

Finding orchids on Réunion

GAB VAN WINKEL and ROGIER VAN VUGT recount their experiences on an orchid expedition. First they discuss the habitats and orchids they found, and examine the special culinary uses of faham. Rogier takes a closer look at *Cryptopus elatus*. Then TON KLAASSEN reveals what he learnt about cultivation.



Cynorkis purpurascens
growing on the roadside

Gab Van Winkel

A PART OF EUROPE IN the tropics? A piece of France in the Indian Ocean, with coral reefs and lush tropical forests? Yes, such a paradise exists: it is called the island of Réunion. Located 700km east of Madagascar, there are daily flights to France, no need for visas or inoculations, the roads are good, the food delicious, tapwater is safe, and the people are extremely friendly. Moreover, it is infested with orchids!

The Mascarenes

Réunion is the westernmost, geologically youngest and most mountainous of a small group of islands called the Mascarenes. 200km east sits Mauritius, famous for its beaches, and another 600km further east is the third, much smaller island, Rodrigues. Although certainly known earlier by Arab and other navigators, the Portuguese admiral Pedro Mascarenhas is said to have discovered the islands in 1512, hence their collective name.

Permanent settlement began in the 17th century and soon turned into a confusing story of takeovers between rival Portuguese, Dutch,

French and British colonists, leading to several name changes of the islands. Réunion was long known as Bourbon, which is reflected in botanical names such as *Disa borbonica* (overleaf).

In the 18th and 19th centuries, thousands of slaves and contract workers from Africa, Madagascar, India and other countries were shipped in to work in the expanding coffee and sugar cane plantations. This explains the present mixed population and the pleasant French-Creole culture and cuisine. While Mauritius and Rodrigues became independent in 1968, Réunion has remained an overseas department of France – an unchallenged status that has brought a lot of advantages and prosperity for its 800,000 inhabitants (Tavera & Tavera 2004).

Evolution and endemism

The archipelago is of ancient volcanic origin. Réunion itself is just 2 million years old, but the oldest Mascarene islands are estimated to date back 35 million years. These first islands have been completely eroded to a few scattered coral reefs and banks below sea level, but it is important to realise that these early islands served as

stepping stones for the plant and animal species blown across from Madagascar. While colonising island after island, these plants and animals evolved into hundreds of endemic species of Mascarene flora and fauna. The most famous of these is, or rather was, the flightless dodo that lived on Mauritius until European settlers caught and ate them all.

Much of the native flora and fauna has become endangered or extinct since the settlers cleared most of the lowland forests for agriculture and grazing, and introduced many exotic plants and animals. Several of these introductions have become pests, out-competing native species.

Geography and climate

Despite all human interference, Réunion still has much of its original natural richness, especially in its central mountain area where Piton des Neiges (Snow Peak, although snow is quite rare) rises up to 3,070m, the highest peak in the Indian Ocean. It is an inactive volcano now and its progressive erosion has produced three beautiful circular valleys, the Cirque de Mafaté, Cirque de Salazie, and Cirque de Cilaos.



Above Réunion lies 700km east of Madagascar
Right The main sites on the island of Réunion



The active volcano,
Piton de la
Fournaise, erupts
once or twice a year

and the Cirque de Cilaos. Once a safe haven for refugee slaves, these remote valleys still play that role for endemic plants, such as *Angraecum cilaosianum*, named after the valley where it grows.

The island's southeast is dominated by an active volcano, the Piton de la Fournaise (2,632m). As the name implies, it is a furnace indeed, with one or two eruptions every year. Sometimes the lava reaches the sea –

a spectacular sight, although it blocks the coastal road for months. Apart from that, it is a friendly volcano and a favourite among volcanologists and the locals. Families set out *en masse* to watch the red-hot lava creeping down while enjoying a *pique-nique*.

At 2,500sq km (70 x 45km), Réunion is comparable in size to the state of Luxembourg. It has a tropical climate with two seasons: warm and

rainy from November to April, with occasional cyclones; cooler and drier from May to October, with night temperatures down to freezing in the high mountains. Due to the eastern trade winds, the east and south of the island receive far more rain – locally up to 10,000mm – than the west coast. This is reflected in the vegetation and, of course, in the number of epiphytic orchids. Several orchid species, however, have adapted to the semi-dry forests in the western part of the island and occur only there.

