

# THE PREDACIOUS FUNGI

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A number of species of fungi have the ability to catch, kill, and consume certain animals. A variety of methods and mechanisms are used to capture prey, some of which are similar to those of the carnivorous angiosperms. Most of the predacious fungi are either Phycomycetes or Deuteromycetes. Most of the predacious Deuteromycetes are Hyphomycetes, many of which belong to the family Moniliaceae. About half of the genera of predacious Phycomycetes belong to the family Zoopagaceae. A few predacious fungi are aquatic, but most can be found in soil, decaying plant matter, etc.

The most common method used by the predacious fungi to capture prey is with adhesion. The adhesive may be found covering the fungus, on special branches, on the inside of rings, or on spherical knobs. The knobs are found atop short, lateral branches. The rings are formed when hyphae bend and fuse with their own bases. In many species, complex networks are formed when secondary and tertiary rings arise from other loops. Some protozoans or other organisms are captured with adhesives, but nematodes are the principle prey, and in the case of adhesive rings, the only prey. The prey is captured on contact, and as it struggles, the fungus secretes additional adhesive to prevent its escape. Trophic hyphae then enter the prey to absorb nutrients. The adhesive found in the Phycomycetes is considerably stronger than that found in other fungi.

Probably the most fascinating trap used by predacious fungi is the constricting ring. The ring is composed of three cells, and is situated on a two cell stalk. The inner surface of the ring is sensitive to touch. When a nematode touches it, the cells swell to about three times their original volume, pinning the worm between them. Prior to swelling there is a lag of one to two seconds but the actual swelling takes only about one tenth of a second. Following capture, hyphae enter the prey and absorb the nu-

trients. The exact process causing the swelling is not known, but it has been hypothesized that the cell membrane becomes more elastic, allowing water to rush in and the cell to swell.

Rings are also used to capture nematodes in another way. These rings are slightly smaller in diameter than the nematodes captured. When a nematode tries to pass through the ring, it gets stuck. It then tries to force its way through the ring, but can only wedge itself tighter into the ring. Once the worm is caught, hyphae enter it to withdraw nutrients. This type of trap is usually called a "non-constricting ring."

Another method is used to catch rotifers. The tips of hyphal branches act as bait for the rotifers. When the rotifer bites the hyphae, it swells within the rotifer's mouth and secretes mucilage. Hyphae then grow through the mouth and absorb all but the shell. One species, *Monacrosporium passalopaga*, has developed another way to capture rotifers. When the rotifer bites its filament the fungus thrusts a lateral branch into the rotifer's mouth. This branch then swells, making it impossible for the rotifer to escape. The rotifer-catching fungi are usually found in association with algae where the rotifers are often found feeding.

There are also some species of fungi whose spores either adhere to or are ingested by their prey. The spores which adhere to the body surface then penetrate the surface. Both types grow within the prey's body, eventually killing the prey. Only the hyphae which produce spores grow externally; all other growth remains within the prey's body (with a few exceptions). At least one species (*Harposporium anguillulae*) has been shown to be highly attractive to a certain species of nematode, indicating that the chance of infection is not always purely random. While most other predacious fungi can survive without prey, these species cannot.

Not until 1888 was the carnivorous nature  
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shoot so that there is a maximum of petiolar base tissue. Place the leaf upright about half way down into damp living sphagnum and keep in conditions similar to mature plants. It is important not to over-water and to keep the cuttings on the warm side of limits. New buddings will often appear from the base of the leaf petiole down in the sphagnum. These new shoots should not be disturbed until they appear like miniatures of their mature counterparts. During this budding, rooting and initial growth phase, keep the growing living sphagnum carefully pushed down so that it does not cover the cuttings.

2. Rhizome—This is the most rapid and successful method of all. One can simply cut rhizomes into 1.5 cm lengths and plant these horizontally as for plants, and new shoots will appear. Or one can simply plant an entire rhizome horizontally, allow new shoots to appear, be certain of root development, and then divide the rhizome halfway between adjacent shoots. Each of these sections of rooted rhizome with new shoots can then be potted up as separate plants. Obviously, this process will usually occur naturally in any healthy planting, and one can make offset pottings at any time.

#### Final Comment—

*Cephalotus* is certainly one of the most "growable" carnivorous plants and is now commercially available from propagated material. There does not appear to be a dormancy requirement and propagation is very simple by the rhizome method. The most likely pitfalls will be overwatering (especially in cooler situations), lack of proper drainage, overheating, and improper lighting.

When you first obtain your plant, your first step should be to establish it with sound horticultural techniques as described above. After the plant is flourishing, then try propagation, first dividing the rhizome between shoots which will likely have appeared. Next, try the vegetative leaf technique which is somewhat more chancey but can work well. Do not peel off all the flat leaves from your main plant, and do not

damage the central stalk of the growth shoot.

Many enthusiastic new growers try to rush into propagation too early—a cardinal rule of horticulture is to look after your stock plant first. Once your stock plant is robust, then try propping, using the most certain method first, and one method at a time sequentially until you have a reserve of many offset plants. At this point, you can then safely experiment with new or un-checked techniques, or ideas you might have. If they work, let us know about it!

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of some fungi was discovered. Now, over 100 species in about two dozen genera are known. There is still confusion, however, about these fungi and their classification, and much work will have to be done before they are as well understood as the carnivorous Angiosperms.

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