

Identification of airborne microfungi by Fourier-Transform Infrared spectroscopy (FT-IR) based on mycelial extracts

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For proper characterisation of the pathogenic potential of airborne microfungi a reliable identification of species is necessary both in public and occupational hygiene. Microfungi can be allergenic, toxigenic and some may cause infections. Preliminary experiments have shown that species identification and intraspecific characterisation of fungi from the genera *Aspergillus* and *Penicillia* leads to very promising results.

A method for the preparation of mycelial extracts from liquid cultures was developed, which lead very good FT-IR spectra. Initially a small database was created for a limited number of *Aspergillus* species with hygienic relevance, that allowed a reliable identification of additional isolates. The results were compared to those obtained from experiments with conidial suspensions.

Identification of newly isolated strains was possible by comparison to the database established. In some species, intra-specific variation concerning morphological and physiological properties occurred, which was equally reflected in the discrimination of strains. The extraction of mycelium comprised advantages concerning sample preparation, as mycelial cells are more hydrophilic compared to conidia. On the other hand, certain secondary metabolites, e.g. mycotoxins, that are not produced in liquid cultures are lacking when isolates must be characterized physiologically. A set of isolates from additional genera of airborne fungi was also screened. Species could clearly be differentiated.

The taxonomic relationship was reflected in the dendrograms resulting from both methods. The method based on mycelial extracts seems to be particularly suited to be applied in systematic mycology and quality control in culture collections. But its application in characterizing the pathogenic potential of strains is limited.

Penicillium, *Aspergillus*, mycotoxins, chemotaxonomy, identification, FT-IR, conidia, mycelial extracts