A real problem for orchid lovers is that most orchids flower in the rainy season. Our group of four orchid enthusiasts visited in February and had to call off several days of orchid hunting, not so much for ourselves, as the rain is a lukewarm shower, but to protect our cameras. On one of these deluge days we fled to a beach on the west coast. There were no orchids – how boring – but neither was there any rain. With luck, December and April are a better compromise between wet weather and flowering orchids.

Orchid studies

The first person to study orchids on Réunion was Aubert du Petit-Thouars, who described 55 species in 1822. Other botanists in the 19th century added new species, but the orchid flora remained poorly understood. Thérésien Cadet was the first Réunionnais to study the rich flora of his country, in particular the orchids (Cadet 1976). Due to his sudden death in 1987, aged 50, work on the orchid flora came to a halt. His wife Janine then published a book with her own beautiful drawings of 66 species (Cadet 1989).

Martin Benke, a German photographer who lives on Réunion, published a book (Benke 2004) with photographs of 64 orchid species in the wild. Photographs of more species can be seen on Michel Szelengowicz's website. Other popular botanical guides



The rare endemic
Disa borbonica
coming into flower



Tom Nilsson



Mieke Lammers

have been written (Pailler, Humeau & Figier 1998), but without a published orchid flora, identifying orchids on Réunion remains a challenge.

At the Conservatoire et Jardin Botanique de Mascarin, in Saint Leu, we met Vincent Boulet, Christian Fontaine and Jean Hivert, young and enthusiastic researchers who gave us a fantastic tour of the orchid facilities and a wealth of information. Their current species list contains 160 native orchids; more are discovered every year and several await scientific description. Two thirds are epiphytes, one third terrestrials. 37 percent of the species occur only on Réunion, 22 percent are limited to the Mascarenes, 28 percent are shared with Madagascar and adjacent islands, while just 13 percent have a wider distribution. Such a large amount of local and regional endemism makes Réunion

Above Vanilla in cultivation at the Bras-Panon Vanilla Cooperative on the east side of the island
Right Gab van Winkel climbed up a small tree determined to photograph this *Beclardia*

a hot spot for orchids and orchid conservation (Conservatoire Botanique de Mascarin 1992).

Orchids and pollinators

A typical problem of orchids migrating to islands is that their pollinators do not always follow. The Mascarenes have a poor insect fauna compared to Madagascar. For example, there are no long-tongued moths, pollinators of long-spurred angraecoids. In a series of elegant experiments it has been shown that long-spurred species of *Jumellea* on Réunion, are self-pollinating, in contrast to long-spurred species on Madagascar where a pollinator exists (Pailler & Micheneau 2005). Also, many of the

jumelleas on Réunion have a short spur and these depend for their reproduction on the short-tongued pollinators present on the island.

Réunion scientists also made the remarkable discovery that *Angraecum striatum* (p140, 141), one of the three unscented and short-spurred species in the endemic section *Hadrangis*, is not pollinated by moths, the typical pollinators of angraecoids, but by a small bird, the (equally endemic) white-eye (*Zosterops borbonicus*) (Pailler, Fournel & Micheneau 2006).

Vanilla

Réunion is strongly associated with vanilla; the old name of the island, Bourbon, in particular is often used



Mieke Lammes

Above Rogier van Vugt sizes up an *Angraecum*

in connection with this aromatic spice. This is not only because Réunion is an important vanilla producer, but also because it was here, in 1841, that the young slave Edmond Albius invented the manual pollination of the vanilla flower. From then on, vanilla could be produced outside Mexico, where the natural pollinator lives. The vanilla growers made their fortune, while Edmond got his freedom... and died as a poor man.

Vanilla is grown by hundreds of small producers on the east and south coast of the island, often in a semi-natural way at the forest edge. During the flowering period, from September to December, the plants are checked every day; an open flower, which lasts just one day, must be pollinated before noon. An experienced worker is able to pollinate more than 1,000 flowers in one morning. Nine months later, the pods are harvested, but to develop the lovely aroma, a complicated process of scalding, fermentation and drying is required. This work is done from June to November, the most interesting period for a visit to the vanilla co-operative in Bras-Panon.

Where to find orchids?

Everywhere! We found orchids from the lowland forests right up to the rim of the volcano, 2,300m above sea level, where we saw four terrestrial species.



