

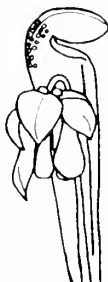
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CARNIVOROUS PLANT NEWSLETTER

VOLUME 13, Number 2

JUNE 1984





CARNIVOROUS PLANT NEWSLETTER

Official Journal of the
International Carnivorous
Plant Society



Volume 13, Number 2
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COVER PHOTOS

FRONT: *Sarracenia flava*. Photo by Joe Mazrimas.

BACK: *Sarracenia leucophylla*. World Insectivorous Plants slide collection.

The co-editors of CPN would like everyone to pay particular attention to the following policies regarding your dues to the ICPS.

All correspondence regarding dues, address changes and missing issues should be sent to Mrs. Pat Hansen, 3321 Hamell Rd., Fullerton, CA 92635. DO NOT SEND TO THE CO-EDITORS. Checks for subscriptions and reprints should be made payable to CSUF FOUNDATION-ICPS.

All material for publication, comments and general correspondence about your plants, field trips or special noteworthy events relating to CP should be directed to one of the co-editors. We are interested in all news related to carnivorous plants and rely on the membership to supply us with this information so that we can share it with others.

Views expressed in this publication are those of the authors, not necessarily the editorial staff.

Copy deadline for the December issue is October 1, 1984.

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News and Views

JOSEPH P. CANTASANO (2726 Wallace Ave., North Bellmore, N.Y. 11710) writes: October of 1983, I spent a few days in the Long Island Pine Barrens. While visiting a number of bogs, I came across *Sarracenia purpurea venosa* and *S. purpurea purpurea* growing in the same bog, both growing in full sun.

Sarracenia purpurea venosa was growing in foot deep sphagnum moss while *S. purpurea purpurea* was growing in coastal plain soil. I found many large crowns of each, plus many seedlings. With *Sarracenia* I found large populations of *Drosera filiformis*, *D. intermedia*, and *D. rotundifolia*. Some crowns of *Sarracenia* measured 20" across. In one particular bog I found no *Sarracenia*, but a very large population of *Drosera filiformis* in a cove near a beach. In another bog I found so many pitcher plants that it was difficult to walk through

the sphagnum without stepping on pitchers. I am happy to say most of the bogs are protected by state and federal law, and the ones that are not at this time, someday will, with the help of the Long Island Pine Barrens Society. The eastern half of Suffolk County is riddled with sphagnum bogs just waiting to be explored. This spring and summer I am going back, and I will keep you posted as to my findings.

MICHAEL HALLETT (25 Grayson Rd., Epping, NSW, 2121, Australia) sent along some comments about his experiences with CP in Australia, opening with how he grows *Drosera regia*:

"I grow the plant successfully in pure peat moss or peat/sand, and I find the potting medium is not terribly important in *D. regia* and in many other CP's. I have two plants about 25 cm tall, one in a small plastic cup, and the other in a six inch wide, seven inch tall plastic pot. I found leaf cuttings to be useless in propagation and I grew five small plants from four root cuttings very easily. The pieces of root were one inch long and were partly above the surface of the wetish peat. Propagation otherwise depends on small plantlets that form around the adults."

Michael then goes on to comment about CP botanizing in the Sydney area. "I go occasionally just south of Sydney near where I live where there is a national park that hosts enormous numbers of CP. Sandy sides of hills where there are seepages usually have mats of *D. spathulata* Kanto white and pink flowers, *D. peltata* and *D. auriculata* growing so thick you cannot avoid walking on them, and occasionally stray patches of *U. dichotoma* var. *uniflora*. Closer to the stream, CP's to be found are *D. spathulata*, *D. binata multifida*, *U. uliginosa*, *U. dichotoma* and *U. lateriflora*. In the water in certain places can be found

CPN Seed List

Byblis liniflora; *Darlingtonia californica*; *Dionaea muscipula*; *Drosera adelae* (3), *D. aliciae* (3), *D. auriculata*, *D. binata*, *D. binata dichotoma*, *D. burkeana* (2), *D. burmannii*, *D. burmannii* (Australia) (1), *D. capensis*, *D. capensis* (narrow leaf), *D. capensis* (mix), *D. capillaris*, *D. dielsiana* (15), *D. filiformis filiformis* (5), *D. glanduligera* (5), *D. indica* (2), *D. intermedia*, *D. menziesii* (5), *D. peltata* (5), *D. pugmaea* (10), *D. rotundifolia*, *D. spathulata*, *D. spath.* (Kansai), *D. spath.* (Kanto), *D. spath.* (white fl.) (5), *D. whitakeri* (5); *Drosophyllum lusitanicum* (5); *Pinguicula vulgaris* (5); *Sarracenia flava*, *S. leucophylla*, *S. leucophylla* (red), *S. purpurea purpurea*; *Utricularia lateriflora* (2); *U. uliginosa* (2).

\$.75 each. For details on sending or ordering seed, see CPN, March, 1984, page 3.

huge clumps of *U. exoleta* that look fantastic when in flower. In the more dry, flatter sandy areas *D. pygmaea* and occasionally *D. glanduligera* thrive. It is great to be able to see so many CP's so close to home. Further south up in the mountains, I find *D. arcturi* growing in the hundreds of thousands (there is no exaggeration in this), and a *Utricularia* that may be *U. monanthos*."

DONALD N. CLEMENTS (104 Sunset Ave., Atco, NJ 08004) has recently observed two unusual growth habits of *Droseras* in southern New Jersey. Some populations of *D. rotundifolia* have individuals that nearly all have a forked flower stalk as shown in the photo. *D. filiformis* in his area nearly all produce a summer bud, the enlarged base of which has a dense collection of pale plant hairs that almost appears like spittle bug activity superficially. He has not noticed mention of these habits in print before and wonders if they occur elsewhere in the range.

(Photos are by Paul Porch.)



D. rotundifolia with forked flower stalk.



D. filiformis. Summer bud has enlarged base with dense collection of hairs.

CLAUS THIEDE (Goslarsche Str. 70, D-3300 Braunschweig, Germany) writes:

Thank you for your letter of 22.02.84. In the meantime there has been some news about the German society. As I wrote in my letter to Pat Hansen I've been looking around for the society all the time. Then I phoned with Robert Kresanek (Germany) some time ago and he told me that there would be a first meeting of the Society in Mannheim (21.01.84). So I decided to drive to that meeting.

There have been about 25 persons on that first meeting and they told me that Mr. Metin Savignano is a 16-year-old pupil who decided to form the society. There have been several requests from interested people who wrote to him and that seemed to be too much for Metin. He just answered the first letters sending the Number "0" of a Newsletter to them and took DM 20,- fees for the first year membership. Then nothing happened until some interested people met in Mannheim. As I know there are still some difficulties to get the money back from Metin. And up to now the Society doesn't run because we have some formalities to do.

