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# CARNIVOROUS PLANT NEWSLETTER

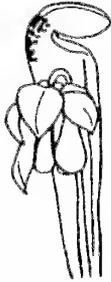
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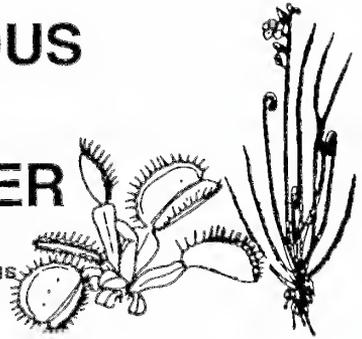
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# CARNIVOROUS PLANT NEWSLETTER

Official Journal of the  
International Carnivorous  
Plant Society



Volume 22, Numbers 3  
September 1993

Front cover: *Nepenthes eymai*, upper pitcher. Plant grown by Peter D'Amato at California Carnivores, photo by Burt Venaas. The preferred name for this plant is *N. infundibuliformis* after Turnbull and Middleton. See CPN 22, No. 1 & 2 page 21.

Rear Cover: *Drosera felix*. This plant from Auyantepui, Venezuela is about 1.5 to 2.0 cm across and has an interesting 1 cm flower that is on so short a peduncle that it appears often to be setting right down on the rosette. Photo by Don Schnell

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 ICPS c/o Fullerton Arboretum, CSUF, Fullerton, CA 92634. **DO NOT SEND TO THE CO-EDITORS.** Checks for subscription and reprints should be made payable to 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.

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# Seedbank

Tom Johnson, P.O. Box 12281, Glendale, CA 91224-0981

Recently, I joined Gordon Snelling in operating the ICPS Seedbank. For those not familiar with the seedbank, seed contributed by ICPS members is repackaged an sold at nominal cost to other members. The income from the seedbank helps to defray the costs of publishing the CPN. Additionally, the seedbank provides plant material at low cost which enables members to increase their collections with minimal impact on an already stressed environment.

**Updates:** The inventory of the seedbank is listed in periodic updates available from Gordon Shelling at 300 W. Carter, Glendora, CA 91740. Please provide a self-addressed - stamped envelope (SASE) or 2 international reply coupons (IRC) if outside the United States.

**Ordering:** Place orders based on the current update. All orders are to be sent to Tom Johnson, P.O. Box 12281, Glendale, CA 91224-0981. Please provide an SASE or IRC. The price per seed packet is \$1.00. Payment should be included as cash, check, or money order made payable to ICPS Seedbank, C/O Tom Johnson. When ordering, please list substitutes, especially if the update indicates less than 15 seed packets (species followed by number in ()) or an old update. Orders will be filled as soon as possible. A new update will be included with your order. Please ensure that your name and address are clearly written on all correspondence.

**Contributions:** All seed in the seedbank comes from contributions. As an inducement, every 10 packets of seed earn the contributor one packet of seed at no charge. After receipt of donated seed, it is repackaged for distribution. All new seed packets are labeled with the species, location (if known), and month and year received (collected if known). All contributions will be acknowledged by postcard. The number of packets contributed and the number of free packets earned will be furnished.

**Maintenance:** Since we have no control over the seed contributed. It is impossible to guarantee viability. Steps, however, are taken to determine and maintain viable seed in the seedbank. For instance, seeds are occasionally planted to determine if they are viable. Seeds are kept refrigerated to help maintain viability. Also, old seed is regularly purged from the seedbank.

Please use the seedbank - whether you wish to contribute or withdraw. The bank is short of seed all genera, so if you have extra seed, please donate. Remember, a seed is a terrible thing to waste!

## **DISCLAIMER**

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## News and Views

Glenn Tolman (Water Lily World, 2331 Goodloe, Houston, TX 77093)

He is an aquatic nurseryman. He grows a lot of CP in floating beds (see figures) ranging from floating pot rings holding the smaller pots, to large “barges” with barrel floats at each end. He pots his plants in sphagnum. The smaller pool with the floating rings (available from commercial water growing supply sources) is kept filled with ordinary chlorinated city water. The larger pool with the lily pads has an acid soil bottom, and the water is two feet deep.



Figure 1 - Plants shown here growing in a pool in Houston, Texas that has been filled and kept up with city chlorinated water

Figure 2 - Plants shown here growing in pond water with acid type soil on bottom plants in sphagnum moss, water 2 ft.

**Barry Meyers-Rice** (Steward Observatory University of Arizona Tucson, AZ 85721)

In CPN 21:1-2 I wrote on forms of *U. calycifida*. I have since found that forms ‘Spotted flower’ and ‘Purple veins’ self and breed true but crosses between them have yet to provide viable seed. While one could argue that my failure to obtain seed from this cross suggests the forms are different species, I do not. I think the lack of success is due to failure on my part in this delicate procedure, and not because of a genetic barrier. I will continue trying. I have also obtained from Christoph Belanger a few other clones of this plant, especially one (‘Mauve flower’) which has foliage the same as ‘Purple veins’ and similar large flowers. The lower lip of its flowers has a reticulated pattern in the proximal palate region similar to the spots on ‘Spotted flower.’ I consider ‘Mauve flower’ to be a plant intermediate between ‘Purple veins’ and ‘Spotted flower.’ In this perspective, it argues against a species or even subspecies distinction for those two *U. calycifida* forms. Lastly, I have heard of white flowered forms in cultivation.

**Don Schnell** (Rt. 1, Box 145C, Pulaski, VA 24301)

*Pinguicula ionantha* has now officially been listed as a threatened species by the

US Fish and Wildlife Service under provisions of the Endangered Species Act, 1973. The announcement is in the FEDERAL REGISTER of 12 July 1993 (Vol. 58, No. 131, pp. 37432f). The listing is made as threatened rather than endangered so that specific locations would not have to be listed or filed for open inspection. Approximately 20 locations either confirmed by herbarium specimens or reliable field reports are mentioned by county; however, this writer feels there are more as indicated in his field notes, even given the criterion of a location being at least three miles from another to be listed.

The FEDERAL REGISTER article contains the usual rather good write-up. Several other non-CP species are included in this listing, so one has to skip through the text to find material on *P. ionantha*. The article also mentions that two nurseries list the plant. However, checking the latest E-Mail CP printout for CP commercial sources, I find one foreign list for seed, one foreign list for plants, and two US lists for plants, one out of stock. As of now, these can no longer be sold without a federal permit.

The article makes the point, and this writer agrees, that commercial demand has not been and is not a problem, nor are personal collections, although both could become so if the plant locations are further depleted. The biggest problem by far is habitat destruction. The plants enjoy a wet, open habitat best. But with drainage and mesophytic conversion to pine plantations, the plants have often been reduced to a few small pockets of wet remaining, or roadside ditches. When the ditches are further scraped and cleaned to make them more efficient, nearly whole populations are wiped out, as was the case in Carabelle, Florida. Rough ditching, as in "the old days", frequently resulted in a string habitat of slow moving water, ponds, etc. which supported a rich CP flora on their banks and in the water itself. Now, more efficient and deeper ditching, and "cleaning" of the ditches into canals has destroyed this habitat, classically in the Green Swamp of North Carolina.

This author feels, and the point is alluded to in the FEDERAL REGISTER article, that the National Forest Service (which must now obey rules against destruction of habitat) should also be enlisted in a positive fashion to seek out locations on their lands, protect them with a wide margin, and actually manage the areas to prevent drying and overgrowth of weeds. The Appalachian National Forest is at the center of the range and has several fine locations within its borders.

In either event, ICPS members should behave appropriately in the field regarding this species and its new listing.

