

Essex **Succulent**Review

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Editorial

Welcome to the second on-line Essex Succulent Review.

Following the first issue I received a number of requests to make the typeface a little larger. I have done this therefore and hope that it will be of help. This has possibly contributed to the fact that this issue is two pages longer than the previous one. I have also featured plenty of colour pictures, which of course is the great advantage of an on-line publication.

I discovered, after I had placed it on-line, that some of the links in the first issue did not work properly. Hopefully I have now rectified this, but my apologies to anyone who tried to email me and found themselves looking at the blueyonder website.

Just a reminder that an on-line 'subscription' is completely free. Just send me an email to the address below and I will add you to the notification list. You can of course stop this at any time simply by telling me.

Essex **Succulent**Review

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Editor Sheila Cude

Address 25 Macleod Road
London N21 1SW

Phone 020 8340 1928

Email
sheilacude@blueyonder.co.uk

BCSS Chelmsford Branch at RHS Hyde Hall 26 and 27 July 2014

by Dr Richard Rolfe



Part of Chelmsford Branch's Display at RHS Hyde Hall

Hopefully most members of the BCSS will have read of the attempts by Chelmsford Branch to stage a display at the Royal Horticultural Society (RHS), Hyde Hall Gardens in Essex.

In 2013 we had been part of a 'family day' but this year we were 'The Event' which took place over the weekend of 26 and 27 July 2014.

As the picture shows we staged an educational display which included many pictures of the displayed plants in flower. This proved of great interest to the public as many were surprised at how highly-coloured the flowers could be. We also had a sales area which formed a second supporting display.

Most of the Branch's active members helped over the weekend, including our newest junior member aged 13. We met around 650 people, about half those visiting the gardens that weekend, and received many compliments on the display. These were especially welcome from the gardeners and staff working at Hyde hall and we thank them for their support.

Now we are considering 2015, and have put forward a suggestion to Zone 15 that the 2015 Zone Show could be held in the barn at Hyde Hall.

Dates and venues for 2015 events will be announced as soon as possible - Ed.



Fig 1: *Pelecyphora aselliformis*

Cristates by Chris Coombs

This is the second part of a series on the weirdos of the succulent world. Do not stop reading! The question that I am sure you're asking yourself is this... are they as hellishly ugly as the last lot? And the answer, unequivocally, is no.

Well, OK some of them can be a little, shall we say, outlandish but the vast majority are in fact quite

beautiful. They often form into unique mounds of stunning architecturally enchanting shapes and swirls and are therefore also commonly known as crests, fans and slightly less flatteringly, brains.

Cristation is a mutation of the apical meristem (the main growth point of the plant). Instead of a single central growing point, the area of active cells form a line. The plant loses its symmetry and changes from a radial to a bilateral mode of growth.

These crests are categorised into three main types depending on how this growth has arranged itself.

A multiplex crest is produced when several growth points are linked together forming a fan like effect as in Fig 1, the *Pelecyphora aselliformis* pictured above.



Fig 2: *Astrophytum onzuka*



Fig 3: *Notocactus (Parodia) scopia*

Cristates continued

A phalangeal crest is one that is formed from a single continuous line of growth (Fig 4).



Fig 4: *Echeveria* sp



Fig 5: *Rebutia heliosa*

A ring cristate starts life as an almost unnoticeable small line staying flat on the surface of the head of the plant. This line slowly makes its way around the head until it meets itself, forming a circle. Only then does it expand, inflating itself like a

tyre, and creating an alien like growth around a usually unaffected centre (Fig 5).

The overall shape of the plant can be drastically diverse depending on which cells within the plant have been affected and can cause plants within the same species to look very different (Figs 6 & 7).

All plants have to reach a certain level of maturity before they can flower. However in the case of a cristate the much extended growth point or points are producing significantly greater numbers of rapidly dividing juvenile cells. This often leads to the plant maturing at a much slower rate, or in many cases, not at all.

Therefore the physiological age of a crest may not depend on its real age, but be determined by the stage at which it developed.

Consequently a plant that grows

cristate from seed may never reach the level of maturity needed for flowering.

