



Orchid Pests, Diseases and Ailments

Part 1

Orchids are subject to attack by numerous organisms and damage from various physical conditions. Most organisms are cosmopolitan, that is, they have a shared host range. However a few, like Cymbidium Mosaic Virus and Odontoglossum Ringspot Virus are specific for orchids only. It is most important to be aware of these organisms and when they are likely to cause trouble, because practicing prevention is better than correction once a problem is established. Problems with orchids may be considered under a number of categories: -

1. **The infections.** Here the attacking organism enters the plant tissues and causes its damage from within. Virus disease and the fungi and bacteria that cause rots affect the plant in this manner.
2. **The infestations.** Here the organism lives on the plant and attacks from without. It generally uses an appendage to penetrate the outer layers so that it may suck the tissue fluids. Two spotted mite (red spider), aphids, scale and mealy bug are examples of sucking organisms.
3. **The chewers.** Snails, slugs and caterpillars and larger animals such as rats and various herbivores up to cows and horses will attack orchids given the chance. These commonly live away from the plant and actually ingest the plant tissue.
4. **Ailments.** These result from adverse physical conditions such as excessive heat, water, sunlight, etc.
5. **Signs** that do not appear normal, but cannot be attributed to any disease process.

Where scientific words are used, they should be used accurately. Symptoms are what you feel, e.g., a headache, nausea, shortness of breath, etc. Because orchids cannot communicate verbally (despite the beliefs of some growers who talk to them), to describe an orchid as showing symptoms is not appropriate; instead they should be described as showing signs. Thus a chlorotic pattern (yellowing amongst the normal green) may be the sign of virus infection, missing areas of tissue may be the signs of snail damage and so on.

It is important to learn the signs indicating trouble and when and where to look for them. Most problems can be predicted. The rots are more prevalent in cold, moist airless conditions, especially in the spring and autumn. Two spotted mite is most active in hot dry conditions and is therefore more a summer problem. Rats appear with the onset of the cold and wet conditions that herald winter. Other pests such as virus, scale and snails are a constant problem.

In the scope of this paper only a superficial account can be given of these problems, however if the topic can be viewed in perspective, then more detailed information can be sought where required.

The Infections.

Virus Disease. To date up to 30 viruses have been described that infect orchids. Of these, three are currently prevalent in Australia. Cymbidium Mosaic Virus (CyMV) and Odontoglossum Ring Spot Virus (ORSV) are the most prevalent and wide spread. ORSV is synonymous with the previously used Tobacco Mosaic Virus – Orchid strain (TMV-O) and is the proper name for the virus. The other virus is rhabdovirus, or Orchid Fleck Virus (OFV). OFV appears to be more prevalent recently. The question is whether it is really on the rise or are we simply becoming more aware of it. CyMV and ORSV are specific for orchids; thus whilst they may infect various orchid genera they do not spread through plants other than

orchids. OFV appears to have a wider range of hosts, which presents greater problems. Also apart from OFV, the only mode of transfer is by direct contact. With OFV, research suggests that the most common source of spread is via the false spider mite and that direct spread is less of a problem unless it is by fresh sap spread from cutting instruments. All orchid genera are susceptible to infection by these viruses.

Virus disease is incurable. Work is currently being done to introduce resistance into the genetic structure of orchids, but while this type of protection is feasible in the future, a plant, **proven** to be infected, should be destroyed. Where a valuable breeding plant is involved there is a case for retaining it just for breeding purposes, as with CyMV and ORSV the disease is almost invariably not transferred to the seedlings when dry seed is used. With OFV the transference is not clear and caution should be exercised until more is known about it.

A knowledge of the presenting signs of virus infection, modes of transfer and appropriate handling techniques is mandatory if it is to be controlled in a collection. Leaf signs include specific chlorotic and necrotic markings. This is shown with CyMV, ORSV and OFV in *Cymbidium* and other thin leaved genera and pitting with *Cattleya* and other thick leaved genera. These signs vary with the orchid genus and the specific virus and can change as the leaf develops and ages. In flowers, colour break, necrotic areas and deformity is common, especially in *Cattleya*. In various orchids such as *Paphiopedilum* and Australian Natives, these flower and leaf signs may not be immediately obvious, which can lead to growers underestimating or disregarding the significance of the disease.

Scientific testing, by those expert in the techniques is best for makes a positive confirmation or not of the disease. Testing using specific serology or ELISA or direct viewing with the electron microscope is currently the most appropriate, readily available and reasonably priced method of confirmation. Recently test kits employing the serological technique have become available for the growers direct use and these are economical, convenient and reliable. They will only test for CyMV and ORSV, no serological test is currently available for OFV. It can only be confirmed with the electron microscope.

The Rots. These are caused by a variety of bacteria and fungi and can be very destructive over a short period of time. The two most commonly encountered are *Pythium* and *Phytophthora*, with *Erwinia*, *Pseudomonas* and *Rhizoctonia* also presenting a problem at times.

With *Pithium* and *Phytophthora*, the organism gains entry into the plant and spreads rapidly throughout the sap stream. Humid and airless conditions, as found in autumn particularly, especially where plants are housed on the ground and in crowded conditions, facilitate infection and its spread. The organisms are water borne and once infection is established in one plant, it can spread rapidly to those around it and downstream via natural drainage lines.

Pithium and *Phytophthora* are anaerobic organisms. This means that they are not dependent on the presence of oxygen, and this, together with their requirement for water is important in their control. They have an active stage during which infection spreads and also a resting stage where they exist in spore form. It is not always easy to distinguish between the two from signs, but the difference is academic as they are equally as destructive. Following breaking up or repotting is a favorite time for infection to initiate, with organisms readily gaining entry through open wounds. *Pithium* is the more prevalent and has a most unpleasant and characteristic odour if the infected part is smelt.

Treatment involves early diagnosis followed by radical intervention. Remove the plant from its container and surgically remove all infected parts and extend a little beyond the last visibly infected tissue. Sterilize the cutting instrument between cuts. Then paste Ridomil® or a like systemic fungicide/bactericide onto the cut surface after soaking the plant in a solution of this for two hours. Repot the plant in fresh compost and keep it on the dry side for a number of weeks. This will give the best chance of cure, but don't be too surprised or disappointed if infection redevelops at a later stage as is commonly the case. Prophylactic sprayings, especially during the danger periods with phosphorous acid and a dispersing agent over the whole collection, especially around areas from which infected plants have been removed is also advised. For lesser infections, removing the infected pseudobulbs may suffice.

Community pots, trays and small seedlings are particularly susceptible to damp-off and regular applications of Rovral® is appropriate here..

The topical fungi such as *Cercospora*, *Anthracnose* and *Gloeosporium* are generally not threatening to the life of the plant, but cause unsightly markings on the surface of the leaves and measures should be taken to prevent their development. One exception is *Anthracnose* with paphiopedilums and here Octave®. is the only fungicide that we have found effective. They are also more prevalent under the conditions in which rots develop and attention to the physical conditions regarding watering, air movement, temperature and spacing of the plants, together with two or three weekly sprayings with Dithane® or Thiram®, during the danger periods should control them.

The other important fungal problem is caused by *Botrytis*. Here, under the adverse conditions described previously, small circular spots develop on the flowers, especially *Cattleya* and *Phalaenopsis*. Benlate® has been used effectively but there have been doubts expressed about dangers for the user with its long term application, so maintaining an optimal growing environment is more desirable. Prevention rather than cure.

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