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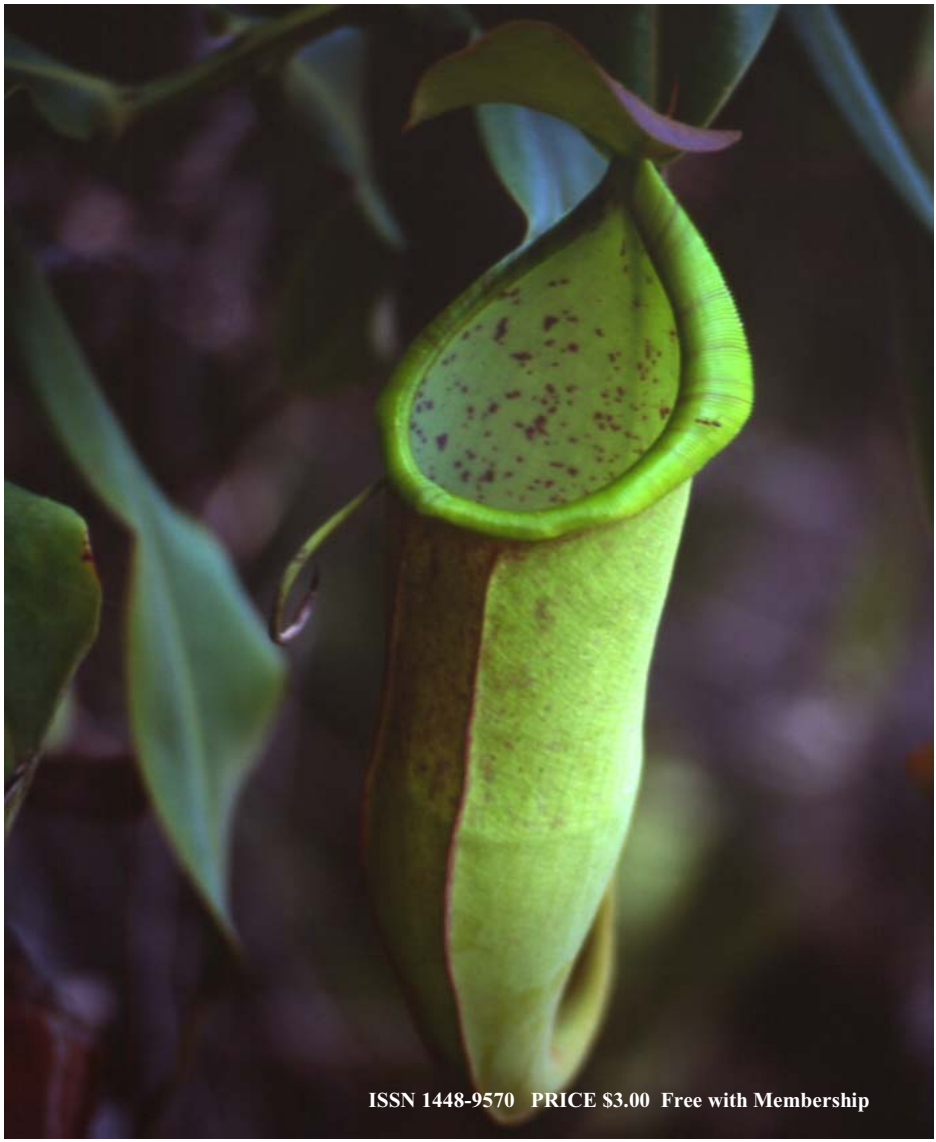

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PO BOX 4009
Kingsway West NSW 2208 (Australia)

Meeting are held on the second Friday of each month
Time: 7.30pm—10.00pm
Venue: Woodstock Community Centre
Church St, Burwood

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Back Page: *Utricularia reniformis,* Grown and photographed by Dr. Chris Schell

UPCOMING SPEAKERS AND EVENTS FOR 2003/2004

Date	Subject	Speaker
November	Carnivorous plants in Western Australia (Slide show)	Greg Bourke
November	Plant Auction	
December	Christmas swap meet.	
January	Seed collection and storing	Greg Bourke
February	General discussion	
March	Sarracenia	Greg Bourke
April	General discussion	

Christmas Swap Meet and Plant Show 2003

Saturday 13 December, 2003
10am to 4pm
Woodstock Community Centre, Burwood

►Come see the largest display of Carnivorous Plants on in Sydney!
►Demonstrations and advice from the experts
►Competitions and great prizes
►Bring your plants for sale, swap or show
►Plenty of off street parking
►BBQ facilities available in a relaxing park setting. A good day out for the whole family
►For more information contact the society enquiries@auscps.com or phone (02) 4684 3478

Sometimes it pays

Kirk (Fűzzy) Hirsch
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This year my *Drosera stolonifera* didn't come up from dormancy. Talking with a *Drosera* guru, he told me not to worry, for sometimes a tuberous one won't for a year, taking a year off so to speak. Still, I fretted. It's the only WA tuberous *Drosera* I have left after my *D. erhythrorhiza* died, and it died because the tuber was buried at the bottom, came out the side of the drainage hole, and didn't like it.

