

anyone has direct experience with this technique and some of the details if so. By the way, we would like to hear from anyone growing C. follicularis successfully, we mean beyond the "holding its own" stage and to the point where actual proliferation and flowering is vigorously taking place.

SPECIAL NOTICES

A place to see carnivorous plant collections: BERKELEY BOTANICAL GARDENS--located on Centennial Drive (N. Canyon Road) one mile beyond the university stadium. An hour long tour is given on weekends at 1:30 and 3:00 p.m. It is free and open between 8:00 a.m. and 5:00 p.m. weekdays, 10:00 a.m. to 5:00 p.m. weekends.

KATSU KONDO recently announced his book Carnivorous Plants came out from The Bunken Publishing Co. of Japan. This book is written in Japanese, but includes a lot of fine photographs of carnivorous plants which are universal language. If you are interested in this book, write to Katsuhiko Kondo, Department of Botany, University of North Carolina, Chapel Hill, N. C., 27514 or The Bunken Publishing Co., Ltd., 4-128, Daido, Tennoji-ku, Osaka City, Japan. The price for each copy and its postage is as follows:

Book price when you buy it at book stores.....	\$4.40
Book price when you buy through Katsu.....	\$3.50
Postage.....	\$5.50 (Air Mail)
	\$1.70 (Surface Mail)

Toward the end of the growing season, JOE MAZRIMAS usually has substantial growth of several Drosera species. At the present time he can offer to CPN members leaf cuttings of Drosera filiformis var. tracyi while they last. Please send a stamped and self-addressed envelope with a baggie. Out-of-state members should have it sent Airmail. Like most Drosera plants, this species is particularly easy to start from leaf cuttings. One inch leaf cuttings are pressed to the surface of sphagnum peat moss that is kept evenly moist by covering the pot with a plastic bag. In about 4-6 weeks new buds will emerge from the leaf cuttings. In about two years the plants will grow rapidly to flowering size. (Address at head of CPN.)

SHORT NOTES

CARNIVOROUS PLANTS OF THE ILLAWARRA AREA

by Brian Whitehead

The Illawarra area is the area on the east coast of New South Wales, Australia from the northern suburb of Wollongong south to Nowra (about 60 miles) and west to a point about 30 miles inland. Although many of our local carnivorous plants are unobtrusive for varying periods of the year, careful investigation over a period of time should reward the observer with a total of nine species in the area. The

habitat for carnivorous plants is usually one which has either permanent moisture or a moisture level which is well above average for surrounding areas for a long period.

Plants which use the trap method of insect capture belong to the genus Utricularia. They are known by the common name of "Bladderworts" and there are four species in this area. The mechanism that they use to secure their prey is complicated, and the trap is usually minute, in most (but not all) cases no greater than 2 mm. in length. The trap consists of a hollow body with a "door" hanging down in front which can be sprung by an unwary minute insect or organism releasing a kind of trip mechanism inadvertently. By a process brought about by the plant, the pressure inside the trap is less than that outside, so that when the door is released, water rushes into the trap carrying the organism with it. It has been said that the trap is complicated and this is further emphasized when it is realized that the plant can expel water through the sides of the trap and also reject the remains of the organism after it has been digested.

Utricularias are therefore associated with very wet places, and are to be found in swamps and mud. One of the local species is a free floating plant with no attachments to the ground found in deep or shallow water in permanent swamps. Except for the free floating species, e.g. U. aurea, the Utricularias are completely unobtrusive when not in flower. Leaves are minute, 1-10 mm. in length depending on the species, usually forming a dense mat in mud or in mud under water, and the bladders are found on tiny stalks on the roots. In their season, a flowering stalk with blue, mauve, pink, yellow or white flowers is produced. The flower shape is distinct, and many species are easily distinguishable from other flora by their tubular spur which forms part of the underside of the flower.

