

# PROPAGATING *PINGUICULA LUTEA*

by Bill Carroll

(Botany Dept., Carolina Biological Supply Co., Burlington, NC 27215)

The propagation of carnivorous plants has been my major interest for the last five years. When I started studying butterworts in 1976, nothing seemed to keep the plants growing. After nearly two years of effort, I developed a successful soil mix and a method for propagating *Pinguicula lutea*.

## THE SOIL MIX

A mixture of two parts peat moss and one part vermiculite is used. When sowing seed, screen the mix to remove large particles.

The peat moss used is the brown fibrous type sold in bales at garden centers. It is often labeled Sphagnum Peat Moss or Canadian Peat Moss.

Vermiculite is a micaceous mineral which contains small amounts of magnesium and potassium. The plate-like, layered structure of vermiculite holds nutrients and gradually releases them.

Perlite may be used in place of vermiculite when transplanting *P. lutea*. However, its lightweight particles float in water and could interfere with the growth of seedlings by covering them up. Perlite is a volcanic silicate and contains no nutrients, nor does it hold nutrients like vermiculite.

## POLLINATION

The flower is structured in a way that seems to prevent self-pollination. Two anthers are attached below the stigma and are covered by a small flap (Fig. 1, corolla removed). I have observed honeybees going into butterwort flowers, and upon backing out, take their forelegs and rake pollen off their backs, depositing it on their hind legs. Some pollen remains on the insect's back. When the bee en-

ters another flower, the pollen is pressed on the stigma, completing pollination.

In order to hand pollinate the butterwort flower, it is necessary to remove the corolla. Gently hold the stem with one hand. Using the other hand, grasp the flower between thumb and forefinger. Slowly pull upwards on the flower until it breaks free. An alternate procedure is to tear away the flower in pieces so that the pistil is fully exposed.

A pair of fine pointed forceps is used to remove an anther. The pollen is then pressed gently onto the stigma. Another method is to use the flattened end of a toothpick to scrape out a small amount of pollen from beneath the flap. Gently push the pollen onto the stigma.

Although self-pollinated flowers will produce viable seed, cross-pollination of different plants results in more and larger seed. Have patience; it may take seven weeks for the seedpod to mature, split open, and reveal its cache of tiny black seeds.

## COLLECTING SEED

To collect seed, tip the seedpod over onto a sheet of paper or a shallow dish. Firm tapping will dislodge the seeds. The entire stem and seedpod are easily removed from the plant by pulling steadily on the stem with a sideways motion. If seed are to be stored, they should be air dried two or three days. This removes excess moisture and thus prevents molding. Store seed in a closed container such as a small glass vial or plastic prescription bottle. At room temperature seed viability is still good after twelve months.

## SOWING SEED

Sow seed on a smooth surface of two parts brown fibrous peat moss and one part fine vermiculite. Do not cover the

---

\*Preceding page

seed with soil. The soil mix is moistened beforehand using *Miracid*<sup>®</sup> at the rate of one-fourth teaspoon per liter of water. *Miracid*<sup>®</sup> is a water soluble fertilizer used for acid-loving plants. It is usually sold at garden centers. Use water that is free of chemical additives such as chlorine and fluoride.

Cover the container with clear plastic or glass to hold in humidity and aid germination. Seedlings emerge in several weeks and soon begin to form the familiar rosettes. Gradually remove the cover over several days so that the seedlings adjust to less humidity.

#### TRANSPLANTING

Transplanting may be done at any size, but is more easily accomplished when the seedlings reach one centimeter in diameter. When transplanting, the same soil mix is used although the strength of *Miracid*<sup>®</sup> may be increased to one-half teaspoon per liter of water. Settle the soil around the plants by careful watering.

#### GROWING CONDITIONS

*P. lutea* has a wide range of tolerance for light and heat. The plants grow best in bright light, but will do about as well in partial shade. Direct sun is not necessary.

Winter temperatures in the greenhouse range from 13°C (55°F) at night to over 27°C (80°F) some days. The plants continue to grow all winter; no dormant period has been observed. In their native habitat, summer temperatures often exceed 38°C (100°F).

Humidity is important for butterworts. A terrarium will provide an ideal environment in the home. For the greenhouse, set pots in a tray of water about two or three centimeters (one inch) deep. Add more water only when the tray is empty of water, but before the soil becomes dry.

#### FERTILIZING

In the greenhouse, *P. lutea* is watered with a solution of one-fourth teaspoon of *Miracid*<sup>®</sup> per liter of water, about every sixty days. This maintains good

growth and bright green color. The solution is poured into the tray in place of a regular watering.

Other carnivorous plants that benefit from *Miracid*<sup>®</sup> include sundews, pitcher plants and Venus flytraps.

#### REPOTTING

Repotting may be necessary as the plants grow older. To do this, place one hand over the plant and with the other hand hold the pot. Turn the pot upside down and tap the edge against a solid object such as a table or kitchen sink. The plant and soil should slide right out.