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# Noteworthy *Sarracenia* Collections

by

Phil Sheridan and Bill Scholl

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11420 Winterpock Rd., Chesterfield, Va. 23832

Over the past several years a number of unreported *Sarracenia* forms and hybrids have been discovered in the wild. For security reasons, locality data is vague but serious students are invited to contact the authors for more information. Below follows a list of these interesting discoveries. *S. rubra* Walter ssp. *gulfensis* Schnell (anthocyanin free form)

A single clump was discovered by Jim Bockowski in 1987 in a shrub bog bordering a major river system in Santa Rosa County, Florida. The leaves, flowers and growth point of this plant are completely green and free of anthocyanin. Phyllodia are produced. Of further note is the presence of abundant areoles on the upper part of the pitcher. John Hummer (1992) reports the areoles are occasionally seen but not a prominent feature of the sub-species. The presence of phyllodia indicate probable introgression with *S. leucophylla* Raf. It is interesting to note the evolution of an anthocyanin free form that is a likely introgressed hybrid. Whether these areoles come from introgression with *S. leucophylla* or *S. psittacina* Michx. (which also grow in the bog) or are an inherent characteristic of the form have not been determined at this time. The areoles are not the very prominent white spots that one sees in *S. leucophylla*, *S. psittacina* or *S. minor*.

*S. psittacina* Michx. x *S. purpurea* L. (*S. x courtii*)

Discovered along a road embankment in Liberty County, Florida by Bill Scholl on 6/13/89. This is the first report from the wild of this hybrid. Ten clumps were found. Additional interbreeding between this hybrid swarm and *S. purpurea* was also suspected based on apparent F2 progeny.

Hybrid determination was made on intermediate characteristics of the leaves between parent species, flower color and shape and the occurrence of only the two potential parents in the vicinity that could result in this unusual *Sarracenia* hybrid.

*S. flava* L. x *S. psittacina* Michx.

Discovered in an open seepage bog by John Hummer on 6/12/88 in Liberty County, Florida. Additional specimens of this hybrid were discovered by Mr. Hummer in the same bog in 6/89 and 6/90. The color of the hybrids varies from green with little veining to heavily red veined. This hybrid was unknown to occur in the wild (Bell, 1952) but has been produced in cultivation.

*S. psittacina* Michx. (anthocyanin free form)

We first learned that such a plant even existed when we visited Fred Case in August 1985. Fred had plants which were discovered and collected by Tom Gibson in Florida. After seeing these plants we kept an eye out for this form and were promptly rewarded with its discovery in the field in Baldwin County, Alabama on 11/3/85. Additional discoveries were made by John Hummer and us in roadside ditches in Gulf



Figure 1. *S. flava* x *S. psittacina*. Wild material under cultivation. Green color predominates even in full sun. Photo by Phil Sheridan.



Figure 2. Flower of anthocyanin free form of *S. psittacina*. Photo by Phil Sheridan.



Figure 3. Growth point of anthocyanin free form of *S. psittacina*. Note complete lack of anthocyanin. Photo by Phil Sheridan.



Figure 4. Robust colony of *S. rubra* (possibly ancestral *S. rubra* ssp. *gulfensis*) growing in hillside seepage bog of Marion County, Georgia 11/2/91. Photo by Phil Sheridan.

County, Florida on 5/11/87.

Flowers, leaves and growth point of this form are pure green and no anthocyanin is present. Best looked for along road sides during flowering season due to the obvious yellow flower.

*S. psittacina* Michx. (yellow flower, anythocyanin in leaves)

Fact is sometimes stranger than fiction and this is the case here. Plants of red veined *S. psittacina* with yellow flowers were collected on 5/12/87 at a seepage bog in Bay County by Phil Sheridan. Apparently a genetic change has occurred which is suppressing the production of red pigment in the flowers of this form. Schnell (1978) showed that *S. psittacina* does have yellow compounds in the petals which are normally not visible in this red flowering species. Apparently red pigment production is suppressed in the petals of this form. No plants of *S. psittacina* (anthocyanin free form) were found at this site so it is suspected that this is a mutant and not the result of hybridization with an anthocyanin free form. The only yellow flowered species at this site was *S. flava* and no hybrids were found between it and *S. psittacina*.

## Comments

We have heard comments from people that the anthocyanin free forms of *Sarracenia* are less vigorous than their anthocyanin producing counterparts. In the case of *S. psittacina* this appears to be the case. *S. rubra* ssp. *gulfensis* (anthocyanin free form), however, has proved to be extremely vigorous. This tends then to challenge the statement that all anthocyanin free forms are going to be slow growing and disease prone. There is definitely a need to explore whether the presence or absence of anthocyanin is a factor in the survival of members of the genus *Sarracenia*.

We have also found that in crossing *S. rubra* ssp. *jonesii* (red form, Greenville Co., S.C.) with *S. rubra* ssp. *jonesii* (anthocyanin free, Transylvania Co., N.C.) a certain percentage of the offspring from the red form parent will be anthocyanin free and the remainder of the seedlings will contain anthocyanin. Previous experiments have shown that covered and selfed material of *S. rubra* ssp. *jonesii* used in these experiments will produce 100% anthocyanin containing seedlings. In addition the material of *S. rubra* ssp. *jonesii* containing anthocyanin is all vegetatively propagated from one rhizome division originally received from Fred Case. This indicates to us that the anthocyanin free form may somehow become more dominant when it is the pollen donor to a anthocyanin producing parent. It also is possible that several genes are involved in the production or suppression of anthocyanin. We will continue our research on this subject and invite others to duplicate our work and report their results.

Recently, Ron Determan of the Atlanta Botanical Garden, as part of a recovery program for *Sarracenia* in Georgia, has succeeded in raising an anthocyanin free form of *S. rubra* from wild seed. Despite our extensive field research we have not once encountered an anthocyanin free form of *S. rubra* in the inner coastal plain of Georgia where Ron got his seed material. Of even greater interest to students of the genus *Sarracenia* is that this plant, even at only three inches tall, possesses abundant areoles! These *S. rubra* from the sand hills of Georgia occur in an area where there are no other *Sarracenia* to hybridize with. It is truly remarkable to learn that once again a normally non areolate species of *Sarracenia* has been found to produce windows.

Schnell (1977) mentioned that areoles in *S. rubra* ssp. *jonesii* may be masked by prominent external venation and this discovery appears to support this thesis for the *S. rubra* complex in general. It is also possible that the genetic change which occurs to suppress anthocyanin production may also be attached to the capacity to produce areoles (witness *S. rubra* ssp. *gulfensis* anthocyanin free form).

We plan another paper to formally describe these new forms and hybrids and invite suggestions or criticisms from the reader prior to formal publication and naming.

## Acknowledgements

Thanks to John Hummer and Don Schnell for review of manuscript and comments. Especially to John for his company in the field and good fortune at making discoveries.

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# GROWING CARNIVOROUS PLANTS IN THE CZECH REPUBLIC

Zdenek Zacek  
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Bohnice, Czech Republic

I live in Prague, the capitol of the Czech Republic. I have been growing carnivorous plants for several years in a glass case in my study, in several aquariums outside on our roofed veranda and in a small enclosure in our garden. At the present time, my collection consists of about 60 species.

I would like to gradually introduce you to my plants in an irregular series of occasional articles in CPN. Because I also draw a little, each of the plants I discuss will be illustrated in color renditions. Please do not try and find a rhyme or system in this series. The illustrated species will be presented by chance as they catch my eye during the seasons and I am inspired by refreshing viewpoints of their characters and beauty as I draw them. If you enjoy what I impart, then it will not be in vain. In the introduction, I would like to thank my friend Don Schnell for his support, help and mental stimulation.

