TUBEROUS *DROSERA*

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INTRODUCTION

Tuberous ***Drosera*** are unique among the sundews in forming an underground storage organ (referred to as tuber) to help the plants survive adverse conditions. These unusual plants are nearly all limited to the continent of Australia with the exception of *D. peltata* which is widespread in Asia from India east to Japan and from Australia north again to Japan.

Three forms of these plants are recognized based on the arrangement of their stems and leaves. These three forms are called upright (sometimes referred to as erect, climbing or scrambling) (Section *Ergaleium*), fan-leafed (Section *Stolonifera*), and rosetted (Section *Erythrorhiza*). The upright plants have an upright to decurrent stem with leaves which range from bell-shaped *(D. hugelii)* to shield-shaped *(D. peltata, D. auriculata).* The upright group includes, among others: *Drosera auriculata, Drosera bulbigena, D. gigantea, D. heterophylla, D. hugelii, D. macrantha, D. menziesii, D. peltata* and *D. subhirtella.* The fan-leaf sundews are characterized by a stem which commonly branches near the base and has leaves which are fan shaped, included in this group are *D. stolonifera* (and all its subspecies), *D. platypoda, D. ramellosa,* and *D. fimbriata.* The third group form a basal rosette of leaves and look nearly identical to most common sundews. Included in the rosetted tuberous sundews are *D. bulbosa* (and the subspecies *major), D. erythrorhiza* (and all its subspecies), *D. macrophylla, D. rosulata, D. zonaria* and several new forms which are at present undescribed but are illustrated in Allen Lowrie's new book "Carnivorous Plants of Australia, Volume 1."

CULTIVATION

Tuberous *Drosera* are winter growers. As a result, when everything else is slowing down for the winter these plants put on a beautiful display. They are generally easy to cultivate if a few of their peculiarities are observed. All tuberous *Drosera* require a dormant period. If forced to grow continuously the plants will most likely die, although a recent article by Tilbrooke (1988) indicated that some forms of *Drosera peltata* (not the west Australian form) can be kept growing continually if proper conditions are provided.

Soil medium — I have found that various mixtures of peat and sand are best for tuberous *Drosera.* Forms which require well-drained soil include *D. bulbosa, D. erythrorhiza, D. huegelii, D. macrophylla, D. menziesii, D. microphylla, D. macrantha planchonii,* and *D. stolonifera* (Pietropaolo and Pietropaolo, 1986). I use a peat-sand mixture of about 60:40 for these taxa. Forms which prefer a poorer drained medium, such as a peat-sand mix of about 80:20, include *D. bulbigena, D. bulbosa, D. gigantea, D. heterophylla, D. menziesii,* and *D. subhirtella* among others (Pietropaolo and Pietropaolo, 1986).

Water levels — During the growing season the pots containing these plants should be set in water. As the plant dies back in the spring, water is completely withheld until the soil medium starts to pull away from the sides of the pot. Depending on your summer conditions and the size of pot used, you may not have to water until growth starts again. The soil can be barely moist at depth in the pots during dormancy, although it is recommended that the pots go completely dry for several months. In your area you may not have to water the pot during the entire dormant season. If kept too wet during dormancy, tubers of many forms will rot.

Light — Tuberous *Drosera* appreciate high light levels. Only a minimum of shading appears needed, although light levels are generally much lower in the winter when these plants are in growth.

Temperatures — I have not had experience with these plants at temperatures below freezing, but in correspondance with Allen Lowrie he stated that the plants ". . . in the wild can withstand

temperatures down to about 1-5°C (circa 35°F) with no ill effects." My plants have experienced temperatures between 40°F and 110°F with no ill effects.

Dormancy — These plants need a dormant period! Dormancy may run up to about 8 months out of a year in some species. During dormancy I leave the plants in their pots and refrain from watering them. A few people have suggested taking the plants out of their pots and putting them in zip-top plastic bags. In California this hasn't worked for me as the tubers still dry out. But in milder climates, this may prevent the tubers from rotting in soil that is too wet.

