Utricularia inaequalis

Utricularia multifida

Utricularia petertaylorii

Pinguicula leptoceras

Drosera moorei

Nepenthes dubia

Nepenthes aristolochioides

Drosera erythrorhiza ssp. squamosa

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December 2005 **No. 78**

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AUSTRALIA

Journal articles, in MS-Word, ready for publication, may be Emailed to the Editor or Secretary.

Meetings

Most VCPS meetings are held in the hall at the rear of the Pilgrim Uniting Church on the corner of Bayview Road and Montague Street, Yarraville – Melway map reference 41K7. These meetings are on the fourth Wednesday of the month at 8 PM.

However, some meetings may be at the home of members during a weekend. Details of meeting dates and topics are listed in each journal.

If unsure of the location or date of any meeting, please ring a committee person for details.

The VCPS Annual General Meeting, usually held at Yarraville in June, provides substantial benefits for each and every member able to attend.

VICTORIAN CARNIVOROUS PLANT SOCIETY Inc.

Issue No. 78 **December 2005**

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One of the largest flowers in its' genus, *Drosera pauciflora*'s flowers can reach 6-7cm in diameter. Photo: Stephen Fretwell

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Cephalotus follicularis. Photographed in the wild at Walpole by Richard Nunn.

BACK COVER:

Clockwise from top left:

- *Utricularia inaequalis*, grown and photographed by Sean Spence.
- *Utricularia multifida*, grown and photographed by Sean Spence.
- *Utricularia petertaylorii*, grown and photographed by Sean Spence.
- *Nepenthes dubia*, grown by Richard Nunn, photographed by Stephen Fretwell
- *Drosera erythrorhiza ssp. squamosa* photographed in the wild near Perth along the Brookton Hwy by Richard Nunn.
- *Nepenthes aristolochioides*, grown by Richard Nunn.
- *Pinguicula leptoceras* grown and photographed by Stephen Fretwell.
- *Drosera moorei (centre)* grown and photographed by Stephen Fretwell.

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MEETING TOPICS & DATES for 2006

VICTORIAN CARNIVOROUS PLANT SOCIETY

This year we have scheduled the following discussion topics, and events:

January	**(14th)**	New Year BBQ, *Darlingtonia, Dionaea.*
February	**(22nd)**	*Sarracenia* species and hybrids, beginners night.
March	**(22nd)**	*Nepenthes and Heliamphora.*
April	**(26th)**	*Drosera*, video and information night.
May	**(24th)**	Growing conditions, pygmy *Drosera* gemmae collection, 'best' and 'worst' plants.
June	**(28th)**	AGM, plant give-away, any CPs.
July	**(26th)**	Seed growing, tissue culture and potting demonstration, any CPs.
August	**(23rd)**	Tuberous/Winter growing *Drosera*, show preparation, displays, and companion planting.
September	**(27th)**	*Cephalotus*, *Brocchinia, Catopsis* and swap night.
October	**(29th)**	Field trip to Triffid Park (Sunday afternoon, commencing with barbecue lunch) *Pinguicula* and pygmy *Drosera.*
November	**(22nd)**	*Byblis, Drosophyllum, Genlisea, Roridula, Utricularia.*
December	**(TBA)**	Annual show at Collectors Corner.

Please note: All meetings, other than those where a specific venue is given, will be on the FOURTH WEDNESDAY of the month in the hall of the Pilgrim Uniting Church in Yarraville – corner Bayview Road and Montague Street, Melway Map Reference 41K7.

***Utricularia australis* in flower at the wetlands at Hoppers Crossing.**

Fieldtrip to Hoppers Crossing and Anglesea in search of *Utricularia australis* and *Drosera binata*

SEAN SPENCE.

In January of 2005 George Caspar, Steve Fretwell and I decided to revisit the Anglesea area in an attempt to locate populations of *Drosera binata*. The seaside town of Anglesea is famous for its sandy heathland that abounds in native wildflowers including many native carnivorous plant and orchid species.

