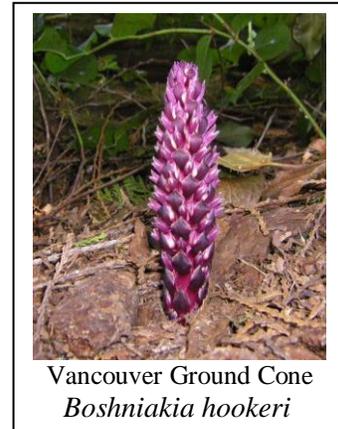


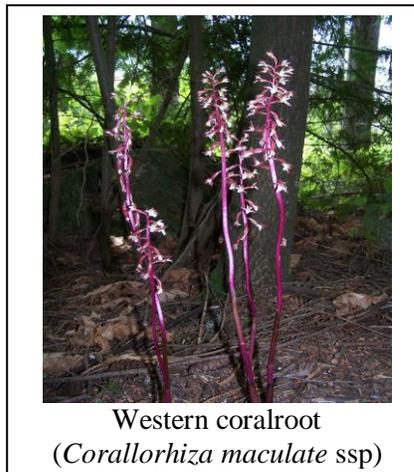
What are Mycotrophic Wildflowers?

To most of us, green and plant go together like peanut butter and jelly on a sandwich. Herbarium Green plants, since they make their own food from sunlight, water, and carbon dioxide, are called autotrophs, meaning "self-feeding." However, there are plants that are not green and having no chlorophyll, cannot make their own food (organic carbon). These plants are called heterotrophs, meaning "other feeding", since they must get their nutrition from other organisms

Heterotrophic plants are divided into one of two groups, based upon how they obtain their food. The first of these two groups are parasitic plants. As parasites, they obtain their organic carbon from a host green plant directly through the use of structures called haustoria. Wildflowers such as Vancouver ground cone (*Boshniakia hookeri*), (usually growing with Salal), and Naked broomrape (*Orobanche uniflora*) possess no chlorophyll, all members of the broomrape family (*Orobanchaceae*), possess no chlorophyll and are examples of root parasites.



The second of these two groups are mycotrophic ("fungus feeding") plants. These plants obtain their organic carbon from a host green plant by tapping into an intermediary mycorrhizal fungus attached to the roots of the host plant. Many plant families include mycotrophs, especially in the tropics. In temperate North America, the orchid (*Orchidaceae*) and heath (*Ericaceae*) families include the highest numbers of mycotrophic genera.



Coralroot orchids such as Western coralroot (*Corallorhiza maculate* ssp. *mertensiana*) are included in but one of many orchid genera that are mycotrophs. All the members of the *Monotropeidae* subfamily of the heath family (*Ericaceae*) are mycotrophs such as: ghost plant (*Monotropa uniflora*)

In the past, mycotrophic plants were considered "saprophytes," plants that derive their carbon and nutrients from decaying organic matter. This concept has been shown to be incorrect and is largely rejected today. We now better appreciate the relationship between many plant species and the soil fungi living in and around their root systems.

Bob Harvey, July 2021

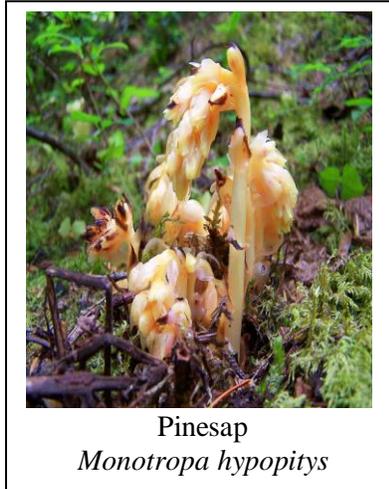
Many wildflower enthusiasts understand the symbiotic relationship between trees and mycorrhizal fungi. In this relationship, the hyphae (fungal threads) enter into the roots of the trees. The trees benefit by increasing the surface area of their root system allowing them to absorb greater quantities of water and minerals. In return, the fungus absorbs carbohydrates and other nutrients from the tree.

Since they cannot make their own "food," the mysterious mycotrophic wildflowers take this symbiotic relationship between tree and fungus one-step further. Mycotrophic plants "tap" into and parasitize the hyphae of a mycorrhizal fungus by reversing the flow of carbon (derived from the host tree) and other nutrients to meet their survival needs. The unlucky fungus "feeds" the parasitic wildflower and receives nothing in return. Some people have even referred to this 3-way relationship as "mutualism gone badly!" For this reason, the myco-heterotrophs are often said to be "epiparasitic" on other plants.

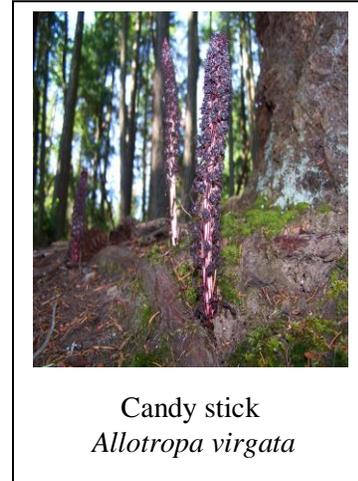
Several of the mycotrophic wildflowers are quite colorful and beautiful. Sugarstick (*Allotropia virgata*) is another beautiful wildflower. This common name is derived from the beautiful red and white striping on the flower stalk. Matsutake mushrooms are its host. Other colorful wildflowers from this group include pinesap (*Monotropa hypopitys*) with their shades of pinkish-red and yellow. One of the more fascinating members of this group of mycotrophic wildflowers is the ghost plant also known as Indian pipe (*Monotropa uniflora*). Ghost plant is a ghostly white translucent color.



Indian-Pipe
Monotropa uniflora



Pinesap
Monotropa hypopitys



Candy stick
Allotropia virgata

Fun Fact

Mycotrophic wildflowers are sometimes called "fungus flowers." There are two characteristics these plant exhibit that are similar to fungi: their mode of obtaining water, minerals and carbohydrates; and, when the plant pushes up through the soil surface they have the appearance of a mushroom poking out of the ground.