PLANTS OF THE SMOKY MOUNTAINS

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If you are a scientist interested in plants from a taxonomic or ecological view point, or if you are an amateur botanist interested in exploring and collecting new plants, or if you are a nature lover interested in the many intricate phases of nature, you will find the Smoky Mountains to be an alluring place. While other of our American mountains may be noted for their glaciers, or hot geysers, or stupendous waterfalls, the charm of the Smokies lies in the luxuriant growth of plants which covers everything. In 1926 an area of 150,000 acres on the border of Tennessee and North Carolina was purchased from more than 6,000 owners and set aside as the Great Smoky Mountain National Park to be kept in its unspoiled condition for all time. Since that time the area has been expanded to more than 400,000 acres.

Anyone who loves trees will surely love the Smokies. When one looks up at mountains thickly covered with trees of

from the mountain top looks down on millions of tree tops, he comprehends in a small way the "symphony" of a forest. Fir, spruce, pine, oak, ash, maple, and many others all blending their characteristic shades into one harmonious whole.

With the exception of a few areas known as "balds" these mountains are completely covered with trees. Fogs are abundant and rainstorms are frequent. This abundance of moisture and also the range of temperature is reflected in the vegetation. Here trees become giants and shrubs become the size of trees. Tulip poplars (*Liriodendron Tulipifera*), reach a diameter of nine feet and those of six feet are not rare. Hemlock, oak, ash, and maple sometimes reach more than five feet in diameter. Cherry, buckeye, black gum, spruce, and others grow larger than elsewhere. One hundred and forty species of trees have been recorded in the Smokies. Growing within a mile of one another one may find trees indigenous to southern Canada and northern Georgia. In the valleys and on the lower parts of the mountains there are hemlocks, tulip poplar, gums, and maples. Hardwoods are found on the lower peaks with beech and cherry being dominant. On the highest peaks are found Frasers fir and red spruce.

The shrubs of this region are very spectacular. The Smokies are famous for the rhododendron, azalea, and mountain laurel. The purple rhododendron (*Rhododendron catawbiense*) begins to bloom on the mountain slopes in early June. Some of these grow to more than twenty feet in height. Where they are not associated with trees they become impenetrable thickets and are known as heath balds. These thickets are locally known as "slicks" because the shiny surface of the leaves gives a slick appearance to the mountain side. Some heath balds have a remarkable development of moist fibrous brown peat frequently one to two feet deep. The purple rhododendron usually follows the ridges and is found with the firs. The white rhododendron (*Rhododendron maximum*) with its large waxy white flowers follows the lower ridges and sometimes streams. In low places it also forms thickets and has been known to reach a height of forty feet. There is also the dwarf rose-pink rhododendron, (*Rhododendron punctulum*) which is found on the summits or slopes with the purple.

There are four species of azalea, locally known as honeysuckle. The pink azalea (*Rhododendron nudiflorum*) grows through the woods and thickets. The white azalea (*Rhododendron viscosum*) is often a low branching shrub, but may become ten feet tall. It frequents swamps and its white blossoms are very fragrant. The smooth azalea (*Rhododendron arborescens*) may become twenty feet in height. Its pink and white flowers have a spicy fragrance. About the middle of June a whole mountain top may seem to be on fire with the flame azalea (*Rhododendron calendulaceum*).

The mountain laurel (*Kalmia latifolia*) is called "ivy" by the mountain people. Its cup shaped blooms of white and pink may be found in profusion in May and June along roads and trails and on the mountain slopes.

Two other interesting members of the heath family are leucothoe (*Leucothoe Catesbaei*) and sand myrtle (*Leiophyllum buxifolium*). Leucothoe, known as "dog hobble" is a shrub growing from three to six feet high, with bright green, lustrous, evergreen leaves, and smooth highly colored bark. It branches profusely from the ground to the top. Its flowers are clusters of small bell-shaped pink blossoms which occur in May and June. It is found along the mountain trails and associated with the rhododendron on the heath balds. A path on top of Mt. Le Conte leads through a dense growth of sand myrtle about knee high. This is a prostrate, much branched shrub, with rough broken bark and small dark green shiny evergreen leaves. At the ends of the branchlets may be found a few exquisite tiny white flowers tipped with pink or red. Sand myrtle is found in many small exposed areas at high altitudes. It fastens itself in crevices and covers many windswept rocks.

Some other shrubs which lend beauty to the landscape are dogwood (*Cornus*), blueberry, (*Vaccinium*), Devil's Walking Stick (*Aralia spinosa*), black haw (*Viburnum prunifolium*) and several other members of the honeysuckle family. The wahoo (*Euonymus atropurpureus*) is particularly showy in October when its

seed pods burst open displaying the orange colored seeds.