Fearing perhaps another scenario of similar fate, I meddled. GOOD THING I DID!

My *D. stolonifera* WOULD have come up if a bloody witchetty grub didn't eat the sprouting shoot all the way to the base of the tuber! It became plant food for some hungry flytrap quite quickly. The poor tuber was safe, no nibble marks on its epidermal layer, just that base of the shoot coming out instead. I planted the tuber some 3cm below the sand this time, in hopes that it will re-sprout this spring season.

I can wait if it doesn't, making sure the pot doesn't completely dry out, for the poor tuber was reduced in size too, and may not have the energy for the long shoot that it prefers to sprout from. So, let this be a lesson to some people that it doesn't hurt to fiddle around sometimes and fuss over plants and go against the advice of the experts.

May your tuberous *Drosera* sprout greenly! Füzzy

Notes on seed germination and viability

Greg Bourke
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This article was inspired by a conversation with Richard Sullivan about his recent experiences with the beautiful small red form of *Drosera Burmannii* known as 'Pilliga Red'. This form was discovered by Robert Gibson in the Pilliga region of western New South Wales. This distinct form with red leaves, red scape and pink petals was brought to Robert's attention as distinct when he compared it to typically pale green populations 30 kilometres away.

Richard Sullivan reports that he planted seed in October 2001 and had seen no germination until August 2003. The seed had not been treated in any way and had been kept damp for the duration. The pot had not been moved so the only real changes experienced by the seed were seasonal temperatures and light levels. Why they didn't germinate in 2002 is unknown but it had been a very dry year when not many of the local *Drosera* grew.

It is not uncommon for many tuberous *Drosera* seed to take three years or more to germinate but when it does, it is roughly the same time of year as seed of the respective species would be germinating in the wild. This does make sense as the seed could be responding to temperature changes but what about seed in tissue culture? A friend who has been experimenting with tuberous species in culture has reported similar experiences. What makes this so interesting is that this is a controlled environment where lighting and temperatures are fixed year round. For the seed to be germinating at this time it must have an internal time clock!

The genus *Drosera* is incredibly diverse and myths have been created about the viability of seed from some sections. William Dilapi of the USA reported germination of *Drosera montana* seed after one year recently which prompted me to try some *Drosera graminifolia* ssp *spiralis* seed that had been stored un-refrigerated for years. The seed has recently begun germinating.

Some genus of carnivorous plants seem to have very short seed viability. *Genlisea, Heliamphora, Nepenthes*, and *Pinguicula* seed viability is quite short but can be increased

slightly when stored in the fridge. There is speculation as to how long you can keep it but my advice is to spread it around and ensure that it is planted out as soon as possible.

Utricularia species from the Iperua section produce green seed that germinates almost immediately and if not kept moist will die. Other *Utricularia* species like many from Australia can lie dormant for several seasons untreated.

Drosophyllum lusitanicum and *Byblis* seed can be stored successfully out of the fridge for many years with no problems at all. It may still take several seasons to germinate after being planted out but can do so without treatment. Gibberalic acid (GA3) will increase germination in some species. There is a strange misconception about *Drosophyllum lusitanicum*. It is said that plants should be separated as they inhibit the growth of others. This is not at all true! Plants grow in close proximity in their natural habitat. I grow several plants in the same pot that adds to the visual effect of growing this beautiful species.

From my experiences with Sarracenia seed it is possible to store seed refrigerated for a few seasons but you'll probably only get limited germinate after storing for two years. If planted out the season after seed was collected more than half the seed will germinate. The following season some more will germinate and in the third season there may be a few but after that the remaining seed is generally not viable.

Dionaea muscipula seed appears to have a good viability and can be stored in a cool dry place for several years. This is a slow species to grow from seed and will take at least three years before plants will flower.

Darligtonia californica seed has a short viability unless stored cold. A good way to store the seed for personal use is to place several seeds in each section of an ice cube tray and store in the freezer. Ensure that the tray is clearly labelled so as to avoid drinking them in summer! The following winter the cubes can be placed onto sphagnum and kept cool. This is an extremely slow growing species taking many years to mature.

The information given here is from my experiences and some fellow Carnivorous plant enthusiasts and by no means should it be taken as gospel! Be patient with your seeds. It may be well worth the wait.

A visit to far north Queensland

Greg Bourke
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In June 2001 I had the opportunity of visiting several carnivorous plant sites in the Cairns area on the far north east coast of Australia. I had hoped to see the three tropical Australian *Drosera, Drosera schizandra*, *Drosera adelae*, and *Drosera prolifera* as well as visit the most southern population of *Nepenthes mirabilis*. Unfortunately various factors prevented me from finding the three *Drosera* but I was able to see some others that I had never seen in their natural habitat.

