

# *FLYTRAP NEWS*

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New South Wales (Sydney, AUSTRALIA)

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Special functions such as the Annual Social and Christmas Swap meet are held on the second Saturday and Sunday of the month respectively. Field Trips are as advertised from time to time.

Meetings are regularly held on the second Friday of the month as shown below.

TIME: 7.30 - 10.00pm

VENUE: Woodstock Community Centre, Church St, Burwood.

Meeting Dates for 1999			
		9th July	
12th February		13th August	
12th March		10th September	
9th April		8th October	
14th May		12th November	
11th June AGM		12th December	Christmas Swap Meet.

#### CURRENT MEMBERSHIP RATES

Single Membership within Australia	\$A20
Family membership within Australia	\$A20
Overseas Membership	\$A20

Please make cheques/money orders payable to the Carnivorous Plant Society of NSW

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#### Chat Corner

Jessica Biddlecombe

Hi again fellow CP'ers

Due to illness Jose Da Costa could not have his talk, but at the time of writing we are very glad to say Sarah is much better now and back on the mend. It was still a great meeting and other than the usual faces we had Brian Gordon from Maitland and Paul Adams from Newcastle join us. It was great to see a few people, Terry Nicholls and Damon De Costa back after some absence.

Well the logos drawn by Nigel Rapley for the Society are official. They are fun and have been well received.

Kirstie Wulf donated the door prize (I won!!) for the night. Kirstie had painted the Nepenthes logo on a T shirt with the Carnivorous Plant Society of NSW printer around it (more talent). It looked great and I have worn it to several shows and festivals to get reactions and I have had some good comments.

Now your plants should be starting to preen themselves and show their growth for the new season.

My own sarra's have put up their beautiful flowers and one *S. leucophylla* grew a large pitcher of over 60 cm last month. I thought this was very early as I am still getting very low temperatures at night (average 3 to 4 °C).

I am a happy little vegemite when I am out talking to my plants as I can see new growth daily and was surprised when a Sarra flower came out orange/red tinged with yellow around the petals and red veining over all the colours. I do not know what the hybrid pitcher will be like but I hope it is something extra special after this flower.

The *D. capensis* is back out in full growth and I know you all think of these plants as weeds but I found them very beautiful. These plants are easy to grow so when I sell one to the public they are very happy at their success and they come back for other plants and there you have another convert. So before you throw them out think who you can give one to. They might become the next new Society member.

My *Drosophyllum lusitanicum* is still doing very well despite my sheer neglect except for the hosing I give it (thank you Jose) and also my *Glenlisea filliformis* can now nearly be seen by my naked eye (thanks Chris).

Now that everyone is dividing their plants I hope to see new plants for sale at the meetings. As you notice I thank people after I mention my plants it is because these people have introduced me to the different genera. They know how tough I am on my plants so if they survive with me they can safely recommend them to others.

Come to our meetings and bring plants for sale, to show or if you need them identified we will help. See you there!

Your Friendly Cper

Jessica



#### To eat or not

Jessica Biddlecombe

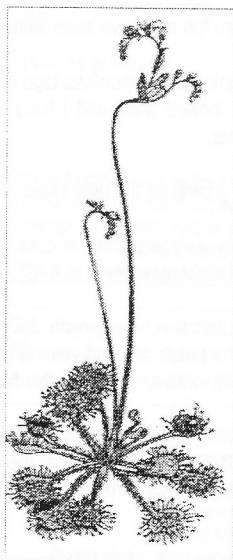
We know different plants of the jungles and forests have been used since time beginning for healing and for those that collect Carnivorous plants they may have more uses than you think!



In the video "Life lines & Death Traps" by Thomas Carow it has been shown the people drinking the liquid in the *Nepenthes* pitcher for its antiseptic healing properties. Also not shown in this video, but it has been noted, the roots and various parts of the plant can be boiled for different ailments.

I have heard the south African sundew *D. capensis* may heal mouth ulcers by sucking the nectar of the leaves.

While we may think these remedies are for Shamans and witchdoctors, alchemists have realised the medicinal uses of certain plants over the centuries as reported in reference [1].

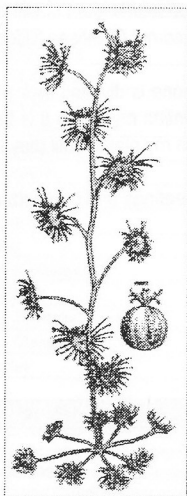


In the thirteenth century, alchemists noted positive results from the use of the sundew's sap in the treatment of consumption (tuberculous) [1].

In sixteenth-century England, John Gerard observed in his Herball that 'Physicians have thought this herb to be a rare and singular remedy for all those that be in a consumption of the lungs'. Today herbalists recommend the sap for soothing coughs due to irritation and ascribe to it antispasmodic properties which also help stop coughing (whooping cough). [1]

Medicinally sundews have long been used in preparations for the treatment of respiratory diseases, including whooping cough and asthma [1].

Pale sundew is used in herbal medicine as a substitute for *Drosera rotundifolia*, a European species which is becoming scarce. The juice extracted from the plant is caustic and has been used in folk medicine to remove warts, but the plant should be used with caution – it is reported that livestock have suffered cyanide poisoning from grazing on foliage of this or other sundew species. [1]



I am sure there are many more carnivorous plants which are used for these purposes but I am not about to go and cut open my *Nepenthes* pitchers to drink the liquid and uproot Peter's plants to boil them and I also hesitate to sucking on my *D. capensis* leaves.

What interests me most is if Cyanide poisoning to livestock grazing on the foliage of certain Sundews has occurred. How many sandwiches of these plants must I feed to Peter?

Food for thought!!!

#### References:

[1] *Magic and Medicine of Plants*, Readers Digest, ISBN 0 86438 560 9

#### *Utricularia reniformis* St.Hil. Fernando Rivadavia

*Utricularia reniformis* St.Hil. was discovered in Minas Gerais state, southeastern Brazil, and described by the French botanist Auguste de Saint Hilaire in the early 19th century (St.Hil., 1830). It belongs to section *Iperua* P.Taylor, which also includes *U.geminiloba* Benj., *U.humboldtii* Schomb., *U.nephrophylla* Benj., and *U.nelumbifolia* Gardn. (Taylor, 1989). These species are all native to eastern Brazil (except *U.humboldtii* which grows in northern Brazil plus southern Venezuela and Guyana) and are commonly called -- together with *U.longifolia* Gardn. from sect.*Psyllosperma* P.Taylor -- epiphytic by CP cultivators. Although *U.nelumbifolia* (always), *U.humboldtii* (very often), and *U.reniformis* (very rarely) do grow epiphytically in the water-filled leaf axils of bromeliads, they should not be confused with the similarly large species of sect.*Orchidioides* A.DC., such as *U.alpina* Jacq., which truly grow on trees and even have small tubers (Taylor 1989).

*U.reniformis* is the most widespread of the species in sect.*Iperua*, occurring in southern and southeastern Brazil, in the states of Rio Grande do Sul, Santa Catarina, São Paulo, Rio de Janeiro, Minas Gerais, and possibly Espírito Santo, according to Taylor (1989). I've seen this species in S.Paulo, R.Janeiro, M.Gerais, and have confirmed its presence in E.Santo, where I discovered it in June '93 at the Serra do Caparaó highlands, on the border with M.Gerais. Furthermore, in April '95 I found *U.reniformis* in the state of Paraná, near its eastern border with S.Paulo -- a distribution gap where it was bound to occur.

*U.reniformis* is most common on the coastal highlands of Brazil, but also extends inland into M.Gerais along the Cadeia do Espinhaço highlands. The northernmost site known for *U.reniformis* on the Cadeia do Espinhaço was, until recently, the Serra do Caraça, which is the type location. This record was broken in July '95 when I discovered it on the Pico do Itambé, nearly 200km further north from Caraça, and then broken again in January '96 by two friends and fellow CPers, Fábio Pinheiro and Mauricio Piliackas, who found it c.40km further to the northwest, near the town of Diamantina. More recently, in April '99, I discovered *U.reniformis* at the Serra da Canastra, in M.Gerais, possibly the most inland location known for this species, nearly 400km from the coast.

*U.reniformis* is a perennial that grows in a wide variety of habitats. I've seen it near sea level on the Cardoso Island off the south coast of S.Paulo and all the way up to 2800m of altitude at the Pico da Bandeira, M.Gerais/E.Santo border. It occurs in shady to sunny locations, in acid to alkaline soils, in waterlogged to barely humid habitats, in sandy to peaty soils, or in live *Sphagnum* spp., or next to waterfalls on rocks and the bases of tree trunks, and even in the waterfilled tanks of bromeliads, as mentioned above.

*U.reniformis* is one of the largest species in the genus *Utricularia*, but its traps are deceptively very small, measuring only 0.7-1.5mm in length (Taylor, 1989). As the name implies, *U.reniformis* has reniform, or kidney-shaped, leaves which may be very thin and fragile, measuring only a few millimeters in diameter, with barely any petiole, all the way to thick and leathery, measuring up to 15cm in diameter, with petioles reaching over 50cm in length (Taylor, 1989). The leaves vary in color between dark and light-green and the larger leaves are often covered



in brown (often purplish) spots or patches, especially in sunny locations. The stolons may be surprisingly thick, fleshy, and white in larger specimens. *U.reniformis* very rarely flowers in cultivation and cross-pollination appears to be necessary for the production of seeds. I've never been able to obtain seeds in cultivation and only on very rare occasions have I found any in the field.