Common along the trails are such vines as Dutchmen's pipe *(Aristolochia macrophylla)*, trumpet vine *(Tecoma radicans)*, virgin's bower *(Clematis)*, wild grape *(Vitis)*, and green brier *(Smilax)*.

With perhaps the exception of December, some plants may be found in bloom in the Smokies at any time of the year. In January, spruce, fir, hemlock, partridge berry, *(Mitchella repens)*, and some green briers begin to bloom. Then follow the maples, willows, and bluets. Later, hepatica, phlox, violets, bloodroots, red bud, service tree, trailing arbutus, virginia bluebells, and meadow rue are found. In the summer come lady slipper and other orchids, iris, bleeding heart, silver bell *(Halesia carolina)*, sand myrtle, galax, columbine, daisies, spiderwort, and a host of others. There are seven kinds of trillium with various forms and colors ranging from white, yellow, and pink to deep maroon. In autumn there are asters of several colors, various species of mints, butterfly weed, lobelia, St. John's wort, golden rod, and sunflowers. In October comes the witch hazel which continues blooming into November.

Dr. A. H. Sharp of the Botany Department of the University of Tennessee says, "There are no less than 1,500 species of flowering plants to be found in these mountains in the growing season." O. M. Schantz of Chicago, a great Smoky Mountain enthusiast, has made thirty-nine trips to these mountains and on each trip has discovered new plants many of which are thought to be rare. Of the forty-six ferns listed for Tennessee he has found thirty-seven growing within a few miles of one another. Arthur Stupka, Park Naturalist of the Great Smoky Mountain National Park, reports that thirty ferns and twelve so-called fern allies have been collected within the boundaries of the park.

Dr. Sharp has recorded one hundred species of liverworts and two hundred twenty species of moss and new ones are being added constantly. There seems to be moss everywhere carpeting the ground, clinging to the bark of trees, and making a thick pad over rocks. On rocky slopes may be seen moss perhaps a foot in thickness, and always saturated with water. At many points where rock cuts have been made for trails, one finds water dripping from overhanging moss the whole distance of the cut.

One cannot help but be fascinated with the colorful, fleshy fungi which he will find along almost any trail. On the trail to Abrams Falls we found them every few feet; masses of coral mushroom *(Clavaria)*, several species of russula, the yellow sulphur mushroom *(Polyporus sulphureus)*, the white deadly amanita, *(Amanita phalloides)*, brackets of many sizes and colors, and busts of others. The study of these interesting plants in the Smokies is still in the pioneer stage. Dr. L. H. Hesler of the Botany Dept. of the University of Tennessee has classified eight hundred species of fungi since 1931. He says that intensive collection may reveal a thousand more different kinds.

This region is also a slime mould collector's paradise. Sixty-three have been recorded thus far. Practically no study has been done on the lichens and algae of the region.

Besides the heath balds which were previously mentioned there are areas known as grassy balds which present a very interesting feature of the Smoky Mountain flora. They are tops of mountains having a herbaceous cover, grass and sedge being dominant. There is no tree line, as we think of it in other mountains. In fact the highest peaks are forested and these grassy balds are only scattered dots throughout the whole. They vary in size from one-fourth acre to one hundred acres. A description of one of these balds will give an idea of what they are. Following the ridge from Clingmans Dome, the highest peak in the park, for two miles, one comes to the end of the ridge. Here inclining to the southwest is a treeless area of approximately seventy acres. It is at an altitude of 5,860 feet; that is 800 feet lower than Clingmans Dome. The soil is very deep and heavy. The cover is dominately sedge with some oat grass *(Danthonia)* and a few other herbaceous plants. This expansive area is dotted with a few widely scattered shrubs, viburnum, gooseberry, and rhododendron. The shape of the area is roughly square in outline. The east and south sides are bounded by fir and spruce of average size. On the west and north there is a border of shrubs,—low brambles grading into higher shrubs

and tall rhododendron which border fir and spruce. There is a spring on the southwest corner. There is no evidence of fire or grazing. Other balds vary in size, shape, herbaceous cover and soil moisture. Most of them tend to a southern exposure, but not all. These grassy balds have been called a "forest enigma" and present an ecological problem which is only now being solved. There is no legend of Indian occupancy. Early theories gave fire or extreme climatic conditions to be the cause of these balds. More recent theories are that they are of ancient human origin. It is no doubt true that several different factors have entered into the formation of a bald and that respective balds have been initiated by entirely different causes.

Because the Smoky Mountains contain an unusual variety of plants it follows that the animals which are dependent directly or indirectly on the plants are also found in abundance. Many species of mammals, birds, reptiles, insects, and other groups are found; and their relationship to one another and to the flora present interesting and challenging problems. This region is truly a nature lover's paradise.