But I've seen cristate plants flowering I hear you cry. And of course that is true. But what has usually happened here is this. A normal plant that has grown and matured enough to reach flowering age has suddenly grown a cristate head. This head will now have acquired the ability to flower from the mother plant. Then a clever nurseryman cuts off the cristate head, roots it down and sells it on as a flowering cristate (Fig 8).

Because of the mode of growth that these plants have, many of them try to bury themselves into the ground. To avoid this, and stop the subsequent rotting, many are grafted on to a stock plant. This lifts them off the surface and can help to enhance growth. The downside is that the stock is usually a more vigorous plant and, with its faster growth hormones pumping into an already juvenile orientated plant, very often any ability to flower is lost.

For those of you who are botanically minded there is another point of interest. Nearly all of the plants that display a tendency towards cristation, in whole or in part, are dicots, (plants with two seed leaves). There is very rarely any cristation seen in the monocots, (more simple plants such as the grasses and, in our hobby, the agaves, haworthias etc with one seed leaf). The reason for this is unclear but a couple of theories come to mind.

In dicots the vascular bundles, (the system that carries the food and water through the plant), are arranged in a ring. So when the plant changes its growth mode from radial to bilateral, it can unfurl this ring into a line to follow the growth pattern. Not an easy task I imagine, but obviously possible. But with the monocots it is far harder. Their bundles are smaller, more numerous and are scattered randomly throughout the stem. This would make changes to its mode of growth far more challenging.



Figs 6 & 7: Two cristate forms of *Uebelmannia flavisipina*

Another difference is that the dicots contain cambium which allows secondary thickening of the cells. This gives support to the plant as it gets bigger and stops it collapsing. The



Fig 8: *Strombocactus disciformis*

monocots do not have this and so any growth abnormality will be liable to fall in on itself.

But despite all of this, somehow a few monocots manage to overcome these difficulties and a few survive (Fig 10).

It is not just the stems and leaves that can be affected by this anomaly. Flower stalks and even the flowers themselves are quite happy to go into mutation mode!

It is more likely that a cristate flower will form on a cristate head but not necessarily. I have a normal single headed *Gymnocalycium* that often puts up two normal flowers followed by a cristate one (Fig 9).

So now we come to the big question. Just what exactly is it that causes all of this. It has been a subject for argument for many years, at least back to the early 1800s, when the first documented theories were tentatively, or sometimes forcefully, put forward.

One of the earliest ideas, after tall-growing cereoid type cacti with huge cristate heads were

seen, was that they had been struck by lightning which had spread the growing point. Then it was explained that in many places where cristates are present there is no lightning... so it was blamed on the hail stones!

Another suspect was woodpeckers, knocking holes into the plant stem of columnar cacti and disrupting the vascular system; or grazing animals, in the case of low-growing specimens.

Plants grazing themselves on rocks as they grew or even earthquakes confusing the root system were also attributed as possible causes of this

malformation, as well as fungal diseases, pests laying eggs in the body of the plant and auxin (growth hormone) poisoning. The list goes on and on including soil toxins, nutritional deficiencies and sudden diverse temperature changes.

In 1948 a chap named J.J. Verbeek Wolthuys tried many experiments to attempt to force plants to turn cristate. His efforts included crushing, cutting, acupuncture and under- and over-watering and feeding.



Fig 9: *Gymnocalycium* sp with cristate flower

Cristates continued

Then poison injections, hormone and irradiation treatment, and the application of chemical mutagens to try and upset the plants' chromosomes. All of these efforts failed.

In 1972 A. P. Sokolov also tried to induce cristation and was convinced that the cause was the occasional vast difference between day time and night time temperatures.

He kept 200 four-month old *Rebutia senilis* seedlings in the sun at over 40°C for 30 minutes and then refrigerated them, at 10° to 15°C for a further three to four minutes. He continued this for five cycles and then recorded the results. Only 19 plants survived, nine of them formed abundant offsets and two formed crest-like structures. However despite repeating this experiment several times, no more crests were formed.

So what is the reason for this growth anomaly?

Well, the simple answer is... we don't know! Sorry about that.