The first site was north west of Port Douglas on the road to Jullaten. Just before the town of Jullaten is Abattoir Nature Reserve. The park was set up as a sanctuary for wetland bird species. There is a boardwalk set up over the swamp that takes you to a hide with a good view over the lake. Unfortunately I only spotted one bird here that flew past so fast I was unable to make out what it was. I did however see many bright yellow flowers poking through the beautiful red carpet of *Azolla pinnata*. These flowers belonged to *Utricularia Aurea*. Plants up to 80cm in length were found with several scapes on them at different stages of development. This large free floating aquatic species has feather like leaves radiating around the central stem and modified hollow tubular leaves or floats at the base of the flower scape. These floats compensate for the weight of the flower scape and its pollinators. This was the first time I had seen this species in its natural habitat. Also found in the swamp was the thread like *Utricularia gibba* although it didn't appear to be in flower. Although there may have been more species growing in this area I did not venture from the Boardwalk as I did not wish to disturb and breeding birds (if there were any).

After leaving the Abattoir I headed back towards the coast in search of *Pandanus* species. There are two reasons for searching for this species. One is that *Drosera indica* and *Byblis liniflora* are commonly found growing near them, and the second is that they are a lot bigger than their carnivorous neighbours and so easier to locate! I found several colonies of *Pandanus tectorius var. australianus* but unfortunately no carnivorous plants. It is possible

that due to the dry conditions, the *Drosera* and *Byblis* here had already set seed and died. By this time the sun was getting low and it was time to head back to the tourist town of Port Douglas for a few beers and a great feed of Emu, Kangaroo and Crocodile.

The next day saw me heading north in search of *Drosera prolifera.* Roughly 30km north of Port Douglas lies the Daintree River. This is crossed via a barge at a cost of $3. Another 20km through lowland rainforest and Crocodile territory takes you to Cape Tribulation. Here I met one of the Rangers and asked about *Drosera prolifera*. After a lot of head scratching with the Ranger and some amateur Botanists, I came up with two possible locations. One of these was simply going to be too far for me to get too so I headed for the second which was accessible only by passing through private property. I asked the owner for permission to enter and for some further directions to a waterfall. At this time I was told that the walk in would take 6 hours return. I only had about 4 hours till sun down! I proceeded to run up the almost dry riverbed stopping from time to time to search the sandy banks for possible sites. I made it to the base of the falls in two hours and frantically searched the area. I found a small terrestrial *Utricularia* (possibly *Utricularia caerulea*) which was not in flower. Unfortunately there was no *Drosera* to be seen There appeared to be good habitat on areas towards the top of the cliff but there was no time to explore this so I left disappointed.

After several days of relaxation I headed south to Edmonton to visit local *Nepenthes* grower Rod Kruger. Rod had some fantastic lowland N*epenthes* growing under shade cloth in the narrow strip between his house and fence. The most beautiful being *Nepenthes rafflesiana*. He also had *Drosera indica, Drosera adelae, Drosera burmannii* and *Drosera lanata* from this region.

After spending some time looking at Rod's plants, Rod drove me further south to Babinda to see the most southern population of Nepenthes mirabilis. This population is on private property. Rod had contacted the owner to gain permission prior to us arriving to avoid complications. This small population is now protected and survives only because the land was too steep for farming of sugar cane. There has been some speculation as to whether this popula-

tion was introduced or a remnant of a much larger population. The Babinda site is several hundred kilometres away from the main *Nepenthes* habitat. Rod explained that the rainfall at Babinda is more consistent and higher than surrounding areas creating the perfect habitat for *Nepenthes* and yes it was raining while we were there.

The soil at the Babinda site is red clay with some gravel or decomposed granite in it. The majority of plants were to be found in open situations where it was difficult to negotiate without stepping on *Nepenthes* seedlings. Grasses and ferns were the only competitors for space. The common east coast carnivorous plant companion the coral fern (*Gleichenia* sp.) being the dominant species. Also present was *Lycopodium cernuum*. Large plants of *Nepenthes mirabilis* scrambled over small trees and many were in flower. The paper thin pitchers were approximately 20cm tall and pinkish/yellow in colour with reddish peristomes. Where there were more trees, the canopy blocked the majority of light and only a few *Nepenthes* plants were seen reaching upwards with long internodes.

Although Rod had given me some good directions for *Drosera adelae* sites, I had to decide whether to search for it or chase other species. I opted to search for *Drosera Burmannii*, *Drosera indica, Drosera lanata* and a yellow flowered *Utricularia* species Rod had seen instead. The directions Rod gave took me to Herberton in the Atherton Tablelands. From hear I headed north along a gravel road. The vegetation here was open Eucalypt (Iron bark I think) with very little carnivorous plant habitat. I crossed several ephemeral creeks before seeing one that was still flowing. I pulled over and headed for an open section just off the road. I was immediately rewarded by the sight of *Drosera indica*. The white petalled golden/red coloured plants were a beautiful. The plants themselves where beautifully scented. This fragrant foliage is uncommon in *Drosera* but common in the *Drosera indica* complex.

