By Jean Nel

Eating OUT

Truly one of the marvels of nature, carnivorous plants have only been known to plant scientists for 200 years.

Carnivorous plants do not exist solely by 'eating' insects. As with all green plants they actually survive by photosynthesis. The insects they 'eat' supplement the nutrients available in the soil. Carnivorous plants are generally opportunistic, thriving in wet, nutrient poor, acid peat and sphagnum bogs where competition from other plants is minimal. There are also exceptions to these growing conditions: Nepenthes (Monkey Cups or Tropical Pitcher plants), climb through the branches of tropical rainforests; whereas the Drosophyllum of Morocco inhabit sandy, semi-arid hills. Whatever their habitats, carnivorism gives all of these plants a distinct advantage in the struggle for survival.

Of the many insectivorous and carnivorous plants available, **DIONAEA Muscipula** (the Venus Fly Trap) is probably the best known. The outer part of each leaf is modified into two lobes that form the trap, the outer edge of which has a row of "teeth". On the inside each lobe has three touch-sensitive hairs set in a triangle and a coating of sweet-smelling red nectar. An insect lured by the colour and aroma will be trapped if it touches more than one of the small black trigger hairs within a space of twenty seconds. On touching the trigger hairs, a nerve-like impulse races through the leaf and it snaps shut. The 'nectar' now becomes glue, sticking the insect's wings and feet together and the more it struggles the more tightly the leaf closes. Enzymes then fill the closed trap; softening and liquefying the insect into a nitrogen-rich protein 'soup' which is then absorbed into the leaf. About a week later the leaf re-opens. All that remains of the insect is a feather-light, hollow exo-skeleton which is easily blown away by the breeze.

If one understands and emulates the conditions in which Venus Fly Traps grow naturally (permanently wet bog lands in the mild parts of the southern coast of the United States) they are fairly easy to grow. Keep them in pots in a greenhouse or on a sunny south-facing windowsill and ensure that the potting medium is kept moist at all times by having the base of the pots stand in water. Ensure that the water has a low mineral content and is chlorine free. The plants enter a period of dormancy during winter, with active growth restarting each spring.

The low-growing swamp Pitcher plants (Sarracenia sp.) have long, slender, hollow leaves (the 'pitchers') which grow in small rosettes around a central root. There are many varieties of pitcher plants and many kinds of traps. Some plants are tall, others are short, all have one thing in common: they trap their meals by luring insects inside and preventing their escape. However, unlike the Venus Fly Trap the Pitcher plants are passive – insects that enter end up slipping into the digestive fluid at the bottom of the pitcher and the plants feast without lifting a finger or closing a leaf!

Pitcher plants use surprising methods to lure, trap and digest insects. The inner walls of the pitchers are lined with soft, long hairs between which can be found nectar glands or honey lined leaf folds. In some, attractive red veins lead to the trap entrance and others confuse their prey with clear windows near the leaf opening. Others snare their prey with combinations of waxy lips at the edge, downward pointing needles and slippery pools of water. The water-filled "stomach" has chemicals that break the surface tension so insects sink and drown. Once the prey is dead the plant prepares to eat by pouring powerful digestive enzymes into the pool. This dissolves the soft parts of the insect in about a week, after which special cells on the inside of the leaf absorb the nutrients from the insect 'soup'. All that remains is a pile of insect skeletons at the bottom. Pitcher plants are easy to grow indoors and require more or less the same conditions as the Venus Fly Trap They are also temperate plants and will enter a period of dormancy in the cold winter months.

The beauty and variety of the 100 or so **Drosera** varieties (Sundews) could well overshadow their unique adaptation to carnivorism. Sundews got their name from the unique dew-like droplets that are found sparkling in the sunlight on the ends of their 'tentacles'. Sundews

> "The Venus Fly Trap is the closest connection between the plant world and the animal world."

occur in all parts of the world, but mostly in Australia, America and New Zealand. South Africa also has 18 species, which are indigenous to the Western Cape. Sundews are generally small plants growing in flat rosettes up to 10 cm in size but there are some giant species forming leaves over 40 cm long. They are found in wetlands, alongside streams and in marshes. Their leaf shapes range from slender threads to broad paddles to elaborate sprays resembling deer antlers. The leaves bear tentacles that radiate in all directions, each bearing a gland that secretes droplets of mucilage, giving the plant its dewy appearance. Insects are attracted by the look and smell of the leaves and become mired in the sticky 'dew'. The struggling victim stimulates the tentacles to bend and touch it, drawing it closer to the leaf. At the same time glands in the leaf secrete powerful digestive enzymes and acids in anticipation of dinner. When compared with other carnivorous plants, Sundews extract nutrients from the insect very quickly, taking from 24 to 48 hours. When finished, the tentacles release the carcass, ready for another meal. Sundews can easily be kept in a potting mixture similar to that used for the Venus Fly Traps. They can be grown outdoors, even in full sun, as long as the medium in which they are growing is kept moist. However, they require humidity in order to form the 'dewdrops'.

The genus **Nepenthes** (Monkey Cup or Tropical Pitcher plant) is one of the most fascinating of all carnivorous plants. Currently almost 100 species are accepted scientifically, most of them from Borneo, Sumatra and the Malaysian region. The climbing vines of Nepenthes produce a modified form of leaf called a 'pitcher' hence the common name 'Tropical Pitcher plant'. The size of the pitcher varies and some species are large enough to hold up to two litres of water! The name 'Monkey Cup' arises from the fact that monkeys have been seen to drink water from them in the rainforests. The pitchers are not simply water reservoirs for the plant in times of drought, as the first European observers assumed. They are actually highly complex passive insect traps, which secrete and absorb a mild to very acidic digestive fluid that contains many as yet undetermined compounds. Insects are attracted to the traps because of nectar secretions and coloration. The slippery rim and inner walls of the pitcher encourage insects to fall into the digestive fluid at the bottom of the trap. Nutrients are absorbed from this 'soup'. The variation in pitcher colour and shape is what most interests exotic plant enthusiasts and the horticultural trade. The wonderful hanging pitchers of Nepenthes attract attention wherever they are found. They generally like bright light without much direct sun so they can be grown in a greenhouse, sun room, in a partly sunny window or under lights. They need similar conditions to most Orchids, so if you are already growing Orchids in a greenhouse, then Nepenthes should thrive in there too.

Why grow carnivorous plants? Because they are decorative and fascinating and a constant source of discussion! They can be bought at garden centres and are generally easy to grow if one meets their basic requirements. Only plant them in imported sphagnum-based peat moss. Ensure that you use water with a low mineral and chlorine content (such as rain, distilled, reverse osmosis or bottled water with a low total dissolved solids content). Never allow the potting mix to dry out and never use any fertiliser. Other than that, Venus Fly Traps, Sundews and Pitcher plants enjoy high levels of sunlight so sunny patios and windowsills are ideal for them. Although Monkey Cups require bright light they should be kept cooler and out of direct sunlight. In frost free areas they can be planted in hanging baskets and placed under trees where the garden is shaded and moist. The leafy Pitcher plant will thrive in the bathroom, where the plentiful use of water adds humidity to the atmosphere. All canivorous plants are ideal for growing in a terrarium, with the added humidy being ideal for them.

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