After years of lobbying, the surrounding area is gazetted to become a National Park in the near future. The area is characterised by low heathland vegetation with sandy soils combined with areas of swampland – both perfect habitats for CPs.

I had last seen *D. binata* at Anglesea back in the late 1980s following a bushfire that had cleared out the large swamp that dominates the Anglesea river valley. Since that time the area had become increasingly overgrown by *Gleichenia* fern which had made penetration of the undergrowth surrounding the swamp virtually impossible.

We headed off to the area early in the morning after George and Steve arrived at my house. On the way we had decided to check out a swamp near Hoppers Crossing which was known to contain large populations of the aquatic *Utricularia australis*. I had discovered the plants growing in December of the previous year whilst searching for the flowers of *Utricularia beaugleholei* with Greg Bourke. We were hoping that the *U. australis* would be flowering as the water level had gradually receded.

Upon arriving at the open swamp it didn't take long to locate the *U. australis*. The swamp had dried considerably since I was last there and many of the *Utricularia* were growing on dried ground. Upon lifting some of the dried specimens we discovered that they had formed small turions on the undersides. The turions were produced on growth points of various lengths, some up to 5cms long. The turions had been pushed into the soil by the plant, an adaptation to survive the remainder of the hot dry summer. Previously we had assumed that this species only produced the turions in response to the cooler weather of winter. It was interesting to discover a new adaptation of these storage organs.

As we headed further into the wetland the water became deeper and the *U. australis* became more prevalent. The depth of the water in most areas was about 20-30cms and teeming with aquatic life. Many flowers were apparent however most had been damaged by rains received in previous days. The rains, combined with intensely hot days following, had left the flowers with tears and blemishes. Eventually we managed to find a few specimens with perfect flowers of which many photos were taken. Having achieved our aim in finding flowers of *U. australis* we headed off to the seaside town of Anglesea in an attempt to find *D. binata* and other summer growing CPs.

After a 45 minute drive down the Princes Freeway and through Geelong we arrived at our turn off, a few kilometres before the Anglesea township. We headed down Forest Rd until we found a small dirt track called Shiney-Eye track. This track heads down to the swamp and is recommended only for 4 x 4 vehicles – as George in one of his previous journal articles can attest. Unlike our previous trip to the spot, which was incredibly muddy, this time the area was very dry. We

***U. australis* left stranded on a high mud flat.**

Turions forming from the stem of *U. australis*.

George with a leech found in the wetlands.

***Drosera binata* T-form.**

Utricularia dichotoma.

Utricularia lateriflora.

also had the luxury of a larger 4 x 4 should the environment become too rugged.

Shiney-Eye track is one of a series of tracks which criss-cross the sandy conservation area. Most of these tracks are accessible year round however there are a few which head down to the swamp that are seasonally closed. The gates of these tracks are only open for the dry period between summer and autumn. We took a detour off Shiney-eye track down one of the seasonal tracks and headed for the swamp.

The swamp itself is approximately 5 kilometres in length by around 500 metres in width. The track winds around the circumference. We drove around the swamp in the hope that we might find an open area that we could walk into. Unfortunately the swamp was in dire need of an intense bushfire and accessibility was virtually impossible. We stopped at a couple of areas which were low and swampy but had no luck in locating any CPs. After circumnavigating the swamp we realised that it was fruitless continuing our search in this area.

At this point we headed off the track and found ourselves on the sealed Gumflats Road. We turned left and headed back into the bushland. It wasn't long before we passed another seasonal track called Allardyce track. This was a track I had never travelled down before and had no idea what to expect. After a short drive through very sandy soils we hit the top of a hill overlooking a low valley. We were very surprised and pleased to see that the area had been burnt out sometime in the recent past. Through the middle of the valley ran a small stream. The closer we got to the area the more it appeared to be the perfect habitat for *D. binata* and other CPs.