Disperis tripetaloides is a forest terrestrial

Being surrounded
by thousands of
wild orchids is
unforgettable

Rogier van Vugt

An abundance of orchids grow in the wet forests on the east of the island, with Forêt de Bébour as the absolute paradise. Over 11 days in the field, we identified 50 different species; many others remained nameless. We saw how wild orchids often live at the edge of existence and do not flower every year – far removed from the pampered orchids we grow at home. Even in the peak flowering season, only a small

percentage are in bloom, making them hard to find and to identify. Luckily, the trees in mountain forests are not tall, so epiphytes are often at eye-level. Being surrounded by thousands and thousands of wild orchids is an experience you will never forget. A word of advice before you go though: try to learn a bit of French, such as *du vin* and *du pain*, or you may have to eat orchids too. ■

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A delicious *Jumellea* from Réunion

ROGIER VAN VUGT and GAB VAN WINKEL make an orchid liqueur

Many orchid lovers think vanilla is the only orchid used in food, but if we look into kitchens around the world we find many more. Turkey has its famous salep, an ice-cream made from orchid tubers. Tons of tubers are harvested each year for this purpose. Australian aborigines love the barbecued pseudobulbs of *Dendrobium speciosum*, and on the internet you can buy herbal tea from China made with *Dendrobium* flowers.

On Réunion another orchid is used in the kitchen, *Jumellea fragrans*, known locally as faham. It is endemic to the Mascarenes and quite common on Réunion at mid-altitudes where it often lives high in the trees. It grows fast, and after a few years becomes a bushy, often semi-pendent plant with many shoots. The name *fragrans* is nothing new for an angraecoid orchid, but the fragrance in this species refers not only to the flowers. The whole plant, especially the dead and decaying old leaves spread a sweet coumarin-like scent. This aroma, similar to new-mown hay, makes faham the best (and for many locals the only) known wild orchid on the island. The dried leaves are used to make a tea and nowadays, more commonly, to flavour rum. For this purpose you can buy faham kits at the local supermarket. They consist of a faham leaf and two vanilla pods tied together, ready to soak in the rum.

You will not find large quantities of faham for sale on Réunion as the species is protected. Uncontrolled harvesting would drive the species towards extinction so the faham for sale today is cultivated. Perhaps



‘First drink a bit of rum from the bottle to make room for the other ingredients’

cultivated is not quite the right word; the plants from which branches are harvested grow naturally on private property. This seems a bit odd as *Jumellea fragrans* is not hard to propagate or to grow so a few nurseries could easily supply the whole island with faham. At present there is no reason for concern because faham is not rare and locally is even abundant, high in the trees where people cannot pick it.

Try this at home

If you own a *Jumellea fragrans* plant, why not try making this delicious, orchidaceous drink? It uses very little faham and results in a lot of fun. The best flavour is obtained from leaves picked green. Carefully cut off a few leaves and let them dry in a dark and airy place in the house. When you can smell their sweet fragrance, they are ready to use.

What you need:

- 1 bottle of white rum
- 1 or 2 large faham leaves
- 2 vanilla pods
- 5 tablespoons of brown cane sugar
- 3 months of patience (this is often the most difficult ingredient).

What you do:

- First drink a bit of rum from the bottle to make room for the other ingredients.
- Pour the sugar in, and add the faham and vanilla pods.
- Close the bottle and mix well.
- Store in a dark place for three months. The aroma of the vanilla and faham will be absorbed by the rum, which will become a warm, golden colour and turn syrupy.
- Then it is time to enjoy orchids in a different way...



Cryptopus elatus on Réunion

ROGIER VAN VUGT describes his excitement at finding this rare orchid

WHEN YOU ARE a plant enthusiast about to visit an exotic destination, you often have a favourite species in mind that grows only in that place. While browsing books, or the internet, you find yourself looking just a little bit

longer at that particular plant, silently hoping that sometime you will see it in the wild. Silently, because you are aware that it is rare, which only increases your desire to find it. So it was for me with *Cryptopus elatus*. One of the most spectacular orchids

of the Mascarene islands, it occurs only on Mauritius and Réunion.

Why so rare?

