larva to eat a single stalk. Once finished with this stalk it will move on to an adjacent one and continue. In this manner an entire leaf can easily be stripped in a few hours. For some reason, the longer marginal glands are either ignored or eaten last.

The larvae are usually a grayish-brown in color, though the color can vary considerably depending on what material the larva has been eating and which can be seen through the semi-translucent body wall. Therefore, younger larvae tend to be red or purple, from eating the stalked gland, whereas the older larvae are greenish due to the color of the ingested leaf blade.

How does the larva avoid being trapped in the secretion? This is not as difficult as it seems. The body of the larva hardly ever touches the secretion, and if it did, it would become entrapped just as any other insect would be. The caterpillar's contact with the droplets is restricted to its bristles which stick out from its body. The bristles can readily be withdrawn from the secretion. Older larvae avoid body contact but because of their great size can escape without difficulty.

Pupation usually occurs on the flower stalk. The pupae which are light green in color, hang head down from the floral stalk and the adult emerges 10-12 days later.

A good deal remains to be learned about Trichoptilus parvulus. For instance, one wonders how the female lays her eggs on the plant without becoming entrapped herself. Of course, she could lay her eggs beside the plant, but the possibility that she oviposits directly on the plant need not be ruled out. It has been found that moths are among the most unlikely of all insects to be captured by Drosera, although I have seen it happen several times. The detachable scales with which moths are characteristically covered and which are known to protect them from adhesion to spider webs might also be why they are so seldom caught by Drosera. When a moth flutters into the leaf of Drosera, it merely releases some of the scales to the viscid secretion and flies on. Adult Trichoptilus must therefore be able to easily approach Drosera with at least some measure of caution.

PYGMY DROSERAS

by Rich Sivertsen

Pygmy Droseras are not necessarily characterized by small size, but primarily by their ability to produce gemmae. They are the only Droseras that do so. Except for D. pygmaea which extends into Tasmania, New Zealand and neighboring islands, all pygmy Droseras grow in southwestern Australia.

In cultivation, seeds are often difficult to obtain in spite of the plants' prolific flowering habit; and the seed is even more difficult to germinate and grow plants to maturity. Methods of propagating these plants from cuttings are not reliable, and are possibly damaging to the parent plant.

The best way to propagate these plants is to encourage, harvest and use gemmae. In constant temperature-light conditions, they will grow for years and produce an abundance of flowers periodically, but generally few or no gemmae. The stimulus needed is the transition from warm temperatures (70-85°F.)--low intensity light environment (such as a fluorescent light chamber) into a cool (38-65°F.)--high intensity light, or full direct sunlight for at least three to four hours daily. Some species may require an even longer photoperiod to produce gemmae.

During gemmification, the first noticeable changes in the plants is swelling of the apex in the center of the rosette. Within a week to ten days, gemmae will be visible within the apex as it opens up to form a nestlike cluster. These gemmae should now be carefully removed and pushed just below the surface of moist peat and placed under a controlled environment, such as fluorescent lights. The peat medium should be prepared about three weeks in advance to allow a plentiful culture of small soil organisms to develop. The young pygmy Droseras will capture these for nutriment and grow faster and better for it. They will mature in about six months in this environment, and given the proper conditions are able to in turn produce gemmae of their own at that time.

Humidity is not essential for gemmae production nor is the amount of watering an important factor. Warming of the peat by sunlight causes no harm either since pygmy Droseras often grow in sands in the wild that are too hot to walk on barefoot. Peat seems to be the best all around medium in my experience.

Gemmae are of different shape, size and color (lighter to darker shades of green) depending on species. D. paleacea gemmae are spherical to oval and light green. D. pulchella gemmae are flat discs resembling small fish scales and dark green. Stipules may or may not disappear during gemmae production depending on the individual or species.
After all the large, ripe gemmae are removed from an apex, more will be produced for several crops as long as proper conditions are maintained. Extreme care and patience are required

along with the steady hand as of a competent surgeon in removing the gemmae from the apex. Often they will be hurled by the remaining stipules so quickly they seem to vanish as they are thrown out of sight. A few weeks later, foreign visitors are then noticed in other pots.