What must be understood is that within the meristem is a **very** complicated genetic formula that determines everything from the size and shape of the plant to the number of ribs, position of the spines and innumerable other features. Countless chemical agents are acting and reacting with each other and it would only take one infinitesimal slip, and the resulting reactions to this, for a plant to be created that looks totally alien to us.

So if you have decided to rebel and grow something a bit more distinctive, something unorthodox to excite the eccentric within you, what should you do?

Well the cultivation of these beauties can be a little more challenging than the standard type of plant.



Fig 10: *Agave filifera* an example of a monocot cristate

For instance, because a much greater amount of the body of the plant is in contact with the soil, I always use a double layer of chippings underneath them to ensure rapid drainage away from the surface.

Also slugs and snails find them easier to get at due to the formation of the spines being generally stretched out thus giving

them less protection. Pests love to hide in all of the extra crevices these plant provide and therefore the regular use of a systemic insecticide is recommended since by the time any problems are spotted it is usually too late.

The final consideration is no doubt the most challenging to overcome. Because of the enhanced juvenile mode of growth, these plants tend to grow more rapidly than the type plant. They often need a little more water and food, but of course this needs to be carefully monitored as over-doing it could lead to a pile of mush!

But unfortunately any check in growth due to a lack of either of these during the growing season, or even if the plant becomes pot bound, often leads to it ceasing to grow permanently, or putting out many heads of normal growth which spoils the look of the plant and eventually take over.

But don't let that put you off! Many growers treat all of their cristates as they would normal plants and are very successful with them.

So go on. Take a journey into the world of the unorthodox. A world of

unparalleled beauty with breathtaking meandering mounds of unique artistry. Plants that will fascinate even the cynics outside of our hobby. Indulge yourself in the extraordinary world of cristates. ■



Some plants take cristation to the extreme. This can lead to plants that look totally alien with even the experts unable to identify them.

Fig 11: *Rebutia krainziana nuda*

Haworthias – haute and hybrids by David Offord



Fig 1

Why is it that most (as it seems to me) growers and showers of haworthias and indeed other succulent plants treat hybrids as inferior to species and varieties of species?

It could be argued that nature constantly experiments with crossings and recrossings of plants and cares not whether this is within or without our human-imposed concepts of what constitutes a plant species. In fact she makes far more 'hybrids' than the whole of the world's nursery industry put together.

In the case of haworthias the crossings depend on:

- a. the geographical consanguinity of the available samples of the same 'species'(form), or of plants of a sufficiently related other species or sub-species;
- b. on the regularity or coincidence of flowering;
- c. on the availability of sufficiently well-winded, capable and hungry pollinators.

In general plant terms it can be said that often the inter-species hybrid is more successful than one, or more than one of its parents, (witness the prolific hybrid swarms of many opuntias etc) and who

is to say whether this is one of nature's chosen methods to replace a species with something better endowed with advantages to fill its ecological niche.

Why is it that when mere man turns his braincells and nimble fingers (paint brush/cats whiskers et al) to the task of producing pleasing morphs the probosces of many *Haworthia* fanciers take on the recognisable pose associated with a bad smell? After all we could achieve in a few years what nature might have effected in a millennium if the dice rolled well for her.

Of course we rarely, if ever, establish a new form that is sufficiently stable and conformative to be judged a species if it were found in a natural habitat. Look you though to the wild and see just how widely non-conforming the morphs of nature appear. There the accidents of fate, weather and drunken insects combine at times to cross unlikely partners and produce specimens of plants that have the air of the mad professor about them. Who is to say they may not, on rare occasions, have something to contribute to the formation of a more survivable form and thus be a valuable addition to the armory of succession. In this eventuality if the 'hybrid' happens to be, by human standards, a more beautiful form than any of its parents, would we judge it less worthy because it is insufficiently stable in its genetic makeup to



Fig 2



Fig 3



Fig 4

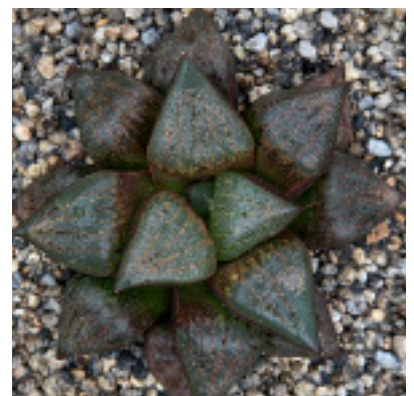


Fig 5

Haworthias – haute and hybrids continued

qualify as a species according to our own ill-defined and artificial designations? No!