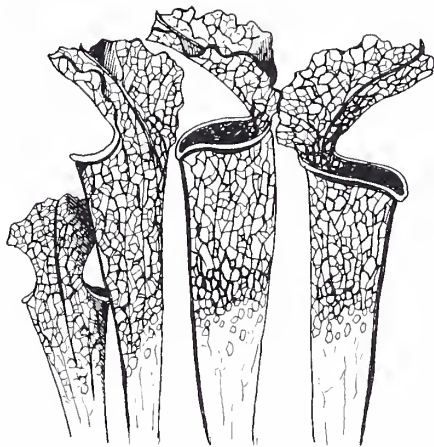
I think you or another co-editor will hear from the society when it's running. The short name of the society is DGfFP (Deutsche Gesellschaft für fleischfressende Pflanzen).

So, the situation around the Society is turning!

ANTHONY REA (296 Precita Ave., San Francisco, CA 94110) writes: The San Francisco Flower and Garden Show will take place August 24-26, 1984 at the Hall

of Flowers in Golden State Park. I urge all Bay Area CP growers to enter their plants in the show. To enter is simple; just drop me a letter and I will send you the official entry form where you will list the plants that you intend to show along with a \$1.50 entry fee. We need a large number of plants this year for display since the manager is giving us a prominent place in the main gallery. Everyone is welcome to join this effort and we will try to make this show the best ever!

PHILLIP HARCHACK (Rt. 1, Box 367A, Osceola Mills, PA 16666) has had some experience with germinating orchid seed on various agar formulas, a process well established among orchidologists and just beginning with CP. He is interested in corresponding with others who may be interested in or have had experience with this technique and CP, and he would particularly like to try hard to germinate species.



Sarracenia leucophylla

Drawing by Jim Miller

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Range of plants &
seeds, inc. *Drosera*,
Utricularia,
Sarracenia, &
more.

MEDICINAL USES OF SOME AMERICAN CARNIVOROUS PLANTS

by Donald Schnell

Being a physician, I am always interested in reading about past, current and possible future uses of various native American plants in medicine. At one time early in the colonization of our country, it was very important for doctors to be able to accurately identify native plants of medicinal value since these were often the only sources of drugs and remedies available to him. Shipments from Europe were not reliable and the doctor was pretty much on his own. Physicians were very well schooled in botany, often to a rather advanced degree considering the times, and some of our most active early botanists were also physicians. While searching through the woods and meadows for medicinals, or traveling trails between farms to visit his patients, the doctor often stopped to notice and originally describe new species, and to even do some basic research.

The following note describes some early medicinal uses of two of our native CP genera, and one possible future use for another. At the onset, I must warn readers *not* to try any of these various concoctions themselves—most of the remedies are unproven and based on anecdotal experience only. The various extracts and even the extractants could be quite poisonous. All drugs, even our most modern synthetically produced medicines, are in fact poisons administered by the physician in a closely controlled manner in hopes of doing the patient some good. The margin between safety and toxicity is often close and sometimes unpredictable in the individual. The author and editors of CPN cannot be responsible for any mishaps should someone foolishly try one of these remedies. This article is presented for interest's sake only.

The bulk of this note is based on a book by Charles F. Millsbaugh called *AMERICAN MEDICINAL PLANTS* and originally published in 1892. It is now

available as an inexpensive Dover reprint published in 1974 (Dover Publications, Inc., 180 Varick St., New York City 10014). Any other references will be noted in the article.

Sarracenia purpurea ssp. *purpurea*

The earliest reports of medicinal use of this plant came to early colonists from the Indians who used it in treatment of smallpox (a disease colonists brought to the Indian!). An infusion was prepared from the rhizome and supposedly shortened the course of the dread disease as well as helped prevent pitting and scarring by the pox lesions. In 1861 in eastern Canada, an epidemic of smallpox broke out among unvaccinated Indians and a Dr. Miles of the Royal Artillery stationed in the region stated that the Indians expressed little alarm as squaws prepared infusions of the rhizome and treated cases, all of which were said to have been successfully treated and even cured. An evaluation of the extract was published and discussed by the Medical Society of Nova Scotia and a resolution passed indicating that the treatment was unproven.

During the American Civil War, the extract was tested in a hospital in Alexandria, VA on smallpox cases, and fifty percent of those cases so treated were lost, more than any other method of treatment. Still, scattered reports on the eastern Canadian frontier persisted among various European physicians who claimed to have witnessed success among the Indians, and in one case a physician claimed the preparation saved his own brother's life. I doubt that there was any degree of uniformity of preparing the infusions at that time and such variability may have played a part in the differing results.

In 1892, the preparation for use was done by collecting the rhizomes or the whole plant early "in fruiting," chopping it up, and extracting it in alcohol for eight

SPECIAL NOTICE

CARNIVOROUS PLANT WORKSHOP

WHEN: August 11, Saturday, 1:00 - 3:30 PM

WHERE: University of California, Botanical Garden Meeting Rm., Berkeley, CA

WHO: For all between the ages of 10 to adult.

COST: \$15.00 with check payable to U.C. REGENTS.

Send to: Education Program, Botanical Garden, University of California, Centennial Drive, Berkeley CA 94720

INSTRUCTOR: J.A. MAZRIMAS

CLASS DESCRIPTION: In this course, carnivorous plants will be the subject of a brief history, a discussion of the different trapping mechanisms and some aspects of how to grow them successfully. A slide show will depict examples of some exotic species and live plants will be used to point out interesting adaptations for attracting and digesting insects. Students will be able to take home some plants provided by the Botanical Garden and detailed instructions will be given on how to grow them.

days in a cool, dark place. The extract was then recovered for use. Various chemical substances claimed to be in the extract included an alkaloid called sarracenin isolated as crystals, acrylic acid as a sour liquid and sarracenic acid, along with some tannin.

At the time of publication by Mills-paug, physiologic actions of the alcohol extract were described as diuresis (increased urinary output), catharsis and gastric "excitation," and "increased and irregular heart action with congestion of the head." One worker noted that use of the extract caused an eruption on the skin similar to smallpox itself!

Clearly, medicinal use of this plant in early days was of dubious value, but one wonders what more modern methods of research with careful controls might yield.

Drosera rotundifolia

In the sixteenth century, this species (which also grows in Europe) was supposed to be curative of consumption, an older name for tuberculosis. It was also claimed to be of value in treatment of asthma. Rafinesque stated that "the juice" destroyed warts and corns, and when used topically with milk helped freckles and sunburn (the sap caused milk to

"clabber" or semi-solidify). The most famous and constant use was as an anti-tussive (cough suppressant) for symptomatic treatment of various diseases involving coughing.