As I scanned the area for more *Drosera indica*, my attention was drawn to a bunch of violet flowers in a wash of sand. A form of *Utricularia caerulea* with multi flowered scapes. The first scape seen had three flowers open with a tight cluster of buds waiting for their turn. It also had ripe seed lower on the 30cm tall scape. I counted a total of 18 flowers on that particular scape. From my field observations *Utricularia caerulea*

commonly produces scapes with less than 10 flowers spaced more or less evenly along a short scape. The characteristic seen in the plants at Herberton is however well documented and not uncommon. I have since cultivated plants from this site and under my cooler growing conditions they produced scapes less than 15cm tall with only 5 flowers per scape.

Also found growing amongst the *Utricularia caerulea* was a small yellow flowered species which looked similar to *Utricularia uliginosa*. With scapes of 10cm *Utricularia bifida* is small but beautiful. I had never even seen photos of this species let alone a live plant. The contrast of the orange/brown calyx and the yellow flower is stunning.

After some 20 minutes of exploring the roadside a four wheel drive vehicle pulled up beside me and two long bearded Aboriginal people got out. They were the owners of the land and were a little distressed that someone was on their property. When I explained that I was photographing carnivorous plants they raced over to see what the nut was talking about. "Oh those things!" one of them said. He then proceeded to point me in the direction of some other sites on the property that I could explore. On this advice I strolled further up the hill to a large seep where *Drosera indica* was common. I searched the boggy area and further up hill onto dryer land in search of *Drosera lanata*. Once at the very top edge of the seep I found *Drosera auriculata*. I was amazed to see that the plant was almost as robust as the *Drosera auriculata* I am familiar with in the Sydney area. From my passed experience, the form commonly found north of Port Macquarie was the only form to be found in Queensland. This form has long thin scrambling stems to 1 metre in length with small lamina and ovoid seeds. The 20cm erect growing plants were not in flower and there was no seed present for comparison with others. This is a plant that requires further study.

The following day took me to the beautiful Cairns Botanic Gardens. The balcony of the visitors centre has several hanging pots with lowland Nepenthes hybrids! *Nepenthes* 'Wrigleyana (*N. mirabilis* x ((*N. rafflesiana* x *N. ampullaria*)), *Nepenthes xhookeriana* (*N. rafflesiana* x *N. ampullaria*), and *Nepenthes* x*trichocarpa* (*N. gracilis* x *N. ampullaria*) from memory.

In the Orchid house grows a huge specimen of Nepenthes truncate which had a 40 centimetre pitcher

on it! It appeared to be growing in a fairly heavy Orchid mix in a 40cm pot. There was also a very interesting but small Orchid collection though there was little in flower.

The large green house contained many different types of plants including (You guessed it) *Nepenthes*! Some very well grown *Nepenthes ampullaria* were of most interest. These plants had the distinctive leafless rosettes of pitchers clumped in the centre of the basket. Other *Nepenthes* species here include *Nepenthes alata, Nepenthes rafflesiana, Nepenthes ventricosa, Nepenthes gracilis* as well as some *Nepenthes* hybrids. The gardens here are well worth the visit if only for the pitcher plants.

The last site I was able to visit was near the Cairns golf course. Robert Gibson had recommended this site for *Drosera burmannii, Drosera indica, Drosera spatulate, Utricularia bifida, Utricularia gibba, and Utricularia uliginosa*.

Golf courses have always been a great place to see carnivorous plants for me. I don't care much for the game itself but I'm good at hitting the ball into the rough which seems to be the perfect habitat for carnivorous plants. In fact, I've never been to a golf course in Australia and not seen carnivorous plants! Another great habitat for carnivorous plants is under power lines and there were power lines crossing the road near the golf course at Cairns!

The *Drosera burmannii* plants here are much smaller than the plants from northern New South Wales and pinkish in colour. This species was not locally common even though conditions appeared perfect. Perhaps many of the plants had finished for the year. No plants were seen in flower but seed was present on old scapes.

Drosera indica could be seen from the car near a roadside ditch under the power lines. These plants differed from those seen near Herberton in both colour and size. The robust gold/green plants grew prostrate for half their length unable to support the weight of the crown. The leaves grow horizontally for about half their length before bending 90° upwards. This gives the stem support while still enabling the ends of the leaves to catch prey. The flower scapes grow to 15 centimetres long with an average of six to ten flowers per scape. After a flower has been pollinated it turns downwards and by the time the seed is ripe it is very close to if not on the soil. The seed can sit wet for

some time without germinating instead waiting for the coming season.
As with *Drosera burmannii*, the Dros*era spatulata* were quite small and uncommon. These were found growing away from *Drosera indica* on less exposed ground. These plants were not in flower.

Utricularia bifida was found growing both above and below the water level alongside *Utricularia gibba* and *Utricularia uliginosa.* The flowers did not differ from those at Herberton. Scape height was adjusted on plants standing in shallow water to position the flowers just above water level.

