Azaleas offer
endless challenges

AZALEAS

Revised and Enlarged Edition

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4. AZALEAS—PLANTS, HABITS, FLOWERS, AND LEAVES

Azaleas are generally described as shrubs, although some of the deciduous species become small trees in the wild. It is not uncommon, for example, to find in established gardens in the southeastern U.S., such as Callaway Gardens, North American native azaleas 15 to 20 feet tall. Wild plants of the Piedmont area of Georgia, U.S.A., are often over 25 feet in height. Many of the deciduous azaleas of Japan have been observed as small trees. In the Nikko Chanokidaira Botanical Garden native plants of *R. quinquefolium* are small trees with trunks over 12 inches in diameter.

The evergreen azaleas include both upright and spreading shrubs, some less than two feet, others up to ten feet or more. The Kurume Azaleas generally have the reputation of being low growing and dwarf shrubs, but many cultivars today are eight to ten feet in height and still growing. Again, at Callaway Gardens, several Kurume Azaleas are 15 feet tall.

Evergreen azaleas are usually densely branched and twiggy, but the Kaempfer Azalea, *R. kaempferi,* tends to send up tall shoots which are filled out with age. At Planting Fields in New York, U.S.A., several Kaempfer Azaleas are at least 15 feet in height. Large massive Southern U.S. azaleas such as 'Formosa' are 12 to 15 feet across and equally as high.

Deciduous azaleas are usually more open or loosely branched, some having ascending and others, horizontal branches. The Royal Azalea *R. schlippenbachii* and the Pontic Azalea *R. luteum* are densely branched.

Among the azaleas one can select plants of nearly every habit or growth. The selections of *R. nakaharai* such as 'Mount Seven Star' and the North Tisbury hybrids are often only 12 to 18 inches in height after ten years and two to three times as wide. Weeping forms such as 'Flame Creeper' and 'Pink Cascade' are now available for hanging baskets and trailing over walls. Some azaleas like the Satsuki, Beltsville dwarfs and selections of the Greenwood hybrids, after 15 years, are less than 24 inches high and twice as wide. A 20 year old plant of

'Salmon Elf' at Callaway is approximately 30 inches tall and 50 inches wide. A 200-year-old plant of *R. scabrum* near Kurume, Japan, is over 15 ft. wide and 10 ft. high, with a trunk diameter of over 15 in.

A century-old plant of the Ghent hybrid 'Unique', at the Sunningdale Nursery in England, is over 16 ft. high and 30 ft. wide. The more spreading types such as 'Indica Alba' 'Mucronatum' will often be twice as broad as high. Old plants of this cultivar can be seen at Morris Arboretum in Philadelphia, U.S.A., over 25 ft. wide, possibly from repeated self-layering. Large wild colonies of individual plants of *R. atlanticum* in the sandy coastal regions of Virginia and New Jersey, U.S.A., may cover several thousand square feet. The size of an azalea after 10 years may vary considerably due to climatic regions. A Kurume Azalea in 10 years may be 4–5 ft. tall in the Southeastern states of North America, only 3–4 ft. in Washington, D.C., and smaller in areas north and the mid-West. In London, England, the plants are 3–4 ft.; in the colder regions of Europe they are even smaller. In contrast, they are taller in Australia and New Zealand.

Azaleas are not fast growers, and the very dwarf azaleas are really slow. Average growth of three to ten inches is common. However, by forcing with a regular fertilizer program, moisture and pinching, the rate of growth can be increased.

FLOWERS

The fascination of azaleas is a direct outgrowth of the wide variation in form, color, and size of the flowers. Understanding the structure of an azalea flower is a prerequisite to identifying the many species and cultivations.

Corolla. The typical azalea flower has five petals or lobes and is sympetalous or joined at the base from which the petals flare out. Collectively the petals form the funnel-shaped corolla, in the form of a tube, as lower portions fuse. The limbs or petals, the upper separate portion, may be overlapping, imbricated, or flaring.