The following species can be found in suitable habitats in the Illawarra district:

1. Utricularia aurea Lour.

This is a free floating plant with a prominent central stem around which are arranged finely divided leaves. The whole plant lies horizontally in the water. In the case of this species, it is the leaves which bear the bladders in great profusion on their fine segments. The plant is found only in permanent swamps, and flowers in late summer. In the local plants, flowers do not appear to be freely produced, but when they do occur, they are golden yellow and very fragile, as I have found that if water is allowed to touch the flower, this will cause the flower to wither at that point.

This species may be observed in its natural habitat at the western end of the Wingecarribbee Swamp in deep water

2. Utricularia lateriflora R. Br.

This is the commonest local species. Its small spatulate or rounded leaves (1-2 mm.) are almost inconspicuous and would need close examination of the ground to be discovered. It is more obvious when in flower, and flowers can be found depending on climatic conditions from

about January till April or May. The flowers are pale or dark blue, sometimes even whitish, and are arranged separately on a stalk which may be from 1-6 inches in height. The traps on this species are usually underground, minute and not easily observed. The plant can spread by means of runners which take root and produce new leaves, so that patches where the plant is found can be quite dense with leaves.

A peculiarity of the plant which does not appear to have been previously reported is its ability to regenerate a new flowering stem from the still living remains of an old stem that has previously flowered and partly died back in a dry period. The new part that is produced will then produce fresh buds and flowers. Its habitat is sandstone, areas on the edges of swamps, or wet areas on flat rocks or rock shelves, often among moss and soil. This species may be observed in its natural habitat in the swamps and heaths behind Mt. Keira.

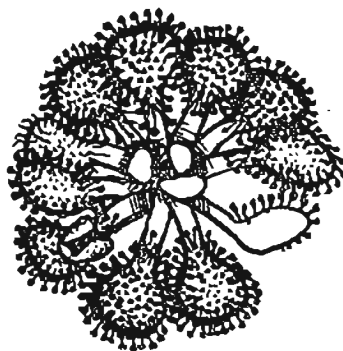
### 3. Utricularia dichotoma Labill.

The flowering spike of this species is by far the most conspicuous of local members of the genus, and may reach 12 inches or more in height. It is most abundant in highland areas in swamps and wet places near swamps. Again the leaves are small, up to 10 mm. and occur in dense patches. The flowers in this species are grouped near the top of the flowering stem, and this feature and its height distinguish it from other local species. Flowers are blue, sometimes with yellow ridges on the palate. This plant, unlike U. lateriflora, is often found in areas which are completely submerged by several inches of water, and the flowering stem will rise above the water. The traps attached to the roots lie on top of the soil or mud, and on examination, large numbers become obvious. This species may be observed in its natural habitat near Burrawang and in the swamps in the Belmore Falls area.

### 4. Utricularia dichotoma var. uniflora.

Although named as a variety of the above, the plant differs in general appearance first by the presence of only one flower at the extreme top of the stem and by the shape of the inflated spur on the under section of the flower. Other differences are apparent but not so easily observed.

The flower is of dainty and delicate appearance, and the flowering stalk may reach 6 inches, but is usually less. In the Illawarra, specimens in the highlands where it occurs mostly are pink or pinkish white, thus differing markedly in color from specimens in sandstone areas around Sydney which have blue flowers. The tiny (2-3 mm.) leaves of this species are almost circular, occurring in dense patches. Traps are underground. The flower has also 4-5 prominent yellow ridges on the palate. The habitat of this plant is the margins of swamps and in swampy heathland areas where no great depth of water lies for any period of time. This plant may be observed in its natural habitat in swamps on Jamberoo Mountain.



PART 2 - THE DROSERAS

Most of us are familiar with the plants known as Sundews, as their glistening "dew" makes them quite conspicuous in the bush. The sticky secretion produced by the plant on the leaf hairs holds small insects, preventing them from escaping, while these tentacles and others nearby, having had impulses transmitted to them, slowly curve forward to secure their prey. Digestive juices are produced from a gland at the end of the tentacle and the captured insect is slowly disintegrated until only the hard parts of it remain.

Droseras (the Sundews) inhabit damp areas, and some species may be found in association with certain species of Utricularias. Many thousands of Droseras may be found in suitable areas and often they are the dominant plant in a particular area.

