

## Understanding Orchids: Part 1

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Many people regard orchids as jewels of the plant world. This special [Eco-Article](#) series examines orchids' diverse family, highlights some Northern Virginia representatives, and reveals the true value of these botanical gems. Some orchid species are epiphytes, living amongst the trees and never touching terra firma. The moth orchids (*Phalaenopsis* sp.), which are the most common, commercially cultivated type of ornamental orchid, are epiphytes from tropical Asia. Terrestrial orchids, such as the ones native to Virginia, grow on the ground, ranging from bogs to dry woodlands, depending on the species.

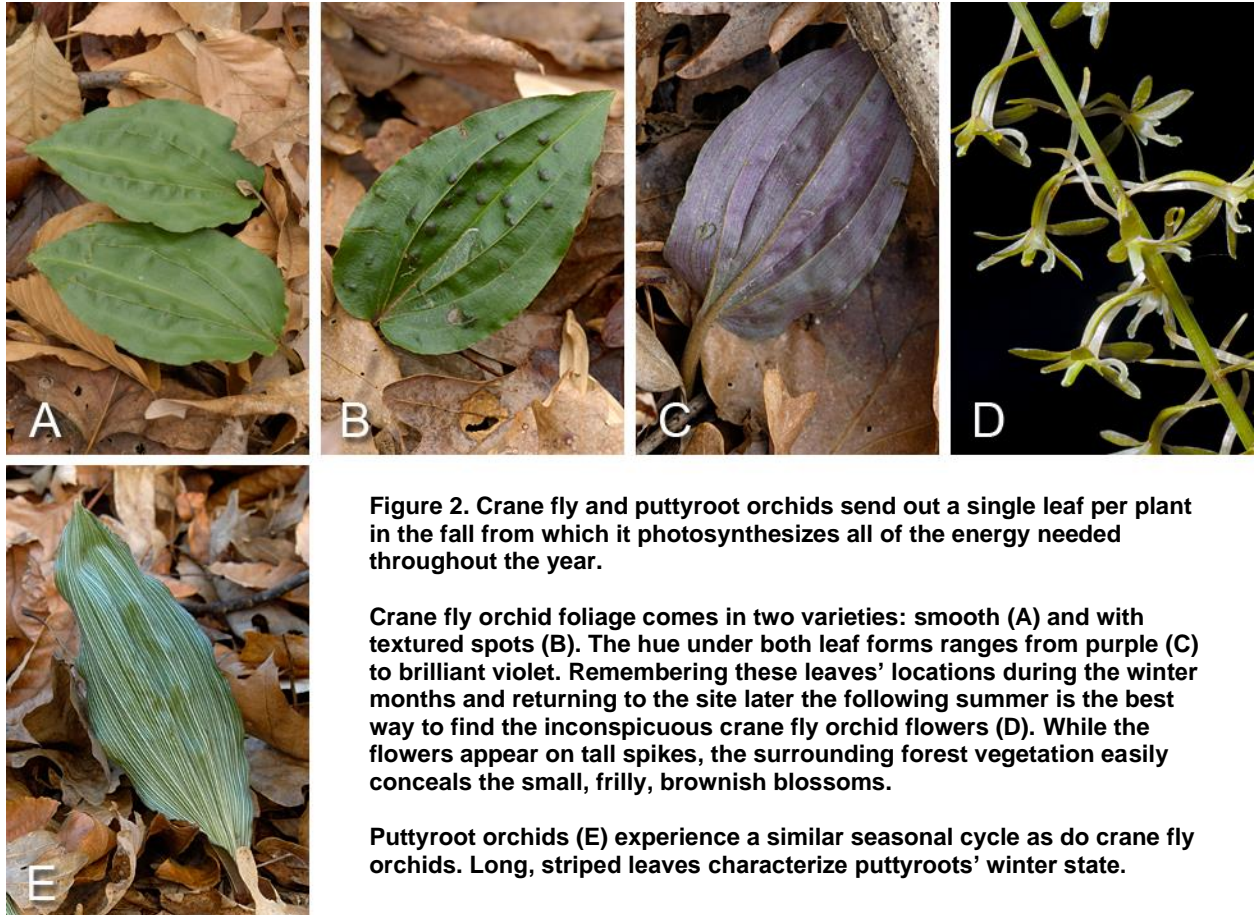
Part of what makes finding wild orchids so special is that they only flourish in particular habitats and are not simply found anywhere. For example, the pink lady's slipper (*Cypripedium acaule*) thrives in pine woodlands whereas its relative, the large yellow lady's slipper (*C. parviflorum* var. *pubescens*) requires sloping hardwood forests with moderately moist soil. A key factor to an orchid's success lies in its dependency on fungi. The Eco-Article, [The World Beneath \(June 2014\)](#), contains an overview on how soil microbes help to form the forest's foundation; [Grant \(March 2018\)](#) delves into forester Peter Wohlleben's metaphorical (and controversial) interpretation of tree and fungal interconnectivity. To summarize, trees nourish soil fungi with sugars while the fungi help trees and other plants uptake elements. Fungal webs interconnect the forest's flora thereby enabling nutrient exchanges—a critical aspect to orchid survival. Soil bacteria play vital roles in founding a healthy natural area, too, but air and water currents freely transport bacteria to new places. Fungal distribution and colonization takes a much longer time. Once established, several miles of hyphae (the individual fungal filaments) stretched out end to end fit into a spoonful of healthy forest soil.

