

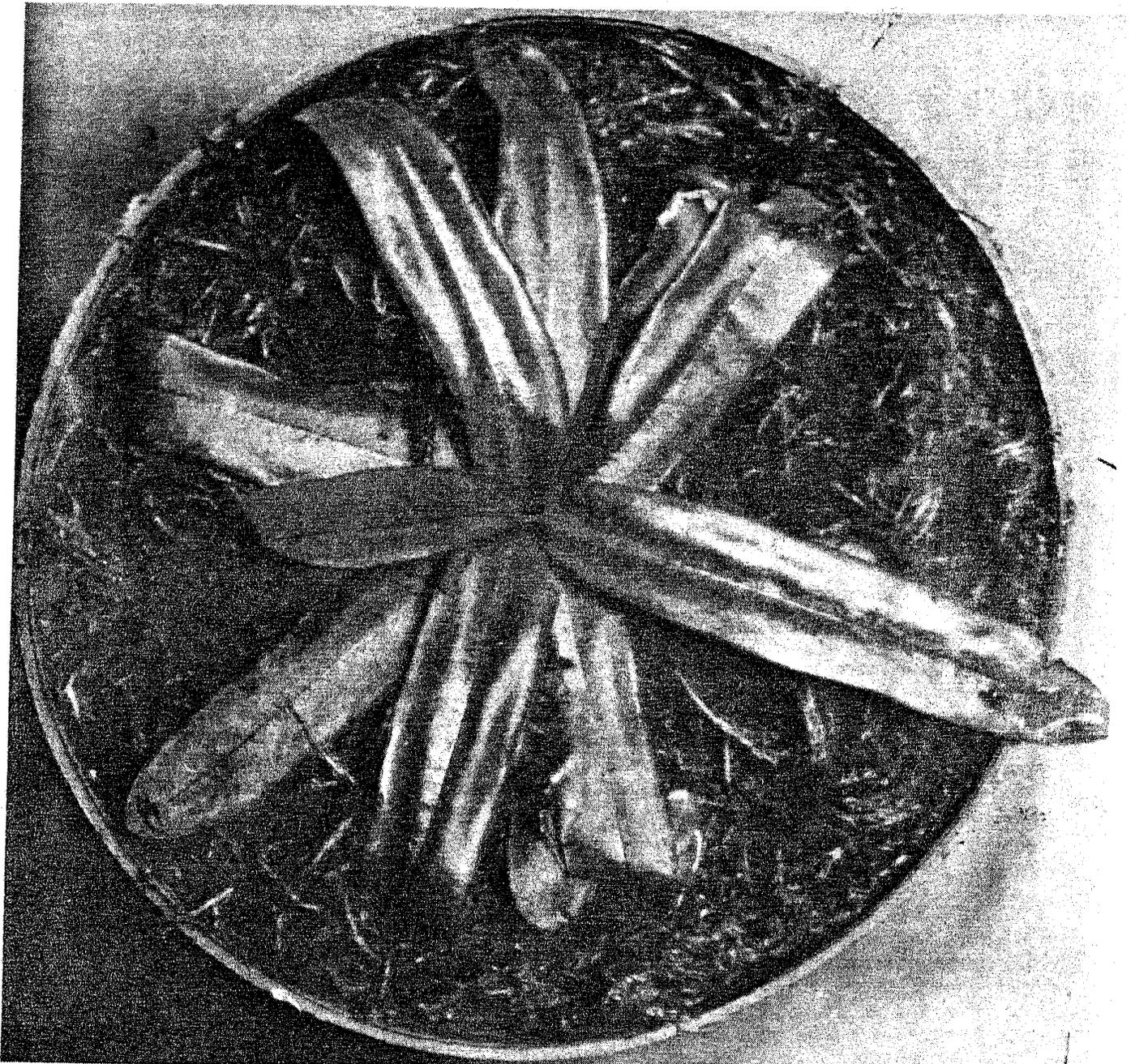
# **CARNIVOROUS PLANT NEWSLETTER OF AUSTRALIA**



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EDITORS

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FROM THE EDITORS.

The response to the questionnaire was to say the least, overwhelming, of the 350 sent out we have to date received a good percentage back. An excellent amount of valuable ideas were received and will be used to improve the quality of the news-letter for the future.

To brief'ly out-line the results of the questionnaire the results were; 98% were satisfied with the way the CPNA is being run to date. Regarding the format; a few of the more experienced c.p. growers are satisfied with the newsletter but would like to see some changes made, we respect their views and look forward to constructive ideas being sent in by these people, the rest of the answers were either satisfied or unable to comment through not having seen the U.S. CPN.

The question of further sections or subjects added brought forth some good suggestions for future issues. Apart from one W.A. subscriber who thinks that C.P. Letterbox is boring there were no others who found any particular section not to their satisfaction.

Finally, those who have used the Seed Bank find it to be efficiently run and most helpful. We thank those who co-operated with this experiment and look towards using the valuable information received to improve the CPNA for this next year ahead.

John Emerson of S.A. who was watching over the competition for the 'Secret Life of Plants' tapes and records, tells us he hasn't received one reply yet. Perhaps Xmas got in the way of that one. Still, they are very good tapes so we will extend for another month or two and I'll give them to the first four write-ups I receive before the next issue.

To a serious note now, we are still in need of good material for the newsletter and would hope this year to see some of you experienced c.p'ers putting pen to paper and sharing your wealth of information with the CPNA members. Whilst on the subject of experienced growers, we would like to send out a call here to anyone who may be interested in joining us in the running of the CPNA. We have had thoughts of increasing the issues to bi-monthly, but for this to become a reality we would need out-side assistance. Any offers would be appreciated.

Now for some disappointing news, the Seed Bank is losing Steve Jackson as its operator. Steve is moving out into a private venture of his own, which I'm sure we'll be hearing more of in the future, and we all of course wish him lots of luck. As sorry as we are to lose Steve, we realize and appreciate the great amount of work and devotion he has put into making the bank the success it is becoming. We are now of course, looking for someone to take over the running of the Seed Bank. More details on this is in the Seed Bank section.

Well the last issue of the year is upon us, don't forget to get your subscription in early, renewal forms are included in the newsletter.

Good Growing,  
Editors.

# C.P. LETTERBOX.



DR. PETER LAVARACK OF BRISBANE WRITES . The questionnaire enclosed in the recent issue of CPNA has lead me to write to you on the matter of the name of this publication. My personal view is that it is an excellent publication spoiled (but only to a small extent) by the clumsy name. Firstly let me set out my objections to the present name.