At the time of publication of Mills-paug, the extract was prepared by chopping and pounding the entire fresh plant to a pulp, then placing the material in a small piece of clean linen which was twisted causing the juice to filter and exude through the linen. It was collected and added to an equal part of alcohol, and this mixture was also allowed to stand for eight days in a closed container in a dark, cool place. The only chemical identified at the time in this extract was alizarin.

The whole plant was early on considered poisonous, especially to grazing sheep. One experiment resulted in three cats being poisoned and autopsy disclosed lung and gastrointestinal tract lesions. In excessive doses, the juice resulted in "shuddering," sense of pain and constriction in the chest, rawness in the throat, cough, hemoptysis (bloody cough), abdominal pain, diarrhea and increased sweating. Still, in carefully moderated doses, the extract was held to be of value

as an antitussive, "where in fact it gives many a patient a restful night and more peaceful day" when suffering from various ailments involving cough.

Sarracenia flava

Skipping ahead to 1974, "modern times," Miles et. al. (J. of Parm. Sciences 63:613-615) reported on antitumor activity of various extracts of this species. The foreword to the paper describes how "moonshine" (ethanol, mostly one would hope!) extracts of this plant were used as a folk remedy among residents of south-eastern Georgia in the Okefenokee region.

Testing was conducted in a highly controlled fashion against one tumor of the type known as epidermoid grown in tissue culture. Cruder extracts using methanol, water and chloroform indicated some antitumor activity. No preparations were active against at least two other kinds of cancers being grown in tissue culture (lymphoma and carcinosarcoma).

After further testing, extractions and isolations of various compounds, it was felt that betulin was the active principle in the results noted. Further testing of

various species, extracts and tumors might indeed be of interest since treatment of malignant tumors by chemicals is very prominent in today's medical armamentarium.

Summary

The early uses of our native CP in medicine are highly dubious by modern standards, although use of *Drosera* extracts for treatment of cough persisted into the 1930's. Still, many of our modern drugs were originally derived from plants and given the numbers of species of all plants in the world and the possible numbers of chemical substances in any of them, medically useful compounds might still be waiting undiscovered. This possibility is one more reason to encourage conservation of all our native plant stands in reasonable numbers consistent with civilization's demands, and also encouraging research toward successful cultivation and tissue culturing of all threatened species.



Sarracenia flava, Pensacola, FL

Animal Associates of Carnivorous Plants

by Oliver T. Massey

(Suite 140, 1300 N. Westshore Blvd., Tampa, FL 33607)

Among CP enthusiasts there seems to be a continuing interest in learning just what these plants' limitations are regarding the capture of non-insect prey. Since my move to Florida, I have established my CP collection outside. I have discovered that a frequent victim of *Nepenthes* and *Sarracenia* is the garden snail. Among the *Sarracenia*, *S. purpurea* is by far the most successful in trapping snails, with *S. × catesbei* a distant second. I have examined *S. purpurea* pitchers with as many as two dozen shells. *S. alata* and *S. rubra* manage to trap a few specimens, but the flat spiral shells are often too large to allow the animal to be caught, and a few inevitably jam the pitcher's mouth. The large erect species, such as *S. flava* and *S. leucophylla*, attract very few snails, perhaps because of their height. Interestingly, *S. psittacina* and hybrids of *S. psittacina* and *S. purpurea* do not appear to attract snails.

Nepenthes also trap these animals with the number of shells found in traps inversely proportionate to the distance of the pitcher from the ground. There are apparently some differences between species in their ability to attract snails, with *N. khasiana* being particularly successful, although the differences are not completely clear.

On the negative side, the condition favorable for snails is too wet for healthy CP growth. Additionally, the snails are capable of damaging CP. I have seen emerging *Sarracenia* traps damaged, even though the snails alone do not appear

capable of killing the plants. *Nepenthes*, on the other hand, do not suffer damage to the new leaves. In the case of *Nepenthes*, the undersides of the lid, the inner side of the pitcher below the peristome, and the peristome are eaten.

Besides snails, I have also had the opportunity to observe how tree frogs relate to CP. These small frogs are generally about 2-3 cm long and are thus small enough to conceivably be trapped by the larger species of *Sarracenia* and *Nepenthes*. A large number of these frogs live in and around the sphagnum in my CP plantings. Surprisingly, I have also found them living in *Sarracenia* pitchers. The first frogs were found in *S. × catesbaei* and the older dried pitchers of *S. leucophylla*. I assumed they would avoid the newer traps of the upright species. In the fall, however, I found them in newly opened pitchers of *S. leucophylla* and *S. flava*. They spend a large part of the day in these pitchers, and retreat down the pitcher tube when threatened. I do not know the extent to which they take advantage of insect prey attracted by the pitchers. They are most active at dusk and during the night when they migrate toward light sources. These frogs also live among my *Nepenthes*, and I eventually discovered that they utilize *Nepenthes* pitchers in much the same way.

As a final note, I recently discovered that at least one frog survived a week of 15 degree nights in December by taking refuge in a *N. alata* pitcher.

ICPS Membership Directory

Plans are underway to publish a membership directory of everyone who has joined ICPS since 1982. *If you do not wish your name and address included*, please notify Pat Hansen, 3321 Hamell Road, Fullerton, CA 92635, before October 1, 1984.

A Field Trip to Gunong Trusmadi

by Johannes Marabini

Am Gründla 24, 8522 Herzogenaurach, West Germany

Borneo is well known as the center of *Nepenthes* species especially the higher mountain regions in Sabah, which are called "Mossy forest."

I visited Sabah in March 1983 to make an expedition to the second highest mountain in Borneo, the Gunong Trusmadi. This enterprise had to be well prepared because there is no trail up to the summit and also to the base of the mountain. The chief of the party, Mr. John Briggs, organized the guide and the porters so that my companion Mr. Paul Deibert from the Botanical Institut Munich and I could start in the early morning after spending one night in Tambunan, a small town in the Tambunan Valley.

It took three days traveling through the lowland jungle to reach the base of the mountain. Gunong Trusmadi is the highest peak (2900 meters) in an east-western

mountain range called the "Crocker Range." The soil consists mainly of gleyic podzol and orthic Acrisols; the parent material is sandstone and mudstone compared to Mt. Kinabalu which consists of acid, igneous and ultrabasic rocks.

On the fourth day we started to climb the mountain. After a few hours we reached the first spur which was covered by mossy forest. It was at an altitude of nearly 1800 meters. All the stems of the trees and the surfaces of the rocks were covered by moss. It didn't take a long time until I found the first pitcherplant: *Nepenthes fusca*. This plant grew as an epiphyte in the crown of a small *Eleocharis* tree. The other species which was wide-spread from there on was *Nepenthes tentaculata*, also well known from Kinabalu. This dainty species grew on the ground and many pitchers were imbedded in the moss. Our guide



View to Mt. Kinabalu

Photo by J. Marabini



Nepenthes edwardsiana
on Trusmadi



Nepenthes lowii Hook. f.