The aquatic *Utricularia gibba* was found both in and out of the water with the stranded plants beginning to flower. Flowering of this species is easily induced in cultivation by similar methods.

The majority of flowers of *Utricularia uliginosa* were cleistogamous. The occasional purple flower was seen and was typically small of the species.

Although I missed out on seeing the three famous *Drosera* from the Cairns area I still managed to see some very beautiful plants. I look forward to little more time here in the future when I will get to see these unique *Drosera* and others.

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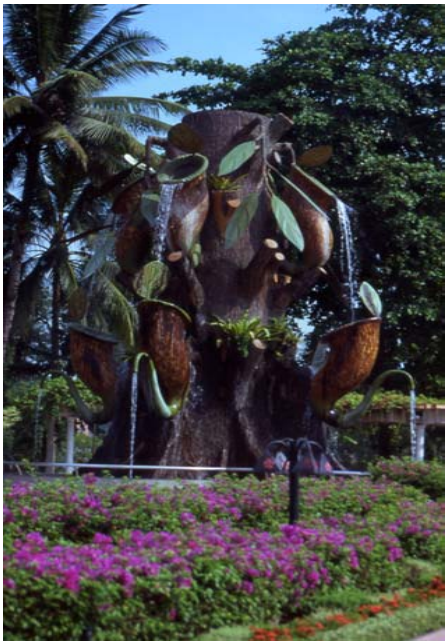
Drosera indica, Herberton

Drosera indica, Cairns

Drosera burmannii 'Pilliga Red'
Photo curtesy of Robert Gibson

Utricularia bifida, Herberton



Nepenthes fountain, Kuala Lumpur

Nepenthes macfarlanei, G. Ulu Kali

Nepenthes macfarlanei, G. Ulu Kali

Nepenthes macfarlanei, upper pitcher

The view south from G. Ulu Kali in the Genting Highlands.

Nepenthes macfarlanei, lower pitcher

Nepenthes macfarlanei x *ramispina*?

Nepenthes sanguinea, G. Ulu Kali

Nepen*thes sanguinea*, G. Ulu Kali

Nepenthes macfarlanei, G. Ulu Kali

Nepenthes ramispina, G. Ulu Kali

Cultivation and flower inducement of *Utricularia reniformis*.

Dr. Christopher B. Schell.
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Utricularia reniformis has been described as an epiphytic species by some authorities however others have observed that this species grows terrestrially in sphagnum bogs. It is this versatility that allows this species to thrive under a wide range of conditions in cultivation. In this article, I will describe the conditions under which I currently cultivate *U. reniformis*. These conditions have resulted in a massed display of flowers.

I have been growing *U. reniformis* for the past five years. During this period, flowering has only occurred once (in the plant's fifth year). Several authors have noted that this species may be shy to flower under cultivation (Slack, 1988; Pietropaolo & Pietropaolo, 1999), yet others (D'Amato, 1998) have found it to be free flowering for extended periods, only to pause throughout the coldest part of the year. In my opinion, this variation stems from the conditions under which the specimen in cultivated for it is a well known fact that many plants will alter flowering periods in response to alterations in hydroperiod / nutrient regimes. Given the diverse range of microhabitats that this species has been observed to inhabit in nature (in trees / in swamps / in bromeliads / in full sun / in full shade) it is not surprising that plasticity within life-history traits exists.

I currently grow all of my *U. reniformis* within a shade-house (50% shade) that receives at least 8 hours of full sunlight throughout the year. I provide no heating during the cooler parts of the year and no cooling throughout the summer months. The temperature extremes experienced by this species has ranged from winter minimums of –5^{o}C to summer maximums of 45^{o}C. Extremes in temperature often result in partial or complete loss of foliage, however, this is quickly replaced upon the resumption of suitable thermal conditions. In established plants, this may take as little as two weeks. In addition to ambient temperature, ambient humidity

is suitable and I have observed that during periods of reduced humidity, the phyllodes (leaf like structures) develop a waxy cuticle, presumably to reduce loss of moisture under such conditions. My plants have experienced a rage of humidity (20% to 80%) although they seem to grow adequately under approximately 60-70%.

In terms of potting, I use a wire basket, lined with coconut husk. Within this I use a mix of equal parts garden potting soil, sphagnum moss, orchid bark and sphagnum peatmoss. The result is a free-draining media that allows adequate airflow to the developing stolon. Once planted, I place living moss (desiccation resistant, epiphytic varieties) onto the surface of the medium to provide some protection to the plant, and to help stabilise the planting environment. I also believe that this 'companion planting' conveys benefits to the *Utricularia* (eg. protection from drought, protection from heavy watering, etc…). This unit is then kept within the shade-house, in an area that receives as much light as possible. The pot is not kept standing in water, but instead is watered from above. Essentially, I treat the unit as an epiphytic orchid. As such, I allow the planting medium to dry between watering, and ensure that adequate ventilation of the area is maintained at all times. During winter (growth generally slows or stops) I allow the plant to dry completely and water only once a week.