- (1). It is too long and clumsy.
- (2). It could lead to confusion with the American C.P.N.
- (3). It lacks originality. I am not anti-American (I think the C.P.N. is great and I love Kentucky Fried Chicken) but I do think that we in Australia should show a little initiative and not slavishly copy the Americans. By all means pattern the publication on the C.P.N. but please let us have an original name.

What I propose is a short, easily - remembered, appropriate name. The Australian Native Orchid Society has 'The Orchadian', the Australian Ornithological Society has 'The Emu', why not in our case 'The Sundew'?

Droseras or 'Sundews' are a feature of the Australian flora, they occur in all states and Australia has 56 out of a total of 90 for the world. Everyone interested in Carnivorous Plants has some, they are easily grown and decorative. It is also the best sounding name I can think of, but if you have a different suggestion please put it forward. For the cost of a small amount of artwork a decorative heading could be made up featuring one or two species of c.p. The sub-title 'A Newsletter about Carnivorous Plants in Australia' could be added in smaller letters below. I feel that this would give our journal just that little touch of originality that it lacks at present.

ROBERT SOLALLO OF VICTORIA WRITES : The CPNA has gotten off to an excellent beginning, proving Australia can compete with other newsletters around the world. I hope the CPNA can help c.p. growers in Australia. I am only 13 years of age and am building up a reasonable collection of c.p.'s with help from Steve Jackson. I wish to share a strange way of propagation asexually on a *Dionaea Muscipula*. It began in early September when one of my plants began to grow a flower bud, but when the bud died it left the stalk, so I cut the stalk from the plant then cut it again. I left these 2 pieces on the sphagnum moss thinking they would decompose and supply elements to the soil. Ultimately they didn't rot and in early December I discovered 3 plantlets rising from the flower stalks, 2 on one and 1 on the other. If this has happened to anyone else could they please contact me. I wonder if there will be any unusual growth cycles. Good growing to everyone.

KIM BENNETT OF WEST AUSTRALIA WRITES : I would like to see an identification section with good quality sketches, plus cultural and germination notes, exclusively of Australian *Drosera* and other genera, including the sub-terrarium parts of the plant. This would be of great importance not only to Australians, but to international readers as well to show what Australia has to offer in the way of c.p.'s and to help with cultivation. If this idea takes off, being a West Aust and being in a state with many plants I will be able to contribute many sketches leaving cultural data to a more experienced grower. If this meets with your approval it could be announced in the CPNA for all Australian subscribers to submit detailed and accurate drawings. Unfortunately, it's the wrong time of the year for most native c.p.'s, so to get sketches we will have to rely on drawings taken from photo's or plants, in collections. If anyone would like to send me photo's, provided they are good ones, I would be only too happy to do the sketches. I have a few other things to add in response to the questionnaire. I think the most important factor about the newsletter is, it doesn't come around often enough. Four times a year just isn't enough, I would like to see a monthly paper with more in it. I think an editorial note should be added to stress the importance of subscriber participation which is pretty poor. If a monthly CPNA is not viable, how about a monthly trading post, perhaps with a separate sub-fee.

## C.P. LETTERBOX.

There also doesn't seem to be enough people using the Trading Post, I'm sure everyone must have a couple of plants they don't need. About the way the CPNA is run, there's nothing wrong with that, it's the content that's pretty poor. It is in my opinion that a lot more sections should be added or the existing one's worked on.

DONALD SCHNELL, CO-EDITOR OF C.P.N. OF AMERICA WRITES : I have just received my first two issues of CPNA (June and September, 1979), courtesy of the CPNA Seed Bank to whom I recently sent a large addition to your seed bank. Your newsletter is certainly off to a fine start and will fill a real need for national communication among C.P. enthusiasts. I hope interest continues at a high level. One piece of advise I would like to offer is do not become discouraged. There seem to be low points in the operation of any newsletter of this type (as we in CPN have experienced in our time), but as time goes on, awareness increases, shyness of readers regarding contributions diminishes, and things fall into place.

If I may, I would like to offer a correction of an answer in your First Aid section on Page 8 of the September issue (Vol 2) regarding storage of seed and stratification. The answer deals with two aspects and may be misleading: Seed storage, and stratification. To cover the storage aspect, all seeds tend to lose viability in storage, especially at room temperatures or higher, and fewer and fewer will germinate as time goes on. However, if the seeds are clean and dry, placed in an air-tight container (such as a dry, clean glass vial with screw cap) and stored in the refrigerator (NOT the freezer section), viability is remarkably prolonged. This kind of storage is especially helpful if initiated right after collection (or receipt from seed bank where they are properly stored) in the fresh state, and will be less helpful if the seed has already been stored casually (paper envelope in a desk drawer) for a period of time.

Stratification is subjecting certain seeds to a period of damp cooling for a certain period of time in order to enhance their germination when they are placed back in growing conditions. Simple refrigeration as in storage description above is not sufficient since the moisture factor is missing. So, store your seeds cool and dry, stratify cool and damp. The latter is best achieved by removing some seed from your storage vial, sprinkling it over the surface of a pot or tray of thoroughly dampened peat or sphagnum, then sealing the pot or tray in a plastic bag and refrigerating for the required period of time (usually 4-6 weeks for most C.P. requiring stratification). Again, do not freeze. After stratifying, remove the pot or tray from the fridge and place in growing conditions.

What requires stratifying? Dionaea does NOT. Generally, among temperate C.P., those whose seeds mature inspiring or early summer will germinate immediately; those maturing in autumn require stratification for a good, complete "burst" of germination. Plants of the eastern U.S. whose seeds do NOT require Stratification include Dionaea, all Pinguiculas, Utrularias and most Droseras. Seeds that DO "require stratification for best germination are all Sarracenias, Drosera linearis and D. anglica.

What is stratification all about? Seeds that mature in the early spring, and then germinate, have a whole summer for seedlings to develop to the stage where they can resist the onslaught of winter. Fall maturing seeds, if they germinated in the autumn, would give rise to weak, small seedlings less likely to survive over winter. So, a timing mechanism is built in. The autumn seeds must first be exposed to the damp coldness of winter before germinating in the spring. You can fool them with the stratification procedure. I hope this is helpful. Don Schnell.