*U.reniformis* seems to have no definite flowering season and flowers may thus be seen year-round \*IF\* you're lucky, since this species does not flower very often in most locations. After seven years of CP-hunting in Brazil and having seen *U.reniformis* countless times at numerous locations, I still consider its flowers a rare treat. Only once was I lucky to catch large numbers of *U.reniformis* in flower, in November '91 at Itatiaia National Park (R.Janeiro/S.Paulo/M.Gerais border), when I saw several breathtaking patches packed with flowers. The longest *U.reniformis* flower scapes I've ever found measured 104cm, bearing flowers 4X5cm wide. One interesting curiosity I've noticed is that the pollen of *U.reniformis* is light-blue in color.

The flowers of *U.reniformis* are a dark-purple to light lilac-blue color, varying relatively little in shape, size, and color from place to place, when compared to other *Utric* species. The lower lip of each flower has two round lobes separated by a long spur curving upwards between them, reminding me always of an elephant (the two lobes being the ears and the spur the trunk). At the base of these two lobes, the lower lip forms a bulge with two diagonal to nearly vertical yellow or orangish-yellow stripes, leaning towards each other at the top, almost forming an inverted 'V'. These remind me very much of feline eyes. The yellow stripes are often outlined in darker purple, giving a lovely contrast. The most beautiful *U.reniformis* flowers I know are found at the type location, where the two yellow stripes outlined in dark purple sit within a white patch, giving the colors even more contrast. Unfortunately though, the flowers of *U.reniformis* are never as colorful in cultivation as they are in the wild, due to the lower levels of light.

Due to the wide spectrum of habitats in which *U.reniformis* occurs, I always find myself at a loss for an answer when asked by other CPers for cultivation tips on this species. Nonetheless, I've made one observation which may help people in getting their plants to flower. During a four-day hike in September '93 across the scenery-rich Serra dos Órgãos National Park, about an hour away from Rio de Janeiro, I found *U.reniformis* in flower growing among clump-forming grasses. I noticed that all of the inflorescences were arising from stolons which had grown up through the dead leaves of the grass clumps. As the stolons climbed higher through the decaying old leaves, the drier conditions above (in comparison to the humid sandy-peaty soil below) were possibly inducing *U.reniformis* to flower. If this is true, then it may be easy to flower *U.reniformis* in cultivation by simply letting its pot dry out slowly, but not completely, for a few weeks. Or one could try planting it in very tall pots with loose soil, which remains wet near the bottom and nearly dry towards the top.

#### References

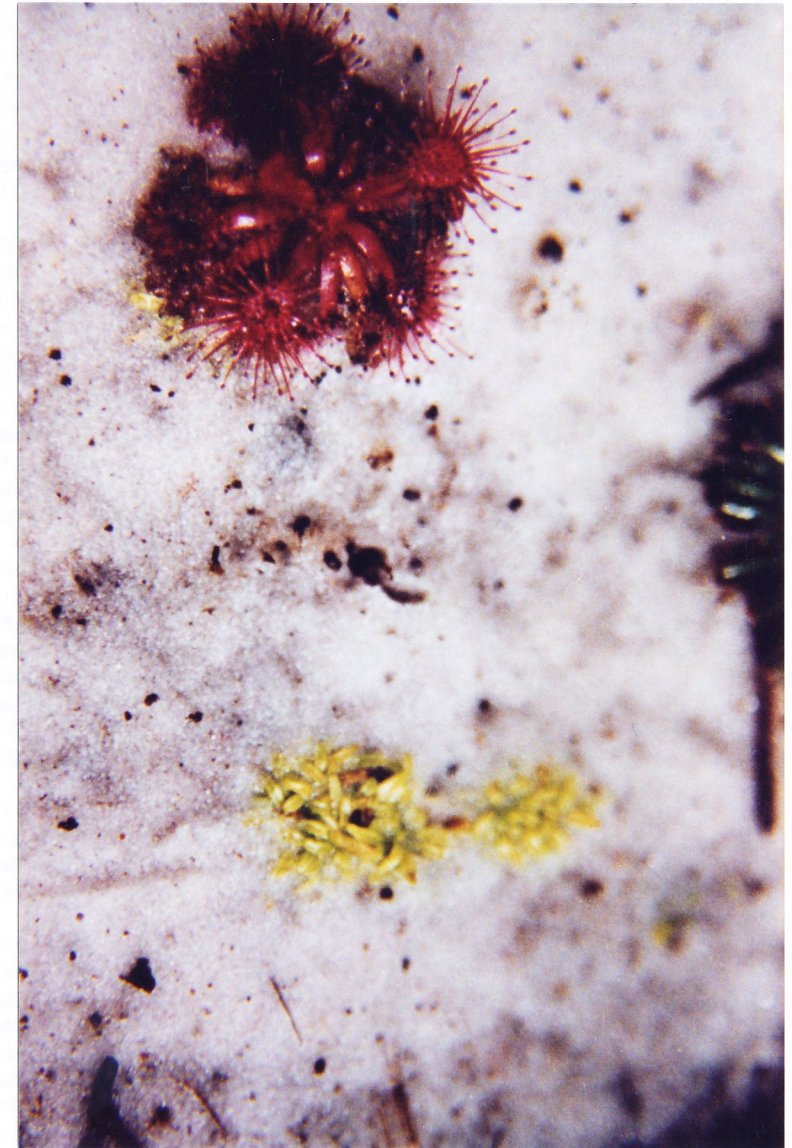
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Taylor, P. (1989). The Genus *Utricularia* - a taxonomic monograph. Kew Bull. Additional Series XIV. HMSO. London.

#### SERRA DO ARACÁ EXPEDITION

Fernando Rivadavia

For nearly six weeks, from mid December '98 to late January '99, I travelled around the northern reaches of Brazil and southern Venezuela. The main goal of this trip was to climb the highest mountain of Brazil and of the Guyana Highlands: the Pico da Neblina. Starting from the small town of São Gabriel da Cachoeira near the Brazilian/Venezuelan/Colombian border, it took seven CP friends and myself (as well as two guides and three porters) thirteen days to get to the top and return. I still find it hard to believe we actually made it there and back in one piece!

When Gert Hoogenstrijd from Holland and I had arrived in Manaus at the beginning of the Neblina expedition, nearly a month before, we had the chance to take a quick look at a large local herbarium. We saw several interesting specimens of *Drosera*, including a few unidentified ones from a place called Serra do Aracá.



*D. esmeraldae* and *U. longeciliata* from the Serra do Aracá



When we asked where this was, we were shown a picture of a beautiful tepuy and told that it was north of a town called Barcelos on the Rio Negro. So as soon as we were through with the Neblina expedition, Gert and I hopped on a ship down the Rio Negro, from São Gabriel do Barcelos. We were joined by another friend, Ed Read from Los Angeles, who had also climbed Neblina with us.

Time was short but we were miraculously already on a boat heading north out of Barcelos less than 24h after arriving in this small riverside town. The trip to Aracá was quite expensive because of all the fuel used by the powerful speedboat we took and because of the distance involved -- we went further north than Mt. Neblina, to a spot near the border between the Brazilian states of Amazonas and Roraima with Venezuela, crossing the Equator yet again. As usual, things didn't work out exactly as promised to us. What was supposed to be a 10h boat ride to Aracá became 18h -- with rain and cold weather during one full day on the boat -- and our two guides became too lazy to climb the mountain once we were there. Luckily we got another guide with a family living out there by the river.

We hiked through thick rainforest for nearly four hours before setting up camp at the base of the Serra do Aracá. At one part of the trail, the soil had suddenly become sandy and the vegetation typical savanna. There we had found *Utricularia subulata*, *U. amethystina*, and a strange little plant which we at first thought was a *Genlisea*, because of its compact leaf rosette. It was a species I had never seen before in the wild: *U. longeciliata*, unfortunately without flowers. From this area, we had our first view of the Serra do Aracá and it was truly enough a perfect tepuy, with the plateau at about 1100m and a few higher peaks up to around 1500m.

The following day we climbed the mountainsides for around three hours, mostly through rainforest. Almost at the top, we found *U. pubescens* growing on mosses by a shady stream. There were also some small filiform *Utric* leaves which I could not identify. Almost as soon as we reached the top, we began finding a small rosetted *Drosera* sp. growing in sandy soil among grasses. The leaves were wine-red in color, the flower scapes glabrous, and the flowers apparently white or pinkish (none were open).

The trail led us across the grassy plateau to a surprisingly nice and comfortable wooden house, which is where we would spend the night with the 'garimpeiros' -- rustic mineral prospectors, usually illegal. We thought they were after diamonds or gold, as usual, but they were actually digging up a mineral called tantalite (from which the metal tantalum is extracted) and the operation was rather well organized. We dropped our things off at the house and headed back out into the field, since we would have to leave early the following morning already. We could see some higher areas, rising above the plateau, but these were sadly too far for us to hike to and back in our limited time frame. We could also see some higher tepuys off to the northwest, reaching maybe 2000m in altitude, which looked very interesting.

