

IDENTIFYING THE NATIVE AZALEAS

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The deciduous azaleas are among the showiest of our native shrubs. Their primary beauty is due to their flowers, which range in color from white to pink, and orange to red. Early in the history of European plant collecting in this country, native azaleas were used to develop numerous cultivars (Ghent, Knap Hill, Exbury, and Mollis azaleas). These cultivar azaleas were the result of initial crosses of *Rhododendron molle* (from China and Japan) and the North American azaleas, or *Rhododendron luteum* (from the Caucasus region) and the North American azaleas. Although these cultivars offer marvelous displays of color in the spring, the native azaleas have their own delicate beauty.

Like other members of the genus *Rhododendron*, the native azaleas have the petals fused into a funnel or cup-shaped corolla. Most of the native azaleas belong to a subgroup of rhododendrons named *R.* section *Pentanthera* [*Rhododendron vaseyi*, a rare azalea found in the southern Appalachians, is in the closely related *R.* section *Rhodora* (1)]. The members of *R.* section *Pentanthera* share several unique characters that indicate a unique common ancestry. These characters include a narrow corolla tube and five stamens that are much longer than the petals. Several members of the section have a darker-colored blotch on the upper petal, others lack this blotch. This is in contrast to the evergreen azaleas (*Rhododendron* subgenus *Tsutsusi*) that have spotted petals, usually ten stamens that are not much longer than the petals, and wide corolla tubes.

There are 15 species of *R.* section *Pentanthera*. *Rhododendron molle* (Mollis azalea, *R.* subsection *Sinensia*) is the most distinctive of the *Pentanthera* azaleas. It has a broader corolla tube than the other members of section, with spots on the interior surface. Its color ranges from yellow, in China and Japan, to orange-red, in Japan only. This species has been extensively used in the development of many cultivars of azaleas. The remaining 14 species of section *Pentanthera* (*R.* subsection *Pentanthera*) are very closely related and therefore the differences among these species are often subtle. All of these species possess a narrow corolla tube and stamens that extend beyond the end of the petals. These azaleas occur as understory shrubs, often under a canopy of oaks. They are less frequent on north-facing slopes because, although they are understory plants, they require a fair amount of sunshine. If the canopy is too dense, azaleas will be absent. They can vary in height from less than a meter to ten meters tall. Although in the past most of the azaleas were reported as non-rhizomatous, they are actually often rhizomatous or stoloniferous. Two species occur outside of the southeastern United States. *Rhododendron occidentale* (Western azalea) occurs along the west coast of southern Oregon to southern California. This species is extremely variable in flower color, but is generally white with a yellow blotch on the upper corolla lobe. It is the only member of *R.* section *Pentanthera* that occurs along the west coast. *Rhododendron luteum* (Pontic azalea) is native to the Black Sea and Caucasus region. Its flowers are bright yellow with a deeper yellow blotch. This species is reputed to have caused Alexander the Great's troops to fall ill after eating honey made from its flowers. This is likely due to the andromedotoxin that is prevalent in the nectar of many members of the genus *Rhododendron*.

All of the remaining 12 species of *Rhododendron* subsection *Pentanthera* occur in the southeastern U.S. The easiest first line of investigation for identification purposes is flower color. Three main groups can be identified using this criterion: (1) white, (2) pink, and (3) orange to red. Within these color groups the timing of flowering and leaf expansion, the type of pubescence (hairs) and characteristics of the flower bud scales are useful characters for identifying species.

Among the white-flowered group are *Rhododendron alabamense*, *R. arborescens*, *R. atlanticum*, and *R. viscosum*. Although the flowers of these species are consistently white, they may occasionally be pale pink or tinged with pink. Of these, *R. alabamense* is unique because it possesses a yellow blotch on the upper corolla lobe and a very delicate sweet fragrance. This azalea is almost entirely confined to Alabama and its periphery. It flowers early in the spring, before the leaves are expanded. *Rhododendron atlanticum* is restricted to the Atlantic Coastal Plain. It is usually a strongly rhizomatous shrub, often less than a meter in height, growing in acid sands. The flowers of *R. atlanticum* bloom before the leaves expand and have a very strong musky-sweet odor. The flowers are densely covered with gland-tipped hairs that are extremely sticky. *Rhododendron arborescens* and *R. viscosum* are two closely related



R. viscosum, the clammy azalea

species with white flowers that bloom after the leaves have expanded. *Rhododendron arborescens* is restricted to the mountains, and the flowers have a bright red style with a cinnamon-like fragrance. The entire plant of *R. arborescens* is smooth and shining due to the lack of soft white (unicellular) hairs that are usually common on plants of *R. viscosum*.