Photos by J. Marabini



The new hybrid: *Nepenthes* × *trusmadiensis* Marabini (*N. edwardsiana* × *N. lowii*)



Nepenthes tentaculata
Hook. f.



Peristome of *N. edwardsiana*
Hook. f.

Photos by J. Marabini

led us through dried-out brook valleys and sometimes along ridges. After we climbed again 300 meters I found the first example of *Nepenthes lowii* with its really imposing pitchers. The difference of size between these pitchers and those from Kinabalu was clearly recognizable. These pitchers were much larger than the Kinabalu ones. A few meters distant we also found *N. edwardsiana* with immense pitchers. The leaf-blades were nearly 60 cm long, but their shape was quite different from those on Kinabalu. These were not so slender, more cylindrical and the peristome not so extremely padded. From there on we walked through a gallery of pitchers, consisting of *Nepenthes lowii*, *Nepenthes edwardsiana* and *Nepenthes tentaculata*.

In the late afternoon we reached the summit. I used the rest of the day to explore the near summit region and after a while I found a hybrid between *Nepenthes lowii* and *Nepenthes edwardsiana*. The pitchers were very large and combined the characteristics of both species. It could be possible that this hybrid is endemic on Trusmadi as the locations of *Nepenthes*

lowii and *Nepenthes edwardsiana* do not overlap so much on Kinabalu. Therefore I gave this hybrid the name *Nepenthes* × *trusmadiensis*. From all species I took herbarium material for the University Erlangen (West Germany). It should help to compare the plant association on Trusmadi with that on Kinabalu. We had sunny weather all the time and the temperatures at noon reached up to 30° C. In the late evening the top of the mountain was covered by clouds and we felt the misty rain. The next morning we got up early and we had a wonderful view to Mt. Kinabalu. The minimum-maximum thermometer showed us a nightly low temperature of 5° C.

This big temperature difference makes clear how difficult it is to imitate in culture the natural conditions which are essential for these highland plants. It's not only the low temperature which is necessary for growing but rather the change of temperature between day and night. And this is only one factor which is necessary for survival in culture.

Hybrid name officially published in Mitt. Bot. München 19:449-452.1983.

Sarracenia Hybrids – The F-1 Generation

Part I *S. Flava* Hybrids

by J.A. Mazrimas & L.C. Song, Jr.

INTRODUCTION

With this article, we begin a new phase in our series of articles on *Sarracenia*. Hybrids have always fascinated growers of plants and CP fanciers are no exception. In this article, the first name listed is not necessary the seed parent. More work and observation is needed on how the F-1 hybrids may differ if the order of crossing is reversed as well as the forms of each

respective parent. Some idea of the effect of different parental forms on the resultant hybrids was illustrated in Clemesha (1983). The Latin name for the hybrid is given, where applicable. According to Slack (1979), all but one of the possible hybrids with *S. flava* are found in the wild. The only hybrids not found in the wild are hybrids of *S. oreophila*.

1. *S. flava* × *S. purpurea* = *S. × catesbaei* (Elliot) Bell

Name origin: Mark Catesby (1749), an English naturalist and traveler.

Pitcher: Widely tapered from its base to the lip with coloration varying from nearly all green to heavily veined with dark purple.

Petals are rose colored or vary with red on the outside and yellowish on the inside surface.

Flower: on the inside surface.

Range: Found from south central Virginia, North Carolina, South Carolina and Florida.

2. *S. flava* × *S. leucophylla* = *S. × mooreana* (Veitch) Bell

Name origin: Thomas Moore, 1821-1887, curator of the Chelsea Botanic Garden.

Pitcher: Trumpet shaped and is evenly expanded from its narrow tapered base to the lip. The areoles around the opening are pale green and the throat is sometimes marked with a pale red patch.

Flower: Petals are pinkish or varying with a reddish surface on the outside and yellowish on the inside.

Range: Southwest Georgia, Northwest Florida and Southern Alabama to Mobile.

3. *S. flava* × *S. minor* = *S. × harperi* Bell

Name origin: R. M. Harper, the first collector of this hybrid.

Pitcher: Tall, yellowish-green and widely tapered from base to rim with some reddish tinge in upper portions. The hood and upper pitcher is veined with maroon or red.

Range: Southeast North Carolina down to South Carolina into Georgia and Northern Florida.



1. *Sarracenia flava* × *S. purpurea* (*S. × catesbaei*).

Photo by J. A. Mazrimas



2. *Sarracenia flava* × *S. leucophylla* (*S. × mooreana*) in habitat in Florida.

Photo by D. E. Schnell.



3. *Sarracenia flava* × *S. minor* (*S. × harperi*) in habitat.

Photo by D. E. Schnell.



5. *Sarracenia flava* × *S. psittacina*.

Photo by J.A. Mazrimas



6. *Sarracenia flava* × *S. alata*. Clump growing in bog in the Fullerton Arboretum.
Photo by L. Song.



7. *Sarracenia oreophylla* × *S. flava*. Immature specimen growing in the lath house at CSU Fullerton. Throat patch is barely visible. Others lack even a hint of a patch.
Photo by L. Song.

4. *S. flava* × *S. rubra* = *S. × popei* Masters (no photo available)

Name origin: Raised by Pope of Glasnevin Garden, Dublin.

Pitcher: Tall and tapered from its base to the opening with the basic color being a light yellow-green. The upper part of the pitcher is veined and shaded with maroon. The hood is green with dark red or maroon markings.

Flower: Petals are maroon but have a yellow margin and are yellow-pink on the inside. Flower is large in size and petals have the obobate shape of *S. rubra*.

Range: North and South Carolina, Georgia, Northern Florida and Southern Alabama.

5. *S. flava* × *S. psittacina*

Pitcher: Decumbent to suberect that taper strongly from the large intermediate globose hood with a slotted opening to the narrow base. Hood is basically green with red reticulation and white areoles on curvature, having a broad straight wing.

Flower: Large flowers with rose colored petals.

Range: Southern Georgia and Northern Florida.

6. *S. flava* × *S. alata*

Pitcher: Erect and more robust than *S. alata*. The lid is oriented similar to *S. flava* but the neck is less pronounced. No throat patch seen in specimens available to us.

Flower: Similar in size and color to *S. flava* with petioles not exceeding the height of the pitcher.

Range: Southern Alabama, the only place where the two species overlap.

7. *S. flava* × *S. oreophila*

Pitcher: Intermediate with traces of throat patch visible in some specimens. Exhibits the late summer die off of pitchers as in *S. oreophila*. Ours may not reflect the full potential as they have not flowered yet.

