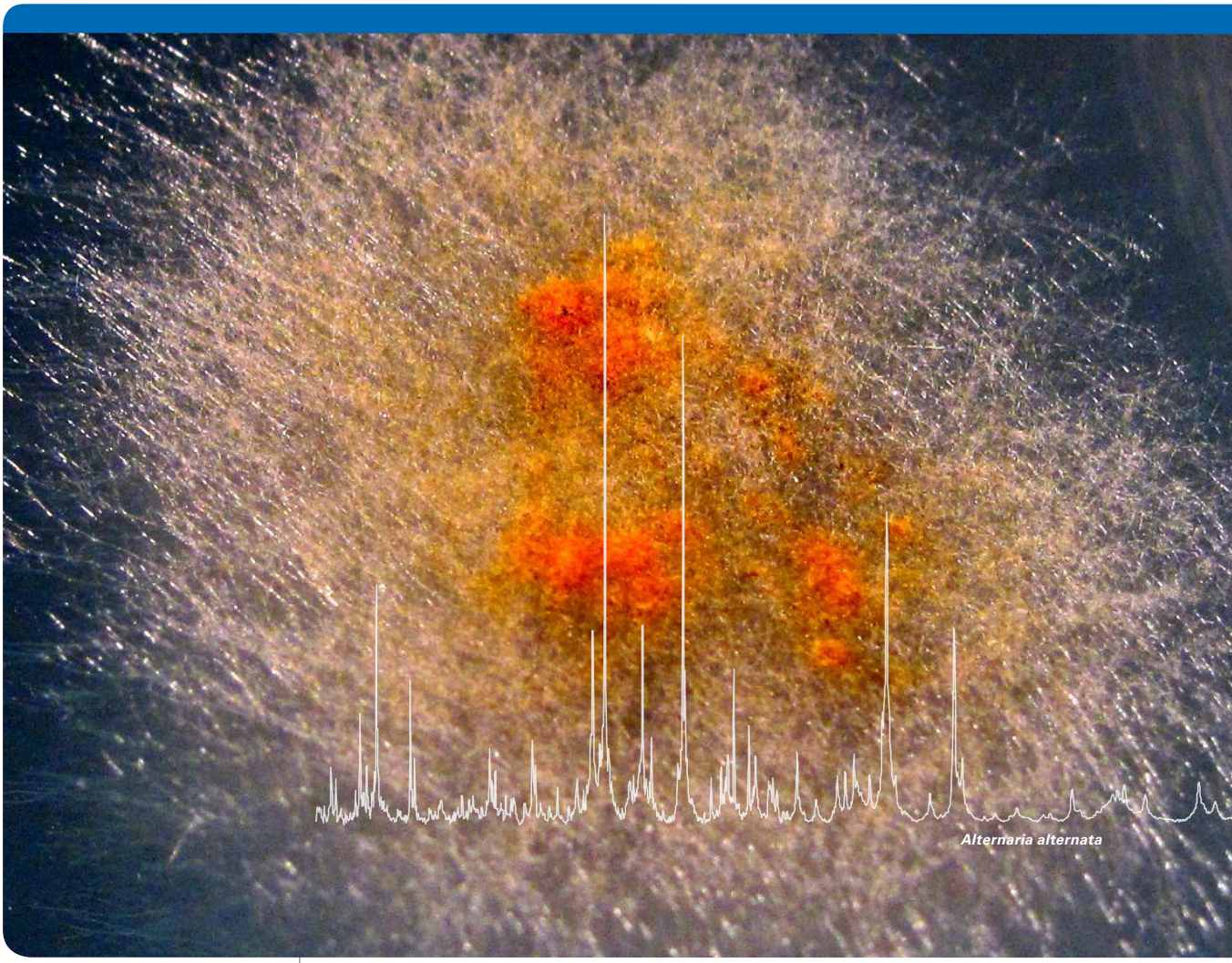


Filamentous Fungi Library

- MALDI Biotyper®

MALDI-TOF MS

Innovation with Integrity

Mass spectrometry has revolutionized the identification of microorganisms within the past several years, setting new standards in speed and reliability. But even in these advanced times of microbial mass spectrometry, the identification of molds and multicellular fungi still persists as one of the most challenging aspects of microbiology. This can be mainly attributed to the effects of culture conditions.

Bruker has therefore developed a cultivation method, a standard preparation method, and the Filamentous Fungi library to facilitate the identification of these microorganism groups.

Standardized liquid cultivation

In order to reduce the effects of culture conditions and to aid in the production of a uniform mycelium, a liquid based cultivation method has been developed which standardizes the physiological status. This method has been used to create the Filamentous Fungi library and is recommended where quick identification from front mycelium is not possible.

In essence, tubes are inoculated with the fungi and placed on a rotator to incubate overnight or until enough biological material is observed.

Using the standardized liquid cultivation method prevents the germination process and the formation of spores.

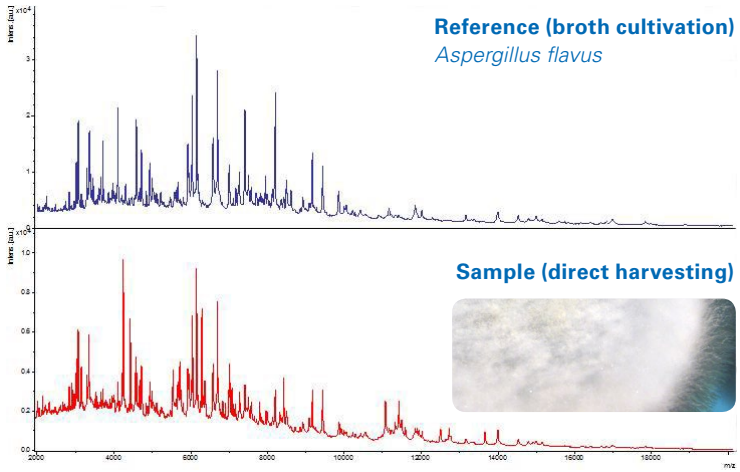
This enables fast and reliable species identification of slow- or fast-sporulating filamentous fungi and many other difficult-to-handle organisms such as agar adhering filamentous fungi.

Daily Routine Workflow – Analysis Possible Direct from Agar

If a front mycelium is clearly visible, as in this example, and can be harvested, then it is possible to sample directly from the agar and, using the simple ethanol extraction method, good results can usually be obtained for most of the samples without the need for liquid cultivation.

In cases were direct harvesting is difficult, the liquid cultivation method should be used.

Typical MALDI Biotyper mass spectra