I parked the Jeep at the top of the hill and we headed down the valley. We first tried the eastern side of the track and pushed through the burnt out tea trees of the heathland. We each had to carry a burnt stick to wave around in front of us as spiders and their webs were rife throughout the area. After a short time searching we finally found what we had been looking for. A small patch of *Drosera binata* was found in a blackened, dry area. The plants were not looking terribly healthy, the extreme heat and lack of water had affected them and they were well past their best. After much searching we failed to locate any more plants on this side of the track.

We then crossed over to the western side. Instantly this seemed a more likely area for finding CPs. The ground was much moister and the creek seemed to be wider and more open. Before long we found large patches of *D. binata* carpeting the ground. The plants were not large, only around 10-15 cms in height. These had also passed their best.

The further we searched the more we found and as we headed down towards the stream we began to notice the small delicate, pale purple flowers of *Utricularia lateriflora* covering the ground. These plants were only small – averaging about 7 cms in height but they were in full flower and quite attractive in their own right.

I then decided to head further towards the centre of the stream where the ground was very wet and peaty. As I peered through the rushes and tea trees I noticed larger purple flowers filling the open areas. This was the first time I had seen *Utricularia dichotoma* growing in the Anglesea area. Most surprising was the time of flowering. Most other populations of *U. dichotoma* in lowland areas of Victoria had finished flowering long ago whereas these had only just begun.

The flowers of this form were quite large and around 2cms in diameter. The scapes too were tall, mostly around 30cms. The most interesting feature of this form though was the colour of the leaves. They were very difficult to spot on the peaty soil and were deep maroon in colour rather than the deep green that is common in other Victorian forms.

After taking many photos we decided to head off and see if we could find any more populations of CP. Unfortunately after much searching and traversing of dirt tracks we were unable to find any suitable habitat. One thing of interest that we did manage to locate was a bone dry stream that had incredibly large colonies of *sphagnum* sp. growing all along the banks. This stream is full of running water during the cooler, wetter months and would be quite an impressive sight during the growing season. We decided that the spot would be worth a look during our next visit.

The habitat at Anglesea where *D. binata, U. dichotoma* and *U. lateriflora* grow.

Utricularia dichotoma.

The Anglesea area is also known to contain the tuberous *Drosera* species – *D. peltata, auriculata, whittakerii* ssp. *aberrans, macrantha* ssp. *planchonii* as well as other *Drosera* species *D. pygmaea* and *glanduligera*. *Utricularia tenella* is also common in spring. Although we didn't manage to find any of these species due to the timing of our visit, it was still well worth spending a day in the area even though it was not at its peak.

The VCPS stand at the Gardening Australia show.

Gardening Australia Festival

GORDON OHLENROTT

This article is to give members some insight into our participation in the Festival at Caulfield Racecourse on the 29th September to the 2nd October this year, 2005.

We set up our display of CPs on Wednesday the 28th, so as to be ready for the first arrivals of the crowd on Thursday.

We included most of the readily available genera to try and give a complete picture of our plants in the limited space provided for the uninitiated visitors.

There were some *Nepenthes*: an N. x Allardii, one of the beauties originally from Triffid Park, and a couple of smaller plants having lots of bright red pitchers.

It was a fortunate time to display *Sarracenia*. In this group were three plants with some open flowers on each – one with deep red petals, one with pink petals, and another with yellow petals – "Wow!", "Beautiful!", we frequently heard. Most visitors to our stand were openly fascinated with the variation of colouring to be seen here.

David's fern log of *Pinguicula* and various other specimens in flower were also beautiful – "And you get them from Mexico? – fascinating!".

The VFTs were represented by a packed tray of small plants and a couple of 6" pots having much larger plants – most people didn't realise the VFTs could be so big. The green plant with red inside the traps, and the maroon 'Akai Ryu'- "The Red Dragon" showed some of the range possible for the Venus Flytraps.

The *Drosera* – *D. capensis* (in various colours), some pygmies, and some wonderful tall tuberous *Drosera* provided a good representation. The visitors were interested to learn that a considerable number of plants in this genus are native to Australia.

Our stand was situated on the Promenade level – the top public area within the grandstand. This portion of the whole festival was shown on the map provided for all the visiting public, so we seemed to have a good throughput of people most of the time.