The five petals are arranged in a symmetrical or butterfly fashion. Facing the flower, one petal, the standard or dorsal lobe is at the top. Two petals, the upper wings, are below the standard and on either side. Usually they constitute the greatest width of the flower. The two remaining petals, the lower wings, are lower and usually closer together, but can be spread out and are equal to or wider than the upper wings.

Calyx. The calyx surrounds the corolla at its base and is composed of five small green sepals that are partly fused at the base. The sepals are minute, ranging in length from 1/24 to 1/8 of an inch or longer. Occasionally, as in the Big Sepal Azalea *R. macrosepalum*, the sepals may be over an inch long and a prominent feature. On double and hose-in-hose flowers, the sepals become petaloid so are usually visible as a separate flower part.

Perianth. A collective term for the corolla and calyx.

Pedicel. A short, slender green stalk, called the pedicel, supports the flower and is attached to the branch. Depending on the species, the pedicel may be up to ¾ of an inch long, very short or sessile, meaning not stalked, or virtually absent. The flower is then sessile, meaning not stalked.

Pistil. The female portion of the flower or gynoecium is composed of the ovary, style, and stigma. The ovary is in the center and just above the base of the corolla. The ovary is the seed bearing part of the flower and consists of five cells or locules. The style is a hollow tube originating at the ovary and terminating in a small, rounded appendage called the stigma. The stigma when ripe is sticky on the surface to receive and retain the pollen.

Stamens. The stamens, or male organ of the flower, are composed of filaments supporting pollen-bearing anthers, and arise at the junction of the ovary and corolla. The stamens usually occur in multiples of five and are often of unequal length. In many of the deciduous

azaleas, the stamens are exserted, extending beyond the corolla, and are a conspicuous, attractive part of the flower. The anthers, pollen-bearing parts of the stamens, are at the top of the filament and are divided into two sacs. The pollen grains are borne in tetrads and come out of apical pores at the end of the anthers. All the pollen comes out together in a stringy matrix. The shedding of pollen from apical pores by azaleas differs from most genera which discharge pollen by longitudinal splitting of the anthers.

Seed Production. The ovary after fertilization by pollen, develops into a five-parted seed capsule which may be only ¼ of an inch long in *R. serpyllifolium* or up to one and a half inches long in *R. japonicum*. The seeds are generally small and numerous and may be winged or nonwinged. The evergreen azaleas have nonwinged seed. The North American deciduous species all have winged seed except *R. arborescens* and *R. vaseyi*. The Asiatic deciduous species all have nonwinged seed except *R. japonicum, R. molle,* and *R. luteum*.

A beautiful study on the morphology of the capsules, seed, and calyx was done by Dr. Johannes Hedegaard titled, *Studies in the Genus Rhododendrons*.