Why then look down on the attempts of man to beautify the already beautiful?

Hybrids are easy!

Well some that become possessed of greater numbers of chromosomes, and go from diploid to quadraploid in this way, are stronger growers and therefore may survive treatment that their weaker parents would regard as a invitation to extinction. Others however retain the slow habits of a parent even where the other is not a shy grower; as witness some of the *limifolia* crosses. Some (usually the less desirable) fill their



Fig 10

allotted pots and then demand *wohnraum* and if denied invade Potland! eg the fairly horrible common *truncata/maughanii* pedigree. Now in rebuttal, instance some fine selected clones, which occur both in nature and out of the hand of man, which at some stage involved those same parents but which result in smallish plants with nice markings on the windowed surface. These I have found can be slow and frustrating as, just when they appear happy, they lose their roots and take a long long time to reroot and then replace the leaves lost during their sulky period. Not so easy then.

Hybrids are not natural species and we learn nothing of botanical interest from them.

This is a little more difficult both to argue and to rebut. However as argued above

nature is a hybridiser and surely that is how some of the plants we now admire as species first originated.

Clearly hybrids that are produced by and for the pleasure of man may have no place in the 'natural' order of things. But ponder, if you will, is that not a kind of hubris? Are we not just one more cog in the wheel of evolution and as such are we not one of nature's instruments? Is not nature, through us, conducting another of her experiments in the viability of lifeforms? We have unarguably operated as an engine of extinction and now perhaps our species is imposing such a crushing burden on the rest of her children that either she must write us off as a failure or allow this inquisitive ape to invent its own companions out of the material she has provided.

In creating plants for our own use are we not speeding immeasurably the work of evolution? Our work on grasses has allowed our species to survive and support its overwhelming numbers using nature's pre-existing, climate-driven favours towards that family of plants. In those parts of the planet that have not been favoured with conditions which promote grasses above others, and are of uncertain humidity, being neither sand desert nor in temperate latitudes, succulence is one of several survival strategies in play. We are part of that as much as we are part of the larger picture of adaptation. One way of participation, be it all unknowing, is to play with the genetics of the plants we admire so that we produce forms which please the eye.



Fig 6

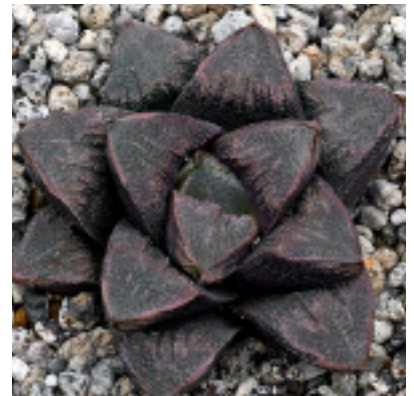


Fig 7



Fig 8



Fig 9

Haworthias – haute and hybrids continued

It is well said that form follows function and that which looks right and fit for purpose more often is than is not. So, if man makes a plant which fulfills the function of aesthetic appreciation better than the efforts of insects, it is likely to be a plant which, if it can be sexually reproduced, will be capable of filling an ecologic niche as well as, if not better than, its constituent parts. Of course it is true that few hybrids fall into this category because we admire weak plants such as variegates and monstrose forms and because hybrids will not breed true. However what the new gene pool comprised in the hybrid can bring to a population of plants can be seen by random crossings within a collection. Occasionally you get a nice plant that is less 'unstable' when back crossed with the original hybrid. A speeded-up version of natural selection (but here selection for an admittedly unnatural habitat) is in operation and why should the result of this process be any less worthy of our appreciation than any other?

