps some extra shading to this group during the brighter months, as even in a Northern European summer they can readily scorch under glass. Sometimes the albino condition may not be total, and therefore the intensity of visible green varies from cultivar to cultivar. Some cultivars such as *Lithops hookeri* var. *dabneri* ‘Annarosa’ appear to be saturated with green, while others such as *L. pseudotruncatella* subsp. *archerae* ‘Split Pea’ show only subtle verdant hints. Exactly where one draws the line between a normal form and a cultivar can be contentious, so it pays to have a laid down description of the natural plant for comparison. Unsurprisingly and as mentioned above, I choose to follow the descriptions in *Lithops-Flowering Stones* for this purpose. Although some “G-” form aberrations such as *L. terricolor* ‘Speckled Gold’ are more yellow than green, they still fall within this group. Unusually there is yet another “G-” form aberration of *L. terricolor* called ‘Green Sandpoort’

which is pea-green, finely speckled and distinct from ‘Speckled Gold’. There are many other examples of “G-” form aberrations, a few of which are depicted in the accompanying photographs.

“R-“ form (or type) aberrations (written as “R” in the first edition of *Lithops-Flowering Stones*).

These have an unusually red leaf colour which as long ago as 1947 was attributed to "an extremely rich production of anthozyan pigment" by Hoeval. As with the “G-” forms, the intensity and shade of colour varies from cultivar to cultivar. *L. meyeri* ‘Hammeruby’ is a milky-red, *L. optica* ‘Rubra’ is a bright red and *L. terricolor* ‘Violetta’ is almost violet. Worthy of special mention is the beautiful *L. otzeniana* ‘Cesky Granat’, but there are many other “R” forms as well, some of which are again depicted here.

“W-“ form (or type) aberrations (written as “A” in the first edition of *Lithops-Flowering Stones*).

These have white flowers in plants that normally flower yellow, so can only be identified when in bloom. Once considered very rare, this type of mutation has been seen more often in recent years due to the large number of *Lithops* raised in cultivation. Examples are *L. terricolor* ‘Silver Spurs’, *L. aucampiae* subsp. *aucampiae* var. *aucampiae* ‘Storm’s Snowcap’ and *L. gracilidelineata* subsp. *gracilidelineata* var. *waldroniae* ‘Fritz’s White Lady’. These days we also have the very unusual *L. hookeri* var. *susannae* ‘White Susan’ whose flowers are white with a yellow centre. Further “W” type examples are depicted.

“Y-“ form (or type) aberrations (not recorded in the first edition of *Lithops-Flowering Stones*).

These have yellow flowers in plants that normally flower white, and remain very rare. Professor Cole did not recognise this type of mutation until he was presented with a yellow flowering “R” type *L. optica* ‘Rubra’ by Mr. Yasuhiko Shimada. This became known as *L. optica* ‘Rubragold’, and was only accepted as not being hybrid by Professor Cole because of the long standing relationship and deep respect that existed between the two growers. I once enquired from a botanist if yellow aberrations were theoretically possible in normally white flowering *Lithops*, and the reply was a simple “yes”. It does seem likely however that yellow flowers on plants that look like white flowering species are mostly hybrid. Yellow flowers are generally accepted to be dominant over white.

“Pattern Bred” (a non-Cole term) *Lithops* are those selectively bred for one or more distinctive feature.

This may be leaf colour, pattern, flower colour, specific quirk or a combination of features. Selective breeding of this type was not something the Coles pursued because they deemed it un-natural. The results of such practice however can be beautiful. The brilliant purple *L. karasmontana* subsp. *eberlanzii* ‘Purper’ that came from Frik du Plooy in South Africa is one such example, although it could be argued it really belongs in the “R” group. Others include *L. amicorum* 'Freckled Friend’, *L. dorotheae* ‘Zorro’, *L. gracilidelineata* subsp./var. *gracilidelineata* ‘Café au Lait’, *L. salicola* 'Daikangyoku', *L. verruculosa* var. *L. verruculosa* 'Fireworks -ZW-‘ and *L. terricolor* 'Steamy Windows’, the last mentioned being a selection from ‘Silver Spurs’ and equally belonging to the “W” group.