The editors thank Don Schnell for bringing this point to our notice. However, we must point out that the answers written in this section are based on our own experiences and we have found that our germination rate of Dionaea seed has been both slow and poor without stratification.

NOTE. For those growers new to c.p.'s, Mr Donald Schnell is the Author of the excellent publication "C.P.'s Of The U.S. & Canada".

THE NAMES OF NEPENTHES IN CULTIVATION.

By Dr. P.S. Lavarack.

John Graham's recent article on the difference between Nepenthes kampoiana and N. soendji raises the difficult problem of determining the name of un-named plants in cultivation or, indeed, of verifying the accuracy of named plants. Concerning this problem and John's attempt to solve it I would like to make the following points:

1. Feeling fairly sure I know the origin of both the plants compared, I would not place any faith in their original identification, therefore it is probably pointless to compare them.

2. It is not a wise procedure to compare any two species (or hybrids) on the basis of one example from each as this takes no account of variability within the species. The prime example of this variations the case of N. mirabilis on Cape York Peninsula which was once thought to be eleven different species.

3. I have heard rumours that what we call N.kampoiana in Australia may not be that species at all - it may well be a hybrid.

4. 'N. soendji' is a puzzle. This name does not appear to have a legitimate botanical origin nor does it appear in any of the lists of hybrids I have been able to trace.

5. For what it is worth my plants which originally came under these two names appear to be virtually identical and I have labelled them both 'N. kampoiana' until someone sorts it out.

6. The problem of getting a correct name on cultivated Nepenthes is immense. One must treat all names - particularly of hybrids - with a large grain of salt. The N. williamsii, N. coccinea, N. henryana mess is one good example of this. Another is the case of Nepenthes mixta of which Sydney Botanical Gardens has several large plants - some labelled N. rafflesiana and some N. mirabilis. Several plants of N. mixta probably originating from Sydney have turned up in collections labelled N. superba and N. dicksoniana. Standard books like 'Exotica' and 'Tropica' have also compounded many naming errors.



Probably much of the cause of this problem lies in the sudden demise in popularity that Nepenthes suffered in the early part of this century. Large collections at Kew and other Botanical Gardens appear to have run down in the last 60 years and name tags have been lost or placed in the wrong pots when they fell out with the result that wrongly named plants are now common in many collections.

Apparently the cultivation of Nepenthes maintained a level of interest in Japan over the years and plants from that country are more likely to be correctly labelled than those of many others.

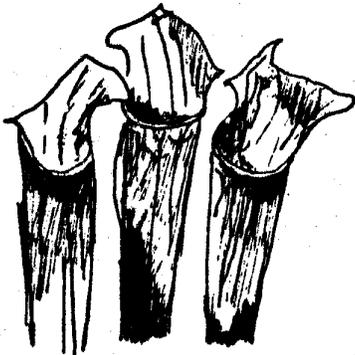
Of the 23 hybrids in my collection I have doubts about the naming of about 8 or 9 plants. It is unlikely that the true identity of many plants growing in greenhouses will ever be known with certainty.

## THE SARRACENIA SPECIES.

BY STEPHEN CLEMESHA.

In Eastern Australia we are fortunate in being able to grow Sarracenia's out of doors. Most are grown in pots, but I have a few clumps growing in wet clay soil beside a dam on my block of land. All species have their distinctive habits and unique characteristics. They keep to a regular pattern and seem fixed in it and do not grow for a longer time in a warmer climate as one would expect.

Sarracenia flava is a fine and handsome species when at its peak in October-November. Each makes a few large pitchers, which in some forms are beautifully coloured. From December on, the colour fades and the new leaves become progressively smaller and the late summer leaves are flat and uninteresting. One form of this species is plain green, another has a red patch in its throat. Another has a coppery tan colour on the lid and upper pitcher, the heavily veined form is red veined all over and one rather rare form has red pitchers and green lid which is strikingly red veined. Some forms grow over a metre tall. Not all forms of the species flower for me. I have had the plain green form from the mid 1960's, and this year they are flowering for the first time. A couple of plants of a giant form have not flowered yet. The colour forms are consistent and appear year after year and are carried into hybrids. They are present only on plants in full sun, and then only for a relatively short time in spring. This is an easy species to grow but not one that is attractive for a long time. The large yellow flowers are impressive and attractive.



beautiful species for an even shorter time than S. flava, but easy to grow and well worth while. Its pitchers have a broader neck to the hood than those of S. flava.

Sarracenia alata is also a yellow flowered species. It lacks the attractive hood and constricted neck of S. flava and S. oreophila. It is a very vigorous grower and all of its pitchers are the one type. The late season pitchers are as good as the early ones. There are two main forms of S. oreophila. One produces green pitchers which have some inconspicuous veins. The other has red inside of the throat and lid of the pitcher and this can extend to the outsides of the pitcher. It is an attractive form with a similar, but weaker scent to that of S. flava.

Sarracenia leucophylla. This tall growing species has large dark red flowers. I know of three basic forms. The first is the most common and variable. Its pitchers are green at the base, but the hood and upper part of the pitcher is white with green and red veins. The second has smaller pitchers which are darker and the white area is reduced. It is as vigorous as the commoner form. The last form is exceedingly rare and to my knowledge has been found only once. It is less vigorous than the other forms, but still is easy to manage. The pitchers are pale green and the tops white with some light green markings. It looks like an albino except that some red pigment is present in the new growth and old leaves. I have flowered this form only once, and the flower is a pure clear yellow. All forms of S. leucophylla grow well and are easy to manage, but are slower to increase than the previously mentioned species. S. leucophylla produces some nice pitchers in spring and early summer, is rather poor over summer, but its last leaves before winter are good pitchers. This characteristic is passed onto the hybrid S. leucophylla x S. oreophila.

Unfortunately, the beautiful colouring of *S. leucophylla* is not passed on to hybrids very well and only the small hybrid between it and *S. psittacina* receives a full compliment of its colour. I am attempting to produce a hybrid that has leucophylla like leaves and no poor summer leaves. It's not an easy thing to do, as all hybrids so far are not as good as leucophylla.