Although we covered a very large area on the Serra do Aracá, we were sad to notice that it was rather poor in CP species. Like on Neblina, we didn't see a single *Genlisea* species. Although we saw numerous habitats that seemed perfect for *Heliophora*, we couldn't find any, concluding that 1100m was simply too low for them. But maybe on those higher tepuys to the northwest

*U. longeciliata* proved to be very common on the Serra do Aracá. In some places there were flower scapes, but these were already dry and flowerless. We did find more *U. pubescens* by a river, even in flower, together with the same unidentified *Utric* with the filiform leaves. I suspect these were possibly mutant *U. pubescens* leaves, and not a different species. The only other *Utric* found was an affixed aquatic species with small yellow flowers which I have been unable to identify. *U. alpina* has been recorded for the Serra do Aracá, but we saw no cloud forests, much less *U. alpina*.

As for *Drosera*, I still do not really know what to make out of what we found. The small rosetted species appears to be *D. esmeraldae*. In wetter habitats we found some rather large specimens with long stems covered with remains of old leaves. We thought these were *D. roraimae*, but the problem was that there were all sorts of intermediates between these and the smaller rosetted *Drosera* spread all around the Serra do Aracá. So were we

dealing with two species which possibly hybridize or were they all a single very variable species? I still haven't been able to solve this question, especially because no such variation has ever been for *D. esmeraldae* or any other species in northern South America.

That night, we sat around organizing the plants we had collected and comparing notes. The garimpeiros were not used to visitors, much less tall fair-skinned ones from distant lands. They gathered around us, mostly just staring. Some were a bit more bold and asked all sorts of questions. I think they had a hard time believing I was Brazilian, even though I spoke their same language. They invited us to have dinner with them, which we were more than glad to accept, sick and tired as we were of our usual never-changing drab camp meals.

As we sat down and began enjoying the rice, beans, and "beef", one guy casually mentioned how good the tapir tasted. "TAPIR?!?" I asked in disbelief and surprise, thinking he was simply trying to pull the legs of the stupid tourists. I didn't believe him until he pointed over to the big tapir head lying next to the stove behind us. Wow, we were actually eating a *Tapirus terrestris* they'd hunted right on the Serra do Aracá! For those of you not familiar, the tapir is the largest mammal of South America, a very shy creature about the size of a large pig and with a long snout. I've never been lucky enough to see one in the wild, although they're widespread in Brazil. And there I was eating one!

The following day we said our thanks and goodbyes and headed down the mountain, stopping briefly along the trail over the plateau to take a few last pictures. We were lucky to get no rain on the Serra do Aracá, but we had seen some large thunder clouds the day before which had nearly missed us. After nearly 4 hours of hiking down back to our boat, just as we were approaching the end of the trail, we suddenly came upon a huge stream which simply hadn't been there before. Looking at each other, puzzled, we thought we'd lost our way. Then the guide explained that it must've rained somewhere upstream. We were able to cross with some difficulty, but as we moved on, we had to cross more streams which hadn't even been there before, until the trail completely disappeared underwater. Trapped by the rising waters!

How would we get back to our boat? We couldn't swim back because we had too much weight, not to mention too many valuable things which were not water proof, like our cameras. We screamed for a while at the top of our lungs, and blew the whistles we carried, hoping someone at the guide's house would hear us, since it was not too far away. But nobody heard and in the end our guide dove into the water and disappeared among the tall trees of the now flooded forest. Maybe half an hour later he returned with our boat and the two guides who had been too lazy to climb the Serra do Aracá and had abandoned us.

Luckily the ride back to Barcelos was ONLY 12 hours long, although again we got lots of rain which lasted a whole day. It sure made us quite sick of riding boats, almost as much as we were of hiking through endless rainforest! We arrived in Barcelos the following day, after spending another night with locals who lived by the river. From there we took a ship on the same afternoon, arriving in Manaus less than 24 hours later.

Everything was fine as we drifted downriver past countless islands of the Anavilhanas Archipelago, which divides the Rio Negro into numerous narrow channels. The views become boring after a while and there's not really much to do. There was even a TV on that ship, but you had to guess what happened during each gap of static, since the satellite dish had to be constantly rotated manually as the boat zig-zagged downriver.

Once past the Anavilhanas Archipelago, we reached an open stretch of river where the margins were amazingly distant from each other and where water extended all the way to the horizons both upriver and downriver. And that's when the storm hit us! The chilly wind roared past us, the boat was suddenly going up and down large waves like on a roller-coaster, the hammocks everyone was sleeping in all swung back and forth together like huge pendulums. As a result, our stomachs turned inside out, wanting to return all our lunch. Aargh! I never knew "riversickness" could be as bad as seasickness! Luckily it only lasted an hour or two and our lunches stayed in place, although I at least was still feeling sick when I went to bed that night in Manaus.



From Manaus, Ed had to return home, but Gert and I continued north to the state of Roraima and then southern Venezuela. We had intended to climb mt.Roraima, but we didn't have time and simply explored the Gran Sabana for three days, turning up nearly 30 species of CP, including *Drosera*, *Utricularia*, *Genlisea*, and even *H.heterodoxa*!

### That dammed elusive Pimpernel

Richard Davion

I've been int'rested in the Scarlet Pimpernel or Common Scarlet Sundew; *Drosera glanduligera* for many years now, ever since I first saw it on the roadside at Cannington Swamp back in the Mid-Seventies.

Although it is often called the scarlet pimpernel I have never seen any form other than that which produces the common Orange flowers that incidentally I have observed to track the sun.

My main interest in the species lies with its deep(3-4mm, the deepest of any known species) scallop shaped traps and the prominent full splay of Ribbon Tentacles that adorn the ground for a centimeter around each trap. These appear to display no refractory period and can on 35°C days move faster than the human eye can detect which probable makes it the fastest moving sundew in the world and well worth studying for this fact only let alone its exceptional beauty.

Most common *Drosera* display a refractory period - ie a time interval or interval of time between physical/chemical stimulation and actual movement or response to the applied stimulus ie bending over of the tentacle. The refractory period of *Drosera pygmaea* is around 20 seconds when the temperature is in the mid-twenties, just enough time for the average enthusiast to give up and move away and miss some quite rapid tentacular movement and can be quite breathtaking when unexpectedly noticed out of the corner of ones eye.

Not much work if any has been done on the vast array of *Drosera* species around the world mainly I think because of the requirement for time-lapse photography at higher temperatures though it may be possible to extrapolate times at higher temperatures by studying them at a number of lower temperatures if a definite relationship between time and temperature can be discovered.

The trouble with *Drosera glanduligera* is that it is a small ephemeral plant with a growing season of about 3.5-4 months from seed and in cultivation it is extremely hard to maintain once germinated.

I have a colony of plants that is only 5 minutes walk from my house but even so I have had little success until recently even though one would think with a colony so close to home that I would have ideal conditions for its growth in my backyard!

Last season (Winter 1998) I tried yet again to grow this species. I laid down a copious quantity of seed in a 32 by 28cm flat and just for a little interest I placed at two of the corners and at the midpoint on the other side 100mls of three related variations of the Serpentine fertilizer I have been developing since 1994.

The flat sat unperturbed through the whole of last year with not a single germination being observed however this year I have had three separate germinations but surprisingly they have all occurred within the fertilizer zones and the plants are continuing to grow as if they were in the wild even though the flat is just a 50/50 peat and sand mix.

So from this I have inferred that we may closer to understanding its requirements for growth however mass germination may still be a matter of smoke and mirrors.

### Black Silt Richard Davion

I have read some of the literature specifically concerned with the Atlantic Coastal plain in which *Dionaea* as well as many other Carnivorous Plants are found. The soil in the case of *Dionaea* is described as a "Rough silt" to "Fine sand". The most graphical representation of this I have seen are photographs of self-supporting wet bridges of this soil - something you can't do easily with quartz sand alone.

Technically the soil is known as The St.Johns' (pronounced synjon by the initiated) soil series which is an intergrade between the Kley and the Leon soil types often referred to just as 'Kley-Leon' and is primarily differentiated from its counterparts by the presence of an *organic* hardpan about 30 cms below the surface which causes it to become inundated following heavy rains throughout the year thereby resulting in its classification as a Ground-Water Podzol though nowadays all these types are ramified under the ungainly umbrella term of Spodosol which frankly conjures in my mind the image of a rapidly liquefying potato rather than anything related to a bog or swamp.

Though the soil is basically a 'sandy' medium of fine sand and silt, it does however incorporate a small percentage of amorphous *black* peaty material, that is very sticky [reputedly gets everywhere when handled], which is often referred to as 'mould'; presumably a reference to the quaint Victorian practice of producing "leaf-mould" every Autumn for the numerous stovehouses dotted around Victorian England and post Civil War America.

