

November 22, 2005

November Green

At first glance, a walk in the forest on a November day seems uneventful, with little of interest to catch our attention. Yet this is a wonderful time of year to focus on elements of the forest that hitherto may have escaped our attention, such as the intricacy and diversity of our evergreen ferns, mosses and wildflowers. Standing out like green beacons against the faded browns and yellows of the forest floor, it's as if they are calling out: "Come and take a look at me!"

Evergreen plants are excellent examples of adaptation to the shorter growing season of the northern environment. They are able to begin photosynthesis as soon as the snow cover melts, because they do not have to grow a whole new set of leaves. They can also continue to produce food later into the fall. Because water is unavailable in the winter, most of these plants have developed woody stems and waxy coatings on the leaves to limit water loss. This is particularly noticeable in some of the evergreen wildflowers like wintergreen and pipsissewa.

One of the first things we notice when we really start to pay attention to the denizens of the leaf litter is how common the various mosses are. Emerging into view now that the profusion of summer foliage has retreated, mosses are usually found on boulders, tree stumps, rotting logs and around the base of trees. They come in dozens of shades of green, ranging from shiny emerald to almost black. Take time to get down on your hands and knees to examine them carefully. It is like entering a verdant lilliputian forest.

Mosses are flowerless plants that evolved millions of years ago from algae. Of aquatic origin, they are believed to be among the first plants to emerge from the water and to adapt to terrestrial life. Some species still grow submerged in streams. Mosses have tiny stems and leaves, but the stems only serve as a support for the leaves and do not actually conduct water or food to other parts of the plant. Even the rhizoid filaments that anchor the moss to the ground, rock or tree bark are not true roots, since they play no part in absorbing water or minerals.

Like nearly all woodland evergreen plants, mosses grow in small colonies that spread through vegetative reproduction by putting down new rhizoids here and there. However, new plants can also grow from spores. Spore-based reproduction is complicated but very interesting.

Moss really consists of two distinct generations - the green, leafy gametophyte and the wiry and leafless sporophyte with the capsule on top. When they are ripe, the capsules open and the spores are dispersed. If a spore lands somewhere with sufficient moisture, it will begin to grow into a mass of green hairs. Buds appear on these hairs that grow into stems with narrow leaves. These structures are called gametophytes, the green, leafy part of moss. Some of the stems will produce either male or female sex organs among clusters of leaves at the top. Sperm produced in the male organ use a film of water in the form of rain or dew to swim to the female organ on another stem and thus fertilize the egg. The embryo, embedded in the cluster of leaves surrounding the female organ, then grows to form a "sporophyte", the familiar long, wiry stalk with the capsule at the end. The base of the sporophyte remains anchored in the cluster of leaves at the top of the female gametophyte. The latter essentially becomes host to the parasitic sporophyte. Spores develop in the capsule which escape, germinate and repeat the cycle.

The Kawarthas is home to dozens of species of mosses. In conifer swamps, different types of sphagnum (peat moss) usually dominate. They are spongy and can form carpet-like mats. Other common groups of mosses include the upright species such as juniper and hair-cap moss, hummock

forming species like pin cushion moss and creeping mosses like shaggy moss.

Club-mosses, too, are quite noticeable in late fall. Some species look like tiny, ten inch tall coniferous trees. Club-mosses usually grow in the rich, shaded soils of mixed deciduous and coniferous woods. They often form colonies that can cover large areas of the forest floor. These plants are a close relative of ferns and reproduce vegetatively and by spores. They were among the first plants to develop true roots, stems and leaves along with cells capable of transporting water long distances. 300 million years ago, these plants grew up to 100 feet tall and formed a major part of the plant material that developed into coal beds.

There are several club-moss species that you can expect to find during a woodland walk in northern Peterborough County. Shiny club-moss (*Lycopodium lucidulum*) has glossy, needle-like leaves and grows from a horizontal stem which is usually hidden in the leaf litter. Bright yellow spore cases appear on the upper surface of the last leaves produced each growing season. The spore cases contain thousands of spores packed with fats and oils which make them both inflammable and water-repellent. Northern Europeans collected the spores in the 19th century to use in the manufacture of fireworks, as a substitute for talc and as a source of illumination in early photography. Ground-pine (*L. dendroideum*) is another common club-moss of our forests. It's upright, symmetrical and tree-like shape looks remarkably like a tiny pine tree. The spore-bearing leaves are tightly clustered at the tip of the stem and form a yellowish, cone-like structure. Ground-pines are used as Christmas decorations. Also watch for ground-cedar, interrupted club-moss and wolf's claw club-moss. All five species often grow in close proximity.

Several species of ferns are also evergreen. Probably the most common are the woodferns (*Dryopteris* species). These lacy ferns are the greenery so often used in floral arrangements. Woodferns are a confusing group for botanists as there are many varieties which can interbreed. The Christmas fern is another attractive species to watch for. Its name comes from the leathery, spiny-toothed leaflets which are reminiscent of holly and from the fact that the plant is still green at Christmas. It used to be a popular holiday decoration. Keep an eye open, too, for rock polypody, a small fern that grows on rocks and boulders in cool, shaded areas.

Coniferous and mixed forests are also home to a variety of evergreen wildflowers. Many look as luxuriant in winter as in summer. Watch for trailing arbutus, goldthread, partridgeberry, pipsissewa, twinflower, rattlesnake-plantain and winterberry, to mention a few. The Bonny's Pond trail at Silent Lake Provincial Park is an excellent location for all of the evergreen plants mentioned in this article.

What to watch for this week:

Snowshoe hares and weasels are acquiring their white winter coats right now. In the case of the hare, the ears and feet turn white first while the back is the last part of the body to change colour. Except for the black ear tips, snowshoe hares are usually pure white by early December. The European hare, which can be found in farmlands south of the Shield, does not change colour.

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