The application of fertilizers is a touchy topic when it comes to carnivorous plant enthusiasts. Some authors do not condone their use (Slack, 1988; Pietropaolo & Pietropaolo, 1999), yet others advocate using acid fertilisers (D'Amato, 1998) and when using them, to use once monthly at very weak dilutions. As I mentioned previously, I treat my *U. reniformis* as epiphytic orchids, and as such, I fertilise them during the growing season fortnightly using Aquasol ™ at orchid strength (1 level measure into 10 Litres of water). However, coming out of dormancy (early spring) I give my plants one dose of full strength fertiliser (1 level measure in 5 Litres of water) followed by a flush of water four hours post application of Aquasol ™. Within 3 weeks of this process, developing flower scapes may be observed. This year, one of my plants produced 12 flower scapes within 5 weeks of breaking dormancy.

Although this plant is a versatile species, I believe that there are several reasons why this plant fails to thrive or flower under many cul-

tural regimes. I feel that too many people grow this species too wet. This is likely to have two outcomes. The first is that the plant may rot, and thus die. The second is that the plant may grow quite well, however it may not flower. It is likely that this is the primary reason for the observations of Slack (1988) and Pietropaolo and Pietropaolo (1999) along with many other enthusiasts. In addition, it seems likely that a period of drying during the winter period is essential to initiate flowering. A lack of suitable ventilation is also likely to result in rot or failure to thrive. It is commonly known that plants (i.e. orchids) that receive too little light fail to flower, and to this extent, *Utricularia reniformis* responds in a similar manner. In my experience, these plants thrive under prolonged bright conditions (not full sun). Finally, through my experience, I believe that *Utricularia reniformis* thrives with the regular application of fertiliser, however, if this is to be conducted, perfect drainage and regular flushing of the media should be undertaken.

Utricularia reniformis is one of the largest members of the *Utricularia* genus. It is versatile, easy to grow, has among the most beautiful philodia of the *Utricularia* and has large and beautiful flowers. This species thrives under conditions similar to those enjoyed by *Nepenthes* and would make an interesting companion plant for such. It is unfortunate that it is not more widely seen in collections.

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Back to Basics. *Sarracenia rhizome and root care.*

Owen O'Neil

I've been growing Sarracenia for years now and over time I've dabbled with different potting mixtures and growing conditions. What I've discovered is that to grow these fantastic plants well you don't have to go to any great lengths. To grow healthy Sarracenias just stick to the basics!

There are three main potting mediums I would suggest. These are; 1) pure live Sphagnum moss, 2) Peat moss or 3) a mix of four parts peat moss, two parts perlite and one part well washed coarse river sand. My personal favourite is the last mix but care must be taken when preparing this. Ensure you purchase good quality peat; you can buy this through produce stores and some nurseries. There is NO SUBSTITUTE for sphagnum peat moss.
Sand is another thing you must take care with. Prepare your sand by placing an amount into a bucket then washing it with a hose on fairly high pressure. You may notice just how dirty the sand is with yellow brown water and froth being produced as the sand is tossed about. Pour this water off and repeat the washing until the water coming out of the sand is as clear as the water going in. The perlite is not usually an issue as its purchased in sealed bags from your supplier and shouldn't contain any impurities. To combine the mix, place the peat in to a clean bucket or wheelbarrow and add water. With your hands or a clean spade work the water through the peat until there are no dry lumps left. Add the sand and perlite and mix until you have an even mixture. You don't want the mix to be overly wet as this makes potting up your plants a little more difficult when the mix can be poured into the pot.

<u>Potting up.</u>
In late August to early September most *Sarracenias* grown in New South Wales, Australia are nearly at the end of their winter resting phase. This is the optimum time to get in and tidy up your collection for the new season ahead. I like to take my plants from their pots, shake off as much old medium as possible then dunk the rhizome in a bucket of water to give it a good wash. At the same time I trim off

all the remaining pitchers from the previous season with the exception of *Sarracenia purpurea* and *Sarracenia psittacenia* species as these pitchers tend to over winter very strongly. It's at this time the plants are divided. I used to treat this process with surgical like precision, rubber gloves, scalpel, the lot! Then I worked out that as long as your not overly rough it's far simpler to wiggle and snap growing points apart. I do keep a sharp heavy bladed knife on the bench to neaten up the odd rough end or trim back dead brown rhizomes.

Placing the growing point of the rhizome towards the centre of the pot place handfuls of medium into the pot until it's nearly full. Give the pot a shake and a bit of a tap on the bench to settle the soil in around the roots and continue to fill the pot to the top. Firm the soil down until it is level with the top of the rhizome and a little lower than the lip of the pot. Place the pot into a water tray; water in well with a soft spray from the hose or watering can. Simple!

