

Carnivorous Plants

What are carnivorous plants?

Carnivorous plants are plants which grow in a poor, generally acid substrate. A sunny, swampy environment which often contains peat (which is naturally arisen from sphagnum) is a typical habitat for many carnivorous plants. To be able to survive in these circumstances it is necessarily to have extra feeding substances for these plants. And this is what makes these plants particular; The leaves of the plants are equipped to catch insects. They lure the prey, can catch it, hold them, and the prey is digested. The plants absorb the released building materials and minerals.



Where do these carnivorous plants live? In Europe grows the *Drosera* (Sundew), *Pinguicula* (Butterwort) and *Utricularia* (Bladderwort) In South Portugal, Spain and North Marocco grows the *Drosophyllum lusitanicum* (Portugese Sundew). In North-America grows the *Sarracenia* (Trumpet pitcher plant), but also *Drosera*, *Pinguicula*, *Utricularia* and Bladderwort. *Sarracenia* is represented at the South East coast, with species growing into Texas. *Dionaea muscipula* (Venus Flytrap) occurs in a small area on the border of North and South Carolina. In the state Oregon and California *Darlingtonia californica* (Cobra Lily) is represented, up to altitudes of 2.5 kilometers (1.6 miles). The harder types, such as some hardy *Drosera*, *Pinguicula*, *Utricularia* and *Sarracenia purpurea* lives also in colder parts

of North America, even into Canada. In the tropical rain forests of mainly Asian continents the *Nepenthes* (Tropical Pitcher plant) has it's habitat, as well as tropical *Drosera*, *Pinguicula* and *Utricularia*. Venezuela is a unique country, because on the high table mountains, in tropical highland climate, the *Heliamphora* (Sun Pitcher plant) grows there. Finally Australia, here grows subtropical and tropical *Drosera*, the *Cephalotus follicularis* (Albany Pitcher plant). In all Warm-temperate / subtropical climats the *Aldrovanda* (Water Wheel plant) has it's habitat, although often very rare.



Method of catching and description:

The *Sarracenia* family exists of 8 species: *Sarracenia alata*, *flava*, *leucophylla*, *minor*, *oreophila*, *psittacina*, *purpurea* and *rubra*. They form pitcher-shaped leaves which grows from a ground anchored rhizome. These erect pitchers can reach a height 1 metre, but typically between 40 and 75 cm. They are equipped with nectarglands which produce a sweet fragrance. These nectar drops are often clearly visable on the lid and around the mouth of the pitcher. The pitchers have diverse colors, green combined with red, purple, yellow, white and gold. Insects are easily attracted. By eating the nectar they become influenced with a paralysing drug called coniine. Inside the mouth and throat it is slippery due to the waxy structure. Because of the poor grip they slide and fall into the pitcher. Trying to fly away they are sucked even further into the tunnel. Sometimes they

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manage to fly away, but they often settle again on on the same or another pitcher. Once at the bottom of the pitcher escape is almost impossible. sides are covered with wax and hairs which points down. Climbing up is nearly impossible. In the bottom of the pitcher is a substance presence which breaks away the soft parts of the insect. These parts are dissolved and absorbed by the plant. The *purpurea* and the *psittacina* have a different shape. The *Purpurea* has low, can-shaped pitchers, which contains rainwater. Insects fall and drown in this whater and are digested by the enzymes and bacteria in the water. The *psittacina*, also commonly named as the "Parret pitcher plant" lures the insects into the tube by desorientate them. The pitchers ly down horizontally on the ground, and the entrance is easily found, but once inside the insects cannot find the exit. The white dots on the bottom and on the pitchers make the insects believe there is an exit. Insects walk further into the pitcher, and long pointy hairs prevent them turning back. This way the insects are packed onto eachother very ergonomic and will be digested. *Sarracenia's* have many subspecies and varieties, for more information see our growlist.



***Dionaea muscipula* (Venus fly-trap)**

The Venus fly-trap consist of one species, but many varieties. The typical form is a rosette of green with pink-red traps on petioles up to 5-8 cm. The traps are 2 to 3.5 cm large. A couple of varieties for example are the 'royal red', the petiole and trap are allmost completely red-purple. The 'heterodoxa' is an all green form,

this form has no red pigment. There are many 'giant forms' of the Venus fly-trap. Typically this form produces much larger traps, often on long petioles. Our giant forms have falls of approximately 4 cm, and sometimes a 5 cm large trap is recorded. The traps produce nectar, combined with the color the insects are lured to land or crawl onto the trap. When the insect touch one of the tiny trigger hairs the plant will do nothing. But when the same or another trigger hair is touched within 20 seconds again the trap will close around the insect. In the summer with high temperatures the closure will happen very fast. After first closure the trap will not seal immediately, a too small insect is allowed to escape, or may be it was closed by another way, although the "safety procedure" of touching a trigger hair twice before closure. The insect trapped inside will keep touching the trigger hairs because it is trying to escape. This way the plant "knows" it has caught something of a decent size. The trap will then in the next 30-40 minutes close itself very tight and releases a digestive fluid into the closed trap. The weak parts of the insect are digested and absorbed by the plant. This complete process lasts approximately 3 to 5 days.