There are five species which might be found in the Illawarra, of which one appears to be limited in distribution or else, being an annual plant, has not been frequently observed. Two types of root growth are to be found, depending on the species. Some are fibrous rooted plants, others regenerate from a reddish underground bulb. Species to be found locally are:

1. Drosera spathulata Labill.

The red rosettes of this species, up to 5 cm. in diameter, are conspicuous in every suitable habitat, especially in heaths on sandstone. Its leaves are spathulate, tapering gradually to the base, and in summer the flowering spike is produced. Flowers are generally bright pink and produced only on one side of the flowering stem. Plants growing in heavily shaded situations may lose their characteristic reddish color and become green. This is a fibrous rooted plant, reproducing from seed. The species may be observed in its natural habitat in almost any local heath or swamp on sandstone.

2. Drosera pygmaea D. C.

Easily distinguished from the above species by its small size when mature (rosettes up to 2 cm. in diameter but usually smaller) and its leaf shape. The leaf consists of a distinct stalk with a circular blade on the end which is covered with dark red tentacles. The flower stalk is tiny, the flower single and white, up to 2 mm. in diameter, but often less. Flowers are produced during summer and autumn. The plant is fibrous rooted and reproduces from seed and asexually by the production in winter of gemmae, small green oblong objects which are produced from the center of the plant and eventually form new plants on contact with the soil.

Dense colonies may occur in suitable areas, giving a pinkish appearance to the ground when observed from a distance. The plant also favors wet heaths, particularly in shallow soil over rocks. The plant may be observed in its natural habitat in suitable areas at the top of Jamberoo Pass.

3. Drosera glanduligera Lehm.

This is a species which appears to reproduce annually by seed, and which therefore is not present for many months of the year. It is a rosetted

plant whose leaves consist of a distinct stalk with an oval blade at the end bearing the tentacles, or glandular hairs. The color is yellowish-green and the species is further distinguished by the dish-like hollow in the oval leaf blade. Several bright red flowers are produced in spring on the flowering stalk which emerges from the center of the rosette.

The plant is not common locally, but may be observed, usually after a search, on wet heaths west of Nowra where it grows with D. spathulata but in much smaller numbers.

#### 4. Drosera peltata Smith

This plant begins its life cycle in late autumn or early winter by producing a rosette of leaves from a red, underground bulb. After the rosette has grown to a reasonable size (about 2-4 cm. in diameter), a central stem is produced bearing leaves equipped with the usual dewy tentacles. At the top of the stem (which may reach 20 cm. in favorably situated plants but is usually less--8-10 cm.), white flowers are produced in spring. The plant becomes dormant after production of seed and re-commences its life cycle the following winter from the bulb.

The presence of the central erect stem, bearing dewy leaves, distinguishes this plant from all other local species. It occurs in heaths on sandstone and on heavy soil in swampy areas. The plant may be observed in its natural habitat in the swamps and heaths behind Mt. Keira.

#### 5. Drosera binata Labill.

The linear leaf blades, borne on a long smooth stalk and divided into two or four narrow segments, assist in the easy identification of the species. It also produces conspicuous white flowers on a tall stalk in summer. The flower stalk may reach 40-50 cm. in height.

The habitat of the plant is varied; it may hang down from rock crevices, or from moss near waterfalls, or it may grow as a stout erect plant in heavy swampy soil.

The leaves are produced vigorously in summer, but in late autumn they die off and all that remains of the plant are the thick black roots from which a new plant is produced the following spring or summer. The plant reproduces by seed, and vegetative reproduction can be induced along the leaf blades where, if kept under water for a long period of time, numerous tiny plants appear. It is not yet known if this method of reproduction occurs commonly or at all under conditions of natural growth. This species may be observed in its local habitat in swamps on Jamberoo Mountain.

### MODIFIED FLORAL PARTS OF DIONAEA

by Ted A. Minton and Dr. Donald B. Jeffreys

Most botanists would agree that floral parts are basically modified leaves. There is nothing unusual about the flower of Dionaea. However, if the flower is abnormal, and if the floral parts become small leaves instead of petals, sepals, stamens or carpels, this causes an