This 5-10% of amorphous black peaty material presumably is of an Ericaceous nature [ie high in Lignin and low in Sulphur and no doubt harbouring some form of Ericoid Mycorrhizae] rather than a Sphagnum degradation product and may explain to some degree the intense acidity (3.5-4.9 average pH range - stronger than neat Vinegar) of this basically sandy medium. Plants grown in 5-10% simulated mixtures of Sphagnum Peat and Quartzite sand usually fair poorly indicating that the native humus although rather meagre in presence, percentage-wise, is nonetheless as important as the Black Silt to the successful culture of this phenomenal plant.

In fact the successful cultivation of *Dionaea* appears to depend on the continued production of the "Long, Persistent" faun-coloured root hairs on each new root that eventually initiates from the base of every petiole. These root hairs are consistently produced in habitat but are rarely seen, in cultivation, outside of its native United States. Presumably mycorrhizae contribute in some way to the plants nutrition via these root hairs. According to DJ Read et al - the main purpose of Ericoid mycorrhizae is to supply Nitrogen from the surrounding humal layer to its host. If such a situation is found to occur with *Dionaea* doesn't this beg the question: "What is the true nature of its carnivory"?! My pet theory at present is that Sulphur, predominantly, rather than Nitrogen and to a lesser extent Potassium is/are the key element(s) being sought by *Dionaea* from its prey. If this view or assertion is in some way correct then a simple gradation of peats according to their Sulphur content ought to show a corresponding pattern of incremental growth.

The black nature of the silt probably indicates that it is either derived from basalt or is alluvial Serpentine washed down from the Appalachian mountains [The "Blue" Mountains' - a range containing a known belt of Serpentine running along much of its length] beyond the Piedmont region of North and South Carolina. I tend to favour the latter for reasons that will be revealed in a future series of articles.

Basalt, Serpentine and Shales(sedimentary rocks formed at the bottom of prehistoric ocean beds.) being derived from magma (unsolidified lava emanating from the Earth's molten core) are enriched with a whole gamut of interesting elements particularly the siderophores: Iron-like elements such as Nickel, Chromium and Cobalt; but are relatively poor in Potassium.

Many *Dionaea* sites are less than five miles ( $\approx$  8 km) from the ocean and undoubtedly receive salt-spray due to their low elevation upon the Atlantic Coastal Plain and prevailing North-Westerly winds. In fact there have been unsubstantiated reports of a few plants occurring in the sand dunes just behind Atlantic Beach, North Carolina



as well as statements that the water around Pocosins is often 'Brackish'. When one studies detailed aerial maps of the coast it soon becomes apparent that the coastline is very filigreed with fairly narrow estuarine waterways reaching many miles inland which most likely accounts for these reports.

My own experiments with seawater from our Southern Ocean have confirmed the view that many CP's can withstand 1/10 to 1/8 dilutions quite readily and ought to evoke reappraisal of the crux of the often publicized toxic nature of "Tap-Water" on CPs in general. After-all Adelaide tap-water is now considered to be the worst in the world and most international ships try to avoid taking on water whilst berthing at Port Adelaide whenever possible; yet I use it all the time, with seeming anonymity! Due to, or as a consequence of, the large amounts of Copper sulphate literally dumped into the Murray (River) annually, to prevent near-yearly resurgences of toxic algae blooms further downstream by Blue-Green algae (Cyanobacteria), Adelaide tap water is practically devoid of Iron - much of it being precipitated along the lower stretches of the Murray. Perhaps this is the key to discovering the precise nature of the often-reported intolerance of CPs to Tap water, worldwide?

The following is likely to be the first article to suggest the use of a biphasic medium for growing Carnivorous Plants \* This probably minimizes the production of noxious H<sub>2</sub>S which is injurious to roots as well as many organisms (Ericoid mycorrhizae?). Its emphasis on the fact that the native soil of *Dionaea* haunts is a mixture of Fine Quartz sand and a Black silt is very illuminating. This description compares well with the "Salt and Pepper" descriptions of other workers; presumably the quartz being a sand as fine as common table salt and the black silt being as fine as ground black pepper.

DIONAEA (Greek name for Venus). Droseraceae. Venus Fly-Trap. A remarkable monotypic genus of insectivorous plants, often grown for curiosity and in botanical collections.

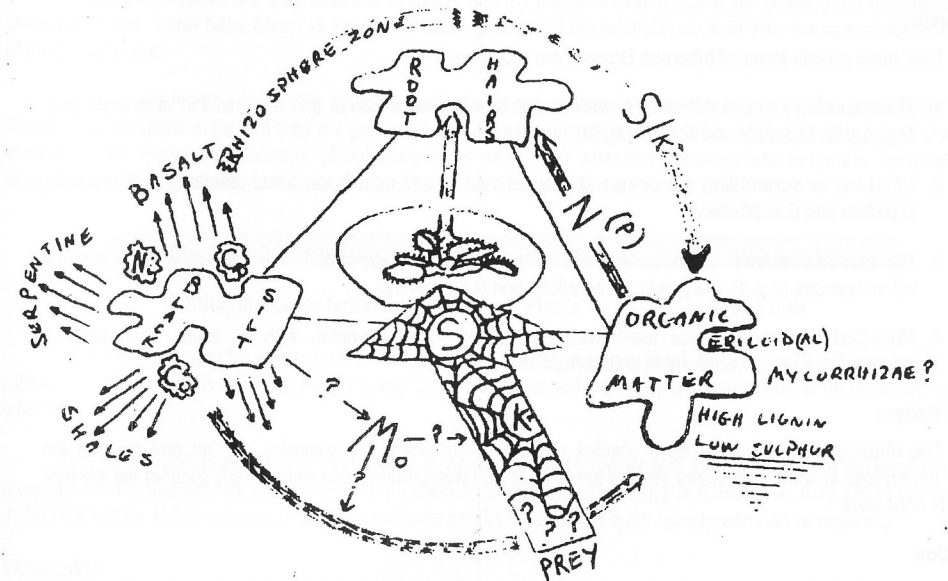
Leaves 1-5 in. long, 4-8 in number, are arranged in a spreading rosette over the soil, each consisting of a flat expanded petiole, and terminal bilobed blade; midrib of the blade contractile, the margins prolonged into bristles that interlock when the halves close, while each half bears 3 jointed and highly irritable hairs arranged in triangular manner over its upper surface; abundant sessile glands, usually of a crimson colour, cover this surface and render it attractive to insects; but when grown in shade the glands and therefore the lvs. are quite green: a single neat touch of a hair fails to cause closure, but when two adjacent hairs are touched once within a short interval apart, the halves close. Owing to continued and repeated stimuli caused by a caught insect, or to chemical stimuli caused by its tissues, the glands exude an acid and peptonizing digestive fluid after a few hours; this starts digestive disintegration of the insect's tissues, and the dissolved products are then absorbed by the fl.-halves: the fl.-stalk lengthens in May to 8-10 in. and bears 4-10 white fls. which expand in June, and which must be cross-pollinated for seed-production. By the end of June the caps. burst, and expose small black shining seeds. These germinate in abundance under a bell-jar on moist sandy soil that is mixed with finely chopped sphagnum moss. Each seedling, after forming 2 lanceolate cotyledons, produces there-after tiny fly-trapping lvs. that behave like the adult ones. Plants thrive well when grown in 3-5 in. pots amid a mixture of fine silver-sand and black silt. The pots should be kept immersed for about an inch in water, should have a slight topping of sphagnum, and must be kept near the glass in a greenhouse with southeastern exposure.

Inhabits the edges of moist sandy savannah "bottom" lands, is found wild over a narrow strip of territory about 10 miles in width and 40 miles north, also to an equal distance south of Wilmington, N.C., and grows well only when the tips of its roots reach a moist substratum, and when active transpiration proceeds. The perennial underground part is a bulbous swelling that can readily be dug and distributed from Nov. to March.

It is seldom that this wonderful little plant is seen in a good state of cultivation any length of time after removal from its native haunts. Its cultivation in a greenhouse is usually attended with more or less difficulty, owing to unsuitable conditions, such as too much dry air, shade or unfriendly soil. It delights in full sunshine, with a very humid atmosphere. **When the plants can be secured and transplanted with considerable of the soil in which they grow attached to the bulb-like rootstalks, they are quite easily dealt with, and may be kept in a healthy growing state for years.** I find a round hanging earthenware receptacle most useful to grow them in; the

bottom is carefully drained, first with large pieces of broken pots, then smaller pieces and the upper layer is quite fine. Some chopped fibrous peat is placed above this, when the plants are built in with live sphagnum moss used to fill the spaces between the clumps. Arranged in this way, it is hardly possible to give too them much water, and they revel in abundant supplies. If kept in the sun the leaves take on a reddish tinge, but when grown in the shade they are always green. Flowers will develop about the middle of June, but they should be nipped off as they make their appearance, for they are apt to weaken the plant. The *Dionaea* has been grown successfully in a dwelling-house by a very different method. The plants were in a wide, shallow dish, without any drainage, and simply placed, not too firmly, in loose live sphagnum moss, with a glass covering. Water was given every other day by filling the space above the plants until the dish was filled, and then it was poured off. In this way the potting material never became sour. From the luxuriant condition in which these plants remained for years, I am inclined to think this was a close imitation of the conditions under which they thrive in a wild state. Some years ago, owing to Asa Gray's endeavor to have the Government purchase a strip of land on which this plant grows, there existed a widespread idea that it was gradually becoming extinct. There seems to be little likelihood of this calamity, however, as *Dionaea* is found abundantly in some places. (G.W. Oliver, in Garden and Forest, 10:237 [1897]).

muscipula, Ellis. Fig 1268. St. short, subterranean, coated by the swollen bases of lvs.: lvs. 1-5 in. long in radial rosette, divided into winged petiole and bilobed lamina: infl. umbellate; fls. 3/4-1 in.; petals white; stamens usually 15; pistil of 5 united carpels, stigmas 5 pencilate: fr. a caps. B.M. 785 F.S. 3:280. Mn. 1, p 69



The use of grit/peat combinations in the cultivation of *Dionaea* and other CPs will probably have to be reconsidered in the light of this information and may result in better growth all round.