The uniqueness of our plant types was a means of attracting attention from most of the passers-by. The people were fascinated and inspired by the beauty of the plants and what they could do to obtain their nutritional requirements. Frequently there was a bit of congestion for people trying to 'get a look' and ask questions about our assembled collection. Many people were slightly disappointed that we were not permitted to sell any plants during this time – this was in the rules for having been provided with a stand free of charge.

David printed a large number of small paper flyers to provide basic information about the VCPS: these were given to everyone we could reach on the way past. For those that stopped we mentioned the events elsewhere that would be of interest, such as the open day at Triffid Park and our show at Collectors Corner on the 4th and 5th of December – where there would be lots of plants for sale in each case. I did see some of the people from the festival attending at the open day. We hope that many remembered to come to our show.

With the hope that we will benefit from general awareness of CPs, and new memberships, we will apply for participation in this event in 2006.

***Utriculaia inaequalis* in flower.** Photo: Sean Spence

Growing annual south western WA *Utricularia* species from seed

SEAN SPENCE

Over many years I have had numerous attempts at growing some of the Australian annual *Utricularia* species from seed with little or no luck. A couple of years back I decided to have a more genuine attempt at adding a few of these fantastic little plants to my collection. These annual species produce only a small rosette of leaves that do not spread across the substrate surface as those of the perennial species do. Due to this lack of spreading capabilities the plants die when conditions do not suit, ie- when the substrate dries out in summer.

My previous attempts had been very hit or miss as I had no real understanding of the requirements of these species. After paying closer attention to their natural conditions I decided to give them another try, this time with great results.

These plants are actually very simple to germinate, grow and flower if they are treated in the correct manner. The key to good germination is fresh seed. Although the seed of many of the annual species generally remains viable for longer than perennial species (which can be extremely short lived), the older the seed is, the lower the rate of germination you can expect.

It is worth noting that these annual species inhabit areas that are very wet during the cooler months with this

The distinctive flowers of *U. benthamii, U. petertaylorii and U. multifida*. Photos: Sean Spence

moisture continuing into spring and early summer. Common environments include perennial and ephemeral swamps as well as seeps on granite outcrops. These areas usually dry out completely during the heat of summer and the *Utricularia* survive these dry periods by producing ample quantities of seed. The seed lies dormant on the baking ground until the rains and cool weather arrives during autumn and winter. The wetness and cooler weather triggers the seed into germination to once again colonise the waterlogged environment.

If you can emulate these conditions you should have no problems with the culture of this group. The species from WA that I have had success with include *Utricularia inaequalis*, *benthamii, violacea, westonii, multifida, tenella* and *petertaylorii*. Other similar species from the south east of Australia (eg- *U. beaugleholei* and *dichotoma* varieties) also respond to the same cultural methods.

I have found that the best time to sow the seed is towards the end of summer. Luckily, I have not found it necessary to provide the seeds with a period of extreme heat that they would naturally experience after dehiscing from the parent plant, as they germinate well without it.

The seed is sown on a mix of peat and sand in equal parts. The pot is then placed into a plastic container with the water raised so that it is level with the surface of the mix. The high water table is helpful in breaking down the seed coat inhibitor that these species produce to prevent them from germinating after light showers or thunderstorms during inappropriate times of the year, ie- the middle of summer.

Once the pot has been placed into the container and the appropriate amount of water has been added, the lid should be replaced and secured. The lid is important as it prevents evaporation. Evaporation in itself is no problem, but the addition of water to replace that which has been evaporated can unsettle the surface of the mix and disturb the seeds or seedlings. I have found that it is best to place the sealed container in a dimly lit, cool spot where it is unlikely to be disturbed. My area of choice is underneath my greenhouse benches where it is placed and forgotten about.

