



William T. Kemper Center for Home Gardening

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Orchids: Problems

As orchids become ever more popular as houseplants, the home grower may encounter problems such as cultural (physiological) disorders, as well as insect infestations and diseases. Orchids are remarkably resistant to pests and to diseases; however, when faced with a failing orchid it is important to be vigilant in correcting problems before they compromise the health of or kill the plant. Optimal cultural conditions can prevent most disease and pest infestations.

CULTURAL DISORDERS

If you have first checked your plant for insects and diseases the problem may be in how the plant is cultured. Many orchid problems closely resemble each other, so it is necessary to inspect your orchids frequently.

Water

Overwatering and underwatering are the major causes of orchid death. Water thoroughly in the morning by letting tepid water run freely through the container and out the bottom. This will usually involve setting the plant in a sink. Do not water again until the surface of the medium is dry, and do not let water remain in a saucer beneath the pot. Even though the surface of the growth medium is dry, that at the bottom of the pot may be soggy. Therefore, consider factors such as plastic versus clay pot, degree of light, air temperature, humidity, air movement, size of pot, thickness of the plant's leaves, etc. You can sometimes judge the degree of wetness by picking up the pot; wet growth medium will weigh more than dry.

Plants that are overwatered are prone to root rot because the roots are deprived of oxygen. Rotted roots in turn are subject to disease. Also, overwatering causes pseudobulbs and leaves to shrivel and grow slowly. The plant will fail. Underwatered plants exhibit the same symptoms and the same result, except the roots remain firm and white.

Also consider the quality of the water used. Water high in soluble salts is not suitable for orchids, although most city water is acceptable. Softened water with a high sodium content can be detrimental.

Some orchids with thin leaves develop "pleating" if there is inadequate moisture during foliage development. This cannot be corrected on the individual leaves once it has occurred; however, adjust the water schedule for future growth.

A condition called oedema occurs when roots take up moisture faster than it is lost by the leaves through evapotranspiration. The excess moisture causes cells in the plant's leaves and perhaps flowers to swell and develop blisters. On the foliage these eventually become corky bumps and remain on the leaf as long as it remains on the plant. No harm results to the plant, however.

Light

Light is another critical factor. Orchids vary in their light requirements. With insufficient light the foliage becomes very dark green, and new growth is weak and spindly. Different orchids naturally have differing degrees of “greenness”, so consider the genus when you evaluate this. Insufficient light also affects flowering, which may be reduced or eliminated entirely. The light in the prospective exposure needs to meet the minimum requirement for the chosen orchid.

With too much light foliage may become yellowish-green or red. Sunburn can result if light conditions are suddenly changed to a direct exposure. Sunburn produces scorched blotches on leaves or overall yellowing of the plant.

Light Requirements		
(footcandles)		
Low	Medium	High
500-1500	1500-3000	3000-4000
<i>Ludisia</i>	<i>Cymbidium</i>	<i>Dendrobium</i>
<i>Masdevallia</i>	<i>Dendrobium</i>	<i>Oncidium</i>
<i>Miltonia</i>	<i>Epidendrum</i>	<i>Vanda</i>
<i>Phalaenopsis</i>	<i>Laelia</i>	
<i>Paphiopedilum</i>	<i>Odontoglossum</i>	
	<i>Phragmipedium</i>	
	<i>Cattleya</i>	

Artificial light poses entirely different considerations than natural light. Group orchid plants of similar height together and use full-spectrum fluorescent bulbs. Alternately use cool (blue light) and warm (red light) fluorescent bulbs in the same light fixture. Light the bulbs for 12—16 hours per day, no more, and place them about six inches above the plants.

Weak growth and no flowers will result if there is insufficient artificial light, or if the temperature is too high when the lights are on. If the lights are drying out the atmosphere too much the orchids will have weak, shriveled, stunted growth. And if plants have good growth but fail to flower, the lights are being left on too long for short photoperiod (short day) orchids.

Temperature

Temperatures in the home can be a problem. Orchid genera have different temperature requirements. Under natural growing conditions outdoors, the temperature drops at night. Therefore, eliminate most temperature problems by dropping the temperature 10 degrees at night. A programmable thermostat makes this convenient.

With improper temperature new growths are softer and more spindly, and flowering may not occur.

