THE SOILS OF THE HUNTER VALLEY

by Bill Hanna

Blackbutt Reserve is located within ten minutes drive of the central business district of Newcastle and is approximately 375 acres in area. Within this reserve, two species of carnivorous plants grow. The genus is Drosera and the two species are auriculata and peltata. To generalize, Drosera auriculata is found at the top of the hills and on well drained slopes, whereas Drosera peltata is found at the bottom of the slopes where conditions tend to be slightly more moist. One can find mixtures of both growing together.

In the following passage, I have attempted to describe a soil profile typical of the area where these plants are found. The soil type itself is podsolic.

The soil profile was taken at an old mine shaft in the Queen's Road area of Blackbutt Reserve. A good soil profile was easily obtained for the first fifteen feet. The typical vegetation of this area is mainly tick bush with occasional gum tree. Due to the presence of one of these gum trees near the pit head, root penetration from this tree could be seen to a depth of 15 feet. The first two feet was gray clay. The surface of this clay was liberally covered with coarse angular pebbles ranging in size from 7 x 4 inches down to 1/8 inch in diameter, consisting of weathered ironstone, sandstone, and chert. The majority of the pebbles were on the surface but some were found scattered through the cross section.

In the three foot depth area, there was well weathered shale, yellow-brown in color, its texture granular and ranging in size from a two-inch piece to a speck with some pieces of ironstone scattered through this layer. At the four foot level the shale is now black to black-brown, probably due to the action of humic acids. This shale is extremely brittle and the presence of some iron platelets can be observed. In the rest of the layers the soil type was mostly green-brown chert followed by bands of brick-shaped chert.

MISSISSIPPI FIELD TRIP

by Robert Folkerts

Growing and caring for carnivorous plants has been a rewarding experience for me, but I could not help wanting to go out and observe first hand how they actually grow and function in the wild. Early in November, 1974, my chance came, and I find it difficult to express how wonderful it can be to see some of the plants you pamper and nurture in glass houses growing by the thousands in their natural environment. Along highway 90 about ten miles out of Pascagola, Mississippi, we found a spot mentioned in Randall Schwartz's book Carnivorous Plants. For the short time available to us for exploration, much insight was gained into how these plants fit so well into nature's plan.

Plants seen from the road were, of course, the first things to be investigated and were recognized as colonies of Sarracenia leucophylla, also known as Sarracenia drummondi and sweet trumpet. There would be anywhere from two or three plants to several hundred bunched loosely in a given colony, and colonies seemed to be clearly separated. Most notable to me at first, aside from the sheer beauty of these plants, was their remarkable diversification of coloration and pattern even within single colony groupings. Many lids were predominantly white with almost no venation or red coloration, some had mostly red venation, while still others had both red and green patterns. At least one specimen had a snow white cap with a red border around the edge. Variation within leucophylla species seemed almost endless and it set me to wondering how so many genetic combinations could ever be clearly separated into one classification. Specimens waist tall were predominant (measuring approximately 30 inches from base to tip). Pitchers taller than 30 inches were not nearly so numerous, and lesser forms were almost hidden from view in places because of tall grass. One specimen of about average height had a remarkably large opening, almost 3 inches across. Great efficiency of insect trapping mechanisms became apparent because so many of the pitchers were literally bursting at the seams with insect carcasses.

Walking further, we began to notice that grass was not as thick in some places, and in one of these thinned out areas we noticed a small clump of Sarracenia alata and others. These pitchers were roughly the same average height as S. leucophylla but variation is even more pronounced in this species. Color ranged from solid yellow-green to solid rusty maroon. Some had veined lids, green with bright maroon venation, some with veined throats, still others with veined networks down the sides. These pitchers did not appear as plentiful as S. leucophylla, but one thing that made them seem more scarce could be their lack of brighter colors. Hood structure also varied widely, some tall with deep convolution, others shorter and relatively smooth. There is a strong likelihood of much introgressive hybridization with S. leucophylla.

Wondering if more types of carnivorous plants grew in this area, we began looking closer to the ground in search of smaller types. Nearby we saw the head of a Sarracenia psittacina sticking out of the grass. It was about average size (approximately six-inch

pitcher length), but one specimen (which I later found out is endemic to this state) must have been over a foot and a half in diameter. Being mostly out in the open, shielded only by grass, pitcher color was deep green, spotted white and veined red.