If the seeds are sown at the end of summer in Melbourne, within a month or so the temperatures should begin to decrease. Around this time you should begin to notice the first signs of germination. The seedlings

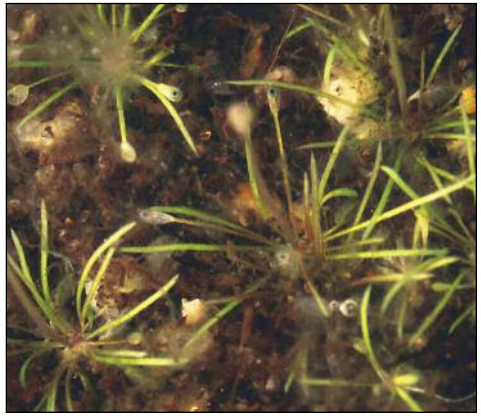
are extremely small and a magnifying glass or something similar is often required to spot the first signs of germination. When germination has been noticed I provide a touch more light, not a lot though as in nature these plants often germinate amongst tall grasses and herbs which provide shade and protection.

During the winter months in their natural environment these plants will often grow as submerged, affixed plants. It is not uncommon for them to grow under several inches of water, sometimes up to a foot in depth. This submersion creates a stable environment providing the plants with plenty of microfauna for them to capture and digest. Several species will produce traps above the surface of the substrate, often suspended on the end of their leaves.

To simulate these conditions I raise the level inside the container so that it is between 2-10cms (depending upon the species) above the substrate after the seed has germinated. By this time the substrate will have settled enough for the seedlings to cope with the higher watertable and should not float off. I try to move the container as little as possible to diminish the chances of disturbing the surface. From here the plants are left to grow and develop until the end of spring when the temperatures begin to increase again.

When the temperatures do increase I move the containers to an even brighter position, but still partially shaded. The lid of the container is then removed and the water is allowed to gradually evaporate and recede, as it would do in nature. As the level drops back down to the surface the plants should have already begun to produce flower scapes. From this stage onwards I keep the water level at the surface of the substrate.

Ideally, by the end of spring the plants should be in full flower. Most of these



The growing rosette of *U. benthamii* – note the traps on the end of the leaves.

Photo: Sean Spence.

species will produce several flower scapes in succession from their rosettes. If you wish to continue growing the plants the next season it is now very important that you make an attempt to pollinate the flowers. The method I use is to use a toothpick or dead *Drosera* flower scape which is wetted on the end. The toothpick or scape is pushed between the gap of the upper and lower corollas and manoeuvred around concentrating on the upper surface. The toothpick is then moved from flower to flower to ensure cross-pollination and good seed set. This process should be repeated over several days to increase the probability of pollination.

By the middle of summer the plants will have finished flowering and the seed can be collected. At this point the plants will perish. I choose to dry out the pot and store it away until the onset of cool weather and then rewet. I have found that further germination can occur from either seed that didn't germinate the previous year or from seed that dropped from the seedpods.

Within a couple of months the collected seed can again be sown and the whole process can begin again.

Drosera burmannii "Hong Kong". Photo: Sean Spence

A summary of the methods used to propagate non-tuberous *Drosera*

STEVE AMOROSO

ABSTRACT

Horticulturalists have been propagating plants for many years in an attempt to regenerate or multiply a species of plant, improve its survival rate, and to make it commercially available to the public. Over the years a number of methods of propagating plants have been employed to achieve such aims. Some of the methods that can be used to multiply a plant include, but are not restricted to – seeds, leaf cuttings, divisions, rhizome and root cuttings and tissue culture. This review will focus on some of the commonly grown species of sundews (*Drosera*) and on the methods that can be used to propagate these plants.