Temperature (F.)		
Cool	Intermediate	Warm
Min. night: 50°	Min night: 55°	Min night: 60°
Max. day: 80°	Max day: 85°	Max day: 90°
<i>Cymbidium</i>	<i>Brassavola</i>	<i>Vanda</i>
<i>Masdevallia</i>	<i>Cattleya</i>	<i>Vanilla</i>
<i>Miltonia</i>	<i>Dendrobium</i>	<i>Ludisia</i>
<i>Odontoglossum</i>	<i>Epidendrum</i>	<i>Phalaenopsis</i>
<i>Oncidium</i>	<i>Laelia</i>	
<i>Paphiopedilum</i> (green leaves)	<i>Paphiopedilum</i> (mottled leaves)	
<i>Sophronitis</i>		

Nutritional Problems

Overfertilization and underfertilization are factors in orchid growth, although potting mixtures rich in decomposing organic matter and water that supply micronutrients mitigate nutritional problems. The general rule for fertilizing is “weekly—weakly” using half or quarter strength liquid fertilizer immediately after the plant has been thoroughly watered. Overfertilization inhibits growth and causes the tips of the leaves to turn brown. As soluble salts build up in the medium they may burn the roots, with disastrous results. If this occurs flush out the pot freely for several minutes with free-flowing water.

When plants are in active growth they may become calcium deficient. The young leaves turn black at the tips, and the blackening spreads down the leaf blade, preceded by a yellow halo. This may resemble sunburn. A fertilizer containing calcium prevents this deficiency. Check the label.

Potting Faults

When the plant becomes too large for the pot overcrowding occurs. It begins to fail, and older growth dies prematurely. Sympodial orchids (those such as *Cattleya* that produce new growth as rhizomes at the base of mature pseudobulbs) grow horizontally and eventually extend over the sides of the container. New roots become long, stiff and brittle. Dividing and repotting are required before the plant grows out of its pot. Monopodial orchids grow vertically by putting on new growth at the tip of the crown as older, bottom leaves die. The bottom of the stem becomes leafless and the plant is leggy. Monopodial orchids, such as *Phalaenopsis*, should be repotted as the old leaves fall off. Lower the plant in the pot so that the bottom leaves are at the surface of the growth medium. As a general rule, repot plants at least every two years after flowering and when new growth appears.

Overpotting creates another problem. In this case the pot is too large for the plant. This leads to overwatering because excess medium retains too much water and leads to root rot. Match the size of the container to the plant’s rootball rather than to its stem(s) and foliage. Orchids prefer to be fairly tight in their pots, allowing for only a couple of years' growth.

Chemical Toxicity

Plants may be injured or killed by herbicides and pesticides that are not recommended for use on orchids or have been mixed in the wrong concentration. It is important to use only chemicals that are approved for use with orchids, and that if used they are mixed at the dilution stated on the label.

Chemicals in the air, ozone and sulfur dioxide, because of a high degree of air pollution, can affect orchids. Ethylene in the air is a bigger problem. At high concentrations there is bud and flower damage, and older leaves turn yellow and drop. In addition to outdoor air pollution ethylene can come indoors from pilot lights, stoves and heaters, as well as from ripe apples. Proper ventilation is the solution.

Weeds

Weeds growing in orchid pots compete with the orchid plants. A type of *Oxalis* and a fern are especially prone to colonize orchid containers, and they are difficult to eradicate. Vigilance at pulling out the weeds before they become established is the best policy.

Bud Blast

Sometimes flower buds shrivel and fall off before they mature into flowers. Usually this occurs because of temperature fluctuations, low humidity or some other sudden change in the environment. Other causes are too much or too little water, inadequate or incomplete nutrients, pesticides, air pollution, pests, and a root mass that is marginal to support the plant. Check any of these conditions to correct future problems. Don't move a plant while it is in bud; wait until the flowers have opened.

PESTS

Although orchids are fairly resistant to pest infestation, regular inspection will identify any pest before it becomes a major problem. Correct any cultural condition, such as improper ventilation, that may be contributing to pest proliferation. In small numbers pests usually can be eliminated by simple means such as physical removal with an alcohol swab or water spray. If there are more than a few pests an insecticidal soap or refined horticultural oil may be the best course of action. Most pesticides are not registered for use on indoor plants. Check the label to assure that it can be used on orchids and follow label directions exactly. Resistant pest populations may result from pesticide use.

Scale

Several types of scale attack orchids. These are piercing, sucking insects that crawl when young, then attach to the leaves of the plant, where they remain. They cause yellow patches on leaves. They can also infect roots and flowers. Most commonly, a hard brown scale and a soft cottony white scale infect orchids, producing a sticky secretion called honeydew. Black sooty mold, which limits photosynthesis, sometimes develops on the sticky surface. Dislodge the scale insects with a swab dipped in 70% isopropyl alcohol or insecticidal soap. Use sprays of insecticidal soap or horticultural oil for larger infestations.