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Byblis gigantea

by

Bruce Pierson

P.O. Box 179, Albion Park, N.S.W. 2527, Australia

Most failures of this species in cultivation seem to be caused by keeping the compost too wet. By using the following method of cultivation, you should be able to grow this species very successfully. Use a 150 mm plastic pot, and line the drain holes with sphagnum moss. This acts as an indicator, while retaining the potting medium, which should be 2 parts river or horticultural sand, and 1 part peat.

The plant can be planted in this mixture, and the pot watered by placing it into 25 mm of water for about ½ hour. Then remove the pot and place it on the bench. By watching the sphagnum moss, you will know when to re-water the pot. As the pot becomes drier, the moss will get lighter, but don't allow the pot to become too dry, as the plant may become water stressed. Place the pot back into the water as necessary, always removing it to drain after about ½ hour.

On reaching maturity, the plant will flower, and if you wish to collect the seed, the flowers will need to be cross-pollinated. Using a small brush, collect the pollen from one flower, by tapping the anthers in order to make them release their pollen, which is collected from the petals, and transferred to the stigma of *another* flower, whose pollen may be used on the first flower. Seed is exceptionally difficult to germinate, but some success will be achieved by placing the seed in a container, and pouring boiling water on it, and allowing it to soak overnight before sowing on the same medium as for the parent plant, moist only.



Byblis gigantea

Photo by J. Mazrimas.

At the end of the growing season, this species will start to die down, at which time, the pot should be allowed to dry out completely. At the start of winter, the pot should be re-watered by using the above method, taking care not to allow the potting medium to become soggy at any time, which may result in the death of the plant. Watering may be necessary every day in hot weather, while in cooler weather, every few days may be adequate.

REMINDER: Changes of address should be sent to Pat Hansen, 3321 Hamell Road, Fullerton, CA 92635. No further issues of *CPN* will be mailed to people whose copies are returned by the post office until a change of address is received.

The following are translations of the photo captions of Japanese books dealing with carnivorous plants. The translations were done by Yasuhiro Fukatsu (49, Ohkan-dori, Hacchocho, Okazaki-City, Aichi-Pref. 444, JAPAN). See *CPN*, March 1984, pp. 16-22.

朝日百科 世界の植物

ASAHI PLANTS OF THE WORLD

page	comment	page	comment
227	above; A mass of <i>U. vulgaris</i> below; <i>P. alpina</i> in habitat	1487	above; <i>D. rotundifolia</i> , this sundew often grows well with sphagnum moss.
228	<i>P. vulgaris</i> in habitat—Nagano Prefecture		below left; <i>D. spathulata</i> (Kanto type)
229	<i>P. vulgaris</i> , whole plants in flower		below right; <i>D. spathulata</i> (Kansai type). 'Kansai' can be seen in Tokai area only, so 'Kansai' has more localized range than 'Kanto'.
230	<i>P. ramosa</i> ; This tiny butterwort is endemic in Japan, and has quite a very limited distribution. A scape branches in two or three portions, which come into flower at the same time. The Latin name " <i>ramosa</i> " means branching. After flowering the scapes grow much longer, and turn on the ground to sow their seeds surely. The tiny rosette and oddly long scape is another habit of <i>P. ramosa</i> .	1488	<i>D. x obovata</i> (<i>D. anglica</i> x <i>D. rotundifolia</i>) in Cze moor
		1489	above; <i>D. peltata</i> Tuberous sundews in Australia grow in winter, while the trap season of Japanese <i>D. peltata</i> is from April to June, for winter of Japan is very severe.
231	above; An inflorescence of <i>U. vulgaris</i> in Alaska below left; A mass of <i>U. inflata</i> floating in the water		below; <i>D. indica</i> (white flower) This species has a very limited distribution, and has two color form, white flower type and pink flower type.
	below right; A stand of <i>U. bifida</i>	1490	<i>Aldrovanda vesiculosa</i> in flower
232	above; <i>U. minutissima</i> (syn. <i>U. nipponica</i>), our smallest bladderwort below; Flower of <i>U. racemosa</i> , note the long horizontal spur of the lower lip.		<i>Dionaea muscipula</i>
		1491	<i>N. villosa</i>
233	<i>U. affinis</i>	1492	<i>N. burbridgeae</i>
1485	<i>D. rotundifolia</i> , the most common species	1494	above; <i>N. gracilis</i> middle; <i>N. maxima</i> below; <i>N. mirabilis</i>
1486	A clump of <i>D. anglica</i> in Oze moor, our most famous bog. This species has a very limited distribution. We, however, can find here this interesting sundew in large colonies.	1495	<i>N. rafflesiana</i>
		1496	above; <i>N. bicalcarata</i> below; <i>N. rajah</i>
		1497	left; <i>N. lowii</i> right; <i>N. edwardsiana</i> below; <i>N. veitchii</i>
		1498	<i>N. stenophylla</i>

CARNIVOROUS PLANTS

by M. Kondo & K. Kondo

page 145

	3	1
4		2
6		5

1. ドロセラ・アルケイ *Drosera arcturi*
2. ドロセラ・ブルマニ *D. burmanii*
3. ドロセラ・ピグマ *D. pygmaea*
4. ドロセラ・ドラムモンディ *D. drummondii*
- 5.6. ドロセラ・アデラ *D. adela*

page 146

	1
2	3
5	4

- 1.2. ドロセラ・スパツタ *D. spathulata*
3. ドロセラ・バーケ *D. burkeana*
4. ドロセラ・カピラリス *D. capillaris*
5. ドロセラ・グランドリゲラ *D. glanduligera*

page 147

2	1
3	
5	4

1. ドロセラ・フィリフォリス *D. filiformis*
2. ドロセラ・ブレイフ *D. brevifolia* (syn. *D. leucantha*)
- 3.4.5. ドロセラ・カペンシス *D. capensis*

page 148

2	
3	1
4	
6	5

- 1.4. ドロセラ・ビタ *D. binata* var. *dichotoma*
2. ドロセラ・ロツンデ *D. rotundifolia*
3. ドロセラ・オボバタ *D. ovobata*
5. ドロセラ・ビタ *D. binata*
6. ドロセラ・ハミルトン *D. hamiltonii*

page 149

2	1
3	
5	4

- 1.3. ドロセラ・ペルタ *D. peltata*
- 2.4. ドロセラ・アウリキュラ *D. auriculata*
5. ドロセラ・ギガ *D. gigantea*

page 150

4	1
	2
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6	3
7	

1. ドロセウ・メンジエシア *D. menziesii*
- 2.3. .ドロセウ・アラゴンシア *D. planchonii*
4. ドロセラ・ストロメラ *D. stolonifera*
5. ドロセラ・マクラサ *D. macrantha*
6. ドロセラ・エリスロライサ *D. erythrorhiza*
7. ドロセラ・ホイタケリ *D. whittakeri*

page 151

- above two *Drosophyllum lusitanicum*
 below two *Dionaea muscipula*

page 152

- above three *Aldrovanda vesiculosa*
 below three *Byblis gigantea* & *B. liniflora*

page 204

2	1
4	3

- 1.2. ヘリアンフロ・ヌタス *Heliamphora nutans*
3. ヘリアンフロ・ヘテロドクサ *H. heterodoxa*
4. ヘリアンフロ・マイナー *H. minor*

page 205

4	1
5	
7	6
8	3

- 1.5. ネペンテス・ベトリコーサ *Nepenthes ventricosa*
2. ネペンテス・メリリア *N. merrilliana*
3. ネペンテス・グラシリス *N. gracilis*
4. ネペンテス・カシアナ *N. khasiana*
6. ネペンテス・ミラビリス *N. mirabilis*
7. ネペンテス・バーケイ *N. burkei*
8. ネペンテス・トランカータ *N. truncata*

page 206

	2	1
5	6	3
8	7	4

1. ネペンテス・アンギュラ *N. ampullaria*
2. ネペンテス・アルボマギナ *N. albomarginata*
3. ネペンテス・レインワート *N. reinwardtiana*
4. ネペンテス・ロウイ *N. lowii*
- 5.6. .ネペンテス・ビカルカ *N. bicalcarata*
7. ネペンテス・マクスマ *N. maxima*
8. ネペンテス・ラーヤ *N. rajah*

page 207

1. ネペンテス・バウリジ *N. burbridgeae*
- 2.3. .ネペンテス・ビロサ *N. villosa*

4	3	2	1
6		5	
8		7	

4. ネパントス・ステノフィラ *N. stenophylla*
5. ネパントス・トレリアイ *N. thorelii*
6. ネパントス・ナゴヤ *N. x nagoya*
7. ネパントス・プリンス *N. x princeps*
8. ネパントス・マスタースイアン *N. x mastersiana*

page 208

4	3		1
7		2	
8	6		5

- 1.2. ネパントス・サードウィルム・ティン・グーパー *N. x dyeriana*
3. ネパントス・コクシネア *N. x coccinea*
4. ネパントス・リグレイヤナ *N. x wrigleyana*
5. ネパントス・ミナミエンス *N. x minamiensis*
6. ネパントス・ミックスタ *N. x mixta* (I think this is not *N. x mixta* but *N. x ohisoensis*.)
7. ネパントス・ツジモト *N. x tsujimoto*
8. ネパントス・ハイブリダ *N. x hybrida* (I think this is not *N. x hybrida* but *N. alata*.)

page 249

3			
4			1
5			
6			2

- 1.2. セファロトス・フリキュラリス *Cephalotus follicularis*
3. ピンクイキュラ・プミラ *Pinguicula pumila*
4. ピンクイキュラ・プランフォリア *P. planifolia*
5. ピンクイキュラ・ヘテロフィラ *P. heterophylla*
6. ピンクイキュラ・セルレア *P. caerulea*

page 250

2		1
5		3
6		4

- 1.2. ピンクイキュラ・ルテア *P. lutea*
3. ピンクイキュラ・オブロンギローバ *P. oblongiloba*
4. ピンクイキュラ・コリメンシス *P. colimensis*
5. ピンクイキュラ・ジプシコラ *P. gypsicola*
6. ピンクイキュラ・カウダタ *P. moranensis* (syn. *P. caudata*)

page 251

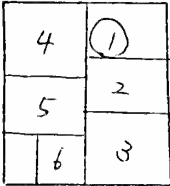
3		1
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- 1.2. ピンクイキュラ・レプトセラス *P. leptoceras*
3. ピンクイキュラ・ネバデシス *P. nevadensis*
4. ピンクイキュラ・コルシカ *P. corsica*
5. (冬芽) *hibernaculas*

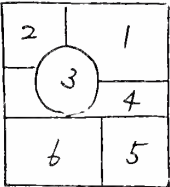
page 252

2		1
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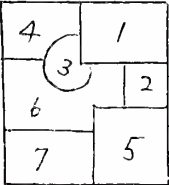
1. ピンクイキュラ・グランドイフロラ *P. glandiflora*
2. ピンクイキュラ・ヴルガリス *P. vulgaris*
3. ピンクイキュラ・マクロセラス *P. macroceras*
4. ピンクイキュラ・ヴァリスネリイフォリア *P. vallisneriifolia*
5. ピンクイキュラ・ラモサ *P. ramosa*



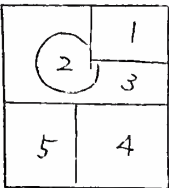
- 1.2. ピンギキョウ・ロギョウ *P. longifolia*
3. ピンギキョウ・アルピナ *P. alpina*
4. ウトリキョウ・インフラタ *Utricularia inflata*
5.6. ウトリキョウ・ギンハ *U. gibba*



- 1.3. ウトリキョウ・デントキョウ *U. livida* (syn. *U. denticulata*)
2. ヂホキョウ・スベキョウ *U. subulata*
4. ウトリキョウ・コルヌタ *U. cornuta*
5. ウトリキョウ・ストリアツウ *U. striatula*
6. ウトリキョウ・ミニッホカ *U. minutissima* (syn. *U. nipponica*)



- 1.2.3. ウトリキョウ・ダイコトマ *U. dichotoma*
4. ウトリキョウ・ラテリフロウ *U. lateriflora*
5.6.7. ウトリキョウ・アウレア *U. vulgaris* (not *U. aurea*)



- 1.2. ウトリキョウ・レスピナ *U. resupinata*
3. ウトリキョウ・ウリグーサ *U. uliginosa*
4. ウトリキョウ・セルレア *U. caerulea*
5. ウトリキョウ・ジモルファンタ *U. dimorphanta*

###

Nepenthes Hybrids

Horticultural name

Parents

<i>N. x nagoya</i>	<i>N. x mixta</i> x <i>N. thorelii</i>
<i>N. x princeps</i>	<i>N. x mixta</i> x <i>N. khasiana</i>
<i>N. x mastersiana</i>	<i>N. sanguinea</i> x <i>N. khasiana</i>
<i>N. x dyeriana</i>	<i>N. x mixta</i> x <i>N. dicksoniana</i>
<i>N. x coccinea</i>	<i>N. x hookeriana</i> x <i>N. x mirabilis</i>
<i>N. x wrigleyana</i>	<i>N. mirabilis</i> x <i>N. x hookeriana</i>
<i>N. x minamiensis</i>	<i>N. x mixta</i> x <i>N. x wrigleyana</i>
<i>N. x mixta</i>	<i>N. northiana</i> x <i>N. maxma</i>
<i>N. x tsujimoto</i>	unknown
<i>N. x hybrida</i>	unknown

A REWARDING HOBBY

by

Curtis Yax, 12 Division, Apt. 1, Oneonta, New York 13820

I have been studying and cultivating CP for a few years, collecting as many species as I have room for in my 55, 30 and 10 gallon terrariums, and a couple of goldfish bowls for the aquatic *Utricularia*. In addition, I have a half dozen mini-terrariums for the enchanting pygmy sundews. It is a most rewarding hobby and a topic of conversation with anyone, especially children who love to see the Venus-fly-traps do their thing!

Although I am an amateur grower of CP, I hope that some of the things I have observed may benefit other growers. For those who grow aquatic *Utricularia* or *Aldrovanda*, you may find that putting water into a fishbowl or aquarium a difficult task especially with a 2 inch layer of soft peat moss sitting on the bottom. I float a sponge in one corner and pour the water gently in a steady stream over the sponge which fills the tank without disturbing the peat moss layer.

Last winter, I used *Drosera rotundifolia* hibernaculum 'leaf buds' for propagation of this plant. The tiny buds or leaves act like pygmy gemmae. The grew very fast when placed under live sphagnum moss. The resulting plants were healthy and vigorous, forming hibernaculum the following fall. The parent plant suffered no harm by the removal of a row of leaf buds.

The tiny pygmy sundews are incredibly pretty and fascinating. I grow mine under lights about 3" from the plants for 16 hours in summer and 8 or less hours during the winter. Plants which are 18" or more from the lights will not develop their sweet traps. An easy pygmy to grow is 'Lake Badgerup'. One day last summer, I fed my plant a minute crumb of a *Tubifex* worm and if I winked, I would have missed the action for the speedy tentacle movement was astounding, perhaps even surpassing the speed of *D.*

burmanii. In order to observe this, use a magnifying lens of about 20x and give the plant about 16 hours of light.

D. spatulata seems to lose its appetite when given only 8 hours of artificial light per day. There is no noticeable leaf movement when digesting its meal.

Another tip for the *D. adaelae* and *D. indica* lover is that a large surface area is needed for *D. adaelae* since this plant propagates itself naturally from roots. Old crowns are constantly being replaced with new ones which are always growing up to the surface. The roaming *D. indica*, a difficult species, would also benefit from a wide container for whenever the plant falls to the moss it roots, enabling it to trail along as if growing outside.

I agree with Michael Homick who gave advice on cooling seeds in the refrigerator. This treatment seems to enhance germination among tropical *Drosera* such as *D. indica* and *D. glabripes*.

I licked the fungus blues! Instead of risking poisoning myself and my plants, I simply spray the surface of my moss with rainwater, soaking the surface twice weekly but being careful not to wet the *Drosera* or *Pinguicula*. It works! All the white fungal growth disappears the next day. Perhaps the fungus cannot cope with the soaking. One problem is fungus on the surface of large seed, such as *Byblis gigantea*, which needs to be rotated once a day to keep fungus off.

I have read in Adrian Slack's book, *Carnivorous Plants*, about the problem with keeping *Pinguicula caerulea* alive for more than a year. I am growing mine since the spring of 1981. They grow under two lamp grow-lights with an 8-hour cycle in winter and 16 hours during the summer and are kept warm under ambient room temperature all year long. I trim back the leaves with a clean razor blade

(Continued on page 55)



Drosera prolifera C. White (Sect. Arachnopus)

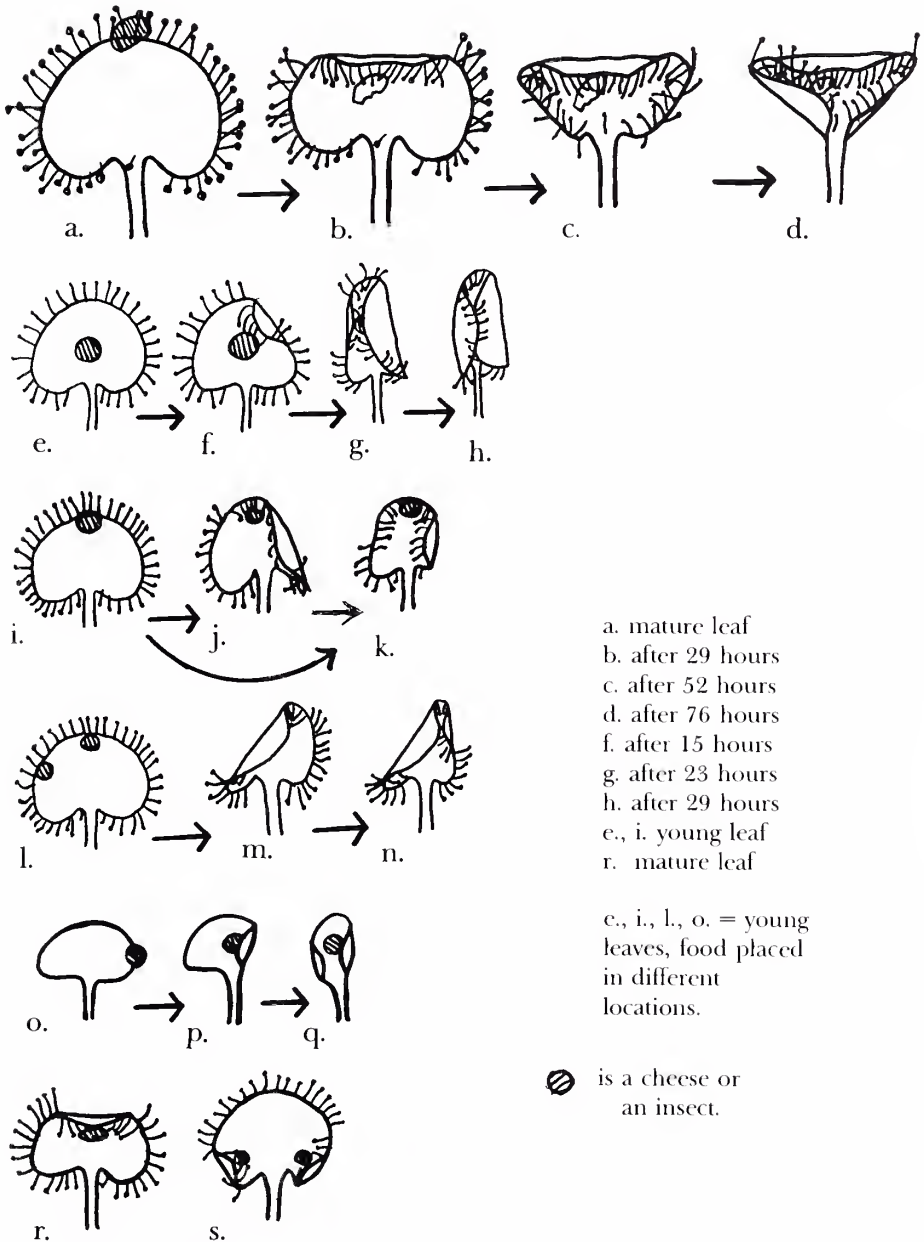
Photos by Yoshiaki Katagiri



Drosera prolifera C. White (Sect. Arachnopus)

The Leaf Blade Movement of *Drosera prolifera*

by Yoshiaki Katagiri
3-1-8, Inaba, Kameda-machi,
Nakakambara-gun, Niigata-pref.
950-01 JAPAN



Review of Recent Literature

Conn, B.J. Review of the infraspecific classification of *Drosera macrantha* Endl. *Muelleria* 5(5): 347-349 (1984).

There are two geographically distinct subspecies of *D. macrantha* said to exist in Australia mainly in Western Australia and another in Southeastern Australia. They were distinguished merely on the size and shape of the sepals. This author refutes this distinction on the basis of actually measuring the length to sepal width ratio of 160 specimens. Therefore, *ssp. macrantha* and *ssp. planchonii* are morphologically indistinguishable.

Daniels, Patricia. 1984. Eating on the fly. *National Wildlife* 22:4-5.

A brief (one half page) popular article on Utricularias, featuring a one and a half page of *U. radiata* color photo of flowering plants in a pond, and two smaller photographs of traps (photos by Makoto Honda). DES

Hutchinson, J.F. 1984. In vitro propagation of *Dionaea muscipula* Ellis (Venus fly trap). *Scientia Horticulturae* 22:189-194.

Variations that improved shoot proliferation of the species on Linsmaier and Skoog medium were use of kinetin, pH 5.7, maintaining nitrogen in formula, use of salt concentrations prescribed, or replacement of the latter two factors with casein hydrolysate.

DES

Taylor, Peter and Martin Cheek, 1983. *Pinguicula agnata*. *Curtis's Botanical Magazine* 184:159-161 (plus plate).

This article gives a complete description of the above species along with details of its habitat and successful cultivation. A feature of the article is a full page color drawing print. DES

BOOK REVIEW

Shivas, Roger C. Pitcher plants of Peninsular Malaysia and Singapore. Maruzen Asia, Singapore. 1984.

This 58-page book is packed with information on *Nepenthes* from the forests of Malaysia. Organized into 6 chapters, this book describes the general biology, where to find them, a key, an individual description of the species and hybrids and finally a short course on cultivation. There are some 21 plates reproduced in full color and a half dozen shown in B&W. It was the author's intention to make this book serve as a field guide and he succeeded in this by giving us good closeup pictures of upper, lower and sometimes intermediate pitchers of all 12 species that are described. Although the book is small, and ideal for field use, it does not lack any of the essential information that one needs to use in finding these plants and admiring them. I recommend this book to anyone who is seriously turned on by the *Nepenthes* genus, as I am. This book may be ordered from the above publisher, 51 Ayer Rajah Crescent # 07-09, Singapore 0513. The cost is U.S. \$9.80.



Nepenthes dyeriana

Drawing by Ron Fleming

when they start to die and rot during the winter. They are cut back very gently down to a tight ball. This is done when the plant stops growing. After a month or so, new leaves and flowers emerge from the sides of the ball. All of my *P. caerulea* have multiple crowns and are flourishing well.

Drosera capensis is one of the most charming and beautiful of the *Droseras*. They are a hardy lot and adapt easily to different conditions. Since my plants all live together, tropicals with the temperate species, they all receive the same amount of humidity during the winter.

There are many bogs in my area full of CP. I have explored some of them, finding the pearl-like bladders of *Utricularia macrorhiza* shimmering in the sunlight. Last spring I discovered a clear, cool spring nearby in the woods which

streamed out into a clearing. I dammed up the area with logs and mud, digging out a lot of earth and grass to form a pond. I placed some *U. purpurea* and *U. gibba* in the water and they grew like weeds. By summer's end, large clumps could be seen growing in every direction. Also, leopard frogs, too, found a home there. I will plant some *S. purpurea* and various *Drosera* around the pond when the moss takes over. The water is neutral in pH.

I like to end this note with a beautiful picture of *S. purpurea* which I saw in an exotic flower book which was mistakenly labelled as *S. flava*. There was a nice ground covering of *U. pubescens*. The book described briefly what gorgeous flowers the plant had. The supposed flowers were merely the deadly crimson pitchers of the pitcher plant.

WANT ADS

When submitting Want Ads, please be sure to print clearly for best results and to eliminate mistakes. Please circle the correct letter before each item (Want, Trade, Sell or Buy). Want ads are limited to carnivorous plants, terrariums, greenhouses and moss. There is a charge of ten cents per item, with no limit to the number of items you may submit per issue.

Send coin or check to:

Arboretum, Want Ads
California State University
Fullerton, CA 92634

Carnivorous Supplies, P.O. Box 179, Albion Park, N.S.W. 2527 AUSTRALIA (TS) *Drosera*, *Utricularia*, *Sarracenia*, *Pinguicula*. Also CP seeds. Please send 2 international postal coupons for list. (W) Unusual species (seed only) Please send list of available seed.

Michael Hallett (25 Grayson Rd., Epping, 2121, N.S.W., AUSTRALIA) (S) *D. adela*, *D. arcturi*,

D. 'Bannister', *D. regia*, *U. lateriflora*, *U. uliginosa*, plus many other native Aust. CP. (WB) Any *Heliamphora*, *Aldrovanda*, *Pinguicula*.

Joachim Nerz (Arndstr. 2, 7030 Boblingen, WEST GERMANY). (WTB) *Drosera falconeri* (I've *Heliamphora minor* or other species to exchange for it), *N. dipeata*, *Biovularia*.

Bruce Pierson P.O. Box 179, Albion Park, N.S.W. 2527 AUSTRALIA, Has plants and seeds for sale and swap. Interested in rare or unusual plants and seeds. (W) Seeds of *Heliamphora*, *Gentesia*, *Roridula dentata*, or anything rare or unusual.

Jeff Williams (4407 Peridot, Friendswood, TX 77546) (TS) 21 varieties of *Sarracenia* (S) *D. spathulata* Kansai, *D. burmanni*, *D. capensis*, *D. intermedia*, *U. fibrosa*, and *U. longifolia*; (TB) *Nepenthes* cuttings (B) *Cephalotus*, *Byblis*.

Note: All individuals or organizations selling, trading or buying CP are advised to be cognizant of certain restrictions under the U.S. ESA and international CITES for certain species (see editorial, CPN 12 3, 1983).

