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Jewels of the Orchidaceae

By W. John Hayden, Botany Chair

To temperate-zone plant enthusiasts, the orchid family seems more than a little strange. On the one hand, native orchids grow wild without assistance from people, they are rooted in the soil, and they survive freezing cold winter temperatures. On the other hand, the tropical orchids that we encounter are ornamental plants, pampered by their human caregivers, cultured indoors in pots filled with fir bark or other media designed to mimic the plants' natural epiphytic habit, and, as a group, these ornamental tropical orchids have essentially zero tolerance to frost. Of course, their flowers, fruits, and seeds define them all as members of the orchid family, Orchidaceae, but from the perspective of how they actually live, and how we interact with them, native orchids and their tropical ornamental relatives seem utterly, profoundly, different.

Our Wildflower of the Year for 2016, *Goodyera pubescens*, or Downy Rattlesnake Plantain, however, is an exception. It belongs to a small group of orchid genera known informally as Jewel Orchids, and these plants, as a group, bridge several of the stereotypical distinctions between native wild orchids and the tropical orchids found in cultivation. First, Jewel Orchids are reasonably closely related to one another; all are members of subfamily Orchidoideae, tribe Cranichideae, and subtribe Goodyerinae. But most important, though some are tropical and others are temperate, all are terrestrial, naturally rooted in soil. Further, these are orchids notable for their attractive ornamental leaves, much less so for their relatively small



Figure 1 *Goodyera pubescens* (Photograph by W.J. Hayden)



Figure 2 *Anoectochilus setaceus*: by Miss Drake (1803–1857) del., J. Watts sc.—*Edwards's Botanical Register*, volume 23 plate 2010 (<http://www.botanicus.org/page/240734>), public domain, <https://commons.wikimedia.org/w/index.php?curid=5857934>.

flowers. In some ways they are opposites of hothouse denizens like *Cattleya*, *Dendrobium*, and *Phalaenopsis*, which are drop-dead gorgeous when flowering but downright plain, some might say homely, otherwise. This article will explore three genera of Jewel Orchids that are close relatives of our Wildflower of the Year.

Before considering its exotic relatives, let's first characterize briefly the genus *Goodyera*. Our Wildflower of the Year (Figure 1) is just one of 25 species of Rattlesnake Plantain, only 4 of which are found in North America. Other species range from temperate forests of Europe and Asia to tropical and temperate Australia and various islands of the Atlantic, Pacific, and Indian oceans. Their leaves are green, but their leaf shape (outline) and the pattern of white veins varies from species to species.

Anoectochilus (Figure 2) is an even larger genus, with approximately 50 species distributed from the Himala-



Figure 3 *Ludisia discolor* (Photograph by W.J. Hayden)

yas through China, Japan, Southeast Asia, the islands of Melanesia, and Australia. Although some species of *Anoectochilus* have green-and-white leaves much like *Goodyera*, most have prominent anthocyanin pigments that, together with chlorophyll, render interveinal portions of the leaf as dark green and, in the absence of chlorophyll, render veins white to red or purple; undersides of leaves are often reddish. One species, *A. sandvicensis*, is endemic to the Hawaiian Islands. Although known as the Hawaiian Jewel Orchid, its foliar veins only subtly contrast with the green tissue at large. Also, the flowers of the Hawaiian Jewel Orchid are yellow, setting it apart from the white flowers found in other species of the genus. Though found on most of the major islands of the Hawaiian archipelago, *A. sandvicensis* is rare and threatened by habitat loss.

Another Jewel Orchid belongs to a genus, *Ludisia*, that is monotypic, i.e., it consists of just a single species. *Ludisia discolor* (Figure 3) is found in the deep shade of warm, humid forests from southern China, nearby Thailand, Myanmar (Burma), and Vietnam to the islands of Indonesia and the Philippines. As might be expected from a single species occupying a broad geographic area and having a long history in horticulture, one can find cultivated plants with a wide variety of vein and interveinal colors on the leaves. Most are green with red tinges and clearly contrasting veins, but some are dark purple with



Figure 4 *Macodes petola*: By JMK. Own work, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=32596095>.

obscure veins, and others, evidently anthocyanin-lacking mutants, have bright-green leaves with white veins, much like our *Goodyera*.

Finally, there is the genus *Macodes* (Figure 4), consisting of 11 species from more or less the same shady forest habitats in roughly the same overall range as *Ludisia* and *Anoectochilus*. Though *Macodes* is not found in cultivation as often as is *Ludisia*, its leaves are striking, with high-contrast differentiation between veins, mostly white, yellow, or green, and leaf background colors that range from yellowish green to dark green or reddish purple.

In summary, the Jewel Orchids are terrestrial plants with creeping rhizomes and variegated or otherwise colorful leaves and usually smallish flowers found mostly in the tropics of Southeast Asia but with some species, such as our Wildflower of the Year, extending to the temperate regions of North America and Eurasia. So, next time you encounter that precious jewel we know as Rattlesnake Plantain, don't focus on the apparent disconnect between native and tropical orchids. Rather, recall these relatives of *Goodyera*, several of which can be found in conservatories or even household windowsills, and appreciate these special jewels in the crown of biodiversity's most extravagant and flamboyant plant family.

AN ETYMOLOGICAL NOTE

The English word orchid is derived from the Latin *Orchis*, the name of a genus well known to the ancient Greeks and Romans. But orchis is also Latin for testicle. Here is the connection: *Orchis* orchids are perennial plants arising from swollen, often paired, storage roots. To the ancients, when pulled from the ground the lower extremities of these plants were reminiscent of testicles, so this somewhat earthy name came to be associated with them and, by extension, the whole family, Orchidaceae. ❖