The Orchidaceae

The ability of orchids to exploit the physical and biological environment for the purpose of perpetuating their kind is unmatched by any other plant family. There are too many orchid genera in the Conservatory's collection to cover them all. We have selected the following as they are often found in the galleries:

*Bulbophyllum*
*Cattleya*
*Coelogyne*
*Cymbidium*
*Dendrobium*
*Dendrochilum*
*Dracula*
*Masdevallia*
*Miltonia*
*Miltoniopsis*
*Oncidium*
*Paphiopedilum*
*Pleurothallis*
*Stanhopea*
*Vanda*

For information on orchid care, visit the American Orchid Society's webpage, www.aos.org, and click “All About Orchids”. This is an excellent resource to recommend to visitors who have questions about growing orchids.

As you read the enclosed information, reference this diagram listing parts of an orchid flower:
Orchid Reproductive Parts

- Column contains anther (male) & stigma (female) parts
- Sepal
- Petal
- Lip or Labellum

- Landing pad for pollinator

- Anther (male) is where the pollen is produced
- Female
- Stigma
- Pollinium
- Rostellum is the flap of tissue that separates anther (male) from stigma (female) to discourage self pollination
- Anther Cap

- Viscidium sticky tab that adheres the to pollinator
- Pollinia usually in pairs, but there can be up to 8

Conservatory of Flowers
Updated: 7/14
Orchid ID Worksheet

There are over 25,000 members of the orchid family, but all orchid flowers have:

- **3 sepals**
- **3 petals** with a fancy one called the lip or labellum. The lip is usually very colorful or has a special shape to attract insects for pollination.
- The petals are the front whorl; the sepals are the back whorl. Sometimes petals or sepals are hidden or fused.
- **A column.** In most flowers the male and female parts are separate. However, in orchids they are combined into the column, which contains the stigma, the “female” part of the flower and the anther, the “male” part of the flower. In most orchids the anther is located at the front top part of the column. The anther is made up of the anther cap, which protects the pollinia (pollen masses), and the anther is often sticky to help it attach to the pollinator. Most orchids have two, four or eight pollinia. No orchids have loose pollen grains.
- **Bi-laterally symmetry.** Orchids may only be cut in half vertically (through the dorsal sepal, splitting the lip in half), not horizontally, to produce mirror images.

Label all the flower parts visible in the photos:

- Dorsal sepal
- Lateral or fused sepal(s)
- Petals
- Lip
- Anther cap

**Phalaenopsis**

No pseudobulbs. Large thick leaves. Robust, reaching roots.
**Paphiopedilum**
No pseudobulbs. Shoots with several leaves. Long fleshy roots.

**Oncidium**
Prominent oval-shaped pseudobulbs. Long, thin leaves.
BULBOPHYLLUM

Containing over 1,000 species, Bulbophyllum is one of the most diverse and truly odd orchid genera. To help you recognize the genus, here are photos of plants similar to those found in COF:

*Cirrhopetalum, B. longissimum*  
*B. scaberulum*

*B. frostii*  
*B. eberhardtii*

**Country of Origin:**
Most species occur in Southeast Asia, particularly New Guinea.

**Native Habitat:**
Rain forests and cloud forests. Epiphytic.

**Galleries where found:** Aquatics, occasionally Highlands and Potted Plants

**An interesting adaptation of this plant is** that most are pollinated by flies attracted by floral parts moving in the breeze or fragrances of urine, sap, blood, dung, or rotting meat. The odor of *B. beccarii* has been compared to a herd of dead elephants. If you have a sensitive sense of smell, you might notice that there’s a Bulbophyllum in the Highlands gallery by odor alone.

**General Plant Description:** One or two leaved pseudobulbs spaced closely along the rhizome. Inflorescences arise laterally from the base of the pseudobulb rather than the top of the pseudobulb. Most flowers are small and have a column that is hinged to the lip, making the lip flexible.
CATTLEYA

Country of Origin: Mainland Tropical America

Native Habitat: Lower elevations in wet forests. A majority are found in treetops.

