Orchids are one of the largest and most diverse families in flowering plants. Many genera have adapted to very specific pollinators and so have evolved very different forms. So the important question arises as to which of their characteristics can be called up to give them an identity as a group. What can we look to, to be able to spot a plant as modest as a rattlesnake plantain, and find a cousin in a huge, showy Cattleya and know that they are closely related?

First of all, orchids are monocots. This means they are kin to lilies, tulips and grasses, and some of their strongest identifying features are ones they have in common with this large group of plants. I speak of parts in threes, stalkless leaves with parallel venation, a herbaceous habit, and adventitious roots. The flowers of orchids, like many monocots have sepals and petals that are alike in appearance, primarily in the fact that both are petal-like with a wide range of color and pattern. The three sepals and two of the petals are often very similar in form. However the median of the three petals in orchids, really takes off. It is known as the labellum or lip, and its intricate and diverse forms are one of the reasons orchids provide such constant excitement. If the flower were to grow normally this lip would be at the top of the bloom, but orchids are what is known as resupinate. That means as the flower grows it undergoes a twist in the pedicel or inferior ovary of 180° and the lip ends up at the bottom.

Orchids have two primary habits. By far the largest number are tropical and epiphytic, plants that grow on other plants for support. They are not parasites, but grow in the crotch of limbs or along the branches with ferns and bromeliads and provide their own water and nutrients. This is done in a number of ways. Some have vertical stems that swell to become storage organs, and these are called pseudo-bulbs. Others have aerial roots enclosed in a whitish tissue called velamen that is designed to absorb and hold water. Often the aerial roots of the epiphytes will grow upward to form nestlike structures, to catch nitrogen rich matter. Other orchids, especially our temperate natives are terrestrial. They grow like most flowering plants with their roots anchored in the ground, although their roots may still have velamen, and sometimes tubers. There are some orchids that combine features of both of these growth styles, and there are even some genera that are saphrophitic, growing on dead organic matter, without chlorophyll.

Vegetative growth also takes two primary forms. Monopodial growth implies a single vertical axis for the life of the plant. Seasonal growth continues upward, and the pattern of leaves is often as great a graphic element as the flowers. The entire, alternate leaves of monopodial orchids fold into each other, right and left, leaf by leaf. Aerial roots and flower stalks originate from the nodes, and hence from between successive leaves. Vanda and Phalaenopsis are two genera typical of monopodial growth. Vertical growth that starts anew each growing season along a lateral stem is called sympodial, and this is by far the most common form. Sometimes the inflorescences are lateral as in Dendrobium, Cymbidium and Oncidium. Other sympodial plants have terminal flowers, such as Cattleya, Laelia and most Epidendrons. It is with the sympodial orchids that you will find pseudobulbs.

One of the major unifying features of this incredibly diverse family is the fused male and female elements of the flower. The stamen, usually single (but with two in the slipper orchids) is fused to the style and stigma of the pistil. The anther takes the form of a cap at the apex of this combined unit, called a column, or a gymnostegium (if you want to impress your friends). Under this comes the stigma whose three lobes have
evolved into two hollow receptive areas separated by a center sterile beak. This is called a rostellum, and it functions in various ways to abet the distribution and reception of the pollen. The pollen in this family is also distinctive, clustered together in soft or bony masses called pollinia, that take on as many individual forms as there are genera. Part of the reason for the presentation of the pollen in this manner is the fact that the inferior ovary contains thousands of ovules, and the packages of lots of pollen are delivered by the pollinators (mostly bees) to serve this purpose.

The perianth is clearly in sets of three, The middle sepal reaches upright with two lateral sepals at either side, the two lateral petals alternate with these and often are quite similar in appearance. Opposite and below the upper sepal and differing wildly in most cases comes the median petal. This lip or labellum takes on many forms, some spurred, some extreme and highly decorated. In Cattleya and Laelia the lip becomes tubular, in the slipper orchids a pouch. In some cases the lip even reverses direction as in the spider orchids where it lets the other five tepals steal the show. In the subfamily Cypripedioideae, the slipper orchids, the upper sepal becomes a bit showy and is called a fan, and the two lower sepals often fuse together and lay directly behind the sacklike labellum. This is also the group that retains two stamens. You can find them under the anther cap on either side of the style. In most cases the lip conceals or at least distracts the eye from the column, which remains a rather modest element in all this spectacle.

What can I say about that miracle of diversity, the orchid flower? It ranges in size from downright tiny (where it is usually assembled in spikes or racemes) to spectacularly large single blooms. The color and patterns look as if designed on drugs, although each species has been adapted to lure some particular and often unsuspecting pollinator. The texture of orchid flowers is another challenge, and here again they range from the most delicate tissue to very hard and waxy surfaces.

There are numerous texts on these plants and the internet can always be counted on to supply help on specifics of identification and morphology. I haven't touched on the problems of naming orchids. Since so many are hybrids there is an entire nomenclature apart from our Latin binomials that is kept in something known as Sandler’s Complete List of Orchid Hybrids. Suffice it to say here that you can tell a hybrid by the fact that what would normally be regarded as the specific epithet is capitalized. In some cases they create an ‘artificial’ name made from parts of the parental genera like Brassolaeliocattleya. Yuk.