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# The Flowers That Bloom in the Spring . . .

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*Yes, the flowers that bloom in the spring, tra la, bring promise of merry sunshine. They also stimulate questions about the ways people describe and classify plants.*

## Blotch or Spotting—Who Cares?

I do. And anyone concerned with the accurate description of azalea flowers should! Recently, the color markings on *R. oldhamii* and *R. weyrichii* blooming in a cool greenhouse again focussed my attention on the distinction between "blotch" and "spotting":

¶ On *R. oldhamii*, the basic corolla color was a strong reddish Orange; on the standard (upper) petal, an area extending from the throat to about 5 mm from the apex was a fairly uniform deep purplish Pink (the blotch); and superimposed on the blotch was spotting of deep purplish Red.

¶ On *R. weyrichii*, the basic corolla color was a deep purplish Pink; on the standard petal, the blotch area extending from the throat to about 3 mm from the apex was a fairly uniform moderate purplish Pink; and superimposed on the proximal half of the blotch was spotting of strong purplish Red.

Some would assert that only one term is needed for description of the variant coloration on the standard (upper) petal of some azalea flowers—either "blotch" or "spotting"—explaining an area of solid color as a confluence of spots. But where the solid area (blotch) and the spots are different in hue as well as lightness of color, a vocabulary limited to one or the other term is wholly inadequate to communicate a mental image of the flower. Both terms are needed. Although the blotch and/or spotting (when present) are typically located on the standard (upper) petal, they often extend to the adjacent (wing) petals.

## Does Bud Morphology Distinguish Evergreen From Deciduous Azaleas?

The distinction between evergreen and deciduous azaleas seems perfectly clear before one encounters a plant that is listed in one category but behaves like plants in the other. Indeed, "evergreen" may itself be difficult to interpret: some evergreen azaleas lose so many of their leaves in winter that upon casual observation they may appear to be deciduous. Even where there are green leaves on the plant year-around, the evergreen azalea is not evergreen in the same sense as, for example, *Magnolia grandiflora* in its native range.

It is well known that the leaves of the typical evergreen azalea are dimorphic; that is, the spring leaves (those produced in the spring flush of growth) differ in form and/or size from the summer leaves (those produced in the summer flush of growth). The spring leaves are thin, relatively large, well-spaced along the growing stem, and usually drop with the onset of winter. The summer leaves are leathery, often different in shape and smaller than the spring leaves, cluster near the terminal bud of the shoot, and remain on the plant through the winter. In contrast, the leaves of deciduous azaleas develop throughout the summer but fall during autumn and winter, leaving only the terminal bud on the stem.

A key difference between evergreen and deciduous azaleas is sometimes said to be the place where new growth originates: from the flower bud in the evergreen, but only from axillary buds along the stem below the flower bud in the deciduous. Having been assured by experts that this is a reliable diagnostic character, I "did a double-take" this spring when *R. oldhamii* and *R. weyrichii* were in bloom. Galle (1985) includes *R. oldhamii* among the evergreen azaleas and *R. weyrichii* among the deciduous. Indeed, from the respective presence and absence of leaves when the plants started to bloom, this characterization appears unexceptionable. But as I returned to the deciduous *R. weyrichii* some days later, I noted new vegetative growth emerging from the same terminal bud that produced the flowers. Oops—the hallmark of "evergreen" on a deciduous azalea!

The answer to this seeming riddle is that most but not all of the azaleas in *Rhododendron* subgenus *Tsutsusi* are evergreen. This is clarified by reference to the taxonomic account in Chamberlain & Rae (1990):

Subgenus *Tsutsusi* (Sweet)  
Pojarkova...Leaves persistent and/or deciduous...

1a. Leaves linear to broadly ovate, usually of two kinds, the spring leaves larger and deciduous, the summer leaves smaller and persistent through the winter, if of one kind only then persistent, scattered along the stems (but see *R. tashiroi*); corolla rotate to tubular campanulate Sect. *nutsusi*.

1b. Leaves rhombic to rhombic-ovate, of one kind, deciduous in winter, in pseudowhorls of (2-) 3; flowers appearing before or with the leaves, corolla funnel-shaped to funnel-campanulate Sect. *Brachycalyx*.