INTRODUCTION

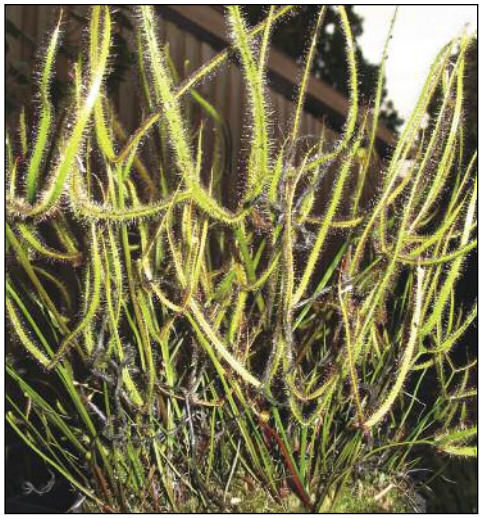
There are a number of different genera of carnivorous plants that exist, each of these having a specific method of catching prey. The sundews (*Drosera*) are one type of carnivorous plant. There are over 170 different species of *Drosera* [2]. Some of these species are annuals (species that only live for a short period of time before perishing to be replaced the following season by seed), whereas most species are perennials (can live for a number of years, some species experiencing a winter or summer dormancy). The species grow in various climates, some in tropical, sub-tropical or temperate zones [1]. Furthermore, the genus *Drosera* is distributed across all continents of the world, excluding Antarctica.

Drosera trap insects by using sticky glands on their leaves. Many species readily curl their leaves around the trapped insect (eg- *D. capensis*), whereas the leaves of other species do not seem inclined to curl (eg- *D. binata* & *D. filiformis*). Though in the latter, kinks are sometimes observed across the leaf in areas where larger insects are caught. This leaf curling assists in the digestive process, as it allows a greater number of digestive glands to contact and engulf the prey.

There are a number of different groups of sundews, and each species differs from another in many and various ways (eg- growth habit, flower size & flower colour, seed shape & cultural requirements). *Drosera binata*, commonly referred to as the forked sundew, has a number of stem-like leaves that radiate out from a basal growth point. At the top of each of these "stems", or petioles, the leaves adopt a fork shaped appearance. These forks are covered in sticky digestive glands. There are a number of forms of *D. binata*, and each form can be distinguished from another by features such as the size and colour of the plant, the length of the leaves or the size or number of fork divisions of the leaf.

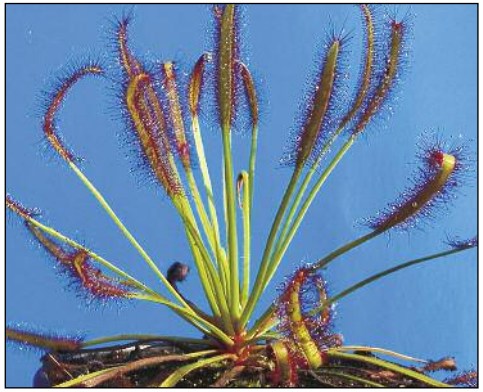
The *D. binata* var. *dichotoma* "Giant form" is one of the larger varieties with petioles well over a foot in height. This form can produce a number of forks, but typically two to form a four pointed leaf. One of the leaves currently in my collection has been measured at 22cm across. The flowerscape can reach over two feet in height and produces a number of large white flowers. Unlike some of the smaller forms of *D. binata*, this plant does not seem to be self-fertile in my growing conditions and therefore requires vegetative propagation in order to multiply (see Propagation using root cuttings).

***D. capillaris* "Brazil".** Photo: Sean Spence



***Drosera binata var dichotoma* "Giant".** Photo: Stephen Fretwell

Drosera burmannii and *D. capillaris* are smaller, rosetted species of sundews. In my conditions *D. burmannii* on average reaches a diameter of around 2.0cm*. However, a while ago I had a *D. burmannii* which reached approximately 100mm in diameter.



Drosera capensis.

***Drosera capensis* flower close-up.**

This plant was growing in a Lithuanian-based peat moss. I have found that *D. capillaris* usually reaches a diameter of around 1.5cm* (although these have been known to reach 8cm in diameter, [1] and personal comment from a reviewer).

Both of these sundews form a rosette-shaped growth habit with rounded leaves in the case of *D. capillaris* and wedge shaped leaves in *D. burmannii*. The major differences between the two species is that of leaf colour, leaf shape and flower colour. Although both species produce short flowerscapes (13cm for both *D. burmannii* and *D. capillaris*)*, *D. burmannii* generally produces white-coloured flowers and *D. capillaris* usually produces pink-coloured flowers (white coloured flowers have also been observed for *D. capillaris*, personal comment from a reviewer). Also, the most commonly grown form of *D. burmannii* produces light green-coloured leaves, whereas *D. capillaris* will produce dark green leaves which turn red to dark-red if the plants are exposed to high light intensity.