While moving grass away from around Sarracenia psittacina, another discovery was made. Sundew (Drosera capillaris and D. brevifolia)were covering the ground! The latter were all quite small (no more than one inch diameter) and bright red in almost direct sunlight, sparkling like rubies against the jet black soil. Many ditches snaked through the area, and all along the sides and bottom of these, Drosera were so abundant we could not walk without stepping on them. Butterwort (Pinguicula lutea) were easy to spot, being bright yellow-green. Two or three specimens were collected but because of a lack of a suitable digging tool, I had to almost tear them out of the ground and survivial is doubtful.

Across a shallow ditch and a little further ahead, we came upon a most remarkable location where every type of carnivorous plant to be found in this area was noted. Sarracenia purpurea found here were all deeply red veined and most beautiful. Here we also found one most spectacular specimen at least eighteen inches across! Pitchers on this plant measured nine inches from base to tip. Spread out hood measured three and one-half inches across and the pitcher part held over four ounces of fluid. Many insects were found inside ranging through ants, moths, flies, and even spiders.

Natural cross breeding was well illustrated in a specimen physically located between a stand of Sarracenia alata and Sarracenia purpurea. This plant appeared to be made up of about 50% of each parent plant but reminding me most of a Sarracenia purpurea with greatly enlarged and elongated upright pitcher structures. This being the most unusual example observed on this trip, I did take a sample, but made certain to leave enough rhizome to insure survival in the following season.

Fall may be a good time to collect specimens but was not the best time to observe many of these plants. Greatest evidence of flowering observed was that of dried up seed pods, most of which had already burst open and dispersed their seed. Sarracenia leucophylla seemed to be the most productive flowerwise, and as many of these pods were collected as practical for Bob Ziemer's seed exchange service.

Looking over the general terrain of the area, it soon became apparent that these plants lived in a very narrow ecological range. Sarracenia leucophylla did not seem to be particular at all, but others like Drosera and Pinguicula seemed to populate very well defined areas. These areas were not plainly set apart from others except for possibly shorter grass in places. Soil was very black, soggy and surprisingly packed. Digging revealed concentrations of roots near the surface, sometimes quite thick with approximately 10 to 20% fine white sand mixed in. PH readings on a soil sample brought back read 6.4, acid as expected. Most notable was the fact that although the soil was very wet, it was not waterlogged. In fact, any areas that would be submerged for any length of time were void of carnivorous plants.

Tall grass and weeds (two feet tall in places), although proving a hinderance to exploration, probably serve smaller plants well by providing a less hostile micro environment. Several advantages come to mind: (1) Drosera and Pinguicula are provided shade from the constant relentless sunlight which might burn delicate leaves. (Some sundew were noted growing under very dense matted coverings of grass.) (2) Delicate mucilage droplets are protected from drying wind and other drastic humidity changes, thus enjoying greater average humidity than they would in the open. (3) Drosera, which are especially sensitive to over-stimulation, find some protection from wind-borne debris or raindrops under this natural umbrella.

During somewhat limited preparation, Jim Davis and I gathered a number of items we thought would be of use, but as things turned out, we were most unprepared. Anyone contemplating a trip into the wild in search of our bug-eating friends might benefit from a list of things we missed. Planning is most important. Once you locate an area, and if time permits, make a list of things to accomplish and try to allow enough time to do so. Of course individual requirements may vary widely such as photographic or specialized study, but most of these items can be of some use in one way or another. Here is our list: appropriate clothing (it could be extremely hot and muggy depending on what area of the country you go bogging--count on getting dirty); high top boots; snake bite and first aid kit; water (for drinking and washing specimens); knife; photo equipment (as per individual requirements); compass (if there is any doubt about finding your way back); digging tool (for specimen collection); plastic bags (for specimen collection); measuring device (optional); pH kit (optional); notebook and pencil (for taking notes); maps.

Other locations around the country may not have the variety and number of plants we encountered in Mississippi, but if the opportunity presents itself to go on a field trip, don't turn it down. It will be greatly rewarding if for no other reason than to see Nature at her best.