*Sarracenia purpurea*. This was the first species of *Sarracenia* I tried to grow and the last with which I succeeded. Seedlings produce narrow leaves for the first 2 years, and in the third, produce the much broader more open mature type pitchers, and this was when problems occurred. On hot or windy days, some pitchers would dry out and collapse and eventually the plant was lost. Friends overseas, could not advise me on this as they grew their plants in glass-houses. After losing several lots of plants, I overcome the problem by placing 4 or 5 sticks around the pot, covering the plant with a plastic bag, then cutting the top of the bag out. This stopped the problem entirely. If pitchers can be kept full of water at all times this problem does not occur. A number of variations of this species occur. The northern sub-species has pitchers which have a smaller less frilly hood. Their outsides are slippery smooth, if grown in good light the pitchers usually are dark coloured. This plant increases better than the southern sub-species, but in my sub-tropical climate, seldom flowers. One form has all yellow green leaves and yellow flowers. It is heterophylla and it is an albino. Intermediate forms, which have pale pitchers with some colour, produce orange flowers. The normal flower colour in *S. purpurea* is maroon and the flowers are large on a tall stalk.

The southern U.S.A. sub-species *venosa*, has larger pitchers which usually are finely hairy on the out-side. I have two colour forms. The commoner one when grown in full sun has green pitchers with purple suffusions and dark flowers. The other, when grown in full sun has deep red-purple pitchers, especially in winter. Its flowers are lighter in colour compared to ssp. *purpurea* from northern U.S.A., ssp. *venosa* is much larger and has a larger frilly hood. Both forms of *S. purpurea*, ssp. *venosa* have flowered freely. All forms of *S. purpurea* are most attractive and their pitchers persist throughout the year better than most, but this characteristic is not passed to its hybrids. It has rather small roots and likes more water than the other species.

In addition to the forms of *S. purpurea* I have described, there is another form of *S. purpurea* ssp. *venosa*. It grows on the Gulf Coast of U.S.A. and its flowers are much paler than the Carolina type, etc. Also they often are larger and its pitchers are the same as the common form.



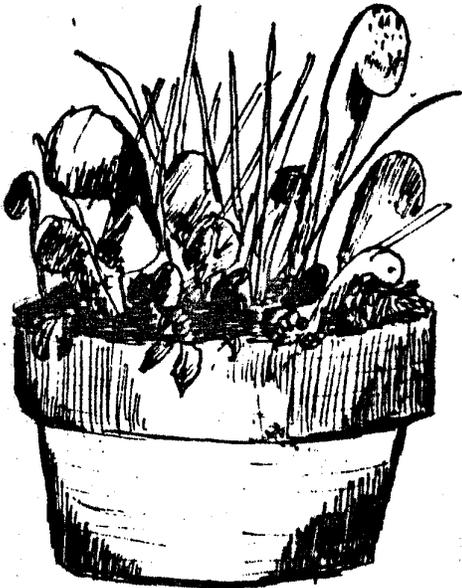
*Sarracenia psittacina* like *S. purpurea* is low growing, has rather few roots and likes plenty of water. Some clones grow better for me than others. Plants I have from Alabama are a little smaller and darker than those I have from further west. *S. psittacina* will do well treated as *S. purpurea*, but I find that in my present climate, the plant can be grown well without a plastic bag cover. As with *S. purpurea*, this species is slow to increase. Its rather small red flower is produced on a tall stalk. It's a neat and colourful little plant and its colour tends to be passed on to its hybrids. Like *S. purpurea*, its leaves are all of one type and grows throughout the full season.

*Sarracenia minor*. This is a distinctive and very stable species which has interesting pitchers that have translucent spots at the upper back, and a brownish hood that encloses the top and is open at the front. It has a neat appearance and character of its own. There are two forms, the main one grows about 15 - 20 cm tall while the other grows to twice the height with more slender pitchers that are much harder in texture. This form is very impressive when fully grown, but it has only a small distribution near Lake Okefenokee in Georgia and was for a long time thought to be a habitat form, but I have grown it for enough years to know that it is not. In both forms all the pitchers are of one type and *S. minor* makes its main growth in spring and early summer. Its flowers are yellow and it produces longer and stronger roots than the other species, this

THE SARRACENIA SPECIES CONT.

characteristic extends to some of its hybrids. I prefer a deep pot for it to allow its long roots plenty of depth.

Sarracenia rubra is the most variable and controversial of the Sarracenia species. I support Don Schnell's treatment of it (also his treatment of the other species) because he has made extensive field observations and studied plants in cultivation for a long time. The typical form of S. rubra occurs in coastal North Carolina. It has rather slender pitchers with dark veins. For me, it is a problem in cultivation and often rots off. I suspect it needs to be grown drier than other species. In the highlands of North and South Carolina, S. rubra ssp. jonesii occur's. This differs from the typical form in having taller pitchers which are more expanded at the top. As with the previous and following pitchers are produced through the growing season and is at its best in late summer when most of the others look awful. Considerable argument concerning its status went on for years, and while it did, one by one of its known habitats were wiped out. By the early 1970's it was believed extinct in the wild, but a short time later a new colony was found. This contained a few plants of a pure yellow green pitched - yellow flowered form and a number of rather pale looking intermediates and a larger number of darker normal plants. I received seed from a yellow plant and some seedlings were pure yellow while others the intermediate. They grow almost as well as the normal darker form. All rubra ssp. jonesii plants do not flower regularly with me because of the mild climate, but I do get some flowers most years. As with all S. rubra forms, the flowers are small, maroon in colour and sweet scented. For me, this plant grows better than the coastal Carolina form. I have sent plants of S. rubra ssp. jonesii back to U.S.A. to help ensure its survival.



In the Gulf Coast region of Florida another S. rubra form occur's. It has taller stout pitchers which are dull reddish with faint veining. It is an attractive form that is as large as the taller species, grows easily and flowers greely.

S. rubra ssp. alabamensis is a rare sub-species that is found in a limited region of central Alabama and is in danger of extinction. It's pitchers vary from very pale with some darker veins. It makes a reasonable crop of pitchers in spring then slows down over summer. It needs to be looked after and made sure more vigorous species don't over-shadow it in its slowed down stage.

S. rubra ssp. wherryi resembles it but seems to persist through the summer better. I have not had it long enough to be sure, but it seems easier to grow and its pitchers are a bit darker than those of sub-species alabamensis. The flowers of these last two sub-species of S. rubra are similar to those of the other S. rubra types.



# BEGINNERS PAGE.



## CEPHALOTUS FOLLICULARIS - THE WESTERN AUSTRALIA PITCHER PLANT.

By Robert W. Riedl.