Galleries where found: All

This plant is noteworthy because... A premier flower in the floral industry. Creating hybrids and prize plants challenges orchid enthusiasts.

An interesting adaptation of this plant is that some have a pseudobulb on every leaf to store water and nutrients, which are used in the latent season of the plant. In the wet season new leaves grow twice as fast.

General Plant Description: Cylindrical pseudobulbs. Thick leaves. Large showy flowers.
COELOGYNES
(see-lodge-eh-nee)

Country of Origin:
India, China, Indonesia, Fiji

Galleries where found: Aquatics. Coelogyne pandurata, pictured left, is usually next to the west bench. The C. cristata seen below is sometimes found in Highlands.

This plant is noteworthy because the black lip of C. pandurata is considered very desirable with orchid collectors, as true black is rare in orchids. The wild population of this orchid has decreased due to loss of habitat and over collecting.

An interesting adaptation of this plant is that the flower smells like honey to attract pollinators.

General Plant Description: Epiphytes. Spikes of showy flowers arise from the apex of the pseudobulb. The dorsal sepal is usually concave and hangs over the lip, which has a series of lamellae (tufts or areas of hairs or glands). Most Coelogyne range from green to white to beige.
**CYMBIDIUM**

**Country of Origin:** S.E. Asia, China, Japan, Indonesia, Australia.

**Native habitat:** high altitude or temperate climates to the lowland tropics.

**Galleries where found:** Potted Plants.
Most cymbidiums at COF are actually grown outside all year round and moved inside when blooming.

**This plant is noteworthy because** although there are approximately only 44 species, thousands of hybrids exist. The flower is popular in the florist trade for corsages and floral design. Cut flowers last for weeks. They are widely grown in Bay Area gardens.

**An interesting adaptation** is that species exist as semi-terrestrials, lithophytes and epiphytes (especially the lowland tropics).

**General Plant Description:** Flowers are 3-4 inches, and in dozens of color and marking combinations. Pseudobulbs are mostly hidden by leaf bases. Linear leaves.
DENDROBIUM: General

Country of origin: wide Malay and Indonesian distribution; Australasian including New Guinea, New Caledonia, Borneo, the Solomon Is. Japan, southern China, Taiwan, Korea.

Native Habitat: low to highland tropics to 3000 meters (10,000 ft.) temperate climates.

Galleries where found: Aquatics, Highlands, Potted Plants.

Noteworthy because: This genus is one the largest genus of orchids with over 1,000 known species; by itself, surpassing the number of species in many other flowering plant families. And the number grows as more are being assessed and named.

An interesting adaptation of this plant is that members are found in virtually every environmental niche throughout its geographical range: as epiphytes growing high in the forest canopies, on old wooden stumps in forest clearings, in trees suspended above riverbanks, growing on river embankments, as lithophytes, and sometimes as semi-terrestrials growing in pebbles and humus.

General Plant Description: Classification of such a large and diverse group as the Dendrobiums poses an extraordinarily challenging task even for taxonomists involved with identifying, naming, and establishing their evolutionary relationships. Three types are discussed in the following pages.
DENDROBIUM: Monsoon Groups

**Country of Origin:** From the highlands of Burma, Nepal, India

In the foothills of the Himalayas bountiful and spectacular floral cascades from the boughs, trunks, and rocks announce the coming of spring in advance of the monsoons. Two basic types predominate:

**TYPE 1:** Deciduous or semi-deciduous cane-like stems, often pendant creating a dazzingly fountain effect. Flowers last only six to eight days. These were a Victorian era favorite.

Photo: *Dendrobium loddigesii*

**TYPE 2:** Persistent leaves. Clusters of semi-erect to erect grooved stems bearing multi-branched densely flowered, often delightfully fragrant, short lived inflorescences.