FLOWER FORMS

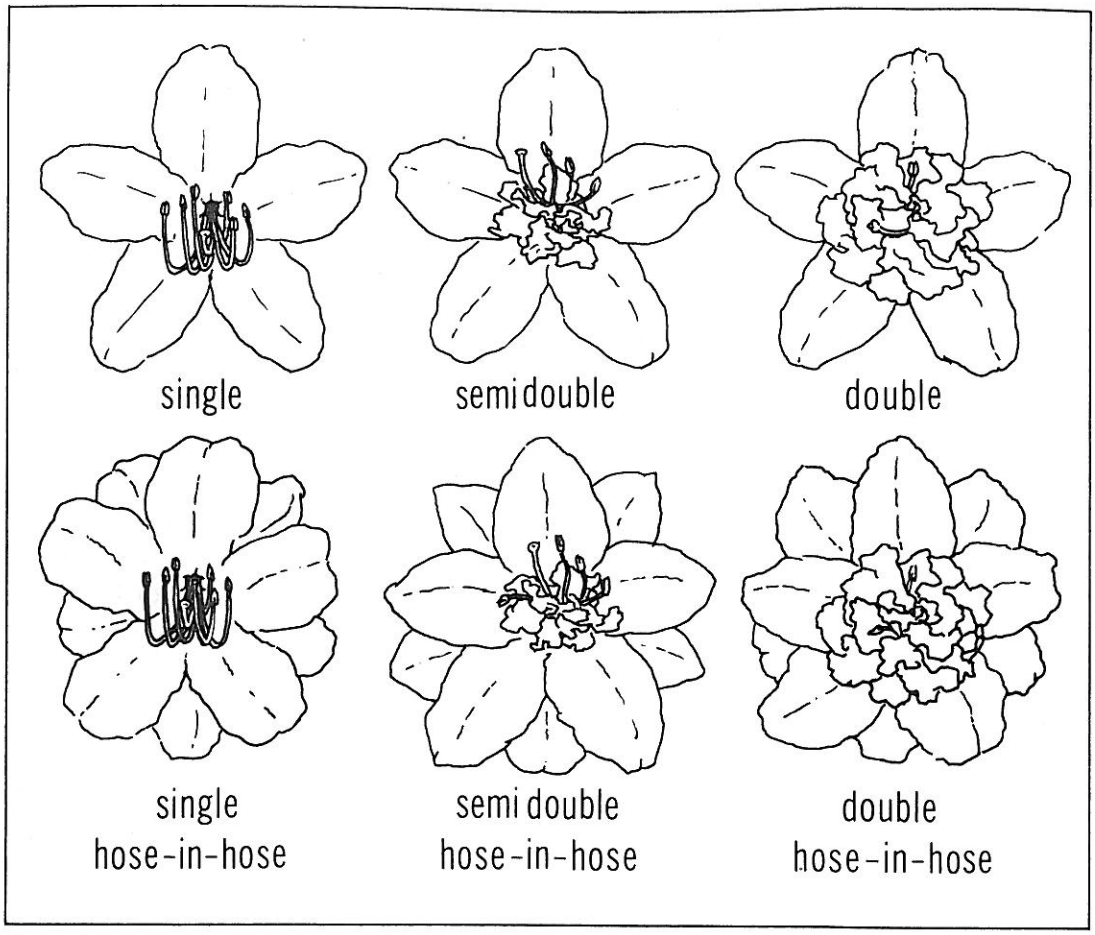
Azalea flowers vary, often with one or more types on a single plant. The most common azalea flowers are single with five lobes. However, with increased petals through the metamorphosis of sepals, stamens, or both, various doubling effects occur that vary the flower's appearance. Even the shape of the petals will alter flower appearance. The indiscriminate use of terms such as semidouble, double, fully double, and others are often misused and misleading in describing flower form and appearance.

Unfortunately, the American Rhododendron Society has not promoted a classification of azalea flowers, but the following classification may be helpful.

I. Single types: The most common azalea flower form consists of a corolla of five or more petals or corolla lobes usually fused at the base. The calyx consists of five sepals and five calyx lobes usually fused at the base. Finally, there are five to ten stamens and a single pistil. The conspicuous stamens and pistil give this type its distinctive appearance. Examples: Kurumes, 'Hinodegiri', 'Debutante', 'Sherwood Red'; the species *R. kaempferi;* Glenn Dale hybrids, 'Treasure', 'Martha Hitchcock' and 'Ben Morrison'; Satsuki, 'Gumpo', 'Kobai', (five to seven petals).

II. Hose-in-hose: A non-botanical term and often used when the sepals are fully metamorphosed, enlarged and transformed into petals. Another description would be: Hose-in-hose, one corolla superimposed inside another or two cycles of petals one within the other. The petal-like calyces have been rotated with respect to the corolla and can be seen together with the petals. The calyx may or may not be present. In many early descriptions the presence of a calyx was not recorded. For the future, when known, the presence of a calyx should be recorded as Hose-in-hose, calyx present or green calyx present. If it is not stated, one can assume that the calyx is absent or not known. In irregular or partial hose-in-hose flowers, the calyx petals are only partially developed and cannot be seen from the front of the flower. A hose-in-hose configuration may also be found in semi and double flowers.

