

# Pythium & Phytophthora



## Biology

### *Pythium and Phytophthora rot*

The causative organs of black rot on roots, rhizomes, stems and leaves of orchids belong to the species of the Oomycetes group. Main species found on Orchids are *Phytophthora cactorum* Schroet., *Pythium ultimum* Trow., *Pythium debaryanum* Hesse and *Pythium splendens* Braun. Characteristic features of these fungi are round to lemon-shaped sporangia. This is where the flagellate zoospores are formed that makes the causative organ spread. Sufficient humidity is the decisive factor for multiplication and spreading of the fungi in the plant stand. Constant substrate humidity helps to grow fruiting structures and zoospores. Spraying or irrigation spreads the rot from plant to plant. Most *Phytophthora* species prefer high temperatures and sufficient humidity, many other fungi, however, grow best in cool and humid conditions. The fungi intrude their host plants with the help of specific enzymes and excrete toxic substances in them. Within a very short time infested plant parts may decompose and there will be extreme soft rot. Whereas *Pythium* only infests underground plant parts as a parasite, *Phytophthora* may occur on all plant parts.

## Damage

*Pythium* infestation on *Phalaenopsis* usually occurs on seedlings and young plants, less frequently on older ones. Newly thinned out seedlings die quickly within a short time, the roots turn brown and rot. Often the root cortex is destroyed whereas the stele is still more or less intact. Different animal organisms feed on the roots as a consequence of or as initial cause of the disease. Older plants of *Cattleya*, *Paphiopedilum*, *Oncidium* or *Odontoglossum* show brown to black infested areas on the leaf base, the pseudobulbs and the rhizomes. The infested plant parts rot away and finally the plants die. The disease usually occurs in the darker seasons as a result of inadequate cultivation. *Phytophthora* almost exclusively infests older plants. These causative organisms that occur frequently on orchids mainly attack the stem base, but can also infest the leaves. Quickly enlarging brown or black rot spots occur on the infested parts which finally make the plant die when there is extensive soft rot. *Phytophthora* is a causative organism that has ideal infection conditions in high humidity and high temperatures, i.e. in the summer.

## Control

- Plants showing symptoms must be removed from the stand immediately.
- Endangered stands should not be sprayed with water as this might help the zoospores to spread quickly, in companies with recycled water the pest might spread via the roots.
- Cultivation vessels, shelves, greenhouse tables and tools that were in contact with infected plants or water must be disinfected.
- To prevent infection, cultivation conditions must be improved. In addition to avoiding high temperatures (early shading required) water treatment must be done carefully. Humidity may only be increased moderately.
- Stagnant moisture is not to be expected in orchid substrates, but the substrate used for *Phytophthora* prophylaxis needs to meet certain requirements. The substrates used should not warm up too much, which would lead to the considerable weakening of plants in extreme conditions and contribute to spreading the disease more quickly.
- *Pythium* and *Phytophthora* belong to a special group, so direct treatment must be done with special fungicides.

Orchids diseases

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Colmanara: Phytophthora root rot



Disa: Phytophthora stem rot



Disa: Phytophthora rot



Disa: Phytophthora stem rot

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Orchids diseases

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*Disa*: Phytophthora stem rot



*Phalaenopsis*: Pythium-Wurzelfäule an Jungpflanzen



*Phalaenopsis*: Pythium root rot at young plants

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