Although the distinguished French botanist Jacques Julien Houtton de La Billardiere (1755-1874) is generally accredited with having first recorded and even discovered *Cephalotus follicularis*, certain circumstances of his voyage make it less than likely that he has ever seen living specimens of this plant himself.

La Billardiere accompanied D'Entrecasteaux's 1791-1794 expedition on the ships 'La Recherche' and 'L'Esperance' in search of La Perouse. The expedition reached Terra Van-Lewin, as Australia's south-west was then known, with the desire to temporarily make anchorage at King George Sound, now the site of Albany, but the ships were carried some 400 km further east by strong, unfavourable winds to finally make their landfall in 1792 at Esperance Bay instead. Esperance is almost 350 km east of the nearest *Cephalotus* site, but it was here where La Billardiere received material of this plant from an unknown, unrecorded someone who had collected it near King George Sound. In 1806 La Billardiere published a description of the plant, and in 1823 live specimens were collected in the Albany area and sent to Kew in England where they were successfully cultivated flowering some years later.

*Cephalotus follicularis* is the sole member of its own plant family, the Cephalotaceae. No varieties of forms are officially recognized, yet several growers have noted significant differences of growth habit in different clones of the plant, an observation which might be further substantiated as more plant material becomes available.

*Cephalotus* only occurs in the extreme southwest of Western Australia from about Augusta to slightly eastwards of Mt. Manypeaks. Here it inhabits nutrient-leached peaty sand, which is for most of the year wet with seepage water, in a mainly coastal stretch some 400 km long which hardly ever extends more than 60 km inland. In effect, the total area in which the Western Australian or Albany Pitcher Plant can be found is even smaller than the total natural habitat of the Venus Flytrap.

*Cephalotus follicularis* (from the Greek word 'kephalotos' meaning 'headed' which refers to the filaments of the stamens, and the Latin word 'folliculus' meaning 'small pouch', which describes the shape of the pitcher) is a plant of strange and singular appearance even amongst pitcher plants. It is a relatively small, rosetted plant with a thick, branching root system which bears numerous clusters of pitchers during most of the year. During the cool season, particularly during late winter and spring, more conventional foliage leaves are produced, oblong in shape, glossy green and fleshy. The typical pitchers appear at the onset of the warmer months and are continuously formed until late autumn. The pitchers may be green when grown in shade, but colour deep crimson in a sunny position and may reach up to 6 cm in length. Their shape has been compared to the one of a moccasin, ornated with three ribs stretching from the toe to the top, with its heel turned up and over to form an awning or lid over the pitcher mouth which has a well developed rim of smooth, glossy ribbings which curve over into the pitcher opening where they end abruptly in downward pointing teeth. Inside the pitcher, just below the teeth, is a downward pointing, light green, smooth collar or ledge overhanging the cavity of the pitcher. Insect-attracting nectar glands are scattered over the entire surface of this ledge, but are also found, like an initial lure to insects, a preliminary invitation device, on the internal and external surfaces of the lid itself, which has numerous, unpigmented, translucent 'windows' or areolae similar in appearance to those found in *Sarracenia minor* and *Darlingtonia*.

Cont Over.

BEGINNERS PAGE CONT.

Insects feeding along the collar surface have frequently been observed to lose co-ordination of their movements as if under the influence of some narcotic fed to them with the nectar. Once they have lost their footing, they fall into the purplish-black coloured cavity of the pitcher which contains a small amount of fluid, which seems to have a clogging, paralysing effect on the victims. The cavity or well of the pitcher is equipped with numerous digestive glands in its upper part which reach their greatest concentration in two distinct, thickened, elongated areas about half-way down on each side of the cavity.

It is still unclear whether digestion of prey is entirely effected by the digestive enzyme system secreted by the plant or whether part of the digestion process is to be contributed to bacteria present in the pitcher fluid. While I was able to demonstrate the presence of bacteria in the pitcher fluid and an increase in their population density subject to the age of the pitcher and the relative concentration of accumulated prey, I was unable to demonstrate any significant contribution by bacteria in the digestion process :

In an experiment the same number of ants was introduced to mature pitchers of about the same age; the fluid in half the pitchers was then sterilized using the antibiotics Streptomycin and Penicillin, and the lids of all test pitchers were artificially sealed over the pitcher openings to prevent further introduction of prey. Periodically the degree of prey solubilisation was visually examined by lifting the lids from the pitcher openings to inspect the cavity contents with the aid of a dentist's mirror. The observed result was that the rate of prey breakdown appeared to be about the same in all pitchers. This would suggest that bacteria found in pitcher fluid may be present primarily in the role of opportunists feeding on nutrients made available by enzymes of the plant acting on the bodies of prey. Ultimately, it would seem that this 'pirating' of nutrients from the plant by bacteria is only temporary as the food assimilated by bacteria becomes to a large extent available again to the plant upon the death and ensuing lysis of the bacterial cells. Irrespective of the effect or absence of any effect by bacteria upon prey digestion in *Cephalotus*, it was interesting to note that the rate of digestion seemed more rapid in the temperature range between 25 and 35 deg C, slowing down if the temperature was further increased and virtually coming to a standstill at temperatures below 15 deg C. This may suggest a direct confirmation of the behaviour of most biochemical processes, reaching an optimal reaction rate over a more or less narrowly defined temperature range and slowing down again if the reaction takes place below or above the optimum temperature limits due to inactivation or denaturation respectively of the chemical compound eliciting a particular reaction sequence. The fact, that efficient digestion of prey and subsequent nutrient assimilation is very slow or non-existent in *Cephalotus* at low temperatures, could give a clue to why this plant produces different kinds of leaves at different times of the year : it seems more opportune and of greater survival value for the plant to invest and expend its energies during winter and spring in more conventional foliage leaves which are better equipped than pitchers to photosynthesize and therefore more suited for the manufacture of sugars and starches, and it only produces summer leaves or pitchers when the enzyme system associated with them can be utilized to the full in the translation and assimilation of insect-derived nitrogen, potassium, phosphorus, saccharides and trace elements.

*Cephalotus follicularis* is easily cultivated in a variety of media : pure sphagnum; quartz-sand and peat in about equal parts with a little perlite added for better soil aeration; and some growers claim excellent results by using a mix of 2 parts peat, 2 parts sieved, well rotted leaf mould, one part perlite and one part quartz sand. Irrespective of the particular potting medium used, it is of utmost importance that the plants are not kept too wet, especially not during the cooler months of the year. While I stand my *Cephalotus* containers into a 5 cm deep tray with water during the summer months, I keep the plants just slightly damp during the cool season, watering them only about once a week from above, but avoiding to wet foliage or crown to prevent rotting. Most failures with this species seem to be the direct result of keeping the compost too wet, having insufficient soil aeration or using an unsuitable potting mixture. These plants eventually form long underground root systems which branch over long distances. Secondary plants arise at some distance

BEGINNERS PAGE CONT.