On both islands the species has become rare, not only because it has been (and still is) collected for its beauty, but also because it is a plant of the lower altitudes, areas that are very suitable for sugar cane culture and building. Today, only small relicts are left of the original lowland forests and the once abundant flora that occurred there. We suspected that the botanic garden would be the only place to see the elusive *Cryptopus elatus*. Indeed, in the Jardin Botanique de Mascarin in Saint Leu we saw a few plants happily growing in the orchid house. Sadly, they were not in flower. There we were helped by knowledgeable local botanists who trusted our intentions, and it did not take long before some detailed maps were unfolded and the best orchid habitats were pointed out. That was the moment to ask about *Cryptopus*. 'Oh, sure, that one isn't a problem to find,' said Jean Hivert, one of the botanists, pointing at a twisted little road on the upper side of map. 'You can find them close to the D42, together with some other interesting species like *Cynorkis purpurascens* and *Disperis tripetaloides*', (p132 and p136).

He also told us that if we wanted to see the original semi-dry lowland forest we should visit a small hill near the west coast. There we could find the rare *Graphorkis concolor* var. *alphabetica*, an unusual orchid that looks like the South American genus *Cyrtopodium*, and the well-known *Angraecum eburneum* and *A. calceolus*.



Above *Cryptopus elatus* growing as a semi-vine, with some distance between it and the trunk
Inset The flower form of a typical clone has red markings in the centre and a branching lip

On the hunt

From a distance the hill was easily recognisable, as a forested island in a sea of sugar cane. We started our walk in friendly sunshine. It quickly changed into a climb in choking heat. The forest was lower and more open than the wet mountain forests we had visited. An endemic screw palm, *Pandanus sylvestris*, was the most striking and dominant tree in most places. There was far less moss on the trees than in the mountains, almost no shade from the hot sun, and epiphytes were very scarce.

Suddenly, one of my friends, Mieke, shouted, 'That looks like an orchid.' She was pointing at a little plant that looked like a reed stem *Epidendrum* with bright green, shiny foliage. As I walked toward it I thought, that looks like a *Cryptopus*. I disappeared into the bushes hoping to see for real what I had dreamed of. There was another plant. And another. And there... 'Flowers!', I shouted excitedly. Immediately there was a crackling sound as my companions rushed through the bushes, quickly followed by the clicking of cameras. We soon realised that the plants were quite abundant, with about a dozen in an area the size of a tennis court. Some grew almost on the path and surprisingly several seemed quite old. Poaching did not seem to occur here.

Variable flowers

Interestingly the flowers were very variable, both in shape and colour. Most had the typical two red dots in the centre, but some had yellow dots. One plant even had a combination of red and yellow dots. An even more striking difference was the branching of the lip. It ranged from a simple cut in the mid-lobe of the lip, making it

Rogier Van Vugt



A clone with a simple cut in the mid-lobe

Interestingly, the flowers were very variable both in shape and colour

Rogier Van Vugt



A clone with yellow markings in the centre

look like a puppet, to complicated structures like moose antlers.

The plants always grew as semi-vines in the surrounding shrubs. It looked as if they germinated on the ground and then grew upwards into the surrounding vegetation. Typically, the stems of the plant never touched the host – there was always a distance of several centimetres between the orchid and the trunk. The orchid roots grew horizontally towards the trunk

and attached themselves to it before growing downwards. Old drawings of *Cryptopus elatus* show that particular growing style too.

The vegetation in the habitat was rather open so the light levels were high, meaning even small plants flowered very well. All the *Cryptopus* plants were less than a metre tall. This makes an exotic agave, *Furcraea foetida*, a great problem for them. The agave was originally introduced to the island for the fibres that can be extracted from its leaves, but has become a serious pest. It makes many new plants on its old flower stalk and reproduces rapidly. *Furcraea* grows much faster than native plants and takes away the light and growing space. Luckily, local enthusiasts are aware of the danger and had removed many of these invasive plants. In the open patches, young *Cryptopus* plants were already visible.

Epiphytes on the ground

We did not find the *Graphorkis* we originally came for, but did come across the two *Angraecum* species. Like the *Cryptopus*, they grew either in the ground or not far above it on a rock or tree trunk. We found that most ferns that normally grow epiphytically were growing near ground level. This made us think that even though the area is close to the sea, there is no reliable source of mist and rain to sustain a rich epiphytic flora. At first glance this seems strange as *Cryptopus* is known to prefer high humidity in culture, but we also know that it is sensitive to rot if its environment is too wet. Without a doubt, the area where this species grows is just as special as the plant itself and we can only hope that places like this will remain for many generations to come. ■

Lessons from Réunion

TON KLAASSEN explains how wild orchids improved his cultivation

A TOPIC OF endless discussion among orchid growers is – how does nature treat her plants and how should we translate this to our cultivated orchids at home? Should we give a lot of water at once, some water from time to time, perhaps only dipping, or just misting, what about the air movement and ventilation, and the levels of light?