III. Semidouble types: Flowers with a true corolla but in which some of the stamens have been transformed into petals and with true or only partially transformed sepals. The transformed stamens are smaller than the true petals or contorted, or the anther or filament of the stamen remains evident. In addition, there may be a few normal stamens or a few stamens fully transformed into petals. Examples: Belgian hybrid, 'Crimson Glory', Southern Indian, 'William Bull' (may also be double).



IV. Semidouble hose-in-hose types: Same as above with the calyx fully developed and visible and transformed to petals. The calyx and corolla look alike. Examples: Pericat hybrids 'Glory'; 'Rival' and 'Sweetheart Supreme'.

V. Double types: Flowers with true petals and complete or nearly complete transformation of stamens into petals. The green calyx or a small remnant is present. The pistil may be present or transformed. The petals may be up to thirty or more. Example: Gable hybrid, 'La Premier'; Satsuki, 'Beni-kirin', 'Balsaminaeflorum'.

VI. Double hose-in-hose type: similar to the double type but with hose-in-hose characteristics and the calyx not present. Example: 'Anna Kehr'. Many flowers described as double hose-in-hose have a remnant of a green calyx present and should be labeled as double hose-in-hose, calyx present.

VII. Spider type: The petals are not fused, forming a tube, but are separate, narrow, and strap-like. Typical examples are *R. macrosepalum linearifolium*, the cultivar 'Koromo-shikibu', and the Satsuki, 'Kinsai'. There is considerable variation, with often more than five narrow petals and examples where the stamens appear as narrow petals. While not common in deciduous azaleas, the cultivar, 'Chattahoochee' is a spider type, as is the triploid, *R. atlanticum f. tomolobum*.

LEAVES

Azalea leaves possess esthetic features often overlooked. The obvious characteristic is an evergreen or deciduous species or cultivar. However, the size, shape, color, arrangement, and hairiness all add interest to a particular plant. The morphological characteristics of the leaves are a help in identifying species and assist in deriving the parentage of hybrids.

Leaf Size. The Wild Thyme Azalea *R. serpyllifolium* has elliptically shaped evergreen leaves 1/4 to 1/3 inches long. The 'Tschonoski Azalea' has narrow lanceolate, deciduous leaves 1/3 to one long, and 1/6 to a half inch wide.

At the opposite extreme, the uncommon Nippon Azalea *R. nipponicum* has deciduous leaves up to seven inches long and three inches wide. Both the Japanese Azalea *R. japonicum* and the Plumleaf azalea *R. prunifolium* have long leaves up to five and six inches long. More commonly, azalea leaves are one to two inches long in the evergreen species and three to four inches long with deciduous species.

Persistence of Leaves. The major division of azaleas is determined by persistence of leaf—deciduous azaleas lose their leaves in the winter while evergreen azaleas leaves are persistent. Most of the deciduous species are natives of the eastern United States; all the evergreen species come from eastern Asia. The designation of the two major groups of azaleas as deciduous or evergreen is, at best, only an approximation of the truth and may vary depending upon the climatic conditions.

Deciduous Azaleas: The deciduous azaleas do lose their leaves in the fall and put out new leaves in the spring, similar to many broadleaf flowering plants in colder regions.

Evergreen Azaleas: The group of persistent or evergreen azaleas often straddle the fence by being both deciduous and evergreen. They have dimorphic leaves, known as spring leaves and summer leaves. The spring leaves, unfolding at the time of flowering or immediately after, are thinner, lighter and generally larger than the summer leaves, and usually scattered along the branches. These leaves are short-lived, turning yellow and dropping off in the fall.