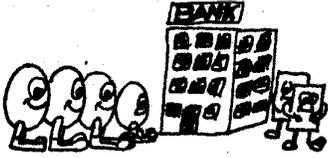
from the parent plant. Bearing this in mind it is better to grow *Cephalotus* in plastic trays of a depth not less than about 15 cm, provided with additional aeration and drainage holes (I use polyurethane fruit boxes available from most greengrocers). Although the Albany Pitcher Plant grows in nature in a Mediterranean climate of relatively dry summers and wet winters, I have no problem growing these plants in Sydney all the year around unprotected in the open in spite of the fact that the climate here is more subtropical with relatively dry, sunny winters and most of the rain falling in summer resulting frequently in long spells of high humidity. At first I used to grow *Cephalotus* in broken light which yielded luxurious growth of long lasting winter leaves, but produced few, although slightly larger, plain-green pitchers. Since I have moved my plants to a position where they receive almost full sun for most of the day, they have started to grow pitchers much earlier in the season, in greater quantity and of much more vivid colouration.

*Cephalotus* blooms from mid to late summer. The flowers are borne on a slender, 50 cm long stem. The actual flowers are inconspicuous, lack petals, are whitish-green and rather small. I am not certain whether the flowers can be self-pollinated as I have never had more than one plant in flower in any given year and all my attempts to produce seeds under these circumstances have so far failed. Joe Mazrimas ('CPN, VOL V, No 1, P 10 ff.) has made the same experience with his flowering *Cephalotus* plant. Allan Lowrie (CPNA, VOL 2, P 10) on the other hand has not only been successful in producing seed (unfortunately he has not stated whether he has self-pollinated flowers of the same plant or cross-pollinated flowers of unrelated clones:), but he has also managed to germinate it (so far a persistently difficult task, and we would like to hear more up-dated information from Allan regarding subsequent successes with *Cephalotus* seed).

Vegetative propagation is easily accomplished by taking 3-5 cm long cuttings of the thick, fleshy root from a large plant in late spring. The cut pieces are allowed to air-dry for a few hours, are dusted with a fungicide (Benlate, Captan, Difolatan, etc.) and rooting hormone (available from most nurseries), and are placed horizontally and not deeper than about 1 cm into a pot filled with a sand/peat mix. The potting mix is then lightly watered and the pot covered with a piece of window glass to minimize evaporation and placed into light shade. Water should be applied only sparingly during this period, but in sufficient quantity to maintain the soil mix slightly damp. About 3-4 weeks later young plantlets can now be gradually hardened off. About a year later the young plants can be subdivided and treated like adult plants.

Another method of vegetative propagation is to take leaf cuttings. An entire leaf or pitcher with the stalk intact is removed, washed in diluted fungicide and the cut base of the stalk is dipped into rooting hormone. The stalk or petiole is then lightly pushed into a bed of live sphagnum with the leaf blade or pitcher sitting flat on its surface. The propagation container is covered with glass or clear plastic to prevent excessive evaporation of moisture and placed into light shade. The tiny corm, which may eventually form near the cut end of the leaf, will with time differentiate into leaves and tiny roots. The plantlet can then be gradually accustomed to stronger light. Repeated spraying with fungicide during the differentiation process seems necessary to prevent damping off.

It must be borne in mind that propagation by root or leaf cuttings only increases the number of plants of the same clone, which makes them all genetically identical. Only plants grown from cross-pollinated seed - and let us assume that cross-pollination is necessary to produce viable seed in *Cephalotus* - will give rise to new clones, to new genetic combinations. To successfully grow *Cephalotus* from seed should be a challenge for all CP enthusiasts. As someone once said: 'You don't really have a plant in cultivation until you can propagate it from seed'.



# SEED BANK.

## IMPORTANT.

The seed bank is temporarily closed down. Notification of re-opening will be published in June issue of C.P.N.A. Please send all Seed Bank correspondence to : C.P.N.A. Wandena Road, Bullsbrook East. W.A. 6084.

In place of the usual seed bank inventory is an article on the correct packaging of seed contributions sent to us by Patrick Dwyer, who successfully runs the United States C.P.N. Seed Bank.

## THE PACKAGING OF SEED.

In order to run a seed bank you need to have seed donations. Harvest your seed just before the seed capsules open naturally. Take the capsules and break them over a piece of paper. After that, collect the seed and place in small paper envelopes. Make sure that the envelope of piece of paper is folded over so that seeds do not fall out or get stuck on tape. Do not place the capsules with the seed. This just makes more work for the keeper of the seed bank. Label the envelope with the full name of the plant, date of harvest, origin and habitat information if collected in the wild. After this, place the seeds in the refrigerator until they are sent.

The important things to remember are :

- 1) Make sure that the seeds are mature (don't harvest too early).
- 2) Make sure that you send only seeds.
- 3) Make sure that you don't lose them.
- 4) Make sure that they are fresh and don't lose their viability.

The seed bank for CPN has had problems with all of these. Nothing is more frustrating than to open up a letter with seed donations of several rare species only to find a couple of seeds in each packet and a pile of mixed seed in the envelope, or to find hundreds of seeds stuck to the tape. The seeds are virtually useless. It is also very frustrating to spend your money for some valuable seed only to watch expectantly and have nothing germinate. All could have been happy if the seeds were only fresh. Last of all, it is important for everyone to donate as much seed as they can spare so that everyone else will be able to enjoy C.P's as well.

## **NOTICE.**

The CPNA is looking for a dedicated c.p. grower preferably, with a good all round knowledge of carnivorous plants, to take over the running of the seed bank.

Fortunately, the first initial stage of setting up and getting the bank running smoothly, has been well accomplished by Steve Jackson, so it only requires taking over.

We at CPNA feel that Steve will give every assistance to the person who takes over. Basic requirements : A knowledge of C.P's - A little spare space - A lot of spare time - A typewriter.

The Seed Bank is run as a separate identity of the CPNA and the person in control is responsible for all aspects of the bank. Please direct any inquiries to C.P.N.A.