\* As a consequence of this article I now regularly incorporate 28-35% Bean-bag prilling ["Bag-o-Beans" - roughly \$10 Dollars / 100 Litres] to my standard flytrap mix of 11 parts (Canadian) peat / 9 part fine quartz sand (from experiments this is +/- half-a-part away from 'ideal' for a plain peat & sand "flytrap" mix ... though at present I just haven't found the time or energy to find out if it should be slightly sandier or peatier; maybe this could be a Societal



effort?). You have to mix the polystyrene (4-8mm) beading into the peat-sand mix in a slightly wetter state than usual in order to get the prills to spread evenly throughout the medium. With *Cephalotus* I like to mound the pots with an attractive dome of the mixture though I must say a number of prills do wander from the surface during, and after, shaping and compacting. If you can withstand your medium looking as though it is sprouting the prelude to a sea of 'button' mushrooms, then I think you'll find this to be a rewarding experience. You can of course exchange the prilling for Sphagnum or large chunks of charcoal ("Black-Magic" brand). Similarly to the mounding I have found that you can insert an inverted pot at the bottom of a deep pot (with a Flywire base) for added drainage. I have contemplated replacing the inverted pot with a mound of black-magic charcoal but so far haven't got around to attempting such a feat.

## Growing Tuberous *Drosera*

Ken Harper

### Introduction

Tuberous *Drosera* are a diverse yet distinctive group of sundews, growing for only part of the year and seasonally retreat to their underground rootstock. All known species are native to Australia, with the greatest concentration in the south-west corner of Western Australia.

### The Species

Four basic growth forms of tuberous *Drosera* are recognised:

1. **Erect sundews** - have thin erect or trailing stems, with peltate leaves and a terminal inflorescence (e.g. *D.gigantea*, *D.peltata* and *D.microphylla*)
2. **Climbing or scrambling sundews** - leaves all cauline and peltate, no basal rosette (e.g. *D.modesta*, *D.pallida* and *D.subhirtella*)
3. **Fan-leaved sundews** - spatulate to reniform leaves, often strongly folded, with either auxiliary or terminal inflorescences (e.g. *D.platypoda*, *D.ramellosa* and *D.stolonifera*)
4. **Rosetted sundews** - have few-leaved rosettes to 12cm diameter, with an erect, often terminal inflorescence (e.g. *D.bulbosa*, *D.erythrorhiza* and *D.zonaria*)

### Growth Pattern

The majority of tuberous *Drosera* species grow naturally where the summers are hot and dry and the majority of rain falls in winter. Sundews survive summer in an underground tuber and in early autumn the sundew breaks its dormancy.

### Cultivation

I generally obtain tubers over summer. Beware to correctly identify the tubers after your purchase because they are frequently mislabelled. Allen Lowrie's book is an essential companion to assist in identifying tuberous sundews.

Provided they are given an annual dormancy period, tuberous *Drosera* are relatively easy to cultivate. I use a basic mix of 1 part peat moss to 1 part coarse river sand but with some of the more sand-loving types (e.g. *D.zonaria*) the mix is more like 1 part peat moss to 2 parts sand.

Tubers must be planted so that their "eye" is facing upwards, just like you would treat a potato. The tuber should be planted at a depth of 5 to 10 cm below the surface of the soil. The exact depth depends on the particular *Drosera* involved.

Tuberous *Drosera* are best grown in large pots, the bigger the better. Over their growing period these sundews need to be kept damp by either watering from above or the tray method and given plenty of direct sunlight.

Watering should be reduced once the above ground portion of the plant begins to die. During dormancy the pot should be kept dry and placed away from where it could receive natural rainfall to ensure a proper dormancy. It is important that the soil does not completely dry out since these conditions are conducive to allowing the tuber to dry out and die. Alternatively, tubers can be removed from their pots and placed in the refrigerator.

### Propagation

I have had most of my tuberous *Drosera* species produce seed and this has been donated to seed banks all over the world. Seed is best sown in the first autumn after it has been produced and plants generally take three or more years to reach maturity.

Asexual propagation occurs naturally with the production of additional daughter tubers. Species such as *D.erythrorhiza* ssp. *erythrorhiza*, *D.whittakeri*, *D.tubaestylus* and *D.bulbosa* ssp. *bulbosa* all reproduce via this means. Tubers should be divided during dormancy and repotted every two or three years to avoid overcrowding. It is a real challenge repotting tuberous *Drosera* to ensure that all tubers are removed from the soil and that pots don't become mixed with a variety of tubers.

### Summary

Tuberous *Drosera* are truly beautiful sundews and my personal preference is for growing the rosetted and fan-leaved forms. I only have about 15 species of these plants and am relatively content with the size of this portion of my CP collection.

My own preference is for CPs that can be displayed or just viewed for twelve months of the year. Tuberous *Drosera* can be spectacular and they are generally at their best when other CPs aren't. I think that all growers should experience the glorious uncertainty of not knowing whether their tuberous sundews are terminally dormant or whether they will indeed reappear when the growing conditions are suitable.

## Potting media for fertilised Carnivorous Plants

Denis Daly

There is a need to be able to fertilise no matter what potting media is used. However with different media the rate of loss of nutrients by leaching and by being "locked up in the soil", will vary and cause one to be uncertain as to when to add more.

For peat based potting mixes the fertiliser is "absorbed" and together with the breakdown of the peat should provide sufficient nutrients for some time. The peat would tend to retard leaching of nutrients as they would be "held" in the peat but for 100% sphagnum growing nutrients can be leached out quite quickly with rain or watering.

### Vermiculite

While vermiculite is excellent in soil based media it tends to be "greasy" when used in large quantities. This is to be expected as it is hydrated magnesium silicate, a clay. For more details refer to reference [4]. 25% vermiculite to 75% peat by volume is OK, but 25% vermiculite to 75% sphagnum is not. 50/50 perlite/vermiculite is OK.

However vermiculite is useful in small quantities due to its ability to retain nutrients [2] and thus resist leaching of those nutrients [2] [4]. One could use a small amount of shale in lieu of vermiculite to "hold nutrients". [5]



## Zeolites

Use in small quantities. Zeolites have superior ability to retain nutrients and resist leaching. Use at less than 1% of pot volume to hold nutrients. Pre-soak in diluted fertiliser is possible. For more details refer to reference [4].

## Perlite

A grey/white volcanic siliceous material. Holds 3 to 4 times its weight of water. Cannot resist leaching of nutrients. A filler to increase air filled porosity. Fluoride content can be a problem. When mixing dry perlite it is necessary to wear a face mask due to the fine dust given off. For more details refer to reference [4].

## Sand

Good old sand. An inert filler that increases air filled porosity. Neutral. May contain weed seeds. [4]

## Polystyrene Foam fillers

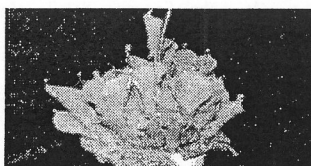
Finely chopped up Polystyrene foam, 50% of the volume of the potting media, can be used to increase the air filled porosity of any media. Used by some orchid growers [3]. Used with sphagnum it will prevent the sphagnum under the live top layer of sphagnum "sticking together" and "glugging up", and thus delay the natural process of sphagnum "breakdown" to sphagnum peat. Chemically neutral[5].

BUT beware of using the soft polystyrene as used for the "beans" in "bean bags" filling. The chemicals that are added to soften them are often toxic to plants[3]. If it is soft and pliable rather than rigid and stiff it is likely to be poisonous to plants. If you have any doubt don't use it. If you try a new brand of bean bag filling use one "expendable plant" first, but to be certain you should wait at least one season before you use it on other plants.

## Live Sphagnum.

LIVE sphagnum has very desirable features:-

- High Air Filled Porosity index.
- Excellent water retaining properties.
- Anti fungal properties.
- Holds 20 times its weight of water[1].
- Any gradual pH rise will be monitored by the health of the growing sphagnum which grows best in an acidic environment.
- As a consequence of low humidity above the pot crystals of salts will migrate to the very tips of the sphagnum and the tips of the sphagnum will go white, or whitish brown or brown and will eventually die. This can be readily seen and removed by "mowing the sphagnum lawn". In a peat based potting mix, when the salts build up on the surface of the pot, its time to repot.
- Ease of detection of problems (sphagnum starts dying) and ease of leaching excess nutrients.
- Compatible with peat, perlite, zeolite, polystyrene and with small amounts of vermiculite.