***Darlingtonia californica* (Cobra lily)**

there is one species in this sort, with one one discovered variety, 'othello'. This variety contains no pigment, making the whole plant green/yellow. The trap is in it's basics the same as the *Sarracenia*. The difference is present in the top of the pitcher and in digesting the prey. The top is shaped as a ball with very thin, see-through light windows. Insects are lured by the the big Y-shaped tongue which produces nectar. Via this tongue insects have an easy entrance into the pitcher through a hole. In the pitcher they cannot find the exit as they try to fly away through the windows. Sooner or later they fall into the tube and pointy hairs and a waxy texture prevents them to climb up. The *Darlingtonia* does not produce enzymes, it has only water in the bottom of the pitcher, and insects are digested by the bacteria living in the water. The dissolved weak parts are absorbed by the plant.

***Heliamphora* (Sun Flower pitcherplant)**

This species grows in the tropical highland climate on the table mountains of Venezuela. Several types have been discovered and

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nursed among a lot of growers the last years. Some subspecies are: *Heliamphora nutans*, *heterodoxa*, *minor*, *ionassi* and *tatei*. *H. nutans* forms pitchers without lids like *Sarracenia* up to 15-30 cm long. These pitchers are filled with rainwater. The trap works the same as the *Sarracenia* and digestion occurs as yet by bacteria. *H. nutans* is offered at the more exclusive garden centres, but the other types are only obtainable by hobbyists and specialized growers.

***Drosera* (Sundew)**

This family has approximately 130 different species which are spread around the entire world. Subtropical and tropical *Drosera*'s grow year round. The more northern types die in winter to a winterbud, to regrow in spring. They catch their preys with their leaves which are covered in hairs with drops of strong glue. With some species these tentacles can bend around caught insects to improve the grip. The insect is digested by digestive enzymes, produced by special glands on the leaf.



***Drosophyllum lusitanicum* (Portugese Sundew)**

This species grows in the south of Portugal, Spain and the north of Morocco. Interesting is the fact that this plant grows in relative dry sand and rocky surroundings. The leaves are thin and approximately 20 to 25 cm long. In sunlight this plant produce a strong scent of honey to attract the prey. The type of catching is a clever one, caught insects are able to struggle up or down on the leaf, and the droplets of glue forms a dense substance

around the insect, choking it. The insect is than digested by the plant.



***Byblis* (the Rainbow Sundew)**

this tropical plant has two species; *B. liniflora* and *B. gigantea*. They grow in the tropical parts of Australia and in New Guinea. The principle of the trapping leaves is the same as those of the *Drosera*. In the sun the plant often produces a very shiny appearance, hence the name the Rainbow Sundew.

***Pinguicula* (Butterwort)**

This family has 50 different species. Globally you can classify *Pinguicula* in tropical, subtropical and hardy types. Tropical and subtropical types grow the year around, whereas the hardy types form a winterbud. Also there are some species which only grow one year. The principle of the fall is the same as the *Drosera*, only the leaves are much broader and shorter than those of the *Drosera*. Most of the types are green of colour, and some types, especially that from the warmer regions, have a red or purple leaf. The complete leaf is covered with thousands of tiny droplets of glue. These are generally difficult to see with the naked eye. The leaves have a very shiny appearance due to this. Small insects are glued solidly to these leaves and often the leaf will curl partially onto the insect, and it is digested.

***Cephalotus follicularis* (Albany pitcher plant)**

This small plant grows in the west part of Australia, Albany, as the name suspects. There is one species of this plant. The plant produces

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small pitchers of 2 to 4 cm large, which lie on the ground in a rosette. There is a "giant" variety, with pitchers considerably larger. The generally small insects are lured by the nectar fragrance, and lose their grip on the slippery edge of the inside of the pitcher. At the bottom is a digestive fluid present where the insect is digested.

***Utricularia* (blaasjeskruid)**

This family has according to the last statistics 214 species. One can classify them in three categories; waterplants, terrestrial and epiphytic types, the last type grows in the moist moss on for example trees in the rain forests. The roots of these plants contain small bladders of several millimetres large. When a small waterinsect like *Daphnia* touches the trigger hairs on the door of this bladder, the door or valve bursts open and sucks the insect into the bladder. Here it is digested, and after this process the bladder will build up the vacuum for the next victim. *Utricularia* is known for its very tiny but complex colourful flowers, often compared to orchids. Often the tropical *Utricularia* have beautiful large complex flowers.

***Aldrovanda* (the Water Wheel plant)**

This family of waterplants can be compared with *Utricularia* for their trap system, only this plant does not have any roots to attach itself. It floats in the water with a "stem" of approximately 15 cm long. The complete stem is occupied with leaves with traps growing on them. These traps look very similar to those of the *Dionaea*. These traps are generally 2 mm long, but there are varieties with up to 5 to 10 mm large falls. Just like the *Dionaea* these are open when in rest, and when a small water insect touches the traps on the inside the trap will close very rapidly. After the prey is digested the trap opens for the next victim.



***Nepenthes* (the Tropical Pitcher plant)**

This tropical family can be classified in two categories; the sea level (low land) tropical species and the highland tropical species. The low land species grows in rain forests to 1 km above the sea level, where the temperature is day and night rather constant. The highland species grows in the higher rain forests as from 1 km to 3 km above the sea level. The nights are much cooler, often as low as 3 - 5 degrees C. Approximately 70 per cent of the *Nepenthes* species are highland growers. The pitcher is often shaped like a bowl, and hangs on a leaf attached by a petiole. The trap is similar as that of *Sarracenia*, but at the bottom of the broader shaped pitcher is a permanent thick fluid, in which the insects drown quickly and is digested.

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