So then what of the hybrids that are reproduced by means of cultural or scientific methods? Here we are considering only what the plant offers to the eye of the only beings we know of endowed with the gift of artistic appreciation. Just because these could

not survive, as they are, in a state of nature must they be forever second class beauties when compared with what can be dug up and exported from their homeland?

Our natural desire is to see plants that delight the eye and this I hope makes sure that the deformities which are sometimes presented as novelties at nurseries and at shows will continue to be rejected as prize winners. That after all is just a matter of good taste!

I hope to live long enough to see the day when well grown horticultural hybrids will be accepted as in the same league as natural plants and judged with knowledge and appreciation by those who know the whys, wheres and whyfores of how they are grown to the near perfection that a few members of our Society can achieve. ■

A short beauty parade is attached. For pleasure – which are 'species', which are human 'selected forms' and which a detestable 'hybrid'?

No prizes but the answers will appear in the December issue of the Essex Succulent Review.

Photos: David Offord



Fig 11



Fig 12

Kent – land of the Opuntia

This, not very seasonal, picture appeared in the on-line Daily Telegraph, courtesy of Tony Roberts, on 14 August, illustrating an article written by Ken Thompson.

It is growing in Tony's garden in Kent and has done for seven years, withstanding cold, rain and, as you can see, even snow. It has flowered and, from time to time, produced seedlings.

Also in Kent it appears there are two naturalised specimens of *O phaeacantha* growing just off the A20 (near the M20). They are on a steep, south-facing bank, which clearly provides the necessary drainage and whatever sun is available.



Opuntia phaeacantha in Tony Roberts' garden in Kent

My Buddy

Stapelia hirsuta by Sheila Cude

I spotted this in a garden centre, complete with well-developed bud.

The cashier looked at it in amazement 'Oooh – I've never seen one of these before – what is it?'. Eager to enlighten her I explained that the enormous bud would open into a five-pointed flower, which was typical of all members of that particular plant family and which smelt of rotten meat, to attract flies to pollinate them. They also lay their eggs on the flowers and you sometimes see the maggots hatch – at this point the cashier appeared to turn somewhat greenish, and hastily rang up my purchase.



The original bud November 2011

The plant was labelled *Stapelia flavirostris*, a label I have seen applied to one or two Stapeliads in a number of garden centres, some of which appear to have smaller and thinner stems than my plant. When the flower opened I put a picture on the BCSS forum and asked for ID. The general consensus was that it is *Stapelia hirsuta* (*hirsuta* meaning hairy of course). Having looked at various pictures of this species I would agree with this. *S. hirsuta* is closely related to *S. grandiflora* and I have seen references to *S. grandiflora* v. *flavirostris*.

In habitat *S. hirsuta* is widely distributed, in areas of South Africa, Namaqualand and southern Namibia, largely in winter rainfall areas. As might be expected therefore it is a very variable species; some forms

for example appear to have copious white hair in the centre of their flowers, while others may have flowers that are less hairy than my plant.

I nicknamed my plant Buddy for obvious reasons. That was back in November 2011 and, since then, it has flowered throughout the summers of 2012, 2013 and 2014. At the time of writing (late August 2014) it has one flower open, another about to open and at least two more buds still developing.