Photo: *Dendrobium chrysotoxum*
DENDROBIUM: The Phalaenopsis Look Alikes

Botanical Name: *Dendrobium bigibbum var. phalaenopsis*

Common Name: Dendrobium phalaenopsis

Country of Origin: New Guinea and Australia

Native habitat: as a lithophyte on exposed rocks, steamy, warm with uniform rainfall.

Galleries where found: Aquatics, Potted Plants

Interesting Adaptation of this plant is its ability to grow as a lithophyte in any crack as long as the drainage is perfect.

General Plant Description: Stems terminate with sprays of Phalaenopsis-like flowers grown in Hawaii for leis and cut flowers.
DENDROBIUM: The Antelope Group

**Common Name:** Antelope orchid

**Country of Origin:** NE Australia and Papua New Guinea.

**Galleries where found:** Aquatics and Potted Plants.

**This plant is noteworthy because** it bears twisted erect sepals reminiscent of unicorn horns. Petals are also twisted.

An interesting adaptation of this plant is that it is found growing in the wild almost exclusively on paper bark trees.

DENDROBIUM: Atypical, But Worth Knowing

**Botanical Name:** *Dendrobium secundum*

**Country of Origin:** Burma, Thailand, Philippines

**Native habitats:** Dry forests lowland tropics.

**Galleries where found:** Aquatics, Potted Plants

**This plant is noteworthy because** it bears spectacular trusses near the tops of old and new growth. Flowers are small, but numerous, and of a heavy glowing substance, pure pink or white sepals and petals with a brilliant orange lip.

An interesting adaptation of this plant is that it can bloom any time of year, though it is partial to tropical day length. Drought tolerant.

**General Plant Description:** Tall stems with persistent alternate leaves.
DENDROCHILUM

Common Name: Inflorescences are often reminiscent of pendant stalks of wheat, hence “wheat orchids”. Also known as necklace orchids.

Country of origin: Sumatra, the Philippines, and Borneo.

Native Habitat: From the lowland tropical wetlands to the subalpine mountain tops.

Galleries where found: All

This plant is noteworthy because in time it develops into spectacular plants bearing thousands of flowers blooming on pendant racemes 3-4 times a year. One of the easiest plants to bloom in the home in a cool room with an eastern exposure.

An interesting adaptation of this plant is its incredible distribution within the tropics found everywhere except alpine regions. Adaptable as a lithophyte or epiphyte but in cultivation it requires regular watering. Pollination is probably affected by tiny flies, gnats, or extremely small stingless bees.

General Plant Description: Pendant inflorescences, often yellow or white and fragrant.
**DRACULA**

**Botanical Name:** Dracula (little dragon, because it looks like a dragon’s face)

**Country of Origin:** Wide spread throughout Panama and much of South America. New Species discovered every year.

**Native habitats:** Montane cloud forests

**Galleries where found:** Highlands

**This plant is noteworthy because** flowers generally hang face down reminiscent of bats or gargoyles in flight. Segregated from Masdevallia as late as 1986 and easily distinguished from it by lurid colors and the closest to black that occurs in nature. Petals reduced, but more prominent than Masdevallia. Most striking is the presence of a prominent lip.

**An interesting adaptation** of this plant is that certain species have their lip on a hinge that tends to hurl the pollinator against the column. Others display a callus (a thickening on the lip resembling certain fungi to attract flies).

**General Plant Description:** Short tufted plants with narrow stems and tongue-like leaves. Among the hairiest flowers of all Angiosperm.
MASDEVALLIA

Common Name: “I can’t find the petals”: Triangle Orchid.

Country of Origin: From Mexico throughout Central America. Columbia is especially rich in this genus. Extends Southward with Peru exhibiting the warmest growing forms.

Native habitats: Lithophytes, epiphytes, and as semi-terrestrials in the crannies of rocks. Most commonly in cloud forests.