PROPAGATION METHODS

The best way to begin experimenting with these plants is to obtain mature tubers of perhaps *D. peltata, D. auriculata* or *D. erythrorhiza* from other growers. After you have successfully grown these for a season or two you should try seed. The seed bank usually has one or two varieties to offer. The seed should be treated exactly as full grown tubers. Plant the seed in the fall and keep it wet until your new seedlings start to die back in the spring. Then withhold water until you see signs of life again. The seed does not always germinate the first year. If it does not, set the pot aside and the following season follow the above procedure again. Generally your patience will be rewarded by an abundance of seedlings. If by the second year nothing appears toss out the seed since it was probably bad.

Another method of producing new plants is by that old standby of *Drosera*-leaf cuttings. Although this does not work with all plants, such as the rosetted forms, I've had luck with some of the upright species. To date I have not tried leaf cuttings with any of the fan leaf sundews because the only one I grow is *D. stolonifera* and it produces abundant new tubers each season so I do not have to resort to other methods to propagate this species.

The last method for propagating tuberous *Drosera* involves doing nothing. If growing conditions are good, tuberous *Drosera* (particularly *D. peltata* and *D. stolonifera*) will produce extra tubers. For example, I recently unpotted a *D. stolonifera* and was rewarded with three fair-sized tubers where I had planted only one the previous winter. Since some species will not, even under the best conditions, produce additional tubers, you may have to resort to the methods discussed above.

CONCLUSIONS

When you receive dormant tubers you should immediately plant them. Keep the soil only barely moist to dry until you see signs of life — then set the pot in water (as always use *only* pure water). After a period of time the plants will start to die back; as they die back withhold water and don't water again (or only minimally if you live in a very warm climate) until you see signs of growth. Then the procedure should be repeated.

If starting from seed treat it identically to a mature tuber and give the seed two years to produce plants.

SPECIES DESCRIPTIONS

All the taxa here are easy to grow and should provide you with hours of enjoyment. I have grown all the species outlined here, but I have selected them for this article partly for their beauty, ease of growth, and partly because I have photographs to illustrate them.

Upright species

Drosera auriculata: This species is an upright form which is very similar to *D. peltata* and is even considered by some to be subspecies of it (Conn. 1981). It has shield shaped leaves and grows to about 30cm. It can be distinguished from *D. peltata* by the presence of spotted sepals (Conn. 1981). Two flower forms occur, one with light pink and the other with white flowers. This species is highly recommended for the beginner (fig. 1).

Drosera gigantea: This is the "king" of the tuberous *Drosera.* It can form large branching plants up to 1m high and nearly the same in width. The tuber, which can grow to 3cm across, can be found down to about 1m below ground level, making the entire plant about 2m high! The leaves are very similar to *D. auriculata* and *D. peltata.* However, the flower is different, making identifying immature plants that flower relatively easy. Without the flower, small plants are, for me, nearly indistinguishable from *D. peltata* or *D. auriculata.* But mature plants are so large and branching that they are easily recognized.

D. huegelii: A smaller species than the last, *D. huegelii* reaches a maximum hight of about 45cm (Lowrie, 1987), but is commonly less. Its few, bell shaped leaves make it easily recognizable. It has a beautiful white flower with totally reflexed petals (fig. 2).

D. menziesii: Three forms of this species are currently recognized *(D. menziesii* subspecies *menziesii, D. menziesii* subspecies *penicillaris* (n.n.), and *D. menziesii* subspecies *thysanosepala*). They are best differentiated by their flower, but there are also differences in the plants as a whole. For distinguishing features between these subspecies, the reader is referred to Lowrie (1987). In general this species is easy to grow and very tolerant of soil medium. It has a small tuber but can form quite a long plant, upwards of 115cm in *D. menziesii* subspecies *penicillaris.* The leaves look like a very shallow bell or bowl and are generally reddish in hue. Flowers are pink in *D. menziesii s.s.* and *D. menziesii* subspecies *penicillaris* and mainly white in *D. menziesii* subspecies *thysanosepala* although a pink form occurs.

D. microphylla: A moderate sized plant which grows up to 40cm, this species is easily distinguished by its orbicular leaves and distinctive flower. Flowers have dark red petals with golden-green sepals, making it one of, if not the most, distinctive *Drosera* flower (fig. 3).