SPECIAL NOTICES

BACK ISSUE REPRINTS AGAIN AVAILABLE - LEO SONG (Arboretum, California State University, 800 North State College Blvd, Fullerton, CA 92634) has undertaken reprinting of back issues of CPN. Original copy supplies were exhausted long ago and the co-editors do not anticipate a reprinting since this would involve capital outlay and maintaining an expensive inventory. In the past, Roger Kirby produced one reprinting of back issues but has decided not to print more. Leo Song is taking up reprinting with the co-editors' permission, but the project is being handled completely by him and the co-editors and CPN have no financial interest. Leo will handle all orders at the following rates:

$5.00 per volume	in U.S.	surface
$6.00 per volume	out of U.S.	postpaid air
$18.00 for all four back volumes	in U.S.	surface
$22.00 for all four back volumes	out of U.S.	postpaid air

Note that all prices are postpaid and only entire volumes will be sold. The four CPN's of each volume have been reprinted consecutively and are stapled as one volume. Send all orders with your check directly to Leo at the above address. Please do not send orders to the co-editors.

NEPENTHES CUTTINGS-1976 - JOE MAZRIMAS and DON SCHNELL have completed pruning of their Nepenthes plants for this year and cuttings are now being mailed to those who sent a note to Joe earlier. There will be no additional cuttings this year, but watch for an announcement in CPN regarding cuttings for next spring (the announcement will probably be in the December CPN).

RECENT LITERATURE

(Anon.) Do sundews really devour insects? Australian Plants 8:161-162. 1975.
A second-hand report on research of Chandler and Anderson of La Trobe University, Victoria (reference not given). Unnamed Drosera ssp. reportedly grew 30% more than controls if fed with insects or nitrogen compounds. Sundews kept under bacteria-free conditions could only digest insects to a limited extent.

(Anon.) Growing Cephalotus follicularis, the Albany pitcher plant. Australian Plants 8:172. 1975.
A resume of a culture method, primarily in pots of peat outdoors in the Sydney area. Pots were placed in saucers of water and in full light which resulted in healther pitchers. No fertilizers were used. Occasional freezing by light frost did no harm. Propagation by rhizome division, though slow due to slow growth of the species, is preferred over seed since seed are very difficult to germinate. Disturbance during division or transplant frequently results in dieback of topgrowth, but new growth resumes promptly.

Fox, William W.: Pygmy Forest: an ecological staircase. Cal. Geology 29(1):3-7. 1976.
History and evolution of the five uplifted marine terraces near Ft. Bragg, CA which are where sphagnum moss bogs form. These are the most southerly habitat in the west coast and are sterile and low in oxygen. The moss is also nearly devoid of bacteria so that peat is formed by compression of its own weight. Here we find Drosera rotundifolia growing.

Fromm-Trinta, E.: Ecological study of the sandy coastal plain flora of southeastern Brazil: XXI Lentibulariaceae. Conselho de Pesquisas da Universidade: Rio de Janeiro, Brazil, 1972.
There are eight species of Utricularia on the restingas of S.E. Brazil: U. subulata, U. fimbriata, U. longifolia, U. erectiflora, U. foliosa, U. gibba ssp. gibba, U. tricolor, and U. nephrophylla.

Heslop-Harrison, Y.: Enzyme release in carnivorous plants. Lysosomes in Biology and Pathology, Chap. 16. J.T. Dingle and R.T. Dean, Eds., Amer. Elsevier Pub. Co., N.Y., 1975.
This chapter gives a thorough review of all the evidence for digestive glands and their secretory products in many genera of CP. Darlingtonia and Heliamphora are not discussed. Scanning electron micrographs are liberally scattered throughout this work. Cytochemical localization of digestive enzymes and the mechanism of the secretory process are discussed by the author in detail. An indispensible background for those who wish to pursue CP digestive biochemistry and relate it to fine structure.