

CARNIVOROUS PLANTS OF OHIO.

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In Ohio we find representatives of all the main types of insectivorous plants:

First those having traps or chambers into which the insects go and are caught; second, those which show definite movements in response to a stimulus caused by contact with the animal; and third, those which have neither pitfalls nor movements, but which have viscid-pubescence or viscid areas on their leaves or stems, on which the insects are caught.

In the first group we find:

Sarracenia purpurea L.
Utricularia cornuta Mx.
Utricularia vulgaris L.
Utricularia intermedia Hayne.
Utricularia minor L.
Utricularia gibba L.
Silphium perfoliatum L.
Dipsacus sylvestris Mill.

Sarracenia purpurea, Pitcher-plant, has its leaves converted into deep tubular pitchers, and arranged in rosettes, which rest on the ground, and from there curve upward. They are somewhat inflated at about their middle, but get smaller again near the opening where they pass into small laminae. These are threaded by red veins, which often form a very striking pattern. The liquid remains in the pitcher for an indefinite period, as there is little chance for evaporation in the hollow tubes. Insects alighting on the short lamina above the opening or crawling up from below, slide down readily into the pitcher because of the smooth, stiff, reflexed hairs. After they are in, their attempts to escape are entirely futile, because of the peculiar arrangement of downward pointing, stiff hairs, which line the throat and prevent them from crawling up. They finally drop into the liquid collected in the bottom, where they drown and may then be absorbed by the plant.

The *Utricularias*, Bladder-worts, are aquatic plants rooted in the mud or suspended in the water, and according to season, either sink down to the bottom or rise to just beneath the surface. In winter, when animal life is gradually disappearing from the upper layers of the water, the tips of the floating stems enlarge and form spherical winter-buds, which sink to the bottom during the winter. In the spring these buds elongate and come up to the surface. Here they put out two lateral branches which are covered with leaves and little bladders. The bladders are pale-green and partially transparent. They are somewhat flattened on the sides and have a convex dorsal surface and a slightly

curved lateral surface. Their openings are in the shape of mouths having their borders fringed with stiff, tapering bristles. The under lip of the mouth is very thick and has a cushion extending into the interior of the bladder. The upper lip is very thin and from it a transparent valve comes down to meet the inner edge of the cushion, thus closing the opening. By pressing against this valve minute plants or animals are able to enter the bladder from which it is impossible for them to escape, because of the valve.

Silphium perfoliatum, Indian-cup, has its leaves arranged opposite each other on the stem, and united to form a cup. This cup is filled with water, probably partly rain and partly some excretion from the plant itself.

Dipsacus sylvestris is a coarse herb having its leaves arranged opposite each other, forming a cup to catch water, much like the *Silphium*. Their edges and mid-ribs are covered with prickles.

In the second group are:

Drosera rotundifolia L.

Drosera intermedia Hayne.

The different forms of *Drosera*, Sun-dew, are usually rooted in damp, mossy soil or bogs. The way in which these plants catch their prey is by means of fine red filaments which are clavate on the free ends and tipped by a drop of fluid. These filaments stand out from the upper surface of the leaf, the under side being smooth and without hairs. They are of unequal length, the longer ones being near the outer edge, the shorter ones in the center. There are on one leaf, sometimes as many as two hundred of these tentacles. The clavate head is really a gland which secrete a thick, sticky, sweet fluid. It is remarkable that in making experiments, by placing bits of non-nitrogenous substances upon the leaf, the movement is scarcely perceptible, in response, while when insects alight upon the surface, the process immediately begins. In many instances the leaf itself becomes concave, so that when the tentacles are down, it has the appearance of a closely doubled fist. When the insect alights near the center of the leaf it is covered by the secretion of all the tentacles.

Those in the third group are:

Silene antirrhina L.

Silene antirrhina divaricata Rob.

Silene virginica L.

Silene noctiflora L.

Silene regia Sims.

Silene armeria L.

Silene conica L.

Silene caroliniana Walt.

Tricuspis seslerioides (Mx.) Torr.

Carduus muticus (Mx.) Pers.

Carduus odoratus (Muhl.) Port.

Parsonsia petiolata (S.) Rusby.

Polanisia graveolens L.

Circaea alpina L.

The plants of this group excrete a sticky substance by which insects are often captured in large numbers.

In the *Silenes*, *Tricuspis*, *Parsonsia*, *Polanisia* and *Circaea* the secretive and absorbing glands are on the stems, while in *Carduus* the viscid substance is excreted on the bracts of the involucre. In this case the excretion acts more as a protection to the flower against crawling insects. In certain western species of *Carduus* the glutinous secretion on the bracts is so abundant that it is impossible for any crawling insects like ants to pass over it to the flowers above. The species in Ohio have the glands on the bracts and insects were observed adhering to them but they are much less prominent.