D. peltata: This is perhaps the easiest tuberous *Drosera* to grow. It is nearly identical to, and possibly related to *D. auriculata* (see discussion under *D. auriculata).* The flowers of this species are always white (fig. 4).

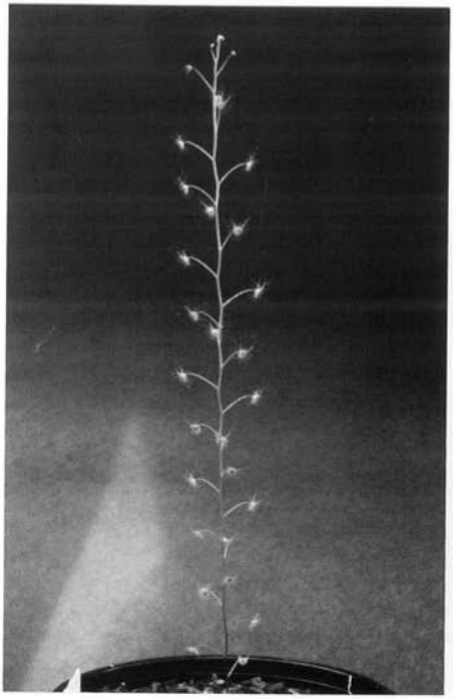


Fig. 1. *D auriculata.*

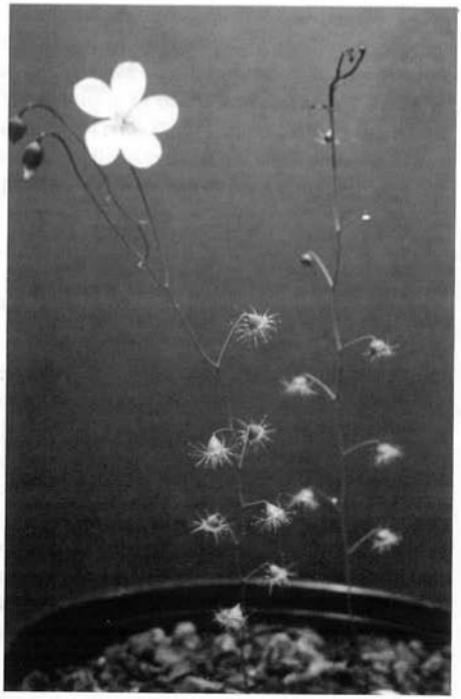


Fig. 2. *D. huegellii*

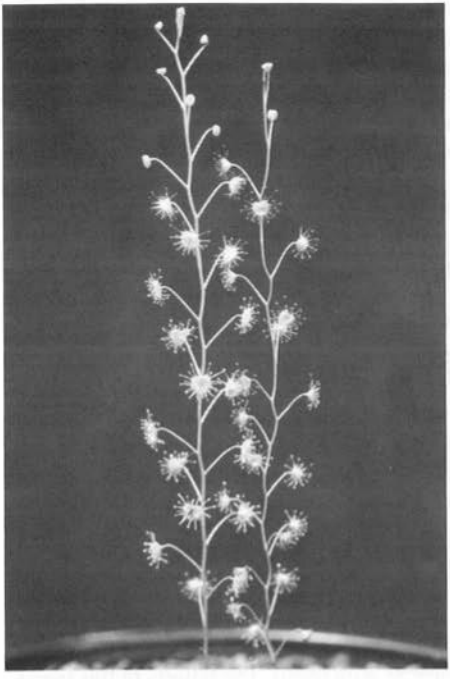


Fig. 3. *D. microphylla*



Fig. 4. *D. peltata* grown by P. D'Amato

Fan-leaf species

D. stolonifera: Six distinctive forms of this species are currently recognized *(D. s. subspecies stolonifera, D. s.* subspecies *compacta, D. s.* subspecies *humilis, D. s.* subspecies *porrecta, D. s.* subspecies *prostrata (n.n.),* and *D. s.* subspecies *rupicola).* For distinguishing features the reader is referred again to Lowrie (1987). The leaves of all forms are generally ovate to spatulate and green to red in color, while the flowers of all forms are white. From one to several stems are produced on all forms except *D. s. porrecta,* which generally forms only a single stem when not in flower. In flower it develops side branches below the inflorescence. On the remaining subspecies the inflorescence rises from the center of the plant separate from the branches containing the leaves. This species, especially the nominal subspecies, is regarded as one of the easiest to grow and readily produces extra tubers after a successful growing season (fig. 5 and 6).