"I love live sphagnum."

Nathan Clemens'  
H. minor x heterodoxa

## Kiln Dried or DEAD Sphagnum

Useless and dangerous (contains infectious fungi). If the bag is a "light as a feather" it is kiln dried. This stuff is rubbish. Don't waste your money.

Also check for traces of green growing tips. Transport costs are cheaper for kiln dried sphagnum as it is very light (1/20<sup>th</sup> of the mass of living sphagnum!) and thus you will have to be on your guard for the reseller who re-wets the kiln dried product and sells it as live sphagnum.

## Peat, sphagnum and polystyrene mix.

When the benefits of the use of polystyrene in orchid cultivation was brought to Peter Biddlecombe's attention by the Species Orchid and Carnivorous Plant Society of the Illawarra[3], I commenced to investigate the benefits that may be realised with a combination mix of sphagnum, peat and polystyrene for carnivorous plant cultivation.

I mixed, by volume, 1/3 peat to 2/3 live sphagnum and then added an equivalent volume of chopped polystyrene. I used a food processor's "cheese grater" to chop up scrap packaging polystyrene. BUT again I reiterate:- beware of using the poisonous soft polystyrene "beans". If the polystyrene is soft and pliable rather than rigid and stiff don't use it on your good plants until you "test it".

This mix "feels" warmer with the polystyrene present and tentative experiments indicate it will be good for *Nepenthes* cuttings. I suspect it will be of great value for many plants, and *Nepenthes* in particular, that are grown in very wet and humid conditions under less than optimal light and temperature conditions, such as terrariums and cool glass houses in winter.

The peat will provide nutrients and "store" some of any added fertiliser nutrients. A layer of 100% living sphagnum should be placed on the surface. Such an arrangement would not adversely affect the beneficial and monitoring functions of the sphagnum.

However not all carnivorous plants should be grown in sphagnum based mixes:- e.g. *Drosophyllum*, *Byblis*, tuberous *Drosera*, pygmy *Drosera* are better in peat/perlite and/or peat/sand mixes. Some *Pinguicula*'s seem to like a vermiculite/perlite mix.

## Peat based potting mixes

The traditional mix for carnivorous plants, particularly for those who dread using fertiliser, is peat and sand.

In reality the peat is your fertiliser. Thus your plants depend upon the "quality" of the peat. This has led to the various controversies as to the "best origin/brand" of peat.

Simply put, the best peat is the brand that has some nutrients left in it and has not been loaded with a strong fertiliser dose to make a "leached out peat" fit to be sold for general horticultural use.

For the "unfertilised peat product" a single application of dilute soluble fertiliser, including trace nutrients, in spring will give your plants a "boost".

## References:

[1] Personally conducted experiments.

[2] DALY Denis, **The salesperson with flecks in their hair**, FlyTrap News Vol 11 No 1, July/August/September, 1997, The Carnivorous Plant society of NSW, ISSN 1323-8159, page 27 paragraphs 1 & 2.

[3] Advice from the Species Orchid and Carnivorous Plant Society of the Illawarra.

[4] DALY Denis, **Mineral Nutrition of carnivorous plants**, FlyTrap News Vol 9 No 4, April/May/June, 1996, The Carnivorous Plant society of NSW, ISSN 1323-8159, page 21.

[5] DALY Denis, **More potting mix component details**, FlyTrap News Vol 10 No 1, July/August/September, 1996, The Carnivorous Plant society of NSW, ISSN 1323-8159, page 11, 12.

### *Utricularia nephrophylla* Benj. in the Wild

Fernando Rivadavia

*Utricularia nephrophylla* Benj. is a medium-sized perennial, although relatively minute if compared to the other members of section *Iperua* P.Taylor: *U.geminiloba* Benj., *U.humboldtii* Schomb., *U.nelumbifolia* Gardn., and *U.reniformis* St.Hil. – some of the largest species in the genus *Utricularia* (Taylor, 1989). The above taxa are all found exclusively in eastern Brazil, except *U.humboldtii* which grows in northern Brazil plus southern Venezuela and Guyana.

The species of sect.*Iperua* are commonly referred to as epiphytic by CP cultivators – together with *U.longifolia* Gardn. from sect. *Psyllosperma* P.Taylor. Although *U.nelumbifolia* (always), *U.humboldtii* (usually), and *U.reniformis* (extremely rarely) do grow epiphytically in the water-filled leaf axils of bromeliads, they should not be confused with the similarly large species of sect.*Orchidioides* A.DC., such as *U.alpina* Jacq., which truly grow on trees and even have tubers. *U.geminiloba* with small tubers are reported by Taylor (1989) and I have seen this in a specimen collected by a friend, but I don't know how common or not it is.

*U.nephrophylla* was discovered and described in the mid 19th century and until recently it was only known from the state of Rio de Janeiro plus nearby areas of Minas Gerais and Espírito Santo, as well as a single unlocalized specimen supposedly collected in Bahia but suspected of being a mislabelled herbarium specimen (Taylor, 1989). It is recorded as occurring "mostly" between 600 and 1200m of altitude, although it has been collected from sea level to 2500m (Taylor, 1989).

The leaves of *U.nephrophylla* consist of a short narrow petiole attached to a small lamina varying between circular and reniform in shape. The lamina is c.0.1-1cm wide, up to 2cm long, and is covered with pinhead sized bumps, or pustules (Taylor, 1989). The scapes measure 10-35cm in length and plants may be found in flower year-round (Taylor, 1989). Seeds are rare in the field and I've never obtained any in cultivation.

I've seen *U.nephrophylla* in the wild at four locations. One was very near the famous statue of Christ in the city of Rio de Janeiro, inside the Tijuca National Park – a fantastic rainforest reserve located on the steep mountains in the middle of city. Along small roads criss-crossing these mountains, I found several sites with *U.nephrophylla* growing profusely on semi-shaded moss-covered wet rocks, at around 600m of altitude. The flowers were white with two yellow wrinkly crests on the lower lip and very rarely with a few purple streaks on the upper lip. On one particular rock wall of the Tijuca National Park dripping with water and more exposed to sunlight I once saw hundreds of flowering *U.nephrophylla* together with *U.longifolia*.

A second place where I've seen wild *U.nephrophylla* was at the Serra do Caparaó, on the border between the states of M.Gerais and E.Santo. Actually, I only saw the plants and not the site where they grew. You see, on this occasion I was on a ten-day CP marathon around Brazil with my friend Josef Mullins from Ireland, a botanist and CP enthusiast. He was the one who found the *U.nephrophylla* location, I was already a few kilometers further down the mountain exploring other CP sites with another friend, Fábio Pinheiro. We'd left Joe behind since he was busy ogling every "weed" along the trail – it was his first trip to the tropics! The *U.nephrophylla* specimens he brought down to us had light purplish-pink flowers with the two ridges on the lower lip colored a deeper purple and showing little or no yellow. He also brought specimens of *Drosera villosa* St.Hil. (a very small and deep-red form endemic to those highlands), a large-flowered form of *Genlisea aurea* St.Hil., and *U.reniformis*, which were all growing with the *U.nephrophylla* – all of which we'd already seen at other sites on that mountain.

Another highland where I've seen *U.nephrophylla* was at the Serra dos Órgãos in R.Janeiro state. This was towards the end of the same CP-marathon with Joe Mullins, while taking the 'scenic route' to the coastal city of Cabo Frio where we would search unsuccessfully for *D.intermedia* Hayne, the only *Drosera* species native to Brazil south of the Amazon Basin which I still hadn't seen in the wild. Excluding the fantastic views along the road carved along the steep granite cliffs, the ascent of the Serra dos Órgãos was rather uneventful since we found no CPs. We finally got lucky near the top, at around 1300m, where we came across two sites with small-leaved and flowerless *U.geminiloba*.

I found it very hard to concentrate on that dangerously-steep and winding road while descending the highlands towards the city of Teresópolis. My eyes constantly wandered from the magnificent views on our right to the rocks dripping with water on our left, offering new possibilities of finding CPs at each sharp bend of the road.

Suddenly at around 1150m of altitude, a curve brought us alongside a rock wall covered with long *Utricularia* scapes loaded with purplish flowers! Yelps of joy as I quickly searched for a place to park. In a flash we were outside the car, examining the plants on the wet moss-covered rock, a habitat similar to that of *U.nephrophylla* at the Tijuca National Park – where I'd take Joe two days later, our last CP stop before heading back to São Paulo. The hundreds of beautiful flowers on scapes 10-40cm high belonged to both *U.nephrophylla* and *U.geminiloba* and I was especially excited because until then I'd never seen the latter in flower. The *U.nephrophylla* flowers were purplish-pink in color with two yellowish crests on the lower lip.

We found a few more sites along the road with both these *Utricularia* species, in some cases alongside *U.tricolor* St.Hil. and *Drosera villosa* St.Hil. The *U.tricolor* had a clear gelatinous mucilage covering its leaves and the base of the flower scapes, especially where these were buried in live sphagnum moss. I've seen this before with *U.huntii* P.Taylor, *U.pubescens* SM., *Genlisea aurea* St.Hil., and *G.pygmaea* St.Hil., but that was the first and only time with *U.tricolor*, a species I've encountered at countless sites while botanizing in Brazil.