Another factor to consider is without a doubt is water quality. Rainwater is by far the best for Sarracenias. The tap water in my local area is woeful and during the drought killed many of my plants, especially affected were my Venus Fly Traps (*Dionaea muscipula*) I know that growers in the Sydney area don't seem to have a problem with their tap water and if your plants are doing ok on your local supply then all well and good but for those people who live outside the Sydney area just take note and try to give your plants the very best water available to them. I use water from a dam situated on my parent's rural property. The water is collected from run off from the bush so it doesn't pick up any fertilizers or lime spread about by farmers on open paddocks.

<u>A few observations.</u>

After plants have been potted up for a week or two if you notice a dark green colour on the soil surface surrounding the rhizome then it's usually time to remove this plant from the tray and take it out of the soil for a closer inspection. What may be happening is the rhizome is rotting, releasing nutrient into the soil that is feeding algal growth on the soil surface. More often than not this is bad news but generally only happens to small pieces of rhizome that may have already been brown and dead on the inside but you've failed to notice and cut back while potting up.

This year I'm growing my plants in a tunnel house. The main reason

behind this is to guard against burn off from late frosts that I experience in my area. If you do grow *Sarracenias* in a green house then you have to pay careful attention to air movement. In nature although the plants are sitting in water at the start of the growing season the temperature and humidity is still quite mild. In the green house the humidity levels can climb quite high in a closed environment while the temperature is still too low for vigorous plant growth. This can cause problems with fugal growth around the crown of the rhizome especially on the stumps of dead pitchers that have been trimmed back. To guard against this potentially devastating problem ensure that the house is opened up each morning to allow good air flow and that water levels in the trays are kept to a bare minimum. Any plants displaying grey, fuzzy growths should be removed from the main growing area and all the plants sprayed with a suitable systemic fungicide.

Just to let you know how tough these plants are let me tell you about a recent event with my plants. Being a shift worker and a full time father can leave you wishing there were more hours in the day and even more hours in the night to catch up on that most wonderful thing called sleep! After four days of early starts, potting up my plants then heading off to work from 4pm until midnight I ran out of time and had to leave some rhizomes sitting in a bucket of water. I had all the best intentions of returning to pot up the left over pieces within a week but one rolled on to two then three and finally a month had passed leaving a bunch of *Sarracenia* rhizomes sitting outside in a bucket full of stagnant water in all weather conditions. I felt for sure that I'd find an oozing black mess of rotting vegetation but to my surprise although the water had a stink like you couldn't imagine there was still visible signs of life left. I rinsed off the rhizomes and put them in a fresh bucket of water then potted them up as usual. After two weeks new growth is emerging and it seems the extended bath hasn't done any permanent damage. Whilst I wouldn't recommend you try this with your most prized *Sarracenias* it just goes to show how well these plants can handle being completely waterlogged for extended periods.

Exploring the Genting Highlands

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On the 29th of March 2002, Richard Riles and I embarked on a journey to Malaysia. Our journey was to have one leg in peninsular Malaysia and three legs in Borneo. The following is a brief account of the carnivorous plants encountered on the first leg of the trip.

We had only allowed two full days to explore both the city and the mountains. Our aim was to reach the summit of Gunung Ulu Kali in the Genting highlands in search of three *Nepenthes* species, *Nepenthes macfarlanei, Nepenthes ramispina and Nepenthes sanguinea.* We left our hotel early for the short 40km journey to the Genting highlands, which due to our navigational skills took us almost three hours! We were lucky to drive past an amazing Nepenthes water feature which we would not have found if we weren't lost. It would be a pleasant drive up the mountains if it weren't for the crazy motorcyclists! They overtake on blind corners, up the inside, the outside or the wrong side of the road at ridiculous speeds! We soon learned to fit in though, emulating this style of driving.

The first carnivorous plant species seen was *Nepenthes sanguinea* at about 1500 meters above sea level. The pitchers were seen hanging almost over the road as the plants scrambled over large ferns of the genus *Sticherus*. These pitchers were quite small upper pitchers at about 15cm and orange/green in colour. As we wound our way up the mountains we found more plants of this widespread species growing on a large exposed embankment. These plants were under 50cm tall but quite broad with some interesting lower pitchers. There were some with all green pitchers with green peristomes and others with deep burgundy pitchers with red peristomes. The largest of these pitchers was almost 25cm tall!

Once high in the mountains we were overwhelmed by the sight of the huge hotels, fun-park and Casino. A whole mountain basically destroyed. I had no idea that this place existed. We drove around the summit for a short while then parked near a roadside cutting, which had some remnant vegetation and were rewarded immediately. A large *Nepenthes sanguinea* plant was growing amongst the disturbed

ground with lower pitchers over 30 centimetres tall. All pitchers were copper coloured with light green almost yellow peristomes. Growing beside this was what I initially thought to be *Nepenthes macfarlanei.* We soon realised it was a hybrid of *Nepenthes macfarlanei* x *sanguinea*. The surrounding vegetation consisted of small ferns, grasses and a few *Spiranthes* orchids.