Orchids' reliance upon fungi starts at germination. Orchids produce a multitude of dust-like seeds that scatter readily yet few grow to reach maturity. The miniscule seeds lack any energy reserves so symbiotic mycorrhizal fungi must affiliate with the embryo for plant development. For many orchids, fungal dependencies continue throughout their lives, including different fungal species at different growth stages. Whereas orchids are not keystone species, their presence indicates good, healthy habitats, which is why orchids burgeon in places like old growth forests but not in scrublands infested with non-native invasive weeds. Adding to the complexity, not all of the fungal species that some orchids appear to rely upon are known to science. Because orchids are so tightly bound to their environment, they rarely withstand transplantation—sometimes taking a year or so to wither away, even when moved to a similar habitat, so **please never take or collect orchids from the wild!**

*Tipularia discolor* is Northern Virginia's most prevalent orchid. Its common name, crane fly orchid, comes from the small, spindly, brown flowers that are reminiscent of the frail insects. In July, the blossoms form on 18-inch spikes where they await pollination by owl moths. Without leaves during this period, only the flower stalk reveals that a plant inhabits this site. One leaf per plant emerges in the autumn and photosynthesizes sugars during the winter, when bare trees allow unfettered sunlight to reach to forest floor. The deep green foliage is either solid or sports a warty texture. The leaf dies back in mid-spring, when upper canopy leaves block the sun. This orchid lives in mixed maple, oak, and beech-dominated forests. The puttyroot orchid (*Aplectrum hyemale*) shares a similar appearance and seasonal phases with the crane fly orchid except its leaf has thin, light stripes running lengthwise.



**Figure 1. The pink lady's slipper is one of Fairfax County's iconic orchids. Sadly, Royal Lake Park's specimens, including this one, are all dead due to people trampling a "social trail" through the orchid patch even after park authorities closed the path multiple times. By keeping to the main trails while enjoying the parks, folks stay out of sensitive, natural, or washed-out sections.**



**Figure 2. Crane fly and puttyroot orchids send out a single leaf per plant in the fall from which it photosynthesizes all of the energy needed throughout the year.**

**Crane fly orchid foliage comes in two varieties: smooth (A) and with textured spots (B). The hue under both leaf forms ranges from purple (C) to brilliant violet. Remembering these leaves' locations during the winter months and returning to the site later the following summer is the best way to find the inconspicuous crane fly orchid flowers (D). While the flowers appear on tall spikes, the surrounding forest vegetation easily conceals the small, frilly, brownish blossoms.**

**Puttyroot orchids (E) experience a similar seasonal cycle as do crane fly orchids. Long, striped leaves characterize puttyroots' winter state.**

Speaking of cool leaf patterns, the venation on the downy rattlesnake plantain (*Goodyera pubescens*) is arguably prettier than its flower! Unrelated to plantains (either common lawn *Plantago* sp. or banana relatives, *Musa* sp.), this orchid mirrors the former genus members with its evergreen leaves growing into ground-hugging rosettes. Whitish veins lace across pine green foliage. Its floral cluster resembles a rattlesnake's tail. This orchid was the Virginia Native Plant Society's 2016 wildflower of the year.

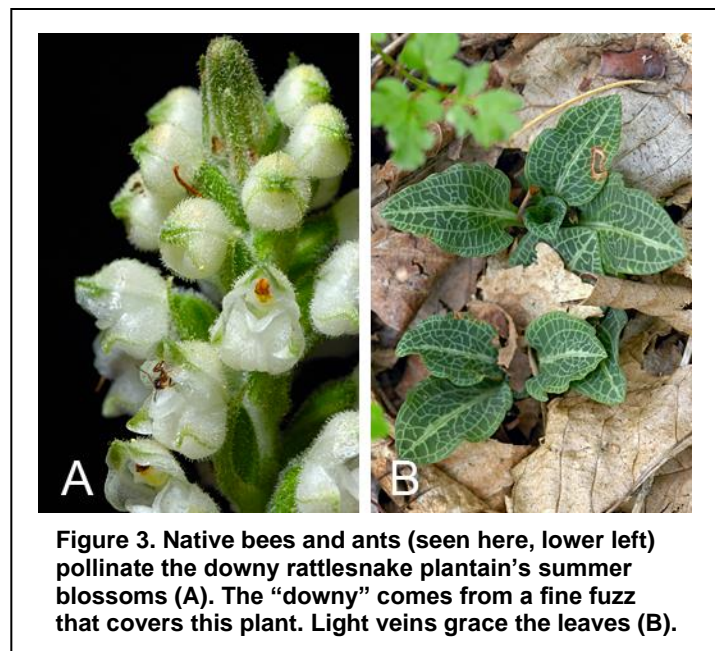
[Part 2](#) of this series introduces more native orchids, best ways to study them, and additional references!

Further reading is at:

Grant, Richard. March 2018. Do trees talk to each other? *Smithsonian* 48(10):44-57.

<https://www.smithsonianmag.com/science-nature/the-whispering-trees-180968084/>

For moth orchids: <http://www.ranwild.org/Phalaenopsis/module/introduction/intro1/Eenvironhead.html>



**Figure 3. Native bees and ants (seen here, lower left) pollinate the downy rattlesnake plantain's summer blossoms (A). The "downy" comes from a fine fuzz that covers this plant. Light veins grace the leaves (B).**

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