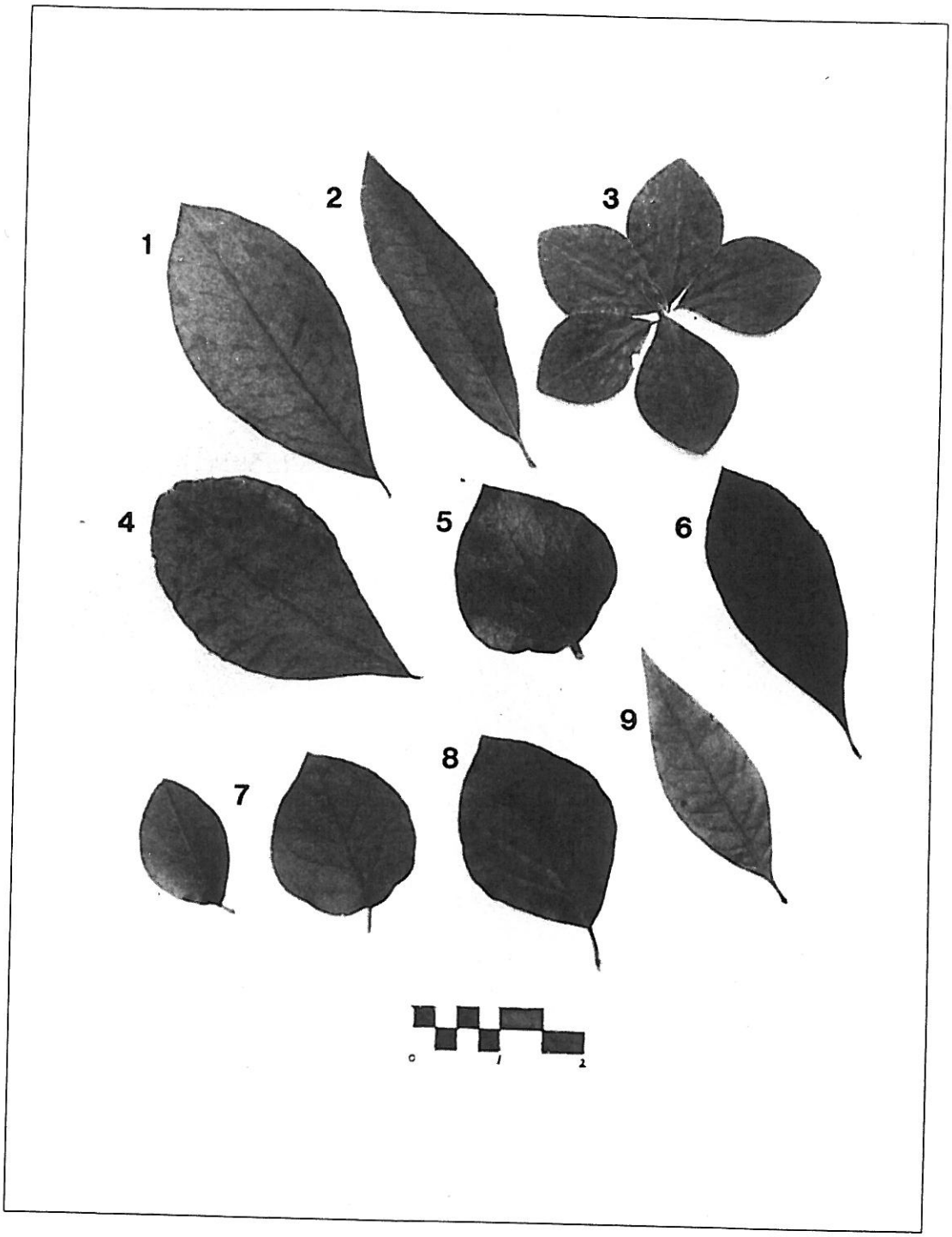
Leaf drop is hastened by summer drought. Novice gardeners often fear their evergreen azaleas are dying in the fall when the plants are merely shedding their spring leaves.

The summer leaves unfolding in early summer are smaller, darker, thicker, and more leathery than the spring leaves and are crowded at the tips of the branches. In most instances, the summer leaves are persistent and remain throughout the dormant period of winter until the following spring. In some cases the summer leaves of evergreen azaleas growing in warm climates may persist for several years.

