



## FUNGI APPEARANCES ON ORCHIATA

Micro-organisms are an integral part of Orchiata and fungi species are regularly isolated from these products. These fungi are generally saprophytic fungi which live off of decaying organic matter, and as Orchiata is created using a natural aging process caused by microbial degradation these organisms will always occur in this growing media.

The fungi present do not cause plant disease but instead help protect plant roots and stems from pathogen attack.

Windrows are regularly tested for fungi present; this not only shows us that there are no pathogens present, but is also enables us to see how healthy the aging material is.

Most of the time fungi are relatively invisible. However when conditions are optimal for one or more species to grow mycelia becomes more prevalent and visual. Certain types of fungi grow better in specific moisture conditions, temperature and pH. It is therefore quite common for fungi to become visible during shipping or storage if growth conditions are favourable.

## DOLOMITE

One area where there are often comments is a white covering regularly seen on Orchiata. Dolomite is applied to the product after processing and depending on the initial pH of the media, differing amounts are added. This is called buffering. Dolomite is a white powder and deposits will usually be seen on the bark especially if the material is slightly drier or in pockets on bark particles where it has been collected. Dolomite can be identified as it has little smell, can be removed easily with a thumbnail, and when submerged in water it does not repel water. Dolomite deposits are regularly mistaken for fungal growth.



Figure 1. Dolomite covering on Orchiata



## FUNGI VARIETIES

There are several typical instances where fungal growth becomes quite visual. Orchiata is rich in fungi which grow in very warm conditions. *Paecilomyces variotii*, *Penicillium* sp, *Mucor* sp, and *Trichoderma* species are present in relatively high numbers in fresh product.

### *Penicillium* sp.

As product travels over warmer conditions and if pH is low then a light overing of fungi can occur in the bags as shown in figure 2. This fungi however will disappear once it begins to be used.



Figure 2. light covering of *Penicillium* sp. In Classic Orchiata

### *Paecilomyces variotii*

*Paecilomyces variotii*, can be slightly more pronounced in short term storage and may appear similar in appearance to *Penicillium* sp. Also not harmful, this fungi is the most abundant fungi during the aging process as it prefers to grow in very high temperatures. As containers cross the equator from New Zealand, temperatures can become very high in containers and high in humidity.



Figure 3. Appearance of *Paecilomyces variotii* on Power grade Orchiata



### *Streptomyces and Trichoderma*

In cooler temperatures under low pH conditions other species of saprophytic can grow as per *Streptomyces* and *Trichoderma* seen in Figure 4 below. It is well known that *Trichoderma harzianum* is an antagonist to pathogens so is very beneficial to have in growing media. This can come about if the pH in the pot drops and can be overcome by increasing the pH.



Figure 4. light covering of *Streptomyces* sp and *Trichoderma* sp.

### STORAGE OF ORCHIATA

When received, if Orchiata is stored in relatively cool, dry conditions with good air circulation the growth of fungi will be unlikely. The addition of dolomite is also important at the production end as it helps to increase pH which also reduces fungal growth.

However, if product is stored outside in damp conditions or the product is left to sit for more than 6 months different fungal species will grow.

The main fungal growth type than can be seen is bright white thick fungi. These are usually Basidiomycete fungi (the ones that grow mushrooms type fruiting bodies) as seen below in Figure 5. Spores of this type of fungi can come from anywhere and the longer product is stored the more likely it can come from the area where the product is stored.



Figure 5. fungi growing on wood chips.

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Fungi will sometimes grow on the product in bags but also in pots. Fungi need specific conditions to both colonise and grow. Generally if fungi are growing in the media where the plants are growing then conditions are remaining relatively damp. Fungi do not like dry/wet/dry conditions.

Also it must be stated that fungal spores are present everywhere, both pathogenic and non-pathogenic therefore because a fungus occurs in the material in the pots does not mean it immediately came from the bark material.

For example the fungus below is *Leucocopirnus brinbaumii* which is a very common Basidiomycete (mushroom or toadstool fruiting fungi). It is found in potted plants throughout the world and can form little white balls and yellow toadstools, but it is not found in Orchiata. Any presence of this fungus will have come from spores in the air or from people working with the media. It is therefore very important to ensure your greenhouse is clear and the people working with the media are not bringing in outside contamination.

### *Leucocopirnus brinbaumii*:



Keep good hygienic practices, have water tested regularly, and use Orchiata within a few months of receiving for best results.