Thus we find evergreen and some deciduous azaleas in subgenus

*Tsutsusi*, members of which characteristically produce flowers and new vegetative growth from the terminal buds. *R. oldhamii* Maxim. is in Section *Tsutsusi* Sweet; and *R. weyrichii* Maxim., in Section *Brachycalyx* Sweet.

Examining the terminal buds and new growth on several evergreen azaleas in the spring of 1992, I noted that new growth does originate in the terminal bud—but not from the flower bud itself. Within the terminal bud, small scales subtend the flower pedicels, separating them from the developing vegetative shoots. The latter are, in turn, subtended by similar scales. The summer "leaves" immediately below the terminal bud are spatulate, and their bases are wider at their attachment than the bases of leaf petioles farther down the stem. New shoots may also develop in the axils of these "leaves" or bud scales.

New Zealand botanist W. R. Philipson (1985), addressing the subject of "Shoot Morphology in *Rhododendron*," points out that:

In addition to foliage leaves, the shoot apex also produces appendages which develop into scale leaves. These enclose resting buds, whether vegetative or reproductive.

After discussing the branching structure and occurrence of vegetative and reproductive buds in various sections of genus *Rhododendron*, Philipson provides an explanation applicable to the peculiar bud structure encountered in subgenus *Tsutsusi*:

A more striking variation is for the vegetative buds to develop in the axils of the outer cataphylls of the floral bud—that is, the buds are compound...the flowers and leaves are still produced by separate buds, on different axes...the upper leaves may be so reduced they resemble cataphylls, and conversely the

lower cataphylls may be enlarged and loosely applied to the bud so that they approach foliage leaves.

The first part of this formulation leaves us with a slight terminological difficulty relating to the meaning of "floral bud": does the term mean a bud that produces only reproductive structures or a bud that produces, inter alia, reproductive structures? Philipson clearly means the latter, as shown by his statement that the floral buds are compound and by the icon used in a summary chart showing both flower-producing and vegetative buds in the terminal bud of subgenus *Tsutsusi*.

Botanists love to challenge each other's taxonomic constructs, and one of their essential tools is use of the terms *sensu stricto* (in a narrow sense) and *sensu lato* (in a broad sense). In the situation described above, we may now—thanks to Philipson's clarification—say that on evergreen azaleas new vegetative shoots originate within the floral buds *sensu lato* but not within the floral buds *sensu stricto*. The reader may well prefer a formulation stating that on azaleas in subgenus *Tsutsusi* new vegetative shoots and flowers originate on separate axes within a compound bud!

Many botanical terms seem designed to confound the layman. "Cataphyll" certainly confounded me on first encounter. The "phyll," frequently encountered in botanical names and terminology, is from the Greek word for leaf; "cata" is from a Greek word for down, below, or under. Presumably, then, a cataphyll is a down-, below-, or under-leaf. Swartz (1971) gives a delightful definition that illustrates the necessity for intellectual creativity and flexibility in interpreting botanical terminology:

cataphyll. A scale-like leaf found in buds, cotyledons, rhizomes, etc.; any rudimentary scale-like leaf which precedes the foliage leaf; the German *Niederblaetter*, .

an underleaf; a leaf present at the beginning of growth. A cataphyllary leaf.

An essential point relating to interpretation of Philipson's statement applicable to the evergreen azaleas is made by Eames' (1977) mention of axillary buds in his discussion of "bud scales, cataphylls":

Bud scales are like leaves in vascular supply and major features of ontogeny—apical and marginal meristems, axillary buds—and many taxa show stages transitional to the foliage leaf....

Just as buds located in the axils of the leaves or scales below the terminal bud are capable of producing vegetative shoots, so in subgenus *Tsutsusi* the bud scales or cataphylls within the terminal bud subtend buds capable of producing vegetative shoots as well as those producing flowers.

The cataphylls of the terminal buds of my *R. oldhamii* show the range of forms encountered in this structure. The outer ones appear to be small leaves with flattened and widened petioles. Others take the form of membranous bud scale with a tiny leaf blade (some only 1 or 2 mm long) growing from the apex. And some appear as simple bud scales with no leaf-blade development.

## References

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