The most widespread species of deciduous azalea is the clammy azalea, *Rhododendron viscosum*. Its geographic distribution ranges from Maine south to peninsular Florida, west to eastern Texas and from eastern Oklahoma to southern Arkansas east to the Atlantic coast. This is the most variable of the southeastern azaleas and has been divided into several segregate species: *R. coryi*, *R. oblongifolium*, and *R. serrulatum*. In the northern part of its range the white corolla is often tinged with pink. The flower bud scales of this species often have a distinctive dark brown line around the edges. This characteristic has been used to separate *R. serrulatum* from *R. viscosum* in the southeast, where the dark brown band is most common. However, the dark brown line can be found far north in some populations of *R. viscosum*. *Rhododendron coryi* and *R. oblongifolium* have been separated from *R. viscosum* due to their long narrow corolla tubes. Plants named *R. coryi* are stoloniferous in habit, whereas plants named *R. oblongifolium* have hairier leaves than many individuals of *R. viscosum*. However, all of these "species" have white flowers with gland-tipped hairs that are in lines up the outside of the corolla tube. They lack a blotch on the upper corolla lobe and have greenish-whitish colored filaments and styles. They all flower after the leaves have fully expanded and have a sweet-musky fragrance. When all of the characters are compared over the entire range of *Rhododendron viscosum* it is apparent that *R. coryi*, *R. oblongifolium*, and *R. serrulatum* represent random local variants of *R. viscosum*, and therefore should not be recognized as distinct species.

The pink group of deciduous azaleas are all early flowering species that bloom before the leaves are fully expanded. These azaleas are *R. periclymenoides* (Piedmont azalea), *R. canescens* (sweet azalea), and *R. prinophyllum* (roseshell azalea). Their flowers range in color from pale pink (almost white) to a deep cherry color and all lack a blotch on the upper corolla lobe. *Rhododendron prinophyllum* can be distinguished from the other two pink azaleas by its longer flower stalks (pedicels) covered with gland-tipped hairs, a broader corolla tube, gland-tipped hairs on the margins of the sepals and on the ovary, and conspicuously fringed (ciliate) leaf margins. This azalea is more northern in its distribution than *R. canescens*, which is restricted to the southern Coastal Plain. It is the only pink azalea that occurs in Arkansas and Oklahoma, as well as in the northeast as far north as New Hampshire. Because it is often covered with soft unicellular hairs it has been confused with *R. canescens*. However, *R. canescens* has very narrow corolla tubes and the fruits lack the gland-tipped hairs common in *R. prinophyllum*. *Rhododendron canescens* is common in swamps or bottomlands in the Gulf Coastal Plain. This azalea has a sweet, sometimes slightly musky odor and flowers just before or as the leaves expand. *Rhododendron canescens* is very variable in pubescence (hairiness) and in corolla color. In some Mississippi populations *R. canescens* has such densely hairy (unicellular hairs) leaves that they appear whitish. The flower bud scales of *R. canescens* are also often white with dense hairs. The outer surface of the corolla is densely covered with unicellular hairs as



R. calendulaceum, the flame azalea

well as gland-tipped hairs. This is in contrast to the closely related *R. periclymenoides*, which has very few unicellular hairs on the bud scales and corollas lacking gland-tipped hairs.

There are five species that have orange to red flowers—*R. austrinum*, *R. calendulaceum*, *R. flammium*, *R. cumberlandense*, and *R. prunifolium*. The plumleaf azalea, *R. prunifolium*, is the rarest of the deciduous azaleas and has been proposed for federally endangered status. Restricted to just a few counties on the southern Alabama-Georgia border, *R. prunifolium* flowers after the leaves have expanded. Its deep red-orange to apricot-colored flowers essentially lack any hairs, and