A FEW TIPS ON GROWING W.A. TUBEROUS DROSERA.

By Allen lowrie.

West Australian tuberous Drosera will grow in just about any medium you can think of. I have grown them in yellow, white and black sand, sphagnum, perlite and peat, straight peat, gravel and loam and even sawdust. I can honestly say the majority of W.A. tuberous Drosera are not worried about what they grow in.

Tuberous Drosera start growth about April-May, about the time of the 1st rains here in W.A. At this time I put the plants out in the rain from dry storage (described later). The occasional hand watering is also done if the rains at this time are scarce, as they often are, here in W.A.

When the first plant in the whole collection shows above the pot surface, I place the entire collection in the glass-house. Tuberous Drosera will also grow very successfully out-doors but I find the plants get knocked about and look rather shabby. In the glass-house one can grow them into perfect show piece specimens. In the glass-house the plants are kept moist at all times.

I might note at this time, when the tuberous Drosera's are going into the glass-house, my Sarracenia collection is going out of the glass-house to spend their dormant period out in the rain, (this method I have found washes all the built up salts out of the pots and makes for healthier plants.)

When the Sarracenia came out of their dormant period, they go back into the glasshouse and the tuberous Drosera are placed out-side again where they die back and build up their tubers for the next season. One could say, it's one in and one out, it also helps with space problems in the glass-house.

Dormancy. This is the hard part. When the plants have died right back (Dec) place the plants still in their pots, in the wood shed completely dry. When the rains start again the following year, put the plants out in the rain and the cycle starts again.

Last year I put a handful of tuberous Drosera tubers in a plastic bag and forgot about them under the bench in my bar. This year when I was placing my tuberous Drosera out in the rain, (April-May) I discovered these forgotten tubers under the bar. To my surprize the tubers had started to grow, (in a plastic bag completely dry, no soil medium and no light), and would you believe were advanced as the plants getting the proper treatment out in the rain. The tubers must have a built in computer style time clock, truely amazing plants and very easy to grow.

AUSTRALIANPLANT & SEED SOURCES.

<u>NAME &amp; ADDRESS.</u>	<u>CATALOGUE.</u>	<u>GENERA.</u>
CARNIVOROUS & UNUSUAL SEEDS. 3 Normandy Ave, Hills. S.A. 5096.	S.A.E.	Carries a good variety of seed only. Para
*****		
<u>EXOTIC &amp; BIZARRE PLANTS.</u> Wandena Rd, Bullsbrook East. West Australia. 6084.	SEND \$ .20 STAMP	Dionaea-Nepenthes Pinguicula-Drosera Sarracenia-Cephalotus Most C.P. Seed.

Overseas inquiries please contact United States agent :

Mr R. Minton. Carolina Exotic Gardens. P.O. Box 1492, Greenville, N.C. 27834. USA.

A 10% discount on plant orders is available to C.P.N.A. subscribers. (Aust Only).

COLLECTING GEMMAE FROM PYGMY DROSERA'S.

By Andre Horvath.

I have drawn a diagram of the device which I made for easier collecting of gemmae. It works something like a vacuum cleaner.

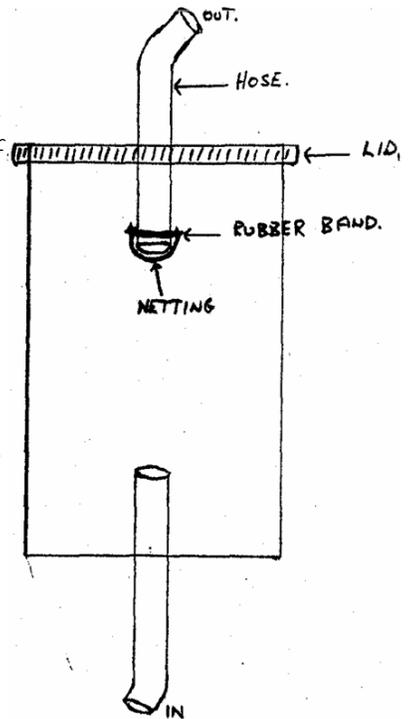
Materials needed : a small bottle with tight fitting top, (e.g. medicine bottle or film container), a clear container is best so you can see what is happening.

About 25 cm of aquarium air hose, a small piece of fine netting (enough to cover the end of the air hose), small rubber band and some glue (if needed).

Pierce a small hole at each end of the container, then squeeze the hose through the hole making a tight fitting, (about 12 cm of hose for each end). From the top end, place the netting over the end of the hose, securing it with the rubber band (as shown in diagram).

It works by sucking on one end of the hose. This will pick up small objects which is collected in the container. If hoses are not tight enough, use the glue. Also by making the hose smaller (bottom end) this will add more drag, making it a bit better. It is important to keep it clean for health. The gemmae can be taken out by using water.

I have used it with great success, collecting gemmae in less than half the time.

