

HANDBOOK

THE RHODODENDRONS
OF
SIKKIM



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RHODODENDRON MONOGRAPH

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Modern classification has its roots in the work of Swedish botanist Carolus Linnaeus (1707-1778). He grouped species together according to shared physical characteristics, especially reproductive features. For example, he and others followed a classification where azaleas and rhododendrons were separated on the basis of stamen number: ten in *Rhododendron* and five in *Azalea*. Linnaeus made a big deal of this idea that the patterns in reproductive structures represented God's grand plan, and at least initially, he would brook no debate about these divine categories. It turns out that not all azaleas follow the rule, and indeed, there are plenty of rhododendrons with stamen numbers exceeding the supposed cardinal number, which is one of the reasons we can't really justify two separate genera for the rhododendrons and azaleas. Leaving aside Linnaeus's slavish devotion to strict categorization for plant groups, one is, nevertheless, left to come to terms with a serious diversity of species in *Rhododendron*. How do we make sense of it? How does it all fit together?

The earliest plant classifications were based on obvious physical attributes or, especially, economic uses. Can it be eaten? Does it kill fish? Can we shelter under its leaves or build a dwelling with it? Taxonomy is the practice and study of classification, and folk taxonomies may seem simple and utilitarian, but they can be sophisticated. The practitioners of traditional medicine can be seen as taxonomists in their own right because of their knowledge of the uses of various materials derived from many different plants. It almost goes without saying that the more "things" the taxonomist studies, the more necessarily complex a

classification becomes. Particularly following the Scientific Revolution and the introduction to the West of new plants and animals, taxonomists have been most interested in comparative morphology; that is, grouping organisms on the basis of similar physically identifiable characteristics. Such systems of organization can be very powerful, especially if the taxonomist is experienced and recognizes as Linnaeus did that some features are more indicative of relationships than others. Counting stamens actually works much of the time, but sometimes appearances can be deceiving. Modern molecular (DNA) analyses have shown time and again where prior assumptions about relatedness based merely on physical similarities have been wrong.

The genus *Rhododendron* includes more species than the early taxonomists ever imagined, and their diversity is remarkable. Some tropical rhododendrons produce tiny, tubular flowers and even tinier leaves that make plants look like heathers. On the other hand, some rhododendrons are forest trees, and still others grow as epiphytes upon those trees. Floral morphology is still a basic tool in classification of these plants, but a number of non-floral features are also used in conjunction to classify the approximately 1000 *Rhododendron* species. For example, early in the history of rhododendron classification, people observed that plant parts were variously scaly or hairy, and that these features could be used to differentiate major groups of species.

Following the flood of previously undescribed rhododendrons coming into British gardens from the Sikkim Himalayas and China in the late 1800s and early 1900s, scientists began to look seriously at bringing logical order to this diverse group. Early in the last century, Sir Isaac Bailey Balfour (1853–1922), professor of botany at the University of Edinburgh and regius keeper of the Royal Botanic Gardens, Edinburgh, popularized a system based on rhododendron flower and leaf features that grouped plants around a number of “signature” species. Each of these species exemplified a particular set of features and each of these sets was called a “series.” The Balfourian system is well entrenched in the rhododendron world; however, important aspects of this system have been misunderstood, probably since its inception. Balfour created the system as an informal stop-gap to help categorize the new species that

did not fit the existing categories. His was always meant as a temporary measure until a more thorough, botanically robust system could be developed to accommodate the new introductions. Unfortunately, the Balfourian series and subseries caught on, but were never formally validated, which left his system open to a certain amount of scientific debate. Nevertheless, the scheme was widely used, and still is to some extent, especially in horticultural circles.

Rhododendron botanists, as might be expected, eschew such informality, preferring hierarchical systems that reflect actual relatedness and evolutionary history. In 1949, Dr. Hermann Sleumer developed such an arrangement of subgenera, sections and subsections that was subsequently embraced by most *Rhododendron* taxonomists. The Edinburgh system, which is now universally accepted as the most accurate representation of the genus *Rhododendron*, is a refinement of Sleumer's original concept. Modern classifications endeavour to capture the nature of adaptation and evolution in their subjects and the legitimacy of the Edinburgh system is based on traditional comparative botanical study, field research, genetics, chemistry and decades of modern molecular analyses. Rhododendrons are an incredibly diverse group and their classification is challenging, not least because many of the species grow in relatively inaccessible places and hybridization in the wild is common. The number and range of rhododendrons growing in the Sikkim Himalayas³⁵ species representing two subgenera, three sections and 22 subsections in an area one fifth the size of Scotland is remarkable. It's not surprising that these rhododendrons triggered a revolution in taxonomy.