The pinkish *D.villosa* grew up to 9cm in diameter. This species is widespread and extremely variable from mountain to mountain. The beautiful variety native to the Serra dos Órgãos – which has semi-erect leaves droopy at the apex, giving it a spider-like appearance – has unusually long petioles, wide lamina, as well as hairy flower scapes and leaves. This *D.villosa* form is featured in Slack (1980) and is the most widely cultivated of this variable taxon. The story goes that it was introduced into cultivation in the 1970's by a former CPer from Rio de Janeiro named Reginaldo Britto, who collected seeds from plants growing along that same road crossing over the Serra dos Órgãos. At other stops along this same road we also found *U.nelumbifolia* inside bromeliads at the base of a cliff and *U.reniformis* in live sphagnum moss – both unfortunately flowerless.

The fourth place where I found wild *U.nephrophylla* was, curiously enough, precisely where Taylor (1989) claimed it was very unlikely to occur, a probable herbarium mislabelling: in the state of Bahia. It was July 1995 and I was CP hunting in the southern part of the Chapada Diamantina highlands, exploring an incredibly botanically-rich region surrounding the isolated village of Catolés. Finding *U.nephrophylla* there was an unexpected surprise, not only because it supposedly didn't grow in Bahia, but also because that was actually the first time I saw this species in the wild. The flowers were a dark purple-blue in color with two yellow crests each on the lower lip. It was growing (once again) on a semi-shaded rock wall dripping with water, mostly in the cracks, together with the tiny light-lilac to white-flowered *U.parthenopipes* P.Taylor.

Nearby, in deeper pockets of soil on a small ridge of the cliff, grew one of the largest species of *Genlisea*: *G.uncinata* P.Taylor & Fromm-Trinta. Until then, this species was only known from the type location, a single mountain c.70km northeast of Catolés, near the town of Mucugê where I'd been botanizing a few days earlier. Only after three days of heavy hiking around Mucugê did I find *G.uncinata*. I almost fell backwards when I saw how huge it was – the inflorescences reached 80cm in height and were sometimes pencil-thick at the base! I think I almost suffered a heart attack when I dug out the first plant. The block of black soil in my hand contained an incredible mass of white severed *Genlisea* traps that were so thick I could split them open lengthwise from the bifurcation point of the two corkscrewed arms to the 'stomach', with my thumb nail! I have only seen similarly-sized traps in *G.guianensis*



N.E.Br. at the Venezuelan Gran Sabana and in M.Gerais state.

Anyway, this article is on *U.nephrophylla*, remember? There has been some confusion in the past between this species and *U.reniformis*, like in the Kondo's CPs of the World (Kondo, 1980), where *U.reniformis* is labelled as *U.nephrophylla*. Flowerless specimens of these two species can be confusing in the wild, since in less-than-ideal conditions *U.reniformis* produces tiny leaves similar to those of *U.nephrophylla*. Cultivating *U.nephrophylla* should be fairly easy, if the habitats described above are kept in mind. It would probably grow well if placed together with the highland *Nepenthes* in one's collection, preferring high air humidity, indirect sunlight, and year-long cool temperatures between 10 and 25°C.

References:  
1.) Kondo, K. 1983. Carnivorous Plants of the World. Ienohikari Association. Tokyo.  
2.) Slack, A. 1980. Carnivorous Plants. Reed. London.  
3.) Taylor, P. 1989. The Genus *Utricularia* - a taxonomic monograph. Kew Bull. Additional Series XIV. HMSO. London.

How to tell *D. auriculata* from *D. peltata* around Sydney Robert Gibson

In the Sydney region four different variants of *Drosera auriculata* and *D. peltata* occur. Although requiring further taxonomic work, an examination of the sepals will enable you to distinguish between the two species:- The sepals of *D. auriculata* are hairless whilst those of *D. peltata* have some degree of hair cover. Most earlier methods of distinguishing between these two species has also been based on seed length; with *D. auriculata* characteristically having long, narrow seeds over 0.6mm in length, and those of *D. peltata* having ovoid seed under 0.6mm long.

The four variants have been informally given names based on their conspicuous features:- *Drosera peltata* var. green rosette/ pink petal form, *Drosera peltata* var. red rosette/ white petal form and *Drosera peltata* var. "Western Sydney" The latter variant has smooth sepals but short seeds and may also be considered a variant of *D. auriculata*. The table below lists key features of the four variants around Sydney and supplements observations presented in FlyTrap News Volume 12 No 1<sup>st</sup>.

Feature	<i>D. auriculata</i>	<i>D. peltata</i> var. green rosette/ pink petal form	<i>D. peltata</i> var. red rosette/ white petal form	<i>D. peltata</i> var. "Western Sydney"
Seeds	Linear, 0.8 to 1.2mm long	Ovoid, to peanut shaped, 0.5mm long	Ovoid, to 0.4mm long	Ovoid, to 0.4mm long
Sepals	Smooth, oval, with a slightly toothed edge	Variably hairy, with a fringed edge	Densely hairy, with a fringed edge	Smooth, oval, with a base variably fringed edge
Basal rosette	Olive green, not always present	Yellow green, almost always present	Red, almost always present	Olive green, not always present
Petal colour	White or pale pink	Pink, rarely white	White	White
Habitat	Sandy to clayey soils; widespread	Clayey soils; widespread	Sandy soils; locally common	Clay soils; very localised

It may not be possible to identify a plant especially if the basal rosette is absent; which can happen when the soil surface is heavily shaded, and before the plant begins to flower. The degree of branching of each variant appears to vary mainly in response to local environmental factors and does appear to be a diagnostic feature of any of the taxa. Additionally, the dormant tubers are virtually identical in shape, size and colour. When dormant or actively growing but non-flowering plants are found in the wild the habitat and basal rosette, when developed, are the most useful guides in applying a name. This is particularly so with the robust yellow green rosettes of *D. peltata* var. "green rosette/ pink petal" and the more delicate red rosettes of *D. peltata* var. "red rosette/ white petal form."

White petalled plants of *D. peltata* var. "green rosette/ pink petal" are uncommon around Sydney. However, this form may still be identified on account of its robust yellow green rosette and the peanut-shaped short seeds.

Further field studies are needed of these variants to resolve their taxonomy. However, all four taxa are quite distinct and may be seen in the field around Sydney.

References  
[1] GIBSON Robert, *Native Carnivorous Plants around Sydney*, FlyTrap News Vol 12 No 1, July/August/September, 1998, The Carnivorous Plant society of NSW, ISSN 1323-8159, pages 4 – 10.

Electronic Dew Drops Nathan J. Clemens

Welcome to a new page to Flytrap News, that deals with the mountains of questions and advice that can be found on the electronic information super- highway. Being on the net, I have a daily smorgasbord of carnivorous plant tit-bits, courtesy of the **Carnivorous Plant Digest**. Now, this is much like a noticeboard, where one can post any cp question, answer or simply mind boggling item. All it requires is that you subscribe via your email address to the listserver, and then you are set for some great surprises. Just try to imagine a daily delivery of the ultimate cp magazine, all free of charge!

As not everyone has access to an email account or the net, I am gracefully allowing all members of the NSWCPs some snippets of privilege. The first little ditty is a light hearted but serious recipe for all of you Nepentheophiles! It originally appeared in the Jan/Feb 1999 issue of Borneo Magazine. So, I will leave you all to read on, ready to run out of the house to harvest your precious *N. ampullaria* pitchers!

- a) Take 2 dozen fist sized pitchers (*N. ampullaria*). Wash and carefully scrub their insides then soak them in several changes of water, preferably overnight. Soak 1kg of glutinous rice overnight.
- b) Trim tails off of the pitchers
- c) Put to boil the rice with coconut milk (first and second squeezing) and salt.
- d) Wash 2 cupfuls of fresh prawn, cut up small. Finely slice half a cup of red onions. Pound a knob of shrimp paste (belachan) with 4 or 5 chillies (to make sambal), and small bundle of spring onions and a small bundle of celery leaves. Combine the pounded ingredients with the prawn. Fry this mixture in a small amount of oil until fragrant.
- e) When the rice is half cooked, remove pan from fire. Cool the water slightly. Half fill the pitchers with rice, add one tablespoon of the fried sambal mixture. Fill up the pitcher with rice.
- f) Stand the pitchers in the steamer, cover, steam over boiling water for half an hour. Serve hot from the steamer, or cold later on. Pitchers may be reheated by steaming them.

Well, I hope that all of you at least try this great recipe, and post the results after you have eaten a few! Until next time, stay tuned for your dose of freshly squeezed Electronic Dew Drops!

References:  
CP Digest 1723, Wed, 07 Jul 1999, cp@opus.hpl.hp.com. Maintained by Rick Walker.