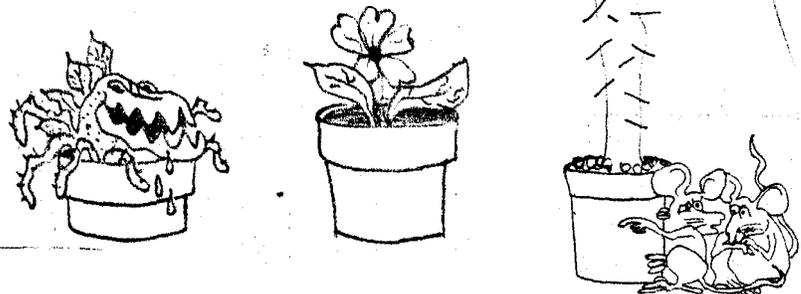


CARTOON CORNER

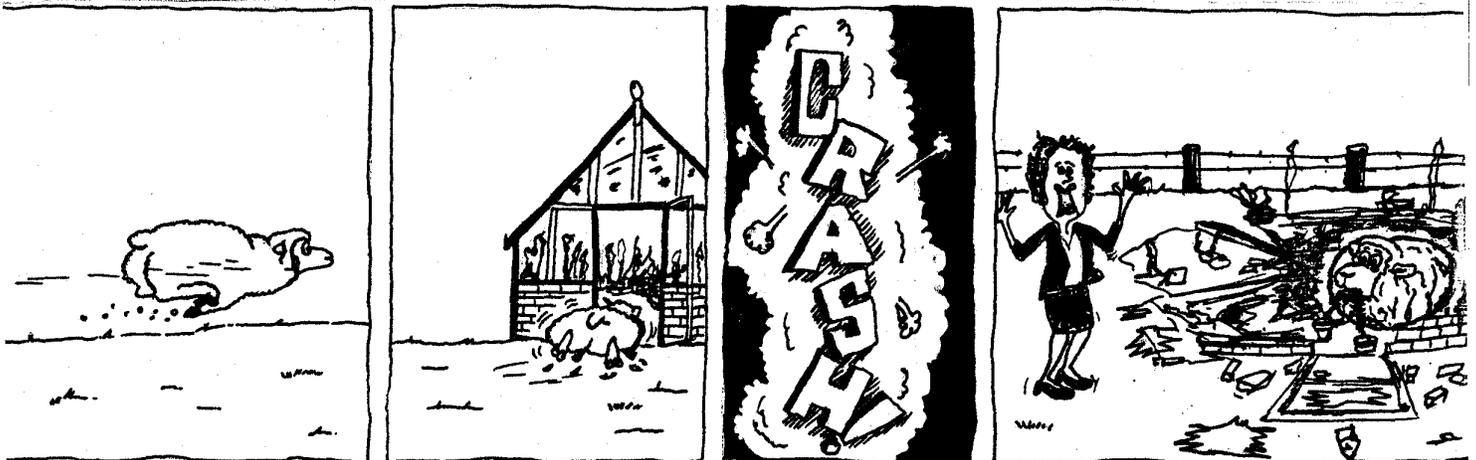
This issue, the award goes to L & A Worland of N.S.W. for the first sketch.

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The second cartoon depicts Sue's first & last attempt to raise a pet sheep.



"WATCH OUT FOR THE ONE ON THE END!"



\*\*\*\*\* BOOK REVIEW \*\*\*\*\*  
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CARNIVOROUS PLANTS.

AUTHOR ADRIAN SLACK.

ADRIAN SLACK is a landscape architect and plantsman. His interest in carnivorous plants began in childhood, and his early choice of species became the foundation stone of what is one of the largest private collections of carnivorous plants in the world, now used for both breeding and study purposes.

Adrian Slack lectures on various aspects of his subject, and he has undoubtedly reached his widest audience in talks over radio and television. He is a founder member of the British Carnivorous Plants Society. His home is in the west of England.

. . . . .

Here in Australia, where to many, the exciting hobby of growing carnivorous plants is a new experience, we must rely greatly on overseas books for our cultural information. Among a number of excellent publications on C.P's, Adrian Slacks recently published book rates amongst the best I have read. This hard-backed 240 page book from introduction to index is literally crammed full of all aspects pertaining to the C.P. world. The most impressive part is the explicate way in which Adrian has fully discribed each species in detail.

The first half of the book covers the discription of all c.p's with the remainder going deeply into the cultivation side, covering such subjects as, How to grow C.P's, Indoor Cultivation, Greenhouse and Outdoor Cultivation, and a very detailed section on cultivating individual species. To top this off, the book contains some of the most beautiful true to life colour and black and white photography produced by Jane Gate, A professional London photographer. There are over one hundred black and white photo's and 16 full page colour plates which must receive a lot of credit in making the book the absolute success it is.

This leaves but one point to make, and that is, if you are into carnivorous plants this book is a must.

The retail price is \$ 14-95 : however, a 10% discount is offered to all interested by ordering through C.P.N.A.

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The discount offered is valid until the June issue only.

Send cheques or money order for \$ 13-45 to C.P.N.A. Wandena Road, Bullsbrook East. West Australia. 6084.

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Continued from page 10.

Cephalotus follicularis (like most carnivorous plants) is remarkably free from disease and pests. Fungal and bacterial decay of the crown and root system only occurs if plant and potting mix are kept too wet and underaerated. Caterpillars occasionally become a nuisance, but they can be easily picked off by hand or killed using a pyrethrum spray.

# TRADING POST.

BUY            TRADE            SELL



When sending in Want Ads, please print clearly name and address in order to eliminate mistakes. Please mark clearly whether you wish to Buy, Swap or Trade. Adverts from commercial sources will not be accepted except where a private collection is involved. .

Keep strictly to your trade agreements and where possible answer all replies promptly.

PAUL WARE. 50 OATLANDS ST, WENTWORTHVILLE. N.S.W. 2145.

Wishes to trade *Sarracenia alata* x *leucophylla*, *S. willisii* x *leucophylla*, *S. minor* plus other rarer *Sarracenia* hybrid seeds, for *Nepenthes* of any variety.

OWEN BAXTER. 6 GOSMAN ST, NEWMARKET. QLD. 4051.

Would like to obtain plants or seed of *Drosera cistiflora* and also has a quantity of *Drosera spathulata* for trade.

JIM LILLIS. 65 COOK ST, BAULKHAM HILLS. N.S.W. 2153.

Wishes to acquire a *Nepenthes mirabilis*, in exchange your choice of either a Mexican 'PEYOTE' cactus (*Lophophora williamsii*), or a Hawaiian Wood Rose Vine, (*Merremia tuberosa*) : both true collector's items.

JAMES LENNON. 7 BAREE ST, KENMORE. QLD. 4069

Wants to buy *Byblis gigantea*, any species of *Nepenthes*, *Utricularia* and *Pinguicula*, *Drosera*, *omissa*, *D. dichrosepala*, *D. zonaria*, *D. ramellosa*, *D. whittakeri*, *D. arturi*, any pygmy *Drosera* and the red form of *D. burmanii*. Any of the plants listed can be seeds, plants or cuttings.

JAMES McCOY. 66'STATION RD ARNCLIFFE. N.S.W. 2205.

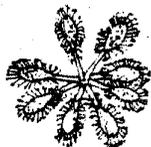
Wants to buy seeds and plants of *Darlingtonia californica*, *Nepenthes* and *Drosera scorpioides*.

JAN LAUSSOHN. 1/600 BOWEN TERRACE, NEW FARM. QLD. 4005.

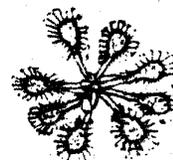
Would like to buy a *Darlingtonia californica*. Please advise cost.

BILL WILLIAMS, P.O. BOX 403, BEGA. N.S.W. 2550.

Wishes to buy 2 *Nepenthes alata*, 'red form'.



D. x nagamoto



D. spathulata (Kansai Type)