*Pinguicula moranensis* (Figure 1). This season, I saw the first sign of flowering on March 20th, 1993. I have seven mature plants. The first flower fully opened on April 5th and persisted until May 17th when its corolla withered, but the calyx and flower stalk always persist for a much longer period of time. Five of the seven plants flowered, some of them with two or three simultaneous flowers. The last flowers faded on June 12th.

In the picture you can see one flower in profile with its long spur, which has given another Mexican species its Latin epithet "caudate" for tailed. The plant in the center of the picture is not only flowering in preparation for sexual reproduction, but also demonstrating its ability to reproduce itself vegetatively by the budding of leafy rosettes, one of which is also flowering.

*Utricularia livida* (Figure 2). I received a small cluster of this terrestrial species in the spring of 1992. At that time, it had only two flowering peduncles. All last season



Fig. 1 *Pinguicula moranensis*

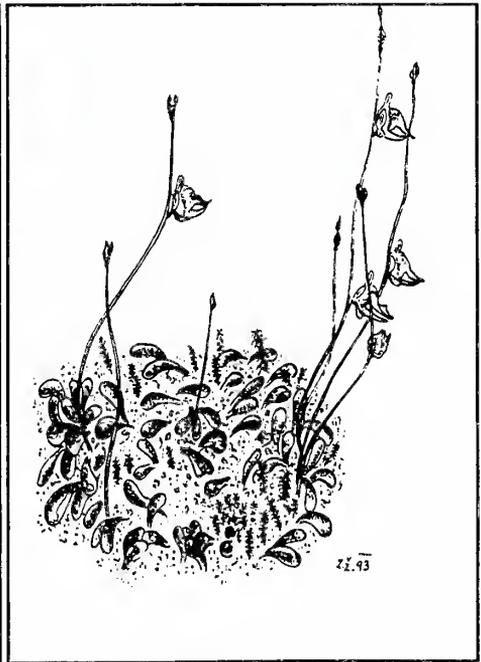


Fig. 2 *Utricularia livida*

as it grew used to me, no other flowers appeared. Only in the spring of 1993 at the end of April did the plant start to flower massively, and has continued to do so through June.

The flowers persist for quite awhile. Multiple buds on the peduncle (flower stalk) open from bottom to top in sequence. After the lowermost bud opens, the next up begins to mature. Then, the short pedicel or stalk of the flower attaching it to the peduncle, starts to lengthen as does the peduncle space between flowers so that there is a 2 to 2.5 cm space between opening flowers.

The flowers are cream white with a delicate violet tinge on the tip of the upper lip, and the spur often touches the lower lip. The flowers in profile remind me of smiling dog heads for some reason. Fantasy has no boundaries!

*Drosera capensis* (Figure 3). This is a now common but very beautiful sundew. In May of 1992 I bought *D. filiformis* v. *filiformis*, and *D. capensis* popped up as a volunteer at the bases of the plants where it was growing as a weed. I repotted it into a separate pot and since then it has grown to maturity. At the beginning of May, 1993 *D. capensis* produced mighty, robust flower stalks and has been flowering through most of the summer with more than 30 flowers per stalk. The flowers open from the bottom up, one per day, rarely two per day on a stalk. The flowers open in the morning and then close for good in the afternoon.

*Drosera adelae*, a giant form (Figures 4, 5). This beautiful sundew comes from the northeastern tropical rain forests of Australia and is quite rare among fellow Czech growers as far as I know. I have been growing this species in a small aquarium along

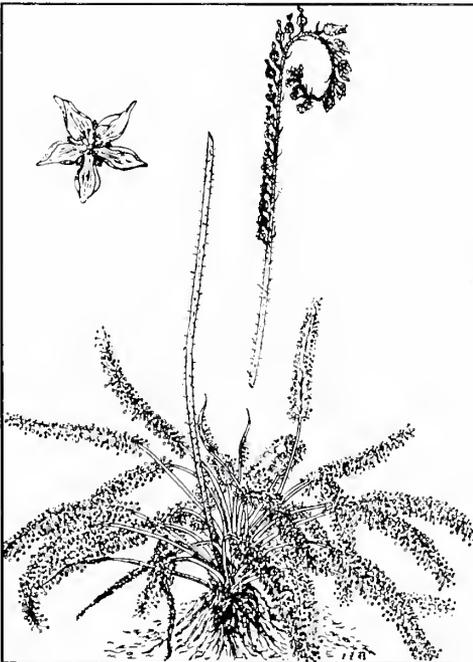


Fig. 3 *Drosera capensis*

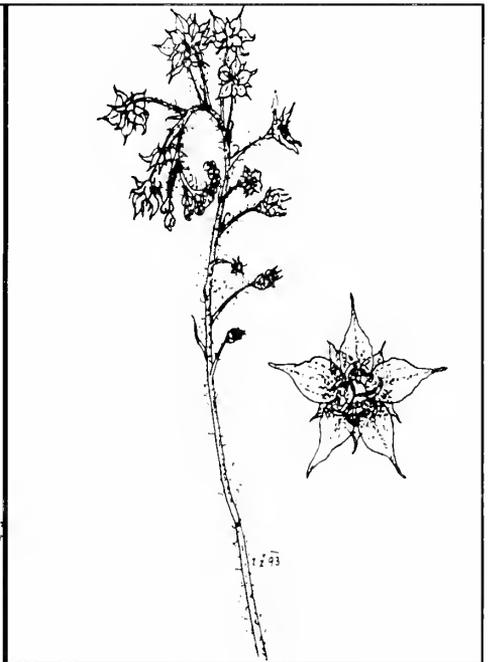


Fig. 4 *D. adelae* "Giant". The inflorescens and one flower in detail.

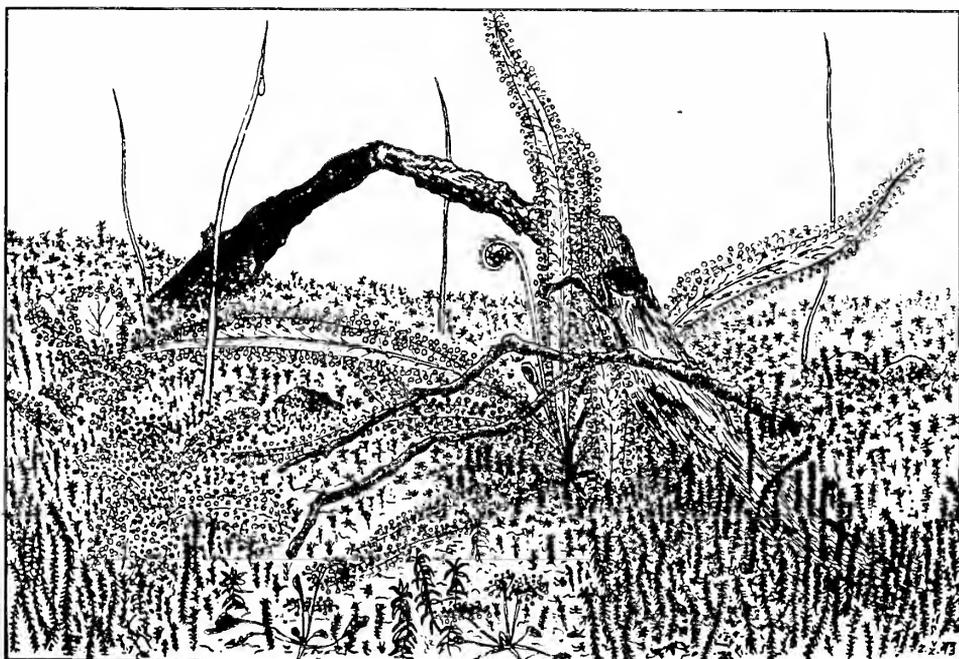


Fig. 5 *Drosera adelae*, "giant" (in the center of the picture). *D. schizandra*, (the left part of the picture, several plants). *D. prolifera*, (two smaller plants in fore ground).

with a close relative, *D. schizandra* (in the left of the large picture) and *D. prolifera* (two small plants in foreground). The tank is covered with a glass to make high humidity which seems essential for the health of these plants. But the flowering stalk of *D. adelae* began growing very fast and soon reached the glass on top. I had to take immediate measures. placed a large plastic bag over the aquarium like a bulging bathing cap to make more headroom and keep the humidity high. As in most sundews, the flowers open in order from bottom bud on up, but unlike most, they stay open as shown in the drawing of the flower stalk. The inflorescence is coiled nicely and with each flower opening, the coil unwinds a bit. The flowers seem to have a slight but pleasant fragrance which reminds me of something I cannot place.