Where cultivars have more than one distinguishing feature they can be designated G- + Y- (or any other relevant combination) should it be wished. It should be stressed this way of grouping *Lithops* cultivars is merely a convenience tool and is not something recognised by the *Cultivated Plant Code*.

Oddities, occasional mutations and extensively hybridized *Lithops* are easily produced and are not unusual. Much can be obtained from cross-breeding, and some growers have been known to advertise bazaar specimens for sale under assumed names. In so much as some interesting forms can be produced through random cross-pollination, the practice is fine and can even be informative. Then there are a few quite expert growers who just want to do their own thing, or even view the *Cultivated Plant Code* as a load of nonsense. Everyone is entitled to their own opinion, but in such instances the strains produced are not officially recognised cultivars. Just as I was told all those years ago by Professor Cole, it is not until the plant in question is formally published according to the *Cultivated Plant Code* that cultivar status can be established.

Difficulties mainly due to differing opinions dog all cultivar registers, and it is the job of the specific ICRA to clarify and harmonise these as much as is possible. Whilst decisions taken may be unpopular in some quarters, they are always taken in an unbiased and as fair a way as possible. A few examples of issues relating to *Lithops* cultivars are mentioned here.

Even if the person publishing a cultivar is not the originator, the originators wishes remain paramount. One such case I had dealings with concerned the lovely green form of *L. aucampiae* subsp. *euniceae* var. *fluminalis*. For several years it went under the epithet of *'Green River', but then I was told by my old friend the now late Tok Schoeman of Namibia, that the originator, the also late Louw Pretorius, was Afrikaans spoken and really wanted these plants to be called 'Gariep Juweel'. In English this translates to "Jewel of the Gariep", the Gariep being a name used by indigenous people for the Orange River. Mr. Pretorius was very knowledgeable and grew his plants to a high standard, yet knew little of the *Cultivated Plant Code.* On discovering this new information a correction was made through two articles published in *Mesemb. Study Group Bulletin* in 2017, and the wishes of Mr. Pretorius belatedly upheld.

Another example is *L. marmorata* var. *marmorata* 'Polepsky Smaragd' which was known for a while in some circles as *'Chartreuse', an epithet officially dropped when it became known the originator, Mr. Petr Pavelka of the Czech republic, had expressed a wish to use 'Polepsky Smaragd'.

A similar situation exists with the violet-purple coloured *L. salicola* 'Sato's Violet' still known by some as *'Bacchus'. The latter Steven Hammer inspired epithet of *'Bacchus' is preferred by many, but not the originator Mr. Tony Sato. Perhaps we should not get too excited about which name is correct, but we do need to know which plant is which.

Contact with other *Lithops* growers is both pleasing and informative, and discussion about the amazing Japanese cultivar *L. olivacea* var. *olivacea* 'Angel's of Tony' taught me a valuable lesson many years ago. Apparently a whole batch of specimens unexpectedly flowered with the same ruffled up petals in the same greenhouse at the same time. Several suggestions were put forward as to the cause, one being genetic mutation due to a virus that may not transfer to the pollen. It seemed to me that if this was so and the flower form could not be replicated through selective pollination, the plants concerned were simply victims of poisoning and not cultivars. I was corrected by the then editor of *Cactus World*, the journal of the British Cactus and Succulent Society, who informed me that where cuttings are possible, vegetative reproduction is perfectly acceptable under the *Cultivated Plant Code*.

It is unfortunate and frustrating, but 'Angel's of Tony' included, some *Lithops* cultivars remain rare and extremely difficult to obtain. What is more I suspect *L. hookeri* var. *hookeri* 'Envy' may even be extinct, although of course the same "G" mutation could turn up again somewhere. With *Lithops* becoming so popular there is every chance rarities will diminish and 'Envy' be resurrected.

The various *codes* that deal with taxonomy may not be perfect, but they are currently the best way we have to consistently and correctly identify the massively diverse natural

world. Albeit the *Cultivated Plant Code* deals with the lowest recognised rank of the plant kingdom, it plays an important role.

A full up to date listing of *Lithops* cultivars is maintained and available on my website which is www.scrapbooklithops.com . Of course you can never please all of the people all of the time, but hand on heart I do my best!

* = An epithet unrecognised by the *Cultivated Plant Code*.

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The author attempting to photograph *Lithops* in the veld. Photograph © Debra Green.