Carefully remove old soil, dead roots and leaves.

Use the same soil mixture as for transplanting and settle the plant in with a good watering. Keep the plant in a shaded area for several days while new roots develop.

#### FLUORESCENT LIGHTS

*P. lutea* does very well under two cool-white fluorescent tubes. Twelve hours of light is sufficient to maintain healthy plants. The lights should be approximately ten to twenty centimeters (four to eight inches) above the plants.

Starting seed under fluorescent lights speeds germination. Put the pot or tray within ten centimeters (four inches) of the lights.

#### TEST TUBE PLANTS

Butterworts are well known for producing plantlets on injured or detached leaves. Under natural conditions, most of the leaf decays before very many new plants get started. With the laboratory culture method, a sterile environment prevents disease organisms from infecting the plant leaf tissue. A nutrient enriched medium supports growth as the piece of leaf freely produces large numbers of plantlets.

At Carolina Biological Supply Company, I have produced tissue cultured plantlets of *P. lutea* and *Dionaea muscipula* for about two years. Both have been

(Please turn to page 71)



PAT HANSEN, CPN secretary/treasurer, was barely able to recognize Venus' flytrap when she began working with CPN two and one-half years ago. Considerably more knowledgeable now, she can hold her own in conversation with people who know nothing about CP.

A Russian major in college, Pat's experience with plants extends mainly to vegetables and annuals. In addition to her work with CPN, she types Slavic linguistics manuscripts, volunteers considerable time at the Fullerton Arboretum, and mothers two small children.

Aside from becoming acquainted with "these marvelous plants", Pat appreciates most her contact with CPN'ers, who are friendly, interesting and very cooperative. She is hopeful that the CP bog at the Arboretum will provide a focal point for CP meetings in the not-too-distant future.

---

## WANT ADS

Gordon Hanna, 168 Kilaben Road, Kilaben Bay, 2283, AUSTRALIA. (TS) *N. maxima*, *D. auriculata*, *D. peltata*.

Steve Hawkins, Rt. #4, Forest Hills, Marion, N.C. 28752. (WB) *N. ampullaria*, *N. sanguinea*, *N. villosa*, *N. gracillis*, *N. lowii*, *Sarracenia oreophila*, *S. purp. x minor* (cuttings, seeds). *Heliamphora*, *Drosera regia*, *D. burmanni*, *Sarracenia rubra*, *N. rafflesiana*, *N. fusco* (plants, seeds, cuttings).

---

and keep in a cool, well-lit place for a few days until they recover.

The large sulphur-yellow flowers are open for a single day only, but are produced over a period of weeks. They are self-fertile and usually set seed without any manipulation, but to insure seed set, rub two flowers gently together, making sure that pollen is deposited on the stigma, which is visible on top of a dome-like structure in the center of the flower. The black seeds can be harvested when the stem below becomes dry or when the dome (ovary) splits open, exposing the black seeds.

(Continued from page 59)

successfully transplanted to the greenhouse. These test tube plants reach maturity in less time than those grown from seed.

### PLANT PRODUCTION

For the commercial grower, large scale production of any plant requires a predictable quality and uniformity of the crop. One thing I try to do is select those plants with the most favorable characteristics and keep them for stock. Another thing is to standardize a soil mix and fertilizer program. Using *Miracidia*<sup>®</sup> and the soil mix described above, healthy carnivorous plants can be produced by growers and hobbyists alike. The result is not only improved quality, but more importantly, increased quantity available so that field collection is no longer necessary. (Fig. 2) (Received 5/12/79)

NOTE: Bill Carroll sent seed to the CPN seed bank so that all requests for seed should be directed to that source. Seed is 50¢ per packet. See page 43.



Plate 5



Plate 6

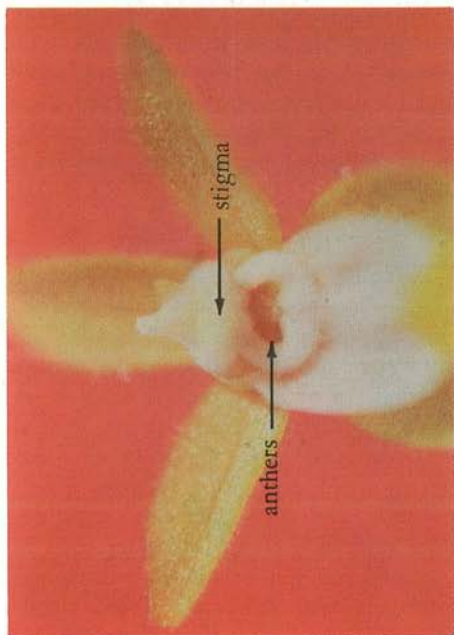


Fig. 1  
Corolla removed



Fig. 2  
Bill Carroll pollinating  
*Pinguicula lutea*

⤴ (Please turn page to view)