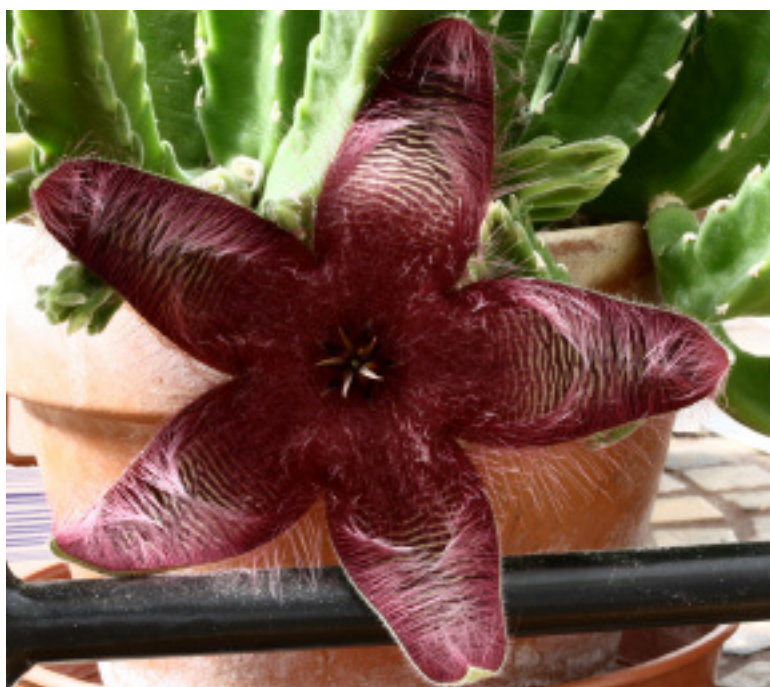
The flowers are indeed hairy, and quite pleasant to stroke. They have a faint odour, but it is not really noticeable unless you bend over the plant and sniff. It does seem to cause a bit of a buzz in the fly-world though. There are usually some giving it their attention when the flowers are fully open.



An alien about to pounce. Actually a bud opening in June 2014.

I give plenty of water during the summer, and plenty of food (Chempak) with it. It gets sun during the morning, but is in shade from lunchtime onwards. It needs some warmth in winter but, as I am growing in a conservatory rather than a greenhouse, it is easy enough to bring the plant into the kitchen at night.

For some reason, the conditions in my conservatory seem to suit it. I am not certain why this should be, but long may it continue. ■



In flower June 2014

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Madagascar in September

by Roger Day

A trip to Madagascar had been on the list for some time. My wife, Val, and I have made eight trips to African countries over the years and, after visits to the rift valley countries of Kenya, Tanzania and Malawi, we decided it was time to visit this big island off the east coast.

Before going I found two accounts of field trips worth a mention. One in 'Alsterworthia International' special issue No 8, published 2004, describes two expeditions to central and south Madagascar. The other is a publication by 'Cactus & Co' called 'Madagascar, a paradise at risk' by Mark Teissier, Thierry Botta and Christophe Blanchy .

Getting to Madagascar and finding accommodation is a challenge. The easiest way is to join a scheduled tour and we used 'Voyages Jules Verne' who can run their tours as private journeys. We went out in September which is the best month to visit the south of the country which is usually dry. We flew Kenya airlines from London Heathrow via Nairobi to Madagascar's capital, Antananarivo.

It is useful to know that an entry visa for UK citizens is obtained on arrival. You cannot obtain Madagascan currency outside the country, there are few ATMs and only the hotels accept card payment. We took euros, which we exchanged at the airport change bureau for local cash. Make sure you get some low denomination notes or you will have problems getting change.

The population mainly descends from people from Arabia, Africa and Polynesia. The local language Malagasy is difficult, but French is the European language which is understood. The locals also shorten the names of places so Antananarivo becomes Tana.



Madagascar continued

Anyone who has travelled in Africa will be used to the general organised chaos that seems to be the norm. Here it was a bit more intense! We had a police barrier outside the hotel to stop non-residents getting in and residents getting out.

Our planned journey followed the main road, RN7, south from Antananarivo (Tana) to Ifaty. In a minibus this would take 12 days. We crossed to the western side of the country by way of the Horombe Plateau, a flat area with no trees and herds of zebu cattle. I was aiming for the reserves of Isalo, the Arboretum d'Antsokay and Reniala and to see the spiny forest plants such as *Commiphora* and *Alluaudia*.

When you get out of town and into the countryside you realise there is something odd about this place, there have been massive clearances of the forest which has been replaced with paddy fields of rice. I am sure you have heard about the destruction of the forest which is very evident and continuing.

Heading towards the dry area which starts south of Fianarantosa, the second largest city, we found a large, *Euphorbia milii* var 'Baroni'.



Above: *Euphorbia milii* var 'Baroni'

Below: *Pachypodium rosulatum* v. *gracilliss*



I will not mention the lemurs just let you know they are there, very furry and noisy.