Travelling through the orchid-rich countries of Costa Rica, Ecuador and Indonesia did not give me a consistent view on what makes an orchid feel comfortable. The late afternoon thunderstorm, the mist that covers the plant at night and in the early morning, a storm now and then, they all contribute to the well-being of the plant.

A beautiful view...

The first stop on our visit to Réunion was at the village of Bourg-Murat, where we had a hotel reservation. This little village is in the middle of

the island and we chose it because of its strategic position, close to Fôret de Bébour and the volcano Piton de la Fournaise. On our way to the hotel we were struck by Col de Bellevue, whose name suggested it would offer a beautiful view over the island and ocean, so we drove a few kilometres to the Col. We stayed all morning, not because we were busy enjoying the view – the fog blocked any panorama – but because nature was busy growing orchids there. Rogier van Vugt, with his eagle eyes, soon discovered bulbophyllums. We went further and further into the hills and to our astonishment saw angraecums, jumelleas and a wealth of other orchids, almost all at eye-level.

New insights

However, we experienced something else – one minute we were soaking wet with perspiration, the next, we were shivering with cold. Col de Bellevue, at an altitude of 1,600m,

is a pass to the Central Mountains and the humid air that comes off the ocean strikes the trees and bushes overgrown with orchids. The plants here are regularly wetted and dried; one moment they are burning in full, hot sun, and soon after they are soaked by the humid clouds. The temperature change is striking. We even saw frost damage on a few leaves. Some hours of observation taught us that this wet-dry alternation is both continuous and irregular. On later visits we found that it could also be misty for the whole day. We stayed for a week near the Col, then later passed through it several times and always encountered more or less the same conditions – mist and sun alternating throughout the day.

Roaming through such a changeable area for just a short time cannot give you rules for growing orchids, for that you would need continuous observations during different seasons (where to get funding for that?), but one thing is certain: many hundreds of orchids grow and flower there.

Imitating nature back at home

The conditions on Col de Bellevue might be extreme, but it still makes you think – how can I more or less imitate nature? A greenhouse is not necessary, there are so many opportunities in the home and the garden. In other parts of the world, orchids grow in mountainous areas with a similar climate to Réunion, and those orchids are known to grow easily in and around the house.

I already had a greenhouse, and since seeing orchids growing on the Col de Bellevue I have installed a



Angraecum striatum with frost damage on the leaves

Rogier van Vugt



Angraecum striatum
with its roots
in moist moss

misting device. Every quarter of an hour it produces a very fine mist, for 10 to 25 seconds, or whatever I want. I also now allow much more light. More light in summer gives greater warmth, but with the little misty layer the foliage can withstand more light. At the same time, I made a permanent opening in the door of the greenhouse, shielded by a fine mesh against insects, which can easily be closed on very cold nights.

As soon as there is no risk of frost, my cool-growing plants now go outside to the garden, where they enjoy complete air movement and

as much light as possible. However, you need to keep a close watch on the weather, and the forecast, so you can move plants if necessary. This takes time to fine-tune, and you may find that some plants are just not suitable for putting outside and need an ordinary well-shaded place in the greenhouse.

Now, after almost two years with more light and mist, in which I aimed more for the extremes, these changes have resulted in plants which are more vigorous, healthy and compact. New insights from a 'beautiful view' indeed. ■

ACKNOWLEDGEMENTS

The authors would like to thank Jean Hivert, Christian Fontaine and Vincent Boulet, Botanic Garden, Saint Leu, for all their help, and Michel Szelengowicz and Marjolijn Lopez Cardoso for useful information and help in identification.

WEBSITES

- The Botanic Garden in Saint Leu:
<http://flore.cbnm.org/index.php>
- Photo galleries of native orchids:
www.orchids.fr
<http://pagesperso-orange.fr/mascaorc/>
www.pbase.com/rogiervanvugt



Above Taking a photograph can sometimes be a team effort. Left to right, Rogier van Vugt, Ton Klaassen and Gab van Winkel.

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