Galleries where found: Highlands

This plant is noteworthy because in many forms petals are so recessed that a jewelers loop is necessary to reveal them and it prompts the question are they vestigial (like our appendix) or functional? The column may also be invisible and found deep in the fused basal tube of the flower. Other forms have prominent petals, but sepals usually predominate.

An interesting adaptation of this plant is the diverse scents, colors and texture of the group that relate to the small fruit flies (Drosophila) that pollinate them. Scents range from rotting gorgonzola to a ripe peach or apple.

General Plant Description: Color and texture are often akin to glossy tropical fruits with deep granular texture rich in nectar secreting glands. Fused sepals.

Types:
Masdevallia coccinea (top photo) red, orange, purple, and multicolored are prominent in cultivation.

Masdevallia foetens (right photo)“foetens” means stinks, muted colors with hairs, bumps and warts.
MILTONIA

Common Name: Sometimes, but mistakenly, called the “Pansy Orchid’, and this is best reserved for Miltoniopsis.

Country of Origin: Primarily Brazilian.

Native Habitats: Cloud forests with dry periods.

Galleries where found: Highlands, Aquatics

An Interesting adaptation of this epiphyte is that it adjusts to a fairly wider range of tropical conditions than its Columbian relative Miltoniopsis which decidedly prefers consistently cool and moist conditions. Pollination most probably by bees and hummingbirds.

General Plant Description: Relatively short, egg shaped, but thin pseudobulbs.
MILTONIOPSIS

Common Name: Pansy Orchid

Country of Origin: Primarily from Colombia to Ecuador.

Native Habitat: On the margins of heavily shaded montane cloud forests: high humidity, consistent annual rainfall, good air movement.

Galleries where found: Highlands, Aquatics

This plant is noteworthy because hundreds if not thousands of hybrids exist and are sold in the plant trade. Pansy types are most difficult to grow indoors and do best in conservatories and greenhouses under specific light conditions and with good air movement. Flowers last a very long time on the plant, but quickly fold if cut and placed in water.

An interesting adaptation of these epiphytes is that a number of species display guidelines on their lips which glow under ultra-violet light indicating bee pollination, though hummingbirds and wasps may also act as pollinators. Some species markings look like a moth or butterfly, however they are not likely pollinators.

General Plant Description: Flattened pseudobulbs sheathed at the base by two ranks of leaves, with one leaf attached to the top. Flower stalks emerge from the base.
ONCIDIUM

Derivation of Name: The diminutive form of the Greek word onkos (pad or mass), referring to the fleshy warty callus on the lip of many species.

Common Name: Dancing Doll Orchids

Country of Origin: Over 400 species native to the American Tropics.

Native Habitat: Primarily epiphytic. Large range - from breezy coastlines to cloud forests.

Galleries where found: All

This plant is noteworthy because lowland forms such as Oncidium ampliatum (right photo), with its abundant floral displays of yellow flowers fluttering in the breeze, appear as competing male bees of the genus Centris, and pollination occurs when angry male bees attack the flowers.

General Plant Description: Flat oval pseudobulbs terminated by a few single-folded leaves. The callus present on the lip may act to entice pollinators, but often offer no food. Some calluses are known to provide oil droplets, which are consumed mainly by bees.
PAPHIOPEDILUM
(and others in Cypripedioideae subfamily)

**Subfamily**: Cypripedioideae

**Botanical Name**: Paphiopedilum, also notable in subfamily are Phragmipedium.

**Common Name**: Lady Slipper Orchid

**Country of Origin:**
Paphiopedilum (left photo): Tropical Asia with a suspected significant number of unknown species to be discovered among the numerous species found in China. Phragmipedium: S America north to Panama and Guatemala.

**Native Habitat**: Lithophytes found mostly on limestone cliffs with abundant humus, or slightly alkaline humus enriched forest floors; virtually all species require shade of a forest canopy.