Rosetted species

D. bulbosa s.s.: There has been much confusion between this species and *D. rosulata.* According to Lowrie (1987) *D. bulbosa* can be distinguished from *D. rosulata* by the former's "golden-yellow lamina when mature; the raised ridge along the length of the middle of the leaf and the lack of black dots on the sepals." *Drosera bulbosa* also has white pollen, while on *D. rosulata* it is yellow. A large pale green to reddish form is known as *D. bulbosa* subspecies *major* (fig. 7).

D. erythrorhiza: Four forms of this species are recognized: *D. e.* subspecies *erythrorhiza, D. e.* subspecies *collina (n.n.), D. e.* subspecies *magna (n.n.),* and *D. e.* subspecies *squamosa.* They form rosettes between 6 and 12cm in diameter. The leaves are generally green, but *D. e. squamosa,* displays a red border. The flower of all the forms is white. The nominal subspecies *(D. erythrorhiza erythrorhiza)* is an easy plant to grow and is highly recommended for beginners (fig. 8).

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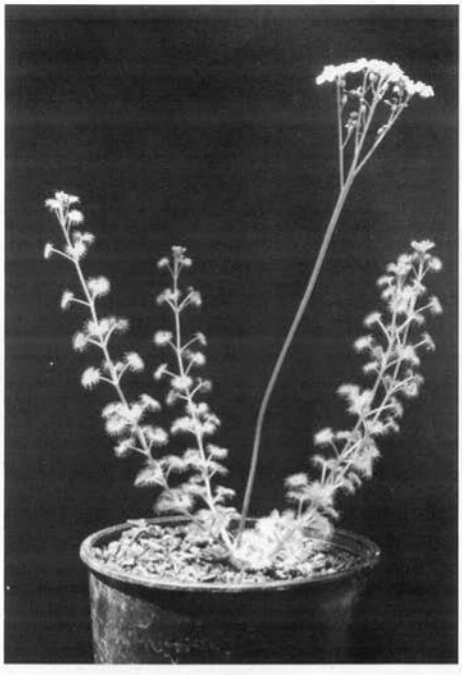


Fig. 5. *D. stolonifera* ssp. *stolonifera.*

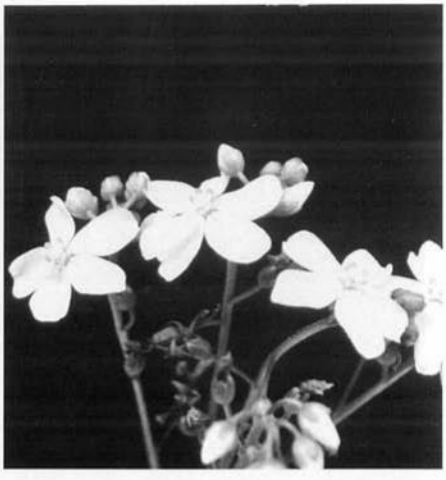


Fig. 6. *D. stolonifera* ssp. *stolonifera* in flowers.



Fig. 7. *D. bulbosa.*



Fig. 8. *D. erythrorhyza ssp. erythrorhyza.*

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D. rosulata: This species is very similar to *D. bulbosa,* as discussed above. It has a very pretty medium green rosette and I have found it flowers abundantly. This too, is a very easy species to grow and is again recommended for beginners if you can find it (fig. 9).

I would like to thank Allen Lowrie who helped greatly with this article and Mary McGann for reviewing the article and adding her helpful criticism. I would also like to thank the editors of CPN for their help.



Fig. 9. *D. rosulata* in habitat - Badgingarra, Western Australia. Photo by P. Mann.

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