The *Sarracenia flava* complex was exactly that, up until now. In the December 1998, Volume 27, number 4 issue of the Carnivorous Plant Newsletter (CPN), Donald Schnell published the amended variety classification epithets for the many varieties of *S. flava*. For a great deal of time, there has been widespread confusion on the correct names for the many variants that the *S. flava* complex contains. Donald Schnell is a well respected authority on *Sarracenia*s, and his final and definitive set of Latin names, with descriptions, sets the record straight for all carnivorous plant enthusiasts. The International Carnivorous Plant Society is the officially recognised body for the registration of all carnivorous plant varieties and cultivars. So, it is with the endorsement of the ICPS President, Dr Barry Meyers-Rice, that I reproduce the seven varietal names and descriptions, so as to highlight the importance to all Australian growers of identifying their collections correctly. This will help present and future communication between all admirers of *S. flava*s, and thus ensure the survival of a beautifully diversified collection within a species.

1. *Sarracenia flava* var. *flava*

Prominent deep red to purple pigment deposition in the pitcher throat with variably prominent red venation radiating from this over the lid and upper pitcher tube. Informally, this was previously designated 'typica' by me (1978). Since this is the predominant variety in the type area of the species, it automatically bears the specific epithet without authority. Very prominent in the Atlantic coastal plain, currently rare in southeastern Virginia, and far more common in North Carolina and South Carolina.

2. *Sarracenia flava* var. *atropurpurea* (Bull) (Bell) (1949)

Lid and external pitcher tube a deep red in ideal growing conditions, pitcher interior pale tan. Informally, I previously listed this as 'all red' (1978) which correlates well with earlier descriptions of var. *atropurpurea*, so of course it is retained here. Uncommon, Atlantic coastal plain of North Carolina and South Carolina, rarer yet in Florida panhandle.

3. *Sarracenia flava* var. *maxima* Bull ex Mast. (1881a)

The epithet is unfortunate for this variety since one would *a priori* suspect it refers to pitcher size, and has been mistakenly used in this respect. In fact, the key early descriptive feature of this variety is that the pitchers are green with no red venation or red coloration of throat. Note: these plants are not the equivalent of anthocyanin-free taxa elsewhere in the genus since the bases of pitchers and cladophylls of var. *maxima* do have some red pigment. Uncommon throughout the range, but most easily found in the Atlantic coastal plain of North Carolina and South Carolina, far less frequent in northwestern Florida.

4. *Sarracenia flava* var. *ornata* Bull ex Mast. (1881b)

Deep red to purple throat pigmentation nearly obliterated by very strong and heavy red venation throughout pitcher tube and lid. This was informally previously designated 'heavily veined' by me (1978). It is frequent in the Atlantic North Carolina and South Carolina coastal plain, far less easily found in northwestern Florida.

5. *Sarracenia flava* var. *rugelii* (Shuttlew. Ex A. DC.) Mast. (1881c)

Top of pitcher more widely expanded and with larger lid than other varieties, prominent large deep red to purple pigment area in pitcher throat that is often fractured with smaller satellite areas but with no significant venation. This variety has erroneously been called var. *maxima* by some. Common and prominent variety in southern Georgia and northwestern Florida.

6. *Sarracenia flava* L. var. *cuprea* Schnell, var. nov.

The upper surface of the lid and sometimes the upper ¼ part of the external tube are prominently copper-colored or rust colored. The epithet *cuprea* refers to 'copper color'. Southeastern coastal plain, most prominent in North Carolina and South Carolina, rare in northwestern Florida. Habitat is open or moderately shaded savannas,

drainage ditches, seep bogs and along shallow, meandering streams. This is the variety formerly referred to informally as 'copper hooded' or 'copper lid' (Schnell, 1978).

7. *Sarracenia flava* L. var. *rubricorpora* Schnell, var. nov.

The pitcher is externally dark red, internally yellowish-buff, the lid yellow-green and having prominent red venation. The epithet parts are '*rubri-*' being red, and '*-corpora*' referring to the pitcher tube body. Restricted to northwestern Florida. Habitat is open or moderately shaded savannas, ditches and seep bogs. This strikingly beautiful variety is restricted to the Florida panhandle Gulf Coast and has been widely known and referred to for years but not formally described. It is common in the global sense, often occurs in rather prominent stands when found where it affords a spectacular view. Being a Gulf Coast plant, it is not in my 1978 paper.

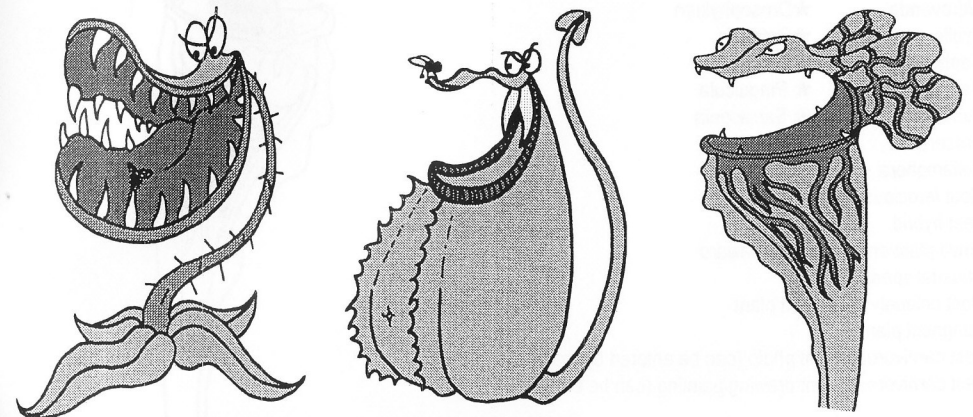
I recognise seven varieties of *S. flava* worthy of naming, the remaining color and vein presentations of a seeming spectrum in some locations being varietal hybrids or back crosses, or ecophenes. Five of these - predominantly in the Atlantic coastal plain - were studied and presented in my 1978 paper with formal designations applied until further 'library research' could match older formal varietal designations to some of these. One is given the 'default' varietal designation var. *flava*, three are matched with previous formal descriptions and varietal names, and one new formal varietal description herein (in CPN) published. On the Gulf Coast, not covered in my 1978 paper, two unique genetic varieties are discerned, one matching a previously published varietal epithet, and the second being formally described herein (in CPN). All seven of these varieties can now be referred to by formal, accurate varietal names, and there should no longer be confusion about what epithet applies to what variant.

So there you have it. I hope that all growers of this species take it upon themselves to amend all of their *S. flava* labels and listings, so as to pave the way for accurate and easy trading and sharing of plant materials. Hopefully these classification reviews can be carried out on a few other species of *Sarracenia*, such as the *S. leucophylla* species and the myriad of variants that are becoming mainstays in many collections.

References

Donald E. Schnell, CPN 27:116-120, 1998

Introducing the logos drawn by Nigel Rapley for the Society

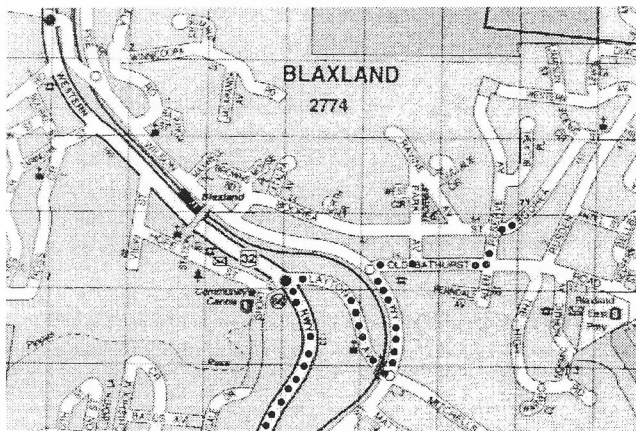




The Carnivorous Plant Society of New South Wales presents  
**The 1999 Christmas Swap Meet and Carnivorous Plant Show**

**When:** 11am Sunday 12 December 1999

**Where:** At the home of **Terry Nicholls 74 Boorea St Blaxland** in the beautiful lower Blue Mountains. To get there just follow the M4 motorway to the Blue Mountains, turn right at the traffic lights at Blaxland (near McDonalds) and follow the dots on the map below.



**What to Bring:-**

Carnivorous plants for competition  
 Plants for swap and sale  
 Any prizes to donate to the competition  
 Barbecue lunch (barbecue provided)  
 A chair (if possible)  
 A tarp (if it is raining)  
 More plants

**Do not miss out on the biggest event on the Carnivorous Plant calendar**

Last years Carnivorous Plant Competition saw some beautiful plants displayed, vying for some great prizes but this years competition promises to be bigger and better and everyone has a chance to win from the big list of species and novelty categories.

Competition categories include the following:

- |  |                |
|--|----------------|
| ★ Aldrovanda   | ★ Drosophyllum |
| ★ Byblis   | ★ Catopsis     |
| ★ Cephalotus   | ★ Nepenthes    |
| ★ Darlingtonia   | ★ Pinguicula   |
| ★ Dionaea  | ★ Sarracenia   |
| ★ Drosera  | ★ Utricularia  |
| ★ Heliamphora  |                |
| ★ Most ferocious plant   |                |
| ★ Best hybrid  |                |
| ★ Small plant encouragement award                                  |                |
| ★ Unusual species award  |                |
| ★ Most uniquely presented plant                                    |                |
| ★ Hungriest plant  |                |
| ★ Best carnivorous plant photo (can be entered by mail)            |                |
| ★ Best carnivorous plant drawing/painting (can be entered by mail) |                |

