

## Analysis of Fungal Burden by Conventional and Molecular Methods in different settings and matrices: implications for public and occupational health

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Fungal burden has traditionally been detected by conventional culture analysis. This method allows the identification and quantification of organisms posing high health/occupational risk and is widely used by the scientific community. The fungal burden determined by culture analysis can, in most studies, be compared with legal and scientific guidelines allowing an estimation of the degree of severity of the exposure. However, this method is limited by several factors, including incubation conditions such as the incubation time, which can be very long for some species, thus preventing a quick assessment of fungal burden. Another limiting factor is competition between species: clinically relevant species might possess lower growth rates than other non-toxic fast growing fungi thus hampering their detection.

These limitations can be overcome by the use of quantitative real-time PCR (qPCR). This method, based on the amplification of genomic regions specific to certain fungal species, increases sensitivity, allowing the specific detection of a given species and removing interference by other species present in the sample. qPCR also allows the detection of dormant forms of fungi, such as spores.

Thus the ideal scenario is to use these two methods in parallel, as they complement each other to provide useful information for the assessment of exposure to fungi.

We briefly describe several studies where both methods were used to detect the presence of toxigenic fungi, namely *Aspergillus*, particularly from the *Fumigati*, *Flavi* and *Circumdati* sections. These include fungal analysis from different matrices such as air, feed and coffee and within different settings, including wastewater treatment plants, slaughterhouses, feed industries, poultry and swine pavilions. The results obtained with both conventional and molecular methods are compared and discussed as well as its implications for the exposed workers health.