Drosera capensis (the Cape sundew) has leaves 10cm* long that grow from a common growth point. This growth point takes on the appearance of a stem as the plant becomes older. The top half of the leaf is covered in red sticky glands (or white for the registered cultivar *D. capensis* 'Albino'). The leaves of *D. capensis* readily fold over an insect when captured. This species can spread very rapidly by seed in a short period of time. It produces a flowerscape that is 29cm* long, and produces pink/purple flowers (or white flowers for the subspecies *D. capensis* 'Albino').

The majority of *Drosera* propagate readily from seed. This method is often the favoured method of propagation for a number of species such as *D. burmannii* and *D. capensis* which produce seedlings that can easily infest a pot within a few months. However, there are a number of species such as *D. binata* var. *dichotoma* "Giant" that do not produce seeds by self pollination, and therefore require vegetative methods for propagation. In this case, other methods such as root cuttings seem to be an effective method for the propagation of this form of *D. binata*. This is probably due to the thickness and fleshiness of the roots.

PROPAGATION OF *DROSERA* BY SEEDS

Seeds are the most common method of propagation of *Drosera*. Many of the *Drosera* species are self-pollinating, meaning that they do not require the pollen from a second plant to produce seeds. The seed of *Drosera* can be extremely variable. Some seeds are long and thin, as for *D. capensis*, or rounded as for *D. filiformis* var *filiformis*. Seeds are black in colour, and for most species the seeds sprout readily within a one to two month period.

Seed should be sprinkled on the surface of growing medium that is composed of peat moss, or a mixture of peat moss, perlite and coarse washed river sand. Placing pots or trays containing *Drosera* seeds in a closed humid environment is recommended. The *Drosera* genus contains many tough species and many of these will readily germinate when exposed to harsh outdoor conditions. Furthermore, for some species if given the chance, a single plant placed in a large container is capable of filling the container with hundreds of plants within a few months. Therefore, the advantage of using seeds as the main method of propagation for this genus is the large number of plants that will result, and depending on the species, these can reach full size from a few months to a couple of years.

Unfortunately, for a number of species it is difficult, and sometimes not possible for these plants to produce seeds without two different clones. *D. binata* var. *dichotoma* "Giant", has been in my collection for approximately 12 years and has never produced seeds. For this variety, vegetative propagation is the only method of producing more plants. Other varieties of *Drosera binata* – *D. binata* var *multifida* and *D. binata* var. *multifida* f extrema, which are beautiful red, and highly leaf forking variants of the giant version, have never produced seeds in my collection either.

***Drosera filiformis* var. *filiformis*.**

PROPAGATION OF *DROSERA* BY DIVISION

Some varieties of *Drosera* can produce a number of plants from the main section of the plant. Examples of species that commonly divide to produce new plants include *D. binata forms* and *D. filiformis*. It is possible to divide up these plants from the main section of the plant, provided these plantlets have their own root system. These can be potted up in either pure peat moss, or a mixture of peat moss (3 parts) and coarse washed river sand (1 part). *D. filiformis* in particular readily divides to produce a number of new plants. This normally takes place in the middle of summer prior to the plants undergoing a winter resting period, as indicated by the formation of a green, round resting bud or hibernacula. In early spring, these small plantlets can be divided off the

main plant and placed in separate pots using the growing medium already described.

The advantage of producing plantlets by division is that a number of mature plants may be produced at a more rapid rate. These will usually reach adult size within a few months if they are not already mature. The only disadvantage (which is usually rare with this prolific genus) is that divisions, even with their own root system, are susceptible to rot caused as a result of fungal attacks. If such a case occurs it is recommended that the affected cuttings are removed as soon as possible, and to treat the remaining cuttings with an appropriate fungicide.