R. prunifolium, the plumleaf azalea, at Calloway Gardens

the bud scales and leaves are also smooth and shining. This species is the most heat tolerant of the red-flowered azaleas. *Rhododendron austrinum* (Florida azalea) is restricted to the panhandle of Florida and a few nearby counties in Alabama, Georgia, and Mississippi. Although it can resemble *R. canescens* because of the general shape of the corolla (the flower color varies from yellow to orange with a dark pink tube), *R. austrinum* has a deep yellow to orange blotch on the upper corolla lobe. Like *R. canescens* it has densely pubescent bud scales, but (unlike *R. canescens*) the bud scales have glands along the margins. In addition gland-tipped hairs are common on the petioles, lower edges (margins) of the leaves, and flower stalks of *R. austrinum*. This species is generally restricted to the bluffs above the Apalachicola River and thus is ecologically isolated from *R. canescens*, which prefers wet or poorly drained soils. The Oconee azalea (*R. flammeum*) is another red-flowered species with a restricted range. This species is found in upland woods on dry slopes and ridges, or on bluffs of rivers or streams. It is found in the Flint River gorge area of Georgia and along the bluffs of the Savannah River. *Rhododendron flammeum* is almost entirely eglandular [lacks glands, ed.], and flowers after or as the leaves expand. Plants of *R. flammeum* are generally flat-topped and the leaves tend to be smooth and lacking very many hairs. Perhaps the most difficult species to distinguish within the red-orange group are *R. calendulaceum* (flame azalea) and *R. cumberlandense* (Cumberland azalea, diploid flame azalea). Both species are variable in flower color although *R. cumberlandense* is usually darker red and flowers after the leaves have expanded. This species also has smaller flowers and leaves that are usually glabrous and shining on the upper surface and glaucous (covered with a whitish-bluish wax) on the lower surface. In addition, plants of *R. cumberlandense* can be distinguished from *R. calendulaceum* by the lack of gland-tipped hairs on the sepal margins and pedicels. *Rhododendron cumberlandense* is primarily found at higher elevations in the Cumberland Plateau and Mountains. *Rhododendron*

calendulaceum (flame azalea) is a common component of the understory in the mountains of Georgia, North Carolina, and Tennessee. This species is tremendously variable in flower color and leaf pubescence. Flowers of this species are generally larger than those of *R. cumberlandense*. This may be due to the fact that *R. calendulaceum* is a tetraploid, whereas all other members of *R.* section *Pentanthera* are diploid. The flame azalea (*R. calendulaceum*) flowers before or as the leaves expand and has gland-tipped hairs that are prominent on the pedicels and sepal margins. It is much more common than the Cumberland azalea (*R. cumberlandense*) and flowers early in the spring. Some may be wondering "What about *Rhododendron bakeri*?" This name has been and is currently used by many for the diploid flame azalea. Unfortunately, the name *R. bakeri* was based on a specimen that is a hybrid of *R. flammeum* and *R. canescens*! Therefore, it can only be applied to hybrids of *R. flammeum* and *R. canescens*, and there is already an older name for such a hybrid (although naming natural hybrid individuals is not recommended). The correct name for the diploid flame azalea, then, is *Rhododendron cumberlandense* (2).

The example of *R. bakeri* (= *R. flammeum* X *R. canescens*) points to the importance of natural hybrids among the native azaleas. Most species of azalea can be crossed and produce fertile offspring. The natural barriers to hybridization among the native azaleas are primarily related to habitat preference and the time of flowering. For example, *R. flammeum* is found in well-drained upland sites, often facing rivers or streams. Usually this is not the preferred habitat for *R. canescens*, which is almost always found in poorly drained soils. However, at the northern edge of the range of *R. canescens* it occurs in habitats similar to that of *R. flammeum*. Under these circumstances hybridization can occur. A particularly well-documented case is that of *R. canescens* and *R. flammeum* and their numerous hybrid individuals on Stone Mountain, Georgia. Because *R. canescens* (pink-white flowers, no blotch) is distinctive from *R. flammeum* (red-orange, blotch on

upper corolla lobe) the hybrid individuals are easy to identify. Usually they are pink to white with a yellow blotch on the upper corolla lobe. Other aspects of these hybrids are also intermediate between the parents. Plants of *R. canescens* are tall with a round top, while plants of *R. flammeum* are shorter with a distinctive flat-topped shape. Hybrid individuals are intermediate in height between *R. canescens* and *R. flammeum* and have neither the flat-top of *R. flammeum*, nor the rounded shape of *R. canescens*.

Although hybrids can be locally common, as in the case of Stone Mountain, Georgia, the phenomenon is not as pervasive as often suggested in the literature. Much of the emphasis on problems of hybridization has been due to collectors' emphases on areas where hybrids are known to occur, e.g. Gregory Bald in the Great Smoky Mountains National Park. However, much of the variability in flower color and pubescence is due to natural variation in the species of native azaleas.

Literature Cited

- (1) Judd, W. S. and K. A. Kron. 1995. A revision of *Rhododendron* VI. Subgenus *Pentanthera* (sections *Sciadorhodion*, *Rhodora*, and *Viscidula*). *Edinburgh Journal of Botany* 52, pp. 1-54.
- (2) Kron, K. A. 1993. A revision of *Rhododendron* section *Pentanthera*. *Edinburgh Journal of Botany* 50, pp. 249-364.

Photographs by the author

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Dr. Kron's Ph.D. dissertation was a revision of the Rhododendron sect. Pentanthera. She also published a revision of the rest of the deciduous azaleas with W. S. Judd. She's currently working on the evolutionary relationships among the major groups of Rhododendrons using DNA sequence data in the Department of Biology at Wake Forest. □