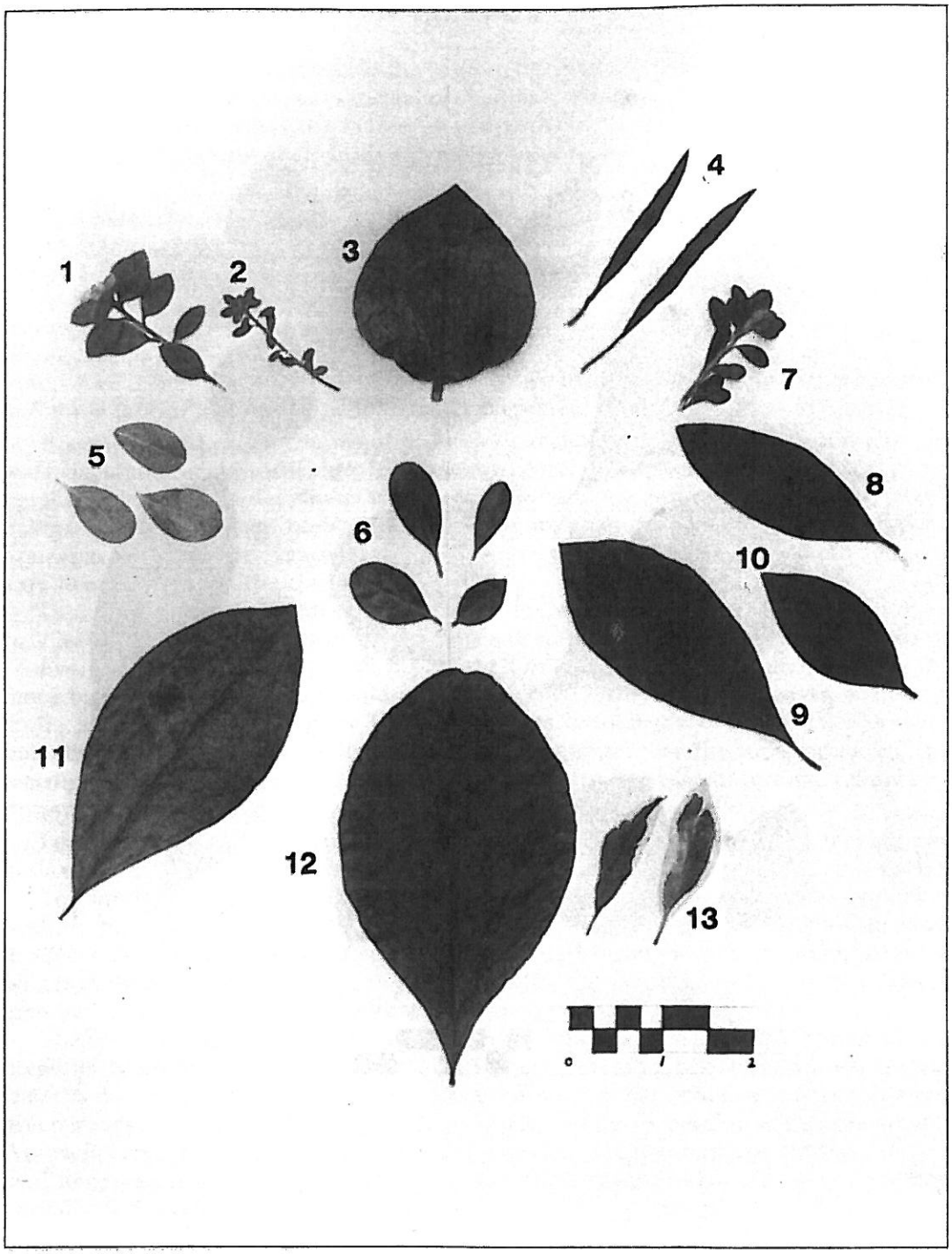
The designations deciduous and evergreen are dependent on the climatic area and this accounts for the term persistent leaves. For example, the Hammock-sweet Azalea, *R. serrulatum,* is deciduous in warm temperature regions but will have persistent or nearly evergreen leaves in subtropical regions. Both the Korean Azalea, *R. poukhanense,* and Kaempfer Azalea *R. kaempferi,* are evergreen in warm temperature regions but usually deciduous in cool temperature regions. Thus, at best, evergreen azaleas are partially evergreen and partially deciduous.