Mealybugs

These are small piercing, sucking insects that have a wooly white exterior covering. Look for honeydew and sooty mold. They are found in crevices of leaf axils, at the base of plants, on flowers, under the sheaths covering *Cattleya* pseudobulbs, etc. Any of the treatments suggested for scale should control them.

Aphids

Another piercing, sucking insect, aphid populations often build up rapidly in buds, flowers, and soft new foliage, causing deformities and yellowing. Honeydew and sooty mold may be present. Aphids are small, soft-bodied and pear-shaped. It is important to eliminate them because they are vectors of plant viruses. A strong water spray, insecticidal soap, or horticultural oil can often eliminate minor infestations, but insecticides may be required if the problem is out of hand.

Thrips

Thrips feed by rasping the plant cells of leaves and flowers and sucking up the exuding juices. They leave silvery markings with a rough surface on the leaves. They are very small, and a hand lens is required to see them. It is important to eliminate them because they are vectors for bacterial, fungal and viral diseases. They are favored by dry conditions, so increase humidity. Destroy infected flowers. Use insecticidal soap or horticultural oil on the leaves.

Mites

Several types of mites attack orchids including the two-spotted mite, red spider mite and false spider mite. They occur when plants are stressed by less than optimal cultural conditions and thrive in a hot, dry atmosphere. Mites are extremely small and only seen with a hand lens. Fine webs may be present. Mites cause large silvery white areas where they have sucked the juices from the leaves. Improve humidity and ventilation. Destroy infected plant debris. Isolate infected plants and wipe with insecticidal soap. Use horticultural oil, insecticidal soap, or a miticide. (Mites are not insects.)

Snails and Slugs

Snails and slugs can cause harm to all parts of the orchid. They gnaw on pseudobulbs, eat through flower spikes, buds and flowers, and damage new roots. They are most active at night. Chemical slug bait is toxic to humans and animals, so it is best to use other means of elimination. A spray of vinegar and water kills slugs. Immerse the infested pot in a bucket of water; snails will float to the top after several minutes. Place preferred slug food, such as sliced apple or banana, on top of the growth medium at night. Then in the morning hand pick and discard the pests that have gathered there, along with the fruit.

Millipedes

These are “thousand-legged worms” that live in soils and feed on humus and dead plant material. They can damage roots, particularly of young plants. Repot the plant in a clean, sterile pot with new, sterile culture medium. Prevent accumulation of excess moisture.

Other Pests

Other pests can include fungus gnats, springtails, caterpillars, wasps, cockroaches, nematodes, beetles, weevils, and mice.

DISEASES

Although orchids are not naturally disease prone, over 100 diseases can attack them. Diseases of orchids are caused by bacteria, fungi, and viruses. They are classified as leaf spots; flower blights; and root, stem and pseudobulb rots, which are the most serious. Prevent diseases by maintaining optimal horticulture and sanitary practices. Purchase disease-free plants and segregate new plants for 4—6 weeks. Don't mix

orchids with non-related plants. Don't cross-contaminate; sterilize cutting tools between working on plants. Sterilize pots before reusing. Don't place too closely together. Inspect plants closely at least weekly as you care for them.

Bacterial Diseases

These usually progress rapidly. The affected areas of the plant are soft, wet and decayed, and there is an offensive odor.

Soft Rot

This results in soft brown decay and is caused by two *Erwinia* spp. that occur worldwide. It is favored by warm to hot temperatures with excessive moisture. If the lesion is small, cut it away with a sterile blade and dust the wound with powdered sulfur. Reduce moisture. It may be best to discard the plant.

Brown Rot

This disease also is caused by an *Erwinia* sp. and can kill the plant in a matter of days. Wet, brown spots appear on leaves and pseudobulbs. It occurs when the temperature is too low and the humidity too high. Improve cultural conditions and cut away the infected area with a sterile blade if the infection is in the early stage. Dust the wound with powdered sulfur. Since disease progression is so rapid, it may be best to discard the plant rather than using antibacterials.

Brown Spot

The causative bacterium is a *Pseudomas* sp. that produces water-soaked lesions on the leaves that become brown and black and advance rapidly. This is the most common and severe disease of *Phalaenopsis* orchids. If the lesion spreads to the crown of the plant the plant cannot survive. Splashing water can spread the disease to other plants. Bactericidal sprays may arrest the disease in its early stage.

Fungal Diseases

Root, Stem, and Pseudobulb Rots

These diseases represent serious situations, and it may not be possible to salvage the plant. Fungi produce airborne spores that can easily travel from plant to plant. Try to correct the conditions that allowed the establishment of the disease. Rotten roots may host diseases, but the prime cause is likely to be growth media remaining wet for too long because it has broken down or has been watered too frequently. Management of fungal diseases requires segregating infected plants; avoiding unsterile growth media, pots and tools; and not allowing water to remain in the crown or elsewhere on the orchid for long periods of time. Water plants in the morning so the leaves will not remain wet overnight. Sanitize leaf spots before the fungus reaches the crown. It may be necessary to treat the plant with appropriate topical and/or systemic fungicides.

Black Rot

This is the most damaging disease of orchids. The causative fungi are two water molds, *Pythium* and *Phytophthora*. Infection produces a black lesion on roots, stems and leaves. If the lesion reaches the crown the plant is killed.

Fusarium Wilt

This fungus invades roots and cut sites on rhizomes when plants have been divided. The plants have yellow, thin, shriveled leaves and decline over a period of months. Roots rot and there is a band of purple discoloration in the rhizome.

Rhizoctonia Root Rot

This fungus is a brown dry root-rot organism. The disease progresses slowly and the plant gradually fails, developing leaves and pseudobulbs that are yellow, shriveled, thin and twisted.

Southern Blight

Caused by *Sclerotium*, the symptoms are rapid collapse and rotting of roots, pseudobulbs, and lower leaves. The formation of small, tan sclerotia on the diseased tissue is diagnostic. Sclerotia are the size and color of mustard seeds. Destroy infected plants.

Leaf Spots

Several fungal leaf spot diseases attack orchids. They usually begin as yellow areas on the leaf undersides, but as they darken the spots are visible on both sides.

Anthracnose

This starts as a sunken, brown, sharply-defined discoloration. Fruiting bodies develop in large numbers on the dead tissue. The causative fungus is *Colletotrichum*.

Cercospora

This leaf spot disease is caused by numerous *Cercospora* spp. and starts as yellow spots on the undersides of leaves that enlarge and eventually engulf the whole leaf. Old spots are purplish-black. Leaves fall from the plant prematurely. Once a leaf is infected the condition cannot be reversed.

Septoria

The spots start as small, sunken, yellow lesions on either leaf surface that enlarge into circular or irregular patches. Leaves fall off prematurely.

Rust

Rust is caused by several fungi genera. Orange, yellow or rust brown spore-bearing pustules develop on the leaves. Rust fungi have high reproductive rates, so plants should be isolated.

Other leaf spot fungi include *Diplodia*, *Guignardia*, *Phyllosticta*, Sooty Blotch (*Gloeodes*), *Fusarium*, Flyspeck (*Schizothyrium*)

Flower Blights

Anthracnose

Small, round, brown to black spots develop on the sepals and petals on old or weakened flowers. These spots coalesce to cover most of or the entire flower.

Botrytis

This is usually a problem with very high humidity. Small, circular, pinkish or tan spots appear on sepals or petals. The fungus is a problem with dead or dying flower tissue, so sanitation is important.

Other flower blights include rust (*Coleosporium* and *Uredo*), yellow bud blight (*Aphelenchoidis*), and *Fusarium*.

Viral Diseases

Viruses are the smallest plant disease agents and can only multiply in the cells they infect. They are spread through wounds by contaminated cutting tools, contaminated pots, and by insects and mites as vectors. Virus symptoms are variable and depend on the host species, the strain of virus, and environmental

conditions. Symptoms include yellowing of leaves, tissue death, and restricted growth. Flowers are also affected. Viral diseases can resemble fungal diseases, the effects of air pollution, insect damage, and physiological and genetic disorders. About 30 different viruses infect orchids.

There is no cure for viral diseases, and the plants should be destroyed and discarded. Prevention is the best policy. Purchase virus-free plants, and don't propagate with infected plants. Wash hands before handling plants, especially if you use tobacco. Inspect and isolate newly acquired plants for abnormal coloration and stunted growth. Disinfect cutting tools between plants. Never smoke or use tobacco near your plants, as this spreads Tobacco Mosaic Virus. Keep insect and mite populations under control.

Disinfect cutting tools with a 1:10 bleach solution, or dip the tool into alcohol and flame it.

An excellent source of information on orchid pests and diseases is The American Orchid Society, Delray Beach, Florida, www.orchidweb.org.