Only a few meters from this disturbed area, the vegetation was denser appearing natural. Here amongst the orchid covered trees we encountered a single *Nepenthes ramispina*. This plant was over 2 metres in length, climbing through the surrounding shrubs. At the base of the stem was a basal rosette with two 10centimetres tall lower pitchers. All pitchers on this plant were a beautiful dark green, almost black.

With the daylight hours swiftly disappearing, we hastened to the nearby summit of an undisturbed mountain. As far as I could tell from our inadequate map, this was Gunung Ulu Kali. Gunung Ulu Kali at 1772 meters above sea level is the highest peak in the Genting Highlands. Young plants of *N. ramispina* and it's hybrids could be seen growing on the almost vertical sides of what appeared to be an old quarry only 50 metres from the summit. From here the short walk to the summit was along a well-worn path. Large chunks of Sphagnum had fallen from above with *N. macfarlanei* plants amongst them. The sight of these helped speed our ascent. The transition from montane forest to mossy forest is immediate as you near the summit. It's like a different world! Here *N. macfarlanei* and *N. ramispina* are everywhere! Unfortunately we only had a short taste of this before we were out of light and had to return to our accommodation.

We were up at first light and returned to the mossy forest. It must be said that before this trip, I had only seen *Nepenthes mirabilis* in Australia so I was quite excited to see the plants I had spent years trying to grow. The sphagnum moss covered summit was unlike anything I had encountered before, spongy and seemingly bottomless. I pushed the leg of the tripod almost to it's full length (almost 2 metres) into the moss with little resistance. The canopy species here consisted mostly of Orchid covered *Leptospermums* and *Rhododendrons*. On the southern side of the summit, where the vegetation was exposed to the elements,

the canopy was quite low, generally less than three metres. In this area *Nepenthes ramispina* was the most common *Nepenthes* species encountered. These plants scrambled across the tops of the trees with their inviting pitchers hanging above the track. Our liking for these soon changed as they emptied their contents onto our heads and down our backs. We also found a few plants that appeared to be hybrids with *Nepenthes macfarlanei*. The pitchers were similarly shaped to those of *Nepenthes ramispina* but lighter in colour with some mottling inside the pitchers.

Deeper into the centre of the mossy forest we came across more *Nepenthes macfarlanei* plants as the canopy became higher. Light levels here were quite low, equivalent to about 50% shade. *Nepenthes macfarlanei* was the most common *Nepenthes* found growing only as terrestrials while *Nepenthes ramispina* plants were commonly found growing on the trunks and branches of the larger trees. The adult *Nepenthes macfarlanei* plants here were large (up to one metre across) with a short nodal distance. The infundibular lower pitchers of *Nepenthes macfarlanei* are generally placed on top of the *Sphagnum*. To achieve this, the plant produces very long tendrils of almost one metre in length. This is essential as the pitchers are quite large and heavy and need the support of the *Sphagnum*. Some of the lower pitchers seen would hold approximately 300 millilitres of fluid. These lower pitchers are beautifully coloured with dark maroon blotches on a lime green background. The peristome is generally red though there was some variation with green striped peristomes seen on some plants. There were mottled pitchers similar in colour to the lower ones but there were also completely yellow pitchers with yellow peristomes and every shade and combination in between. There was very little prey captured by these plants. The insects that were seen were quite small, mostly flying insects. I was surprised not too see more ants in the pitchers as these were the only insects commonly seen by us in the mossy forest.

One plant of *Nepenthes ramispina* plant was seen growing with no root system at all! The three metre long stem growing completely supported by the tendrils curled around surrounding vegetation. This is when the plant is truly reliant on its pitchers.

One thing I learned while photographing these plants in the canopy is that you must be very selective as

to which tree you set your tripod up in. I had set the tripod up approximately three metres above the forest floor and was adjusting the camera to focus on a pitcher when I was set upon by dozens of angry ants. The bites really stung and it took some time to pack the camera up before I could escape. Fortunately the pictures made it worth while.

We thought that the trail we had come up on ran right along the summit and when the afternoon was getting late had turned around and headed back. The feeling of being completely lost came over us as we followed the maze of paths around the mountain. I guess being lost here, surrounded by Nepenthes isn't all that bad but we had a plane to catch! After an hour of searching, we eventually found our way back to the main trail and to the car. Unfortunately this left us no site seeing time in Kuala Lumpur but we were both completely satisfied and well and truly warmed up for the next leg of our journey, Sabah, Borneo.

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Do your carnivorous plants produce seed?

How about donating some to the societies seed bank! For the seed bank to work successfully it relies on donations. Any spare seed you have can be forward to the societies address but it must be clean and labelled.

What do we mean by clean?

You must ensure the seed is separated from all other flower parts.

How should it be labelled?

With the full species name e.g. *Drosera rotundfolia* NOT *D. rotundifolia.* If sending seed from outside Australia, it must also have a customs declaration stating what is in the package. This avoids delays with Australian customs.

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