LEAF SHAPES

The leaves of azaleas vary from obovate to ovate, to lanceolate, oblanceolate and some almost round or oblong. The Satsuki Azalea 'Kazan' (Rukizon) has small, broadly ovate leaves often described as heart-shaped, while the Spider Azalea, *R. macrosepalum linearifolium* has long, narrow leaves from one and a half inches to three inches long, but only 1/12 to 1/4 inches wide. Leaves, too, may be contorted or twisted as in the Satsuki cultivars, 'Rinpu', 'Saikan', 'Shungetsu', and others.



Azalea Leaves
1. Knap Hill Hybrid
2. *R. japonicum*
3. *R. quinquefolium*
4. *R. schlippenbachii*
5. *R. reticulatum*
6. *R. canescens*
7. *R. nudipes*
8. *R. weyrichii*
9. *R. vaseyi*



Azalea Leaves

1. *R. nakaharai*
2. *R. serphyllifolium*
3. *R. reticulatum*
4. *R. macrosepalum linearifolium*
5. *R. sataense*
6. Kurume Hybrids
7. *R. kiusianum*
8. *R. simsii*
9. *R. canescens*
10. *R. indicum*
11. Knap Hill Hybrid
12. *R. schlippenbachii*
13. Southern Belle (variegated)

LEAF COLOR

Leaves vary from the light green of the deciduous azaleas to the dark green of the summer leaves of many evergreen azaleas. White to light flowered azaleas usually have lighter green leaves and generally display less fall coloration and remain green, for example, 'Snow', 'Glacier', and 'Coral Bell'. Thus, from a planting of small seedlings, one can pick out those which will be light pink or white by the winter color of leaves.

The fall coloring of deciduous azaleas ranges from pure yellow through crimson to vinous-purple. The leaves of many evergreen azaleas through the fall and winter are green flecked with bronze or rust or carry red or dark red leaves. This is more common in the red to purple flowered cultivars. For example, the Glenn Dale Azaleas 'Campfire', 'Copperman', 'Fashion', 'Glamour', 'Kathleen', 'Phoebe', 'Refulgence', 'Rhapsody', 'Winner', and 'Zealot' display fall coloration in bronze or copper shades. Often the fall coloration occurs on both sides of the leaf with the under surface being lighter; in other cases the lower surface remains green.

A few years ago azaleas with variegated foliage were uncommon save for a few Satsuki cultivars such as 'Keisetsu' and 'Ukinishiki' with light yellow blotches scattered on the dark green foliage. A marginal variegated plant of *R. simsii* PI 391401, NA 36749, was first introduced to the University of California Botanical Garden in Berkeley from the U.S.D.A. and National Arboretum now believed to be sold as 'Purple Tabor' and other names. Two variegated Satsuki azaleas introduced from Japan are 'Shirafuji' and 'Murasakifuji'. In the 1980's four marginal variegated plants were introduced in the United States: 'Southern Bell', a sport of 'Pink Ruffles' and 'Red Ruffles Variegated'; 'Silver Streak', a Greenwood hybrid which is a sport of 'Deep Purple'; 'Girard's Variegated Gem', a sport of 'Border Gem'; and 'Silver Sword', a sport of 'Girard's Rose'. The latter turns a beautiful reddish tint in the fall while the others retain their greenness. A freckled leaf sport of 'Southern Charm' was introduced in the late 70's.

