



## What are Carnivorous Plants?

What is so special about carnivorous plants that a society with over a thousand members exists to share information about them?

Carnivorous plants are predatory green plants that kill animals in order to derive nutrition from their bodies. They share three attributes that operate together and separate them from other plants.

Carnivorous plants:

- Capture and kill prey
- Have a mechanism to facilitate digestion of the prey
- Derive a significant benefit from nutrients assimilated from the prey

To put it in more human terms, carnivorous plants eat things like insects, spiders, crustaceans and other small soil and water-living invertebrates and protozoans, lizards, mice, rats, and other small vertebrates. Carnivorous plants pull off this trick using specialized leaves that act as traps. Many traps lure prey with bright colors, extrafloral nectaries, guide hairs, and/or leaf extensions. Once caught and killed, the prey is digested by the plant and/or partner organisms. The plant then absorbs the nutrients made available from the corpse. Most carnivorous plants will grow without consuming prey but they grow much faster and reproduce much better with nutrients derived from their prey.

We do not call these plants "insectivorous plants" because no self respecting carnivore is going to check the ID of a potential prey to make sure it is an insect. Some carnivorous plants do specialize on insects but they will consume whatever they can.

The reason for the three rules is that many other plants do some of the things analogous to what carnivores do. For instance some Aroid and *Aristolochia* species capture insects in their flowers to facilitate pollination. They don't kill the pollinators and if some of the pollinators do die in the flower it is more a case of collateral damage. The plant does not benefit from their death. Carnivorous plants tend not to kill their pollinators either but it does happen.

Of course since this is nature, many plant species do not quite fit our definition of a carnivore or we are not sure if they fit. Until recently it was unclear how much benefit three species of [Devil's Claw](#) in the family Martyniaceae derive from the prey they catch. *Ibicella lutea*, *Proboscidea louisianica*, and *P. parviflora* are large plants that typically catch some small flies.



Undoubtedly the most familiar carnivorous plant is the Venus flytrap, *Dionaea muscipula*.



*Drosera whittakeri* is a sundew from Australia.

Maybe their ancestors were carnivorous. Now they are not. They probably maintain their carnivorous-like leaves as a predator defense. There are many other types of plants with some features of carnivorous plants where it is even more difficult to argue they are true carnivores. If these plants kill non-plants in an obvious, body present, way but do not derive significant nutrition from the victim, they are [murderous plants](#).

Another plant that has generated a lot discussion about what we require a plant to do for us to call it a carnivore is *Roridula*. *Roridula* rely on assassin bugs to perform the digestion of prey. The plant captures the prey. The bugs suck out the juicy insides of the prey and defecate on the leaves. The plant absorbs the nutrients in the poop. If the assassin bugs are not present there is a fall-back for the plant but it is unclear how much this fall-back is used in the wild. Bacteria in the gut and on the prey can digest the dead prey and *Roridula* leaves will absorb the nutrients released quite efficiently.

*Darlingtonia* and some *Nepenthes* species have also lost the ability to digest prey themselves. These species rely on bacteria and other organisms to make the nutrients in the prey available to themselves. To put it unscientifically, why should a plant go through all the bother of digesting the prey itself when other organisms will do it for them? Or scientifically, if there is no selective advantage to expending the energy for digestion, mutations will accumulate eliminating digestion. It should be obvious here we have carefully crafted our definition of carnivory to include these plants as carnivores and to exclude purely murderous plants.

If the plants or their story is sufficiently bizarre and their very closest relatives are definite carnivores, we may bend the "rules" a bit to allow them into the club. No one has claimed the toilet bowl *Nepenthes* species are not carnivorous. But the toilet bowl *Nepenthes* primarily use their traps to attract animals and collect their excrement as they feed on nectar produced by the plant. Carnivorous plant enthusiasts go nuts over these plants and could not care less about definitions.

Carnivorous Plant Genera (approximate number of species):

- [Aldrovanda](#) (1 species)
- [Brocchinia](#) (2 species)
- [Byblis](#) (7 species)
- [Catopsis](#) (1 species)
- [Cephalotus](#) (1 species)
- [Darlingtonia](#) (1 species)
- [Dionaea](#) (1 species)
- [Drosera](#) (184 species)
- [Drosophyllum](#) (1 species)
- [Genlisea](#) (21 species)
- [Heliamphora](#) (18 species)
- [Nepenthes](#) (112 species)
- [Pinguicula](#) (96 species)



*Drosera madagascariensis* is a sundew found in Africa.



The Mexican *Pinguicula gigantea* makes a great window sill plant. It is slimy to the touch but won't hurt you.



*Aldrovanda vesiculosa* is an aquatic carnivore very closely related to the Venus flytrap. The traps of this plant are full of planktonic crustaceans.

[\*Roridula\*](#) (2 species)  
[\*Sarracenia\*](#) (11 species)  
[\*Triphyophyllum\*](#) (1 species)  
[\*Utricularia\*](#) (225 species)

-- John Brittnacher

For a more detailed discussion please see the following articles and articles they reference.

Rice, B. (2006) Growing Carnivorous Plants. Timber Press, Portland, OR, USA.

Barry Rice's FAQ:  
<http://www.sarracenia.com/faq.html>

Wikipedia CP page:  
[http://en.wikipedia.org/wiki/Carnivorous\\_plant](http://en.wikipedia.org/wiki/Carnivorous_plant)

Other articles in this series:

Carnivorous Plant Trapping Mechanisms  
<http://www.carnivorousplants.org/cp/TrappingMechanisms.php>

Carnivorous Plant Digestion and Nutrient Assimilation  
<http://www.carnivorousplants.org/cp/Digestion.php>

Evolution -- the Caryophyllales Carnivores  
<http://www.carnivorousplants.org/cp/EvolutionCaryophyllales.php>

Evolution -- the Lamiales Carnivores  
<http://www.carnivorousplants.org/cp/EvolutionLamiales.php>

Evolution -- the Ericales Carnivores  
<http://www.carnivorousplants.org/cp/EvolutionEricales.php>

Costs of Carnivory  
<http://www.carnivorousplants.org/cp/CarnivoryCosts.php>



Flowers or leaves? Good question. These are the traps of *Sarracenia leucophylla*. Many a moth thought these were flowers too and ended up as dinner. All carnivorous plant traps are constructed from leaves.



*Cephalotus follicularis* is a pitcher plant found on the south west coast of Australia.