**Galleries where found**: Aquatics, Highlands, Potted Plants

**This plant is noteworthy because** all are trap flowers and, as far as known, none offers any reward.

**An interesting adaptation of this plant is** that scents released from glands within the trap-like slipper of numerous species attract flies or bees and odors range from foul to pleasant depending on the type of pollinator, consequently, it is suspected that there is a high degree of host specificity within the group.

**General Plant Description**: Pouch-like lip. Large, showy dorsal sepal. Lateral sepals are fused and usually hidden behind the lip. Hairy and warded petals. Most species have only one flower. No pseudobulbs.
**PLEUROTHALLIS**

**Country of Origin:** Central & South America

**Native Habitat:** Usually Highlands

**Galleries where found:** Highlands, the three pictured are permanently attached to branches and tree trunks.

**An interesting adaptation of this plant is** that they have very small pseudobulbs and instead have thick succulent leaves.

**General Plant Description:** There are over 1,000 species of Pleurothallis. As a group they show a huge range in vegetative form, are terrestrial or epiphytic, and can be found as tall cane-like plants, clumped or trailing, pendent or climbing, erect or creeping, tufted and tiny, and delicate moss-like species that can grow on the thinnest of twigs. But they have one common denominator: they all have two pollinia.

Their flowers are among the most diverse and unusual, although often very small, and specialize in using tiny insects such as gnats for pollination.

**Photos of plants found in COF:**
- top: *P. truncata*
- bottom left: *P. restrepiodes*
- bottom right: *P. cardiostola* (notice how the single flower is produced from the top of the heart-shaped leaf).
STANHOPEA

Country of Origin: Central & South America

Native Habitat: Damp forests

Galleries where found: Aquatics, Lowlands

This plant is noteworthy because its complex and usually fragrant flowers are generally spectacular and short-lived. Their pendant inflorescences are noted for flowering out of the bottom of the containers in which they grow.

An interesting adaptation of this plant is that with most Stanhopea flowers lasting three days or less, the blooms must attract pollinators very quickly. Chemical attractants attract the male euglossine bees to the flower. When the bee touches down on the flower, it slides on the waxy surface and glides down on the slippery lip to exit the flower. The long column is touched in the process, resulting in the bee taking up the pollinia (sticky pollen sac typical of orchids) at the very tip of the column. When the bee slides down another flower, the pollinia is deposited on the sticky surface of the stigma.

General Plant Description: Stanhopea orchids, which are mostly epiphytic, have two to three inch pseudobulbs topped with dark green, pleated leaves. The short-lived, large, waxy flowers usually appear in the summer or in the early fall, and hang dramatically out of the bottom of the plant. The limited colors range from white to yellow, with brown or black markings.
VANDA

Country of Origin:
Southern India, Australia, New Guinea, Tropical Asia

Native Habitat: Warm-growing, mostly epiphytic

Galleries where found: Aquatics

This genus is one of the most horticultural important orchid genera because it has some of the most magnificent flowers to be found in the entire orchid family. This has contributed much to the work of hybridists producing flowers for the cut flower market. *Vanda cerulea* is one of the few botanical orchids with blue flowers (actually a very bluish purple).

An interesting adaptation of this plant is that Vandas have monopodial growth habit, which means they grow vertically and reach incredible heights. There are some Vanda species that grew several meters tall. Monopodial orchids do not form pseudobulbs. The new growth will form from the end bud of an old shoot, and leaves and flowers are then produced along the new stem. Also due to the lack of pseudobulbs, the new growth is supported by succulent leaves that store the nutrients and moisture required for the new growth.

General Plant Description: Mostly epiphytic. Flattened, often spotted flowers grow on a lateral inflorescence. The lip has a small spur. Vandas usually bloom every few months and the flowers last for two to three weeks. The blue-purple colors are the most recognizable, but they come in a variety of other colors, from dark reds to yellows, to pinks.