Variegated deciduous azaleas are very uncommon. A seedling was reported from Ohio but later died. The author has a two-year seedling of a North American azalea cross with both marginal and flecked variations of the foliage. A marginal variegated plant of *R. canescens* was collected in North Florida in 1981 by Bob McCartney of Aiken, S. C.

LEAF ARRANGEMENT

Azalea leaves are borne either alternately on the stem or in a spiral pattern. The spirals are often condensed, with the leaves crowded at the tip of the branches so they appear to be star-like whorls. In certain species, leaf arrangements become one of the main attractions. The following azaleas have whorls of five leaves at the end of the branches: Cork azalea *R. quinquefolium,* Five Leaf Azalea *R. pentaphyllum,* and Royal Azalea *R. schlippenbachii.* Many evergreen species, such as *R. kaempferi,* have leaves crowded at the ends of branches but without the appearance of whorls.

LEAF HAIRINESS

The function of leaf hairs is a matter of conjecture, and in fact may be a relic or subsidiary appendage making no special contribution to the well-being of the plant.

The pubescence or indumentum of azalea leaves is sparse compared with the leaves of many other species of *Rhododendron.* Some azalea leaves are glabrous, bald or not hairy, at maturity. Some have hairs only on the underside of the leaves along the veins. The pubescence of azalea leaves consists of hairs which may be straight or sometimes curly, but never branched, and usually closely adpressed to the surface of the leaf. The hairs are visible to the naked eye, and with a hand lens or low powered microscope one can see that they are flattened or laminated and not cylindrical. The hairs may be of uniform size, or as in the Piedmont Azalea *R. canescens,* may occur as a dense, felty pubescence of numerous,

whitish and relatively short hairs, interspaced with occasional longer, thicker and more bristle-like hairs or setae which impart a strigose character to the leaf surface.

Bristle-like setae are usually sharp-pointed. But in some species such as the Coastal Azalea *R. atlanticum* and the Alabama Azalea *R. alabamense,* they are gland tipped (glandular setae), which cause the leaves to be sticky as they first unfold. Under the microscope these bulbous glands vary within plants of the same species from straw-yellow, through pink to deep red. Occasionally, small insects are trapped upon the sticky glands.

Hairs of azalea leaves may vary from yellow through bluish green to reddish. On young leaves, particularly of 'Indica Alba' and its allies and the Piedmont Azalea *R. canescens,* Roseshell Azalea *R. prinophyllum* and others, the hairs may be nearly white.

The Oldham Azalea *R. oldhamii* is one of the hairiest azalea species with conspicuous reddish brown hairs on both sides of the leaves and stems. The leaves of *R. rubropilosum* are also covered with numerous short hairs typically reddish brown in color. Some azaleas have hairs on both sides of the leaf such as 'Indica Alba', while others are hairy only on the underside such as the Big Sepal Azalea *R. macrosepalum.*

LEAF GLAUCESCENCE

Leaves of some species, such as *R. canadense,* have a gray waxy covering or bloom on the underside. Such leaves are said to be glaucous, like the skin of some plums. The bloom can be rubbed off. In some species as the Swamp Azalea *R. viscosum* and the Coastal Azalea *R. atlanticum,* some individuals have glaucous leaves while others do not. Plants with glaucous leaves occur haphazardly throughout the population so glaucescence is not a clear segregating characteristic. Unfortunately, it has been used by botanists as the basis for varietal status.

Without a hand lens, glaucescence and fine white hairs are easily confused, since both give the underside of a leaf a gray appearance. Like hairs, the function of glaucescence is not known.

LEAF ODOR

The leaves of many azaleas when opening in the spring have an unpleasant musky odor. This is usually noted in early morning or in the confined air of a warm place such as a greenhouse.

The Chinese and Japanese azaleas *R. molle* and *R. japonicum* and their hybrid offspring have foliage that is noticeably odoriferous in hot summer weather.

The leaves of some azaleas, as the Sweet Azalea *R. arborescens,* when dry have a persistent vanilla- or coumarin-like fragrance. Fresh leaves of *R. arborescens* have a spicy fragrance when crushed.