

CARNIVOROUS PLANTS OF ORONO BOG

Fact sheet was created by Susan Priest, February 2012 and edited by Ronald B. Davis as an educational resource for Orono Bog Boardwalk.

Some plants at Orono Bog have adapted to the low nutrient environment through carnivory. Carnivorous plants get extra nutrients by trapping and digesting small animals. There are four carnivorous plant species at Orono Bog: pitcher plant (*Sarracenia purpurea*), roundleaf sundew (*Drosera rotundifolia*), spoonleaf sundew (*Drosera intermedia*), and horned bladderwort (*Utricularia cornuta*). These plant species supplement their nutrient intake by breaking down insects, spiders, mites and micro-organisms. To trap prey each of these plants has developed specialized active or passive trapping systems. Pitcher plants and sundews use passive trapping methods, and bladderwort uses active trapping methods to catch prey (Johnson, 1985).

To trap unsuspecting quarry the pitcher plant must first entice prey to land on the plant. The bright venation pattern and the fragrant scent emitted from leaf pores entice prey to the pitcher plant (Figure 1). Once at the plant the quarry will find a wide open lip for landing. If the quarry lands on the lip of the pitcher plant it will find that there are many tiny hairs that point down toward the rainwater filled basin in the cavity of the plant, which make it easier for prey to crawl downward, but difficult to climb out. Once in the hollow, the captured prey finds a sticky substance on the leaf wall, that makes climbing out of the basin impossible, and in the struggle to leave the trapped animal drowns (Johnson, 1985). Decay organisms in the water break down the captured animals into usable nutrients and enzymes emitted by the pitcher plant aid in the digestive process.

Figure 1: Purple pitcher plant identification card (Priest, 2011).

Purple Pitcher Plant

Sarracenia purpurea
Family: Sarraceniaceae



Native evergreen perennial carnivorous plant that can be found in the conifer wooded fen and bog. The red hermaphrodite flowers droop down from a long sturdy stock and are in bloom early to mid-summer. The large pitcher forming leaves form rosettes around a central stem. The top lip of the tubular hollow leaves have many tiny downward facing hairs that make it difficult for prey to climb out of the water filled hollow. Larvae from mosquitos and midges, along with an enzyme released by the pitcher plant in the water filled cavity, take part in the decay process of captured organisms.

Instead of having a pitcher filled with water the tiny sundew (Figure 2 & 3) has a number of leaf pads that spread out in different directions. On each leaf pad tiny hairs with sticky droplets on their tips extend out even farther. When the unsuspecting

quarry flies to close to the sticky hairs or lands on the pad, they find themselves trapped in the sticky goo. Once an organism is trapped by the sundew it will fold the hair like tentacles or leaf pad around the prey. This process enables the sundew to increase the surface area contacting the prey, which increases the rate of digestion and absorption (Johnson, 1985).

Figure 2: Roundleaf sundew identification card (Priest, 2011).

Roundleaf Sundew

Drosera rotundifolia

Family: **Droseraceae**



Native perennial carnivorous plant found in the fen and bog. The flowers are white, hermaphrodite and self-fertile. The leaves form basal rosettes and are round at the tips. The upper surface of each leaf has red hairs that protrude with sticky sweet glands at the tip which attracts insects. Insects that are lured in by the sweet substance become trapped. Once the sundew has captured its prey it secretes a digestive enzyme and enfolds the prey in the hairs to digest it. The enzyme breaks down the insect and then absorbs the nutrients from the catch back into the leaf. The digestive process can take up to a week. The term “Drosera” means dew.

Figure 3: Spoonleaf sundew identification card (Priest, 2011).

Spoonleaf Sundew

Drosera intermedia

Family: **Droseraceae**



Native perennial carnivorous plant found in the bog. The flowers are white, self-fertile and hermaphrodite with both male and female organs. The leaves form basal rosettes, are spatulate shaped and widest at the tip. The upper surface of each leaf has red hairs that protrude with sticky sweet glands at the tips to attract insects. Insects are lured in by the sweet substance then trapped by the sticky secretion. When an insect is caught the sundew secretes a digestive enzyme around the insect to digest it. The enzyme breaks down the insect and then absorbs the nutrients from the catch back into the leaf. The digestive process can take up to a week.

Figure 4: Horned bladderwort identification card (Priest, 2011).

Horned Bladderwort

Utricularia cornuta

Family: **Lentibulariaceae**

Native annual or perennial carnivorous plant found in the bog. Bright yellow flowers bloom atop slender stems in mid summer. The roots spread by rhizome. Tiny bladders with trap doors catch micro-organisms just below the peat surface. The bladder has hairs on it that trigger it to open when something touches it. The bladder is emptied regularly to create a pressurized system where pressure inside the bladder is lower than outside the bladder. The effect of this pressurized system allows water to rush in along with the micro-organism when the trap door opens. The trapped micro-organism is then digested for nutrients. Once the process is complete the bladder is emptied of all water allowing for the bladder to repeat the process and catch more micro-organisms.



Horned bladderwort (Figure 4) is different from sundew and pitcher plants because bladderwort species actively trap their prey. Horned bladderwort does not have roots but instead has tiny leaves that float on the water surface or wet peat surface, and little bladders that capture prey. If a tiny animal passing by the bladder accidentally touches one of the trigger hairs, the trapdoor swings open, the bladder expands, and draws in the animal with the water into the bladder. The trapdoor closes trapping the animal inside. The bladderwort then releases an enzyme to aid in the digestive process. Digestion of captured prey may take as little as fifteen minutes or up to two hours depending on the size and digestibility of the captured animal. Once the animal is digested specialized cells pump out the remaining water and the process happens all over again (Johnson, 1985).

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