The geology and climate divide the island into various climate zones; the geology is formed by the re-emergence of ancient rocks that form a mountainous divide along the centre of the island where the landscape is dominated by mountains that are geologically known as Inselbergs.

Isalo National Park

At Isalo you pay to go in and have one of their guides to accompany you; our guide was hoping to start his degree course in botany. The main access is a short climb through a small valley, the entrance of which is protected by a cleared area which acts as a firewall. This leads to a series of dry sandstone valleys. One reason the area is not disturbed is that it is a sacred site. Burials, part of their secondary burial rite, take place in cliff niches and you may see blocked caves or empty coffins.



Aloe imalotensis (*contigua*)



Ceropegia dimorpha

Madagascar continued



Adansonia 'za'

Reaching the top of the valley we found a group of *Aloe imalotensis (contigua)* growing there and still looking scorched as the result of fire breaking through two years previously.

All around are *Pachypodium rosulatum v. gracillis* with a silver epidermis. Most of them were in flower with some leaves. They appeared to be growing out of the rock where grasses also grew and the population looked healthy with a range of plant size.

Another plant I was looking for was *Ceropegia dimorpha*; our guide knew where to find it, in its dormant state, covered in dust, but unexpectedly under a small tree near a designated camp

Leaving Isalo we headed west, going through the sapphire mining towns, an area where it is not recommended to stop unless it is vital.

Here we saw our first baobab, which we decided was *Adansonia 'za'*, with a stand of *Opuntia* which is found growing near towns and used for cattle feed.

Antsokay Botanical Garden

Next stop was Antsokay Botanical Garden which was previously a private garden and is now a reserve. There are paths and the plants are labelled. Here were the first stands of *Alluaudia procera* and *Didierea trollii*. The reserve also contained

Pachypodium lamerei, *Uncarina grandidieri*, *Aloe suzanne* and many others. There is a visitor centre and restaurant and it is well worth a visit.

A few miles further down the the RN7 you cross the brow of a hill to a fantastic view across the spiny forest to the strait of Mozambique. Next stop is the main town in the area, Toliara, which is at the end of the RN7. This is an organised busy town with the main mode of transport being the rickshaw.

However we did not stop here as we had to get to Ifaty, about 15 miles away, where we were



Pachypodium sp



Alluaudia ascendens

Madagascar continued



Alluaudia ascendens flower

staying for a few days to visit Reniala, which is located less than 1km from the Mozambique Channel near the village of Ifaty-Mangily, about 25 km north of Toliara. The only problem was that there was no road, it was washed away when they cut down the

mangroves. From here it was by four-wheel drive vehicles only.

After a puncture and a lot of sliding about we reached Ifaty, a small village with an excellent hotel called the 'Les dunes D'Ifaty'.

It is not recommended to go from the hotel to Reniala reserve on foot, you need to find transport. There is the option of an ox-cart, but a local mini-bus driver found we needed a trip so appeared out of nowhere. The local TIA (This Is Africa/Mad) messaging system worked again and so we hired a whole mini-bus to the end of the road, then walked the last mile.

Reniala Reserve

Reniala Private Reserve is a small protected area of only 60ha. It is a real miracle and known around the world, although hardly known to the locals. It is run by an environmental association called Reniala (which means baobab in Malagasy) that is trying to develop eco-tourism in the area. It shelters an amazing, unique ecosystem which only occurs in the south-western part of Madagascar: the spiny forest. This is home to more than 2,000 plant species (many of them locally endemic) and some spectacular and very old baobabs, including a giant baobab of 12.5m diameter.

This is a very brief view of the south of Madagascar. It is difficult to get to, but there are still unspoilt areas and a lot to see, but they must be protected and support given to the small reserves. The northern forests are being cleared at an alarming rate, this should not be allowed to happen in the south. ■



The large trees were Adansonia rubrostipa and Delonix decaryi. They appear similar when dry, the main clue to the Delonix is the diameter of the trunk at ground level in relation to the middle. The lower bush is mixture of Euphorbia, Adenia and younger plants.



Adansonia rubrostipa, this is estimated to be the oldest in this reserve.

Photos: Roger Day