



Orchid Diseases: Part II - Problems and Solutions

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(with excerpts from 'Growing Orchids in the Caribbean', M. Light, 1995,
Macmillan)

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You have just received the bad news. Your plant has an ailment, a pest or disease problem or both, and you have to decide what to do. This may be your one and only plant, a real favourite, or one that you recently purchased for a considerable sum. There may be many plants showing the same symptoms. You justifiably have that sinking feeling.

You have made a list of what you already know or have observed as symptoms and have overviewed any cultural aspects which may have caused the symptoms to appear. You may have consulted a club member or a disease diagnostic service. Be sure to have all the facts. Ask them the following questions.

1 - What is the specific name of the disease?

Diseases have many common names. Ask about the scientific name of the organism.

2 - How certain is the diagnosis?

A plant disease affecting commercial crops is never diagnosed on the basis of a single test but for some of the common ailments affecting hobbyist orchid collections, knowing the host plant, the symptoms, where it is being grown and under what conditions, and what the disease organism looks like (bacteria, spores, etc), can serve the purpose. A wide variety of tests are used to identify bacteria including microscopic and immunoassay. The shape of fungal spores and the shape and location of disease lesions are useful in fungal identification. Viruses are difficult to identify correctly because they are so small and symptoms are so varied. An experienced person can make an educated guess as to what viruses may be present by assessing the plant symptoms, and then accurately diagnosis the disease using immunoassay tests specific to particular viruses such as Cymbidium Mosaic Virus.

3 - Just how potentially damaging is this ailment to the orchid collection?

There is no cure for virus diseases. Infected plants must eventually be destroyed although with precautions, they can continue to grow and bloom away from the rest of the collection. Bacterial diseases can quickly destroy the first plant infected then spread rapidly to those nearby so they must be controlled aggressively. Some fungal ailments such as Black Rot are virulent, capable of infecting a range of genera and must be dealt with swiftly.

4 - How does the disease spread?

Poor growing conditions, too little light, inadequate air movement and high humidity, cold or warmth, are always a recipe for disaster for plants unsuited to those conditions. Bacterial and fungal diseases will spread rapidly, especially if the conditions are not corrected. Orchid plants infected with virus may or

may not exhibit symptoms. All infected plants are reservoirs of infection but the disease can only spread by direct contact, by dripping onto another plant or in certain cases, by sucking insects.

5 - What measures are available to control the disease?

a - Isolate the infected plant(s). Do not spray or water especially where the disease is waterborne. Wash your hands after handling the plants.

b - Using a sterile blade, remove diseased tissue plus a generous portion of healthy tissue and dust the cut edges with powdered charcoal or cinnamon.

c - Control measures employing pesticides available to a hobbyist vary according to national, state and provincial regulations. Check locally.

d - Virused plants should be either burned or disposed of in the garbage. Do not compost.

6 - Is the best approach, 'toss' and try again?

With badly diseased and, especially, virused plants, it is best to dispose of them. A thorough clean up of the growing area will be needed before obtaining new plants.

7 - What steps can be taken to ensure that the same problem is unlikely to recur?

Reduce the impact of diseases in an orchid collection through sanitation and cultural practice.

a - Keep the growing area free of dead leaves and spent flowers.

b - Remove and burn diseased foliage and flowers.

c - Use sterile cutting tools.

d - Treat cut surfaces with powdered charcoal or a fungicidal powder.

e - Maintain good air movement within the growing area.

f - Provide a light regime appropriate to the plant type.

g - Do not crowd the plants.

h - Cull plants that become easily reinfected despite good cultural practice.

ORCHID DISEASES

BLACK ROT (Fungus: *Phytophthora spp.*)

Black Rot is a particularly aggressive infection of Cattleyas and other orchids caused by various species of the fungus *Phytophthora*. A new shoot suddenly turns black: the rot moves rapidly, killing the rest of the plant. A whitish 'bloom' of fungal tissue and spores may be seen on the diseased tissue. This disease is more prevalent during the rainy season in the tropics where it spread primarily by splashing water. It can also appear in damp, poorly ventilated crowded collections. Spores must be exposed to continuous moisture for more than a day for them to germinate and enter a plant part. Infection can also occur via cut surfaces.

SYMPTOMS: New growth quickly turns black, usually from the base up. White 'bloom' of spores on surface. Smells somewhat fruity.

CONSEQUENCES: Rot moves rapidly through rest of plant. Plant usually dies although aggressive removal of diseased parts together with adjacent healthy tissue can result in a cure. Highly contagious during rainy season in the tropics or in poorly ventilated, humid growing areas.

CONTROL: Disease spread primarily by splashing water. Stop watering/spraying and shelter plants from rain. Isolate infected plants. Burn diseased material. Wash hands after handling suspect material. Spray or dust with a locally approved fungicide.

BLACK LEG / DRY ROT (Fungi: *Fusarium, Rhizoctonia*)

Dendrobiums and Vandas growing in waterlogged potting materials are susceptible to a slow but inexorable rot of the roots and stem from below. The causative fungi are usually *Fusarium* and *Rhizoctonia* although other kinds may also be found.

SYMPTOMS: Pseudobulbs becomes spongy and discoloured. The leaves, especially in Vanda, will yellow and drop off, one by one, until none are left and the plant dies.

CONSEQUENCES: Plants can be salvaged if the infection is caught early. Uninfected pseudobulbs of Dendrobiums can be removed and these may form keikis. If a Vanda has many aerial roots above the diseased portion, sever the stem above the line of infection and pot in fresh medium.

CONTROL: Since the disease is caused primarily by poor culture, fungicides are not recommended for control. Burn infected material.

LEAF SPOTS and BLOTCHES (Fungi: *Cercospora, Colletotrichum, Septoria, Phyllosticta*)

SYMPTOMS: Leaf-spotting fungi produce unsightly speckles and blotches on the leaves of orchids such as Dendrobium, Cattleya, Oncidium and Vanda. The spots are often rough to the touch. There may be a halo surrounding new spots. Microscopic examination will reveal the presence of fungus tissue and distinctive spores.

CONSEQUENCES: Premature leaf fall reduces plant vigour and flowering potential. Severely infected plants may die prematurely. Spots mar the appearance.

CONTROL: Burn or otherwise dispose of diseased material. Improve air circulation and adjust temperature to plant type. Spray with a locally approved fungicide.

BACTERIAL SPOT / ROT (Bacteria: *Pseudomonas*, *Erwinia*)

Soft rots are often difficult to diagnose but whatever the causative agent, they can be devastating to an orchid collection.

SYMPTOMS: Dark brown circular, fluid-filled blisters on leaves or in the crown of *Phalaenopsis*, *Paphiopedilum*, *Catasetum*. Fetid odor.

CONSEQUENCES: Highly contagious. Crown rot will quickly kill a plant. Because the bacteria produce enzymes which dissolve plant tissue, an infection can quickly spread within a plant and ultimately kill it. Orchids will be more vulnerable to infection if they are overfertilized, given insufficient light and ventilation, and if they are permitted to remain wet especially in the crown. Rots are a problem during the wet season, also after storms when plants are bruised and torn by high winds.

CONTROL: Bacterial infections spread with water during rain, spraying and watering. Shelter susceptible plants from rain. Be vigilant for rot during the wet season. Withhold water from infected collections. Improve ventilation. Remove and burn infected tissue. Be careful not to break the blisters. Consider the fertilizer being used: reduce the nitrogen and increase the potassium component. Pot *Phalaenopsis* so that the crown drains freely. Small isolated leaf spots can be excised and the plant saved.

VIRUS DISEASE (all orchids)

Viruses are extremely small organisms composed of either RNA or DNA and often surrounded by a protein coat. Viruses replicate only inside living cells. Viruses overtake cell metabolism, causing it to manufacture more virus particles. Viruses enter plants in various but specific ways including transfer of cell sap during feeding by aphids, mechanically from contaminated plant sap on hands, tools, or in dripping water from pots above, and during vegetative propagation including mericlone and division. Two viruses are transmitted solely by the grower. These common viruses are the Cymbidium Mosaic Virus (CMV) and the Odontoglossum Ringspot Virus (ORSV). They are most commonly spread with a cutting tool contaminated with infected sap. Other less commonly encountered viruses are spread by insects. Bean Yellow Mosaic Virus is spread from infected bean plants by aphids to *Masdevallias* and other genera.

SYMPTOMS: Viruses cause odd patterns on leaves or petals, mosaics, diamond and ring shapes, stunted growth, stem distortion, and leaf roll. Streaked blooms are said to show color break although this is not always a consequence of virus infection. Sometimes there is no symptom but the plant fails to thrive. Other times, a beautiful, productive orchid is infected but the grower is completely unaware.

CONSEQUENCES: Virus is one of the most dreaded diseases of orchids. There is no cure. Infected plants are reservoirs of infection. Virus can cripple, disfigure and weaken plants. Orchids may fail to thrive and there may be reduced flower production.

CONTROL: There is no known cure! Destroy by burning, all confirmed infected plants. Isolate suspected plants. Always use sterile cutting tools when dividing or potting plants and when cutting flowers.

Steps to keep virus infection out of a collection

- a - Assemble a collection of virus-free plants. Seedlings in flask are less likely to be infected than divisions of plants long in cultivation.
- b - Use sterile cutting and potting tools. Sterilize cutting tools after each use by soaking for 10 minutes in a solution of either 10% liquid bleach or saturated trisodium phosphate solution (see below).
- c - Test plants for the presence of virus.
- d - Destroy by burning or at least isolate proven infected plants.

Saturated tri-sodium phosphate (TSP)

Wear rubber gloves and safety goggles

USE EXTREME CAUTION: The solution is very corrosive

In a clean plastic bucket, add 1/2 cup of trisodium phosphate to 2 gallons of hot water.

Mix well using a wooden paddle. Add more TSP until some crystals remain undissolved. A saturated solution is necessary to inactivate virus. Use immediately or store unused solution (with some undissolved crystals) in a **labelled** plastic container having a plastic lid. Keep in a secure place out of the reach of children.