
LEAVES, ELLIPTIC TO LANCEOLATE- OBLONG, OBTUSE, OR ACUTE. IF I ONLY KNEW WHAT THIS MEANS!

Alice Le Duc, Ph.D.
Manhattan, Kansas

Are you confused or frustrated by the botanical descriptions of *Rhododendron* species when reading about or trying to identify a plant? For example you might read the following description:

Low, much branched shrub; leaves evergreen, elliptic to lanceolate-oblong, obtuse, or acute, dark green and lustrous above, paler and slightly strigose below, 1-2 inches long; flowers usually solitary; sepals small, ovate, ciliate; corolla funnellform, 2-3 inches across, rosy purple to pink; stamens 5-10, anthers purple. June-July. Japan.

Did you recognize the description of *Rhododendron indicum* (L.) Sweet? How do you interpret the description and know the description is that of the plant you are trying to identify? You can refer to books with glossaries of terms to help you translate the descriptions. *The Manual of Cultivated Plants* by L. H. Bailey, published by Macmillan Company, New York, is one of the best. Still exasperated? See if the following discussion helps.

You are at the portals of the field in plant science known as **taxonomy**, which traditionally deals with the identification, naming, and classification of plants. Plant **morphology** treats the observable details in form and structure of plants. Today, genetic data from molecular biology (DNA, RNA, etc.) are being used increasingly to refine understanding of plant relationships and evolution. **Identification** is the recognition of certain plant characteristics, enabling one to associate a plant with a particular category in a classification scheme and apply the appropriate name to the plant. **Classification** places plants into a systematic arrangement of groups (**taxa**, singular **taxon**) having common characteristics, especially those resulting from common evolutionary descent. **Nomenclature** is the orderly application of names to taxa in accordance with international rules. The elements of plant names are associated with levels in the hierarchical classification system.

The **species** is the basic unit in classification—a unit or group of individual plants bearing close resemblance to one another; so much so that this group will not be mistaken for another group or combined with another group in the same genus. The **genus**, the next higher rank in the classification system, is a more or less closely related and definable group of plants including one or more species.

Below the rank of species, plants may be grouped into **subspecies**, **varieties**, or **formae** to distinguish them from other members of the species on the basis of minor morphological differences, sometimes associated with geographic provenance. Unfortunately, taxonomists differ on the criteria for use of the terms “subspecies” and “variety.” Thus the late Arthur Cronquist, an eminent American taxonomist, stated: “Nowadays one taxonomist’s subspecies is likely to be another’s variety.” For horticultural plants, the **forma** designations once

used for trivial variations within a species are in some cases being converted into cultivar names. A **cultivar** (cultivated variety) is a variety developed horticulturally. With respect to woody ornamental plants, it is desirable to limit use of this term to **clones** (genetically identical plants that are reproduced by asexual methods). Many plants are **hybrids**, resulting from crossing of genetically unlike plants. Selections of these hybrids are commonly given cultivar names under the provisions of the *International Code of Nomenclature for Cultivated Plants*.

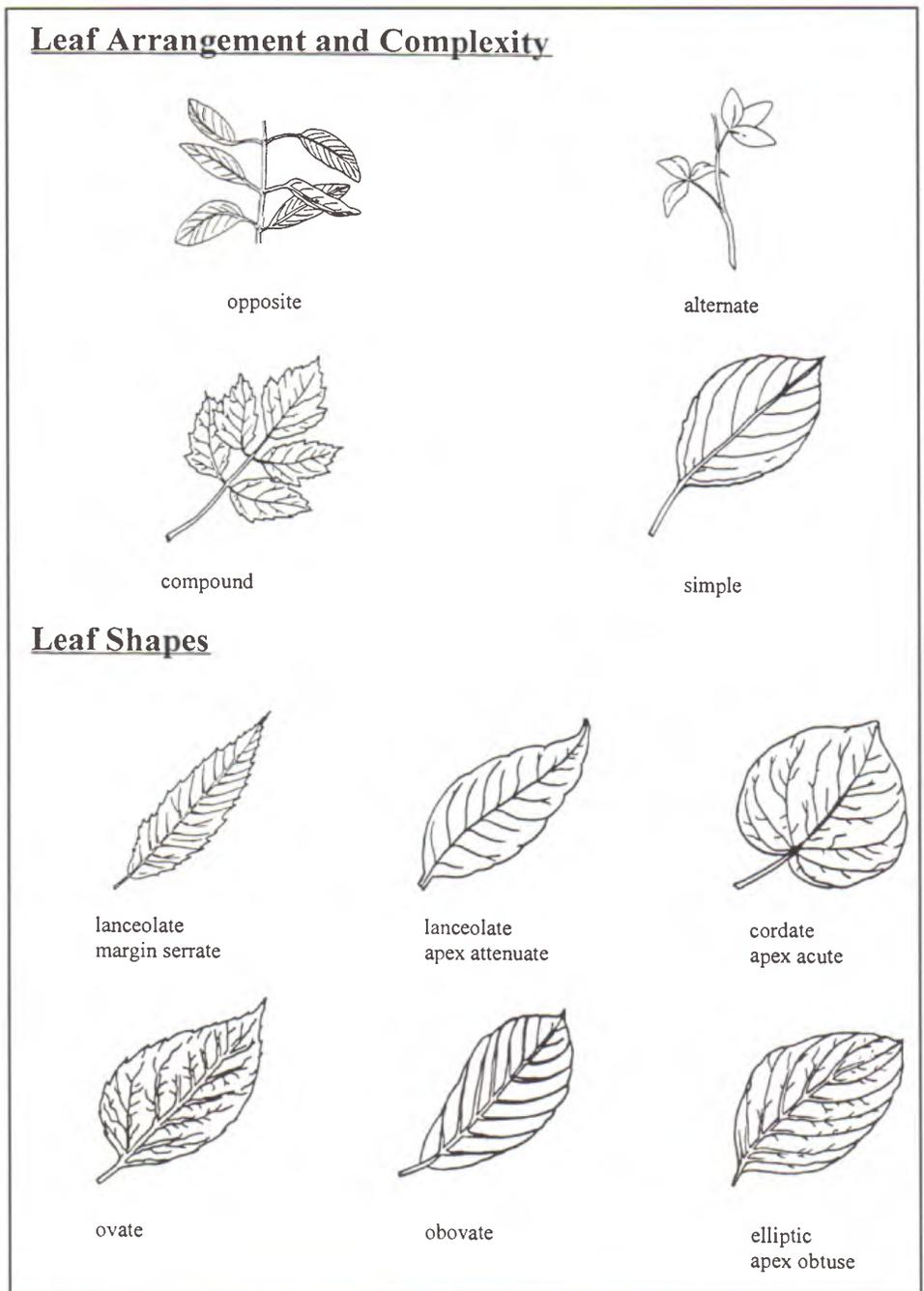
The botanists name plants under the “Botanical Code” and do so in a very logical way, using Latin or “botanical” terms. Using the description of *Rhododendron indicum*, let us go through each part step-by-step. First, why is there a letter and name written after the scientific plant name? (L.) Sweet is the authority, that is, the person(s) responsible for the name. The L. stands for Linnaeus; it is in parentheses because the English botanist and horticulturist Sweet reclassified Linnaeus’ *Azalea indica*, placing it into the genus *Rhododendron*, so the new name is *Rhododendron indicum*. *Indica* became *indicum* because the specific epithet (the descriptive term for the second part of the scientific name) must agree in gender with the generic name.

Now consider the plant description. Low, much branched shrub: this tells you something about the growth habit of the plant. It is a shrub, so it has numerous branches from the base of the plant rather than being a tree with a single trunk. Normally shrubs are from 18 inches to 20 feet in height. Next is the description of the leaves. First, establish the arrangement of the leaves on the stem and their duration (the above species description does not include leaf arrangement because it is considered part of the genus description, and thus the same for all included species). The point at which the leaf is attached to the stem is called the **node**. The region of the stem between leaves is

the **internode**. *Rhododendron* leaves are usually **alternate**, one leaf per node. Some are **pseudowhorled**, leaves still alternate but the internodes so short that the leaves appear to be attached to the stem at almost the same level (close observation will show that each leaf is attached just a little higher and in a spiral around the stem).

Leaf duration is **deciduous** if present only during the growing season, then falling from the plant; **evergreen** if present year round; or **persistent** if present all year but falling off just as the new leaves emerge at the start of the growing season. The evergreen azalea section of the genus *Rhododendron* may have **dimorphic** leaves, that is two different types. The first set comprises the spring leaves, which develop in the spring and drop from the plant in fall or winter. The second set of leaves, usually smaller and somewhat thicker, develop during the summer and persist on the plant till the following spring.

Next consider the overall shape of the leaf blade, the shape of the leaf tip and the leaf base. All rhododendrons have **entire** leaves; that is, the margin is continuous, not notched, toothed, or divided. The single **leaf blade**, the flat leafy portion, is attached to the stem by a stalk or **petiole**. If there is no stalk the leaf is said to be **sessile**. The overall shape of the leaf blade can be **elliptic**, in the shape of an ellipse, broader at the middle and more narrow at each end; **lanceolate**, lance-shaped, much longer than wide, widest point below the middle; **oblan- ceolate**, inversely lanceolate, attachment is at the more narrow end; **oval**, broadly elliptic, the width over one-half the length; **ovate**, egg-shaped in outline and attached at the broad end; **obovate**, inversely ovate, attachment at the more narrow end; **oblong**, longer than broad, two to three times as long as wide, with sides parallel and ends rounded. The leaf tip is called the **apex** and its shape may be **rounded**, gently curved; **obtuse**, forming an angle greater than a right angle; **acute**, forming an angle less than a



right angle; **attenuate**, drawn out into an elongated tapering point; **acumi- nate**, with the tip more or less pro- longed into a tapering point; **muc- ronate**, abruptly tipped with a small point, projecting from the midrib. The shape of the base of the leaf where the blade attaches to the petiole may be acute, acuminate, rounded the same as the tip, or it may be **cordate**, heart- shaped; **cuneate**, wedge-shaped, the petiole attached at the sharp angle. As noted, the margin of the *Rhododendron* leaf may be described as **entire**,

smooth, devoid of any indentation. [Leaves in other genera may be entire or **serrate**, sharp teeth pointing forward; **dentate**, having sharp teeth pointing outward; **lobed**, with inden- tations extending 1/4 to 1/2 the distance to the base or midrib; **revolute**, the margins rolled backward toward the underside; **sinuate**, margins wavy.] Last consider the leaf surface, it may be **dull**, no shine, or **lustrous**, shiny; **glabrous**, smooth, without any struc- tures such as hairs; **glaucous**, covered with a bloom (whitish or bluish waxy

coating); **lepidote**, covered with small, scurfy scales as in *R. mucoranulatum* and *R. minus*; **pubescent**, covered with hairs. The hairs come in many different types: **puberulent**, minutely hairy, with fine, short hairs; **scabrous**, rough to the touch from the presence of short stiff hairs; **setose**, covered with bristles; **strigose**, bearing straight, stiff, sharp, hairs that are **appressed** (flat against the leaf surface); **tomentose**, covered with short, matted or tangled, soft woolly hairs (as in the indumentum of many large-leaved rhododendrons); **villous**, having long, soft, shaggy, but unmatted hairs; **pilose**, having long soft, straight hairs; **ciliate**, a marginal fringe of hairs. Some hairs may be **glandular**, bearing a gland at the tip of the hair containing a sticky liquid, making the plant feel sticky, **viscid**.

The **inflorescence** is the flowering structure. There may be several to many flowers in each inflorescence or there may be only one flower in the inflorescence, i.e. **solitary**. The flower is the reproductive organ of the plant. Terms relating to the flower include: **pedicel**, the stalk of each individual flower in a cluster; **peduncle**, the stalk bearing the entire inflorescence or a solitary flower; **calyx**, a collective term for the sepals; **sepals**, the outer whorl of the floral envelope; **corolla**, a collective term for the petals; **petals**, the inner whorl of the floral envelope; **perianth**, a collective term for the calyx and corolla, especially if they are

similar in appearance; **stamen**, the pollen-producing part of the flower (male reproductive system); **filament**, the stalk of the stamen; **anther**, the structure (attached to the filament) where the pollen is produced; **staminode**, a sterile (non-pollen-producing) stamen; **pistil**, the female reproductive system, composed of the ovary, style, and stigma; **ovary**, the enlarged basal portion of the pistil where the **ovules** are borne (future seeds); **style**, the stalk that connects the stigma and ovary; **stigma**, the top portion of which is the receptive area for the pollen grains. Some of the descriptive terms for sepal and petals are the same as for leaves. The corolla has several specific terms: **tube**, the basal part of a corolla where the petals are grown together; **throat**, the expanded portion of the corolla between the limb and the tube; **limb**, the expanded blade of the corolla or petal, (where the petals are united the limb may be composed of several **lobes**). The shape of the corolla may be **campanulate**, bell-shaped; **funnelform**, having the shape of an elongate funnel; **rotate**, radiately spreading, in one plane, with a short tube; **salverform**, a cylindrical elongated tube and spreading rotate, abruptly flared limb; **tubular**, cylindrical and hollow, having an elongate tube and a short limb; **urceolate**, urn-shaped, having a tube that is expanded below the middle and narrow at the top.

The fruit of a rhododendron is a **capsule**, many-seeded, with several united carpels (**carpel**, simple pistil formed from one modified leaf, within may be one or more ovules), **dehiscing** (opening) **septicidally** (along the line of the union of each carpel). The seeds are tiny, and a capsule may contain from a few to well over 100.

Writing an article about morphological terms for plants is a bit like asking some one to write an article about tooth extraction, and about as exciting to read. I thought at some length on how to make a glossary of terms interesting and readable. I hope that my approach has been successful. However, for those still confused, pictures often are more helpful than words. The figures illustrate several of the terms defined above. If you prefer a simple reference sheet including and expanding on the above terms, you might wish to carefully remove the wrapper of this issue of **THE AZALEAN** and save it with your books on rhododendrons.

Dr. Alice Le Duc
Department of Horticulture, Forestry and Recreation Resources, Kansas State University, Manhattan, KS 66506. □

F. Alice LeDuc is Assistant Professor in the Department of Horticulture, Forestry and Recreation Resources at Kanasa State University. Dr. LeDuc has a Ph.D. in Botany from the University of Texas in Austin (1993) and a M.S. in Ornamental Horticulture from the University of Maryland (1976). She was on the faculty of Texas A&M University for 12 years teaching horticulture.

[Editor's Note: I originally arranged with Society member and contributor to **THE AZALEAN** Dr. John C. Pair (horticultural researcher and Director fo the Kanasa State University of Horticulture Research Center, Wichita, Kansas) to write this article on botanical terms for **THE AZALEAN**. After a bout with a brain tumor in early 1997, Dr. Pair arranged for his colleague, Dr. Alice LeDuc to write this article. With regret, I report that Dr. Pair lost his battle in January 1998.]