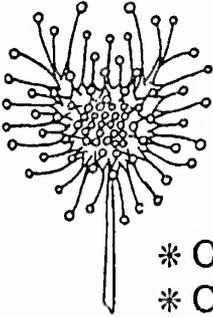
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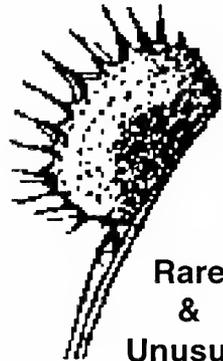
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## *Nepenthes pervillei*

**Travel report to accompany the new CP-video**

by

S. Hartmeyer

Wittlinger Str. 5

7858 Weil am Rhein, Germany

Tropical surroundings without anti-malaria drugs, with carnivorous plants for our new video, and possibilities for snorkeling - These were what we asked of our holiday for 1992. The photo of *Nepenthes pervillei* in the brochure of 'Feria', tour operators persuaded us to make our main booking for the island of Silhouette, one of the Seychelles islands which lie between Africa and India. The accompanying brochure text promised primeval rain-forest with richly varied flora, including many of the pitcher plants of the illustration, these being accessible by a footpath.

On 31.8.1992 we flew from Frankfurt to the main island of Mahe, and the day thereafter we transferred to our goal: Silhouette, 17 km away (about 10 miles), in a relatively small motor-boat with quite a sea running. To some of the passengers this meant a 'sacrifice on Neptune's altar'. I would have liked to film the island as we approached it, with it's dense vegetation of coconut palms and takamaka trees along the dazzling white beach, ascending steeply up to the cloud covered summit at 650 metres plus (about 2000 feet). Instead, sitting on the planking of the deck, I had to cling onto my photographic equipment, holding myself firmly to the steersman's seat as this was firmly screwed down. Irmgard and I thus had a degree of protection from the spray but after two hours of this roller-coaster progress we were more or less wet through.

But with solid ground under our feet again, that long awaited holiday feeling took over. Our bungalow, simple but adequately equipped, lay a mere 5 meters (ca 50 feet) from the shore, it's whiteness broken every hundred meters or so by black granite rocks. Beyond that lay the Indian Ocean, at a temperature of 26°C (nearly 80°F). At low tide it was peaceful and showed all varieties of blue and turquoise; but at high water it made a vigorous onslaught, noisily seeking to undermine the roots of the takamaka trees in front of our temporary home. Such aggressiveness was otherwise only shared by the mosquitoes. Our attempts with insect-repellant achieved little more than that some of the pests died laughing! We soon learnt to keep away after dusk from the magnificent jungle starting a mere 300 meters (about 1000 feet) behind the hotel grounds, after Irmgard had suffered 25 stings in a mere 10 minutes. Yet during the daytime we remained in the rain-forest virtually trouble-free. On the Seychelles there are neither dangerous predators nor poisonous snakes;

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\*Must be in two consecutive issues (4 issues/volume)

nevertheless one must still be constantly wary as we found on our first attempt to reach nepenthes.

At the reception desk in the 'Silhouette Island Lodge', the only hotel on the island. we were given in apparent innocence information that the pitcher plants grow on the peak and the path to them branches off at the church. So on the second day after our arrival, we set off, armed with video equipment, tripod, monopod and a plentiful supply of mineral water. The path began to climb steeply immediately behind the little village. After a few hundred meters the roar of the surf was superseded by the rustling and cracking of the trees in the warm wind at a temperature of 27°C (80°F), interrupted only by the piping and clicking of sundry birds which looked curiously down on the puffing and sweating intruders. Along the edge of the path numbers of brown lizards rooted and rustled in the superficially dry leaf-litter which was broken ever and again by the typical black granite rocks. With increasing altitude and atmospheric humidity these outcrops were covered with algae, mosses and lichens. These growths were being grazed by brown slugs some 20 cm (8 inches) long, precisely at those spots where we wanted to support ourselves and hold on. Another magnificent sight was the giant millipedes, over 30 cm (12 inches) long, which also inhabited these rock formations that sometimes reminded one of prehistoric monsters. More and more this mountain appeared to consist of willfully scattered, rounded, granite blocks, in all sizes. Between these were gulleys and clefts filled with luxurious plantlife. It smelt of moss and damp leaves and numberless exotic fruits, all pleasantly aromatic to our senses.

When we had been under way for some two hours we had the impression that we must have missed the peak we were seeking. Two small paths had indeed already branched off, but since they were blocked by fallen trees we ignored them. No mention had been made of them when the route was described to us. And then, as I walked into the web of a gigantic spider which I had failed to push aside as previously with monopod, and suddenly found myself staring at close quarters into all the eyes of the proprietor, we turned back. After all, we still had 9 days, time enough to search for carnivorous plants. The return trip had the advantage that there was no need this time to push aside the meter (yard) wide webs of these spiders which in themselves were about 20 cm (8 inches) long! Their bite is certainly painful but is not considered dangerous. Luckily too the creatures are not aggressive and prefer to avoid contact.

Before our next attempt we again asked at the hotel as to the proper route. This time the information was much more detailed and there was even a map of the island. We learnt too that the path to the summit - a mere tourist footpath according to the 'Feria' brochure - was barricaded by a fallen tree (in fact there were several trees) because it was quite dangerous and for several days after rain it became impassable. As proof that he had himself once visited these pitcher plants the hotel employee showed us several photos. These quite astonished me because they showed two forms of pitcher, differing in both shape and colour. On the one hand there was the typical green amphora-like *Nepenthes pervillei*, while in the other pictures I would rather have assumed *N. alata*, with the pitchers considerably more slender in the upper part. But known up to now in the Seychelles there was only the endemic *N. pervillei*. Was this latter just considerably more variable than hitherto assumed? Or is there indeed a second species on Silhouette? I dismissed any idea that the hotel employee was attempting to sensationalize the matter since his knowledge of CP was limited to the concept of pitcher plants and the popular French name - Liane pot a eau - about

which he was always being questioned by tourists. Unlike on the main island of Mahe, where the primeval rain-forest has long been chopped down, to be replaced with crops of various kinds, these forests on Silhouette are still virtually untouched. So why not two species ?

Two days later we set off again immediately after breakfast, scrambling over several tree-trunks placed across the way, this time following the correct path which, however, proved even trickier than the one we had taken before. Over 400 meters (ca 1250 feet) the granite rocks, the main feature of the path thereabouts - became increasingly slippery while the previously mentioned creepycrawlies appeared in even greater numbers. Apart from ourselves there was far and wide not another human being, but we often saw flying foxes with a wingspan of over a meter (yard), groups of which resembled Dracula's hordes! In fact they are harmless and quite droll creatures which only eat fruit and which are rated a delicacy by the natives. Here there was a wide assortment of palms, with and without thorns, trees with buttress roots, wild pineapple, orchids, ferns, even a few coco-de-mer palms which officially do not exist on Silhouette and which have nuts weighing over 20 kg (45 lbs), being thus the world's largest seeds. But nowhere did we find the least trace of pitcher plants. When we were still an estimated 40 meters (ca 150 feet) below the summit the so-called 'tourist path' degenerated into a natural run-off for rainwater, its bed consisting of moss-covered rocks and boulders, all at a very steep gradient. Any slip here would have meant at very least the end of the video-gear. For over 5 hours we had been climbing rather than walking, and time was against us as it was absolutely vital we should be clear of the forest before dusk. The decision to turn back caused almost physical pain since I so much wanted material for our new video, and it had cost Irmgard enormous effort to scramble thus far, with the slipperiness of the track and the dozens of enormous spider-webs. So I spoke a furious commentary into the camera (part of which I cut when editing, so that the film should still be fit to show to children!); then I regained my composure because this truly untamed jungle still made the expedition worth while.

Any further attempt to reach the summit came to naught: In the first place the boy who had promised to be our guide cried off at 10 o'clock on the previous evening since he could not leave the hotel; and in the second place the rain started to fall.

So I have to leave to some more fortunate successor the riddle of a possible second *Nepenthes* species on Silhouette. We ourselves still had two aces up our sleeve, even if only on the main island of Mahe. For safety sake, on our arrival there I had arranged a day's tour through the local travel office where we would have the services of an accredited mountain guide, Basil Beaudouin. If even that failed, Allan Lowrie in Australia, when he heard of our plans, had kindly sent me a handdrawn map of *nepenthes* habitats on the main island.

This time, to avoid seasickness, we chartered a helicopter back to Mahe. This took a mere quarter-hour for the 17 km and gave us some interesting views for the video. Having arrived at the hotel we immediately telephoned Basil Beaudouin who came round that same day to discuss plans. He was a tall, friendly, black Seychelles, some 30 years old, with outstanding knowledge of the island. He had even chosen the pitcher plant as his guide's logo; he had been interested in his island's flora since childhood and knew almost every plant personally. He promised to lead us to THE finest place.

We drove by car to about 400 meters altitude (1250 feet) and then proceeded on foot over small paths, past a pine wood and various palms and cinnamon trees whose young shoots of brilliant red were very conspicuous. From about 600 meters (1850 feet) we had a magnificent view over Mahe with cloud-covered Silhouette on the horizon. The ground consisted of the now-familiar black rocks as well as a mix of laterite and coarse granite sand. Although even here we sometimes had to advance by climbing rather than walking, the ascent was appreciably simpler than during our efforts on the smaller island. And suddenly it was as if we had crossed an invisible line of demarcation.

'They' grew along the path, on bushes 1 - 2 meters high, they even used their tendrils to clamber up the few scattered trees in the vicinity. Green amphora-like pitchers, mostly arranged in rosettes, rearing without support into the air. These rosettes were then succeeded by meter-long stems, as in *N. ampullaria*. Although it had now started to rain heavily, Basil pointed upwards and, wreathed in smiles, assured us that further on it would be much better still. With a few additional meters of altitude the downpour became just a fine drizzle and our guide pointed to a bank, and we could see he had not exaggerated. *N. pervillei* was by far the dominant plant. The rocks were clothed in an enormous network of carnivorous plants which extended over bushes and trees. Amidst this nepenthes-carpet we sat down under three large palm-leaves brought to us by Basil, and in high good humour we ate our lunch-packets. Scarcely had we finished eating than the equatorial sun broke through, transforming the scene into a steaming vista with shafts of light between the nepenthes urns. I grabbed the camera and filmed everything I could in order to have some sequences in the can before the next downpour. In so doing I realized that all the pitchers looked so healthy. And then I noticed a peculiarity of these fascinating plants as soon as a pitcher, which is attached to the leaf by a short stalk and stands surprisingly upright (other species would surely tip over!), begins to shrivel it turns over so that its content fall to the ground to the benefit of all other plants. Once leaf and pitcher have dried up and taken on a dark brown to almost black colour, the whole section lays itself against the stem, after the manner of palm-trees. In this way it is always the young fresh pitchers and inflorescences of nepenthes that project into the air, and this conspicuously adds to the attraction. We found astonishingly few plants in bloom. Mature seed-heads were a genuine rarity when compared with the multitude of bushes with urns. However, we did manage to find a few of the dark brown ripe capsules, these being open above, giving them almost the appearance of small jugs. The seeds themselves are jet-black, some 2 mm (one-twelfth of an inch) long, with a thin projection at one end; this, all in all, is very unusual in nepenthes.

Moreover the pitcher colour reverses the usual trend. Upper specimens in full sun are light to yellowish green; but on the ground among the shrubs and in part leafcovered, they are intensely dark to brownish red, so that with their swollen shape and large lid, they almost have the appearance of small *Nepenthes rajah*. Interestingly enough, the insides of the lids of pitchers on the rocks were deep red, yet hanging in the air and with a light background they were light to yellowish green, like the rest of the urns, some of which also had red flecking.

Suddenly it darkened again, presaging the next shower. At the last moment I managed to stow the camera away, but I was not quick enough in getting under my sheltering palm-leave with the result that, in mere seconds, my nearly-dry clothing was again dripping wet. *N. pervillei*, with its large and almost circular lid, is peculiarly well adapted to these cloudbursts since very little rain gets into the pitcher

to wash out the nutrients or even cause it to tip over. Only rarely were the pitchers filled to more than a third of the lower swollen portion.

After 4-5 hours, with rain and sun alternating at 20-minute intervals, we commenced the descent, still keeping a look-out for alata-shaped urns. Then at last, when we had almost reached the lower limit of the nepenthes, Irmgard slipped at just the right place, inflicting some scratches on her leg, but bringing in front of my camera-lens an unfamiliar shape. The brown colour was in itself unusual, the lower swollen section was neither spherical nor barrel-shaped, and it was succeeded by a narrow 'neck', from which an oval peristome led obliquely up to the lid. The nearly circular widening of this horny margin of the trap, which gives *N. pervillei* its typical amphora-like appearance, was completely lacking; thus giving a resemblance to the alata-type. However the round lid showed that at most this was a hybrid with some earlier species formerly living in the now-demolished primeval forest lower down the slope and *N. pervillei* growing on the summit. In addition to the shape and colour, the tendril between leaf and trap was appreciably longer than in the other carnivorous plants alongside. It remains an interesting question for some nepenthes specialists to investigate as to whether some second species did in fact exist there or perhaps even still persists on Silhouette (or if that all is only a variation of the well known *N. pervillei*). If anyone wishes to investigate the matter, we strongly recommend he gets in touch with:

### **Basil Beaudouin - Macabee - Mahe - Seychelles.**

He is always delighted to make contact with carnivorous-plant enthusiasts, and his charges are both reasonable and affordable. It remains true that the Seychelles represent an expensive long-haul, but if anyone is after all able to fly there and to find out anything new about the pitcher plants (or 'Liane pot a eau') there, I would greatly appreciate hearing about it. Irmgard and I have the warmest recollections of Basil and his dream-islands with their nepenthes-peaks.

A summary of our CP-searches, with pictures of the debatable second species, can be seen on our new video (approx. 1 hour) entitled 'Insectivorous Plants Video 1993' (German language), which will be available at the end of February 1993. Further, there will be a treatment of Australian tuberous *Drosera* (In German = Onion-*Drosera*) which do not have onions. *Roridula* bugs are examined also in close-up and there is some account of the CP-year 1992 (AGM, Swiss meeting at Aarburg etc.) and a CP-quiz with real prizes. For the time being I hope I have succeeded in conveying to those unable to fly to the Seychelles some impression of the fascination of this tropical paradise.

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## **Notes on Some *Darlingtonia californica* Torr. Bogs**

by

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### Introduction

In 1988 we made a trip to northern California and Oregon to observe *Darlingtonia*

bogs which the senior author had visited in 1982. New stations for *Darlingtonia* were also sought for in the Siskiyou National Forest. The Siskiyou is considered a botanists' paradise since it forms a bridge between the Cascade and Coast Range Mountains. As a result plants mingle here which are found in areas north, south, east and west with more than 1400 species being accounted for. Thus the Siskiyou was considered by us to be a valuable research area to examine the habitat of the Cobra Lily.

*Darlingtonia californica* is called the Cobra Lily because of its similarity to a snake about to strike. The upright position of the leaf, head like appearance of the globose blade and the downward pointing appendages which look like fangs all conspire to evoke this image. Quite an elaborate construction but very useful for this effective insectivorous plant.

## Discussion

August was selected as the month for our expedition due to the heat and humidity which we wanted to escape on the east coast. Previous experience had shown that the northwestern U.S. coast was both cool and comfortable during August. July - August is the warmest time of year in this part of Oregon with average temperatures of 14 - 18° C. The coldest month is January with temperature averages from 4 - 8° C. Average annual temperature ranges from 6 - 12° C. An example of the comfortable sleeping conditions we enjoyed was a temperature of 9° C on 8/23/88 when we camped at an elevation of 840 meters in Indian Creek County, Oregon.

The significance of these cool temperatures should not be lost on potential growers of *Darlingtonia*. We have found it virtually impossible to grow *Darlingtonia* for any length of time in Virginia under outdoor cultivation. We believe this horticultural dilemma is caused by some essential differences in climate between the northwest U.S. mountain *Darlingtonia* bogs and the southeast U.S. coastal plain. We have not collected environmental data on the coastal *Darlingtonia* bogs although one site we visited appeared to have summer root temperatures similar to bogs we examined elsewhere in the species range. Mountain *Darlingtonia* bogs are located in regions of low relative humidity and are fed by cool spring waters. Low relative humidity allows evaporational cooling from the bogs and enhances local cool growing conditions. In addition, our observations showed a lower average temperature than the southeast U.S. For example, average July wet-bulb temperatures are less than 15° C in the northwest compared to 21-24° C in the southeast.

Southern U.S. summers tend to be hot and humid for protracted periods. This extended heat and humidity is apparently detrimental to outdoor cultivation of *Darlingtonia californica* in this region of the country. We have planted *Darlingtonia* in sphagnum bogs where the water temperature does not exceed 21° C and had 100% mortality. Schnell (1976) states a maximum soil temperature of 20° C and Brownfield (1985) recommends not exceeding 17° C. Our transplants tend to confirm that the 20° C temperature must be the absolute high end of tolerance for this species. Where possible we would advise lower temperatures.

Perhaps the plants become susceptible to bacterial and fungal attack due to heat stress. Another idea we have is that possibly a beneficial fungal root associate, much as in orchids, may not survive well in the southeast and thus the Cobra Lily does not persist in cultivation under higher temperatures. We have seen two cases where growers in the east have successfully grown *Darlingtonia* in pots employing

evaporational cooling in shaded greenhouses or air conditioned enclosures. It would appear though that for whatever reasons cool root temperatures are an important key to successfully raising *Darlingtonia* in cultivation.

## Geology and Climate

With the exception of the Gasquet bog, our investigations were focused on the Siskiyou National Forest located in southwestern Oregon. This area is in the Warm Temperate Subalpine Region with a natural vegetation of Western Hemlock and Mixed Needleleaf-Broadleaf Forest. Continental temperature extremes are moderated by the cool Pacific Ocean and the decrease in temperature with elevation is 1° C for every 275 meters. In contrast the world average is 1° C for every 150 meters.

The soils of this area ( the Klamath Mountains ) are classified as Inceptisols and Alfisols. They are largely light colored, medium to slightly acid, loamy, stony and shallow. Areas of granite are characterized by sandy soils and serpentine areas are mostly shallow, reddish, clayey soils. The Kalmiopsis area (within Siskiyou National Forest ) is underlain by peridotite and serpentine. These may be remnants of sub-crustal rock brought up from great depths by plate movement.

## Observations

Below is a chart listing the temperature and pH data we collected at midday at the various sites on our trip.

### Environmental Data from *Darlingtonia californica* habitats

As you can see the plants were largely growing with root temperatures averaging 14°, air temperature 22°, water temperature 13° C and pH slightly above neutral.

Some comments from our notes on these sites are as follows:

#### Site 1

Gasquet Bog.

A rocky spring fed mountain creek with organic vegetated borders. Large clumps of *Darlingtonia californica* to 81 cm. tall growing along with shrubs on border of creek and in sunny openings. *Pinguicula vulgaris* and *Drosera rotundifolia* noted with *Tofieldia glutinosa* in full flower. Seeds of *Darlingtonia* ripe in capsule on 8/21/88. Insect predation of ovary noted.

#### Site 2

Hunter Creek Bog.

Located at 853 meters approximately five miles east of Cape Sebastian Park and the Pacific Ocean and 1 mile before entering the Siskiyou National Forest. A round, flat peat bog with a forested perimeter grading to an open center. A slow moving, shallow, crystal clear, meandering stream through site. *Drosera rotundifolia* local on dead logs. Large numbers of *Darlingtonia californica* and numerous seedlings. Robust root growth of young plants on borders of pools and stoloniferous invasion of open aquatic habitat. Hummocks, rocky streams and open bog center principal growth areas. Some clumps of *Darlingtonia* measured 3 meters across and 94 cm. tall. Yellow

jackets observed being primary victims of *Darlingtonia* and sweet fragrance from pitchers easily noted in site.

Site 3  
Flycatcher Springs.

Several sites in close proximity in rocky, spring fed drainages. Large numbers of *Darlingtonia*.

Site 4  
Snow Camp Meadow.

The best site observed. This is a large naturally open mountain meadow possibly formed by mass wasting (the collapse of the supporting rocks and side of the mountain) of part of Snow Camp Mountain resulting in a broad mountain terrace. The site grades from dry meadow to wet, sopping bog. Bog characterized by slow moving clear, cool streams with open pools in center of site. A few red salamanders observed in pools. Pools noteworthy for formation of peat masses which looked like rocks. Numerous additional seepages throughout site. *Nuphar polysepalum* growing in open pools with *Rudbeckia californica*, *Parnasia palustris* and *Tofieldia glutinosa* in full flower throughout open springy meadow. Shaded woodland *Darlingtonia* measured to 61 cm. while full sun plants averaged only 20 cm..

Site 5  
Saddle Mountain.

A moist spot on an otherwise dry hillside/ravine. No moisture outlet found and site measured only 5 square meters.

Site 6  
Huntley Springs.

A very rocky creek with clumps of *Darlingtonia* growing out of rock crevices and on mossy, moist rocks.

## Conclusion

I would highly recommend the Siskiyou National Forest to people interested in *Darlingtonia* in particular and nature in general. We actually found *Darlingtonia* to be a fairly predictable plant to find. The primary habitat was rocky spring fed seeps and wet mountain meadows with soil and water temperatures averaging 14 and 13° C and air temperature averaging 22° C. Water pH was slightly above neutral. Evaporational cooling of leaves and cool spring water appeared to be important strategies for survival although root associates may also be important. *Darlingtonia* produces a pleasant scent noticeable in the bogs which was especially attractive to the yellow jacket wasp.

## Recommendations

Our exploration was confined to one small area of the Siskiyou National Forest and I am sure there are many more interesting bogs to be found. The forest contains one million acre

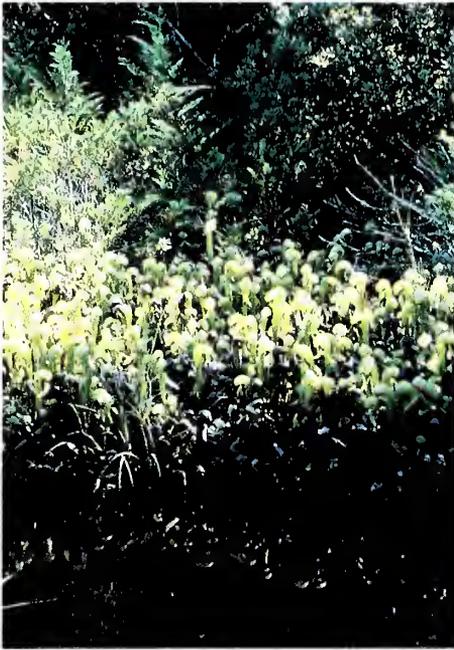


Figure 1 - Hunter Creek Bog - notice crystal clear water and abundant D. californica growth.

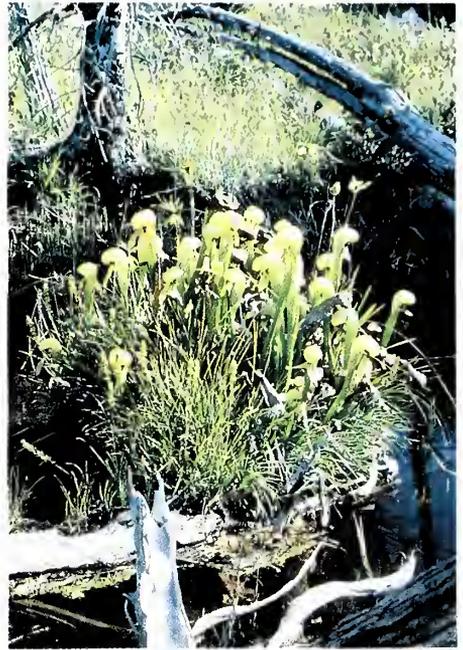


Figure 2 - Hunter Creek Bog - clump of D. californica growing on dead log.



Figure 3 - Open pools and clear, slow flowing streams of Snow Camp Meadow. Note very gentle slope to site and stoloniferous invasion of pools by D. californica.

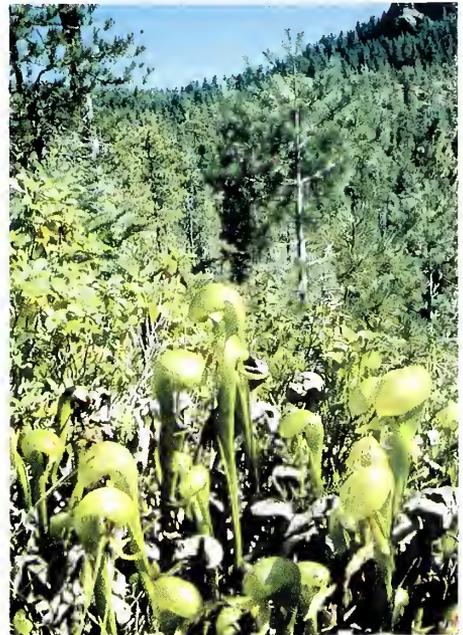


Figure 4 - D. californica growing on moist side of hill opposite Pyramid Rock.

s and has five designated wilderness areas so there is plenty to see and discover.

There is a primitive campground near Fairview Mountain which contains virgin Douglas Firs reaching 1.2 meters in diameter. Camping here is quite an experience and reminds one of the forest primeval. If you desire to see the sites mentioned in this article I would recommend this as a central campsite from which to explore the area.

Our trip in the Siskiyou National Forest was greatly aided by using a current forest service map. For additional information on planning a trip to this area contact the Siskiyou National Forest Headquarters, 200 N.E. Greenfield Road (P.O. Box 440), Grants Pass, Or. 97526

Special Note: VHS videotapes of the above mentioned sites are available from the senior author for \$20.00 plus postage.

## **Acknowledgements**

Thanks to Joe Mazrimas for site information on one of the sites and to Don Schnell and John Hummer for review and comments.

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## **ICPS Informal Gathering**

by

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The First Informal Gathering was held August 7-9, 1992, at the home of Carl and

Sherry Taylor in Lakeport, New York. Attending were 17 IPCS enthusiasts, one tropical fish hobbyist (Sherry), and Bill Scholl's brother, who promptly split for Canada rather than sit through yet another discussion of the relative merits of one CP over another.

Present were Christoph Belanger, Scott Bennett, Fritz Berckmuller, Jim Bockowski, Donna Ziedel, Mitchell Bogan (with his elderly Akita, Scruffy), Peter Keller, Peter and Lisa Northcote, Rob Maharajha, Carl Mazur, Randy and Robin Ogg, Bill Scholl, David Stewart, Dr. Stephen Williams, and of course Carl Taylor. Thanks to several months of making lists of supplies, foods, meal requirements, and a time schedule for various activities, the event went smoothly.

First to arrive was Chris, who has obviously received proper maternal guidance since he quickly offered to take over rug cleaning chores while Sherry attended to last-minute kitchen duties. Scott Bennett appeared, laden with several stunning watercolors of CPs. Several queries brought the response that they were his personal paintings and not for sale but brought for our viewing pleasure. Scott has done numerous ICPS covers. I can't think of a better gift for your special ICPS person if you can talk Scott into doing one for you. He can be reached Delavan Center, 501 West Fayette Street, Syracuse, New York, 13204.

Several others trickled in over the next few hours and spent the time waiting for Carl to arrive from work by getting acquainted and viewing his greenhouse and basement plantroom. A cold buffet was set out, and the evening passed too quickly as attendees caught up on the latest news and views, discovered who was keeping which plants, shared tips and ideas, described plants and seeds they brought to trade and share, and pumped Bill Scholl and Jim Bockowski for details of their Mt. Ilu trip. David began to set up his tent in the yard but gratefully accepted a piece of the living room floor instead as did Peter Keller and Bill. Several people left for their hotel rooms around 11 PM, leaving Chris holding down the spare bedroom, while Peter, David and Bill distributed their sleeping bags colorfully across the living room rug. Finally, conversation died to fits and starts, and sleepy voices muttered goodnights around 2 AM.

A cheerful Peter Keller brought groans from the rest early the next morning, but he was forgiven when he passed out steaming mugs of coffee. Breakfast was quickly prepared and eaten as more attendees straggled in, ready for the day's lectures and slideshows. All headed for the auction barn at the end of the street, where Scott Bennett led off with his slides of wild specimens of *P. vulgaris* in the northeast and *D. californica* along with other CPs. Next up was Peter Northcote with slides covering New Zealand species as well as *D. californica*, again from the wild, mixed with slides and information on other CPs he has encountered in his travels

For lunch, the group returned to the Taylor home for a backyard picnic. As promised, mosquitoes had mounted a bloody onslaught, making Chris feel like the main course on their lunch menu, but liberal applications of "Off" repellent slackened the attack to a divebombing, buzzing annoyance. Intermittent, light rain began as small groups wandered back to the auction barn for the afternoon's shows. First up was Dr. Steven E. Williams of the Department of Biology at Lebanon Valley College in Annville, Pennsylvania, detailing genetic progression and development in plants. Dr. Williams' special interest is *Drosera* species. Completing activities was Chris Belanger, who delved into the mysteries and delights of *Utricularia* species, their care, propagation, requirements and differences. A backyard barbeque had been planned for dinner, but the fitful rain turned into a steady drip just in time to force Carl to move the grill to

the garage. Nevertheless, the unevenly cooked wings and hamburgers were eagerly devoured by all. When you're talking CPs, food is an afterthought! Other planned activities that bit the dust were a formal plant and seed exchange and a meeting to discuss a possible formal convention to be held in 1993. The constant ebb and flow through the house from living room to greenhouse to kitchen to basement plantroom to yard to dining room made it difficult to get everyone in one spot for a meeting. By the end most had wheeled, dealt and traded on an informal basis, anyway. Rob had brought a large bag of carefully-wrapped seed packets, which were tumbled out onto the coffee table and picked over as people came and went. Bill Scholl's tape of the trip was placed in the VCR and played to a standing-room only, appreciative audience. Bill



The group meeting at Carl Taylor's last summer included, left to right, Stephen Williams, Carl Mazur, Donna Ziedel, Jim Bockowski, Rob Maharajh, Sherry Taylor, Carl Taylor, Chris Belager, Bill Scholl, Lisa Northcote, Peter Northcote, Peter Keller. David Stewart is kneeling.

edited some 12 hours of video down to 2-1/4 hours of the finest "you are there" footage. It's available from Bill for \$30 in U.S. format (write to him at 11420 Winterock Road, Chesterfield, Virginia, 23832) or in a European format from Allen Hindle at 29 Montserrat Road, Lee-on-the-Solent, Hampshire, England, P0139LT. If you crave CPs and adventure, this tape you can and should buy! Makes a great gift, too.

After another late evening, the gang gradually dispersed to hotels and sleeping bags. Sunday morning brought photo sessions and more plant/seed trades and talk as cars were loaded for the drive home. David was one of the last to go, reluctantly. However, we had not heard the last of him that day. The phone rang a couple of hours later, and David explained that "in my delirium, I forgot to take my own plants!" Thinking fast, Sherry replied very seriously, "Oh, I think we traded those off." There was a painful silence, and then his carefully-controlled but unhappy voice said "Oh? (long pause) Really." Carl quickly reassured him the plants were safe, and David made arrangements to drive up again in a few weeks to retrieve them.

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## Literature Review

**Schnell, Donald E.** 1993. *Sarracenia purpurea* L. ssp. *venosa* (Raf) Wherry var. *bufkii* Schnell (Sarraceniaceae) — A new variety for the Gulf Coastal Plain. *Rhodora* 95:6-10.

Often referred to as the "Louis Burk" form of the subspecies in an informal way over the years, the author has concluded that the variety is indeed the prominent if not only one of the subspecies along the Gulf coast. Since there is disjunction through most

of south Georgia with the Atlantic and mountain variety of the subspecies, and given the well-known characters of nearly white disc and ovary, pink to lavender petals, and generally more patulous pitcher, formal description seemed in order. The paper includes one color and two black and white photos. (Reprints: Rt. 1, Box 145C, Pulaski, VA 24301).

**Reveal, James L.** 1993. The correct name of the northern expression of *Sarracenia purpurea* L. (Sarraceniaceae). *Phytologia* 74:180-184.

After researching the history of *S. purpurea* re nomenclature, the author has concluded that the northern group of plants should be referred to as var. *terrae-novae*, and the southern as var. *purpurea*. The reader will have to read the original article in its entirety to follow the complex reasoning, but it involves the absence of the original type specimen(?) from Linnaeus' herbarium folder (There is a *sarracenia* folder but nothing in it!) and choice of lectotype. If so, then any nomenclature that follows is based on "original sin" (editor phrase) and one must then choose new varietal or subspecies names according to the ICBN rules. What follows is editorial comment: The author makes a point that may be valid and I am sure he believes so. However, being a physician, I will await "second opinions" on this. His concept of the lectotype does not agree with McDaniel, for instance. Often, interpreting such problems as loss of original type specimens, involves reasoning and maneuvering around in ICBN (which has some passages that can be interpreted in different ways) and a resulting write-up worthy of a Law Review article. Let's wait and see before we change all those labels!

**Cheek, Martin.** 1993. Notes on hybrids in *drosera*. *The Kew Magazine* 10: 138-144.

The author briefly reviews natural and artificial *drosera* hybrids, both extant in the literature and those produced but possibly not published, particularly as sold by some CP nurseries, past and present. The author formally describes *Drosera x badgerupii* (the former Lake Badgerup plants, now known to be the hybrid between *D. nitidula* and *D. occidentalis*), *Drosera x nagamotoi* (*D. anglica* x *D. spathulata*) and *Drosera x californica* (the horticultural hybrid *D. filiformis* 'California Sunset'). Readers may be confused by the latter, but it is quite proper to affix a botanical name to a hybrid as well as a cultivar name to a plant from that cross selected for its horticultural name.

**Dees, Mary,** et. al. 1993. Plants in peril, 19 *Sarracenia oreophila*. *The Kew Magazine* 10:144-148.

This is one of a series of articles on endangered plant species, in this case *S. oreophila*. There is a review of the history of the species, numbers of present locations, range, numbers of plants, threats, etc. There is an informal description of the plant and a nice line drawing. The various attempts at protection and recovery are reviewed.

**Gassin, R. J.** 1993. *Utricularia beaugleholei* (Lentibulariaceae: Subgenus *Utricularia*: Section *Pleiochasia*), a new species from southeastern Australia. *Muelleria* 8:37-42.

There is frequent confusion between *U. dichotoma* and *U. uniflora* in the field and among herbarium specimens. Apparently both species can occur in the same location. The author makes a case for a third species in this small group which he has described in this paper and named *U. beaugleholei* after a botanist named A. C. Beauglehole. Generally, the flowers of the new species are larger although the peduncles are no taller. There are differences in the lateral view aspect of the flowers as well which are illustrated in comparison in line drawings. There are also microscopic trap differences as described and illustrated. The paper also has a range map.

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All material you wish to have considered for publication in CPN must be sent to either Don Schnell or Joe Mazrimas (addresses on inside front cover), not to the business address at the Fullerton Arboretum. Text material similar in character to that in the NEWS & VIEWS and SHORT NOTES will be considered. Please keep written material as succinct as you can.

All written material, no matter how brief MUST be sent typewritten or word-processed in double space format to allow the editors room for editing marks. For purposes of computer scan page setup, a laser or laserjet printout is best followed by a new or recently installed ribbon in a standard printer or typewriter. Copy must be crisp and clear. Copy submitted in any other format will be returned for appropriate processing. Computer users are encouraged to submit a 3.5 inch disk, preferably Macintosh compatible, along with a printout.

Color photos to accompany your article may be submitted as either 35mm slides or quality prints. Slides or prints that are blurred or have poor distinction between the subject and background, cannot be used. Keeping in mind the expense of producing color illustrations, and to allow others the same privilege, keep your numbers of photos to the minimum required to best illustrate your point in using them. All photos must be accompanied by an appropriate legend. Do not write the legend on the back of prints or on an envelope containing the slides. All legends must be typed or word-processed on a separate page as described for text. Number the photos in light pencil (for prints lightly on the backs) and use a corresponding number on your page of legends.

We do not encourage submission of any illustrative material that does not accompany an article. We usually have sufficient material backed up for "filler pictures" and will put out a call if more are needed.

In submitting photos, it is best to send duplicate prints or slides in case of loss or damage. We will make every effort to promptly return photos if requested, otherwise we will assume they are duplicates.

After submitting material please be patient regarding replies. Some material may require review by both DES and JAM, or even an outside reviewer. If your material is accepted, and it is not timed as a dated announcement, please be patient awaiting its appearance in CPN since we sometimes have material for a whole year's issues.