USING ROOT CUTTINGS AS A METHOD OF PROPAGATION

For a number of species, the use of root cuttings can be very successful. For varieties with thicker, fleshy roots, this method is very appropriate. I have successfully managed to produce plantlets for the species *D. adelae*, *D. binata* and *D. capensis* using root cuttings.

Long root pieces about 10cm, should be removed from the parent plant (remember do not take too many root pieces, otherwise you will reduce the chances of the plant recovering quickly). These roots can be cut into smaller sections, say 2-3cm long. These should be placed onto the surface of fresh peat moss, or a mixture of peat moss (3 parts) and coarse washed river sand (1 part), and then lightly covered using the same growing medium. Moisten the peat moss and place the pot into a terrarium or a large plastic container covered with a sheet of glass or perspex. Ensure the container is placed in an area where it receives some filtered (not too much) sunlight, preferably in a semi-shaded position.

I have also succeeded in growing *Drosera* from root cuttings outdoors in harsh

***Drosera adelae*.**

conditions. These root pieces should begin to shoot within a month or so, and the plants can usually be separated and potted up following around three or four months growth, provided the plants have their own root system.

The advantage of using root cuttings as a method of propagation is that it produces a large number of plants that can be potted up separately and treated as mature plants in a short period of time. Plants grown from root cuttings usually reach maturity in a few months (in the case of the giant form of *D. binata* var. *dichotoma*).

LEAF CUTTINGS AS A METHOD OF PROPAGATION

Drosera is one of the few genera of carnivorous plants that can be successfully propagated by leaf cuttings. I have successfully propagated *D. adelae*, *D. capensis*, *D. capillaris* and *D. filiformis* var *filiformis* by this method. However, it is definitely possible to propagate many other varieties of *Drosera* using the same method.

When propagating by leaf cutting, it is important to extract a leaf that is healthy, as well as to ensure that it is removed from as close to the stem as possible. This is because the plant(s) often tend to shoot from the base of the leaf, and it seems that a small piece of the plants stem that is left intact promotes the growth of a new plant.

These leaves should be buried no more than about 1/3 of the total leaf length into the growing medium. The media can be a mixture of peat moss and coarse washed river sand, pure peat moss, or a favourable option for leaf cuttings, sphagnum moss. It is possible to lay leaves horizontally along the surface of the growing medium, and plantlets will shoot along the length of the entire leaf.

The pots with cuttings should be placed in a terrarium or a container covered with a sheet of glass or perspex to create a humid environment. The leaves should produce plantlet(s) in two to three months, and these can be removed from the terrarium and placed outdoors after such time that they have developed their own root system. I have propagated *D. capillaris* using this method, and have observed a plantlet growing out from the centre of the trap where the leaf is covered in digestive glands.

The advantage of using leaf cuttings as a method of propagation is that a large number of plantlets can be produced in a short period of time.

PROPAGATION VIA TISSUE CULTURE

There is a range of various protocols for performing tissue culture, and there are specific protocols that can be used for different purposes. I have successfully managed to germinate seeds of *D. capensis* onto an agar medium. These seedlings were then planted into a growing medium (peat moss and sand), however it was noted that seedlings that were sprouted onto the agar media and then transplanted seemed to take longer to grow in comparison to a plant sprouted directly into a peat and sand growing medium.

CONCLUSION

This review has considered a range of propagating techniques that I have had success in using on the genus *Drosera*. Although this family of plants is very prolific worldwide, there are a number of species that are rare and therefore limited in numbers. It is therefore possible to apply the same techniques on rare species of sundews that are generally more difficult to reproduce or obtain.

"Author's Note"

*These measurements were performed by the author based on the largest plants in his current collection. Therefore these measurements are relevant to plants grown under cultivation conditions, and not in the wild.

Reference

[1] Cheers, G (1992) Carnivorous Plants of the World, Collins. Angus & Robertson Publishers Pty Ltd, NSW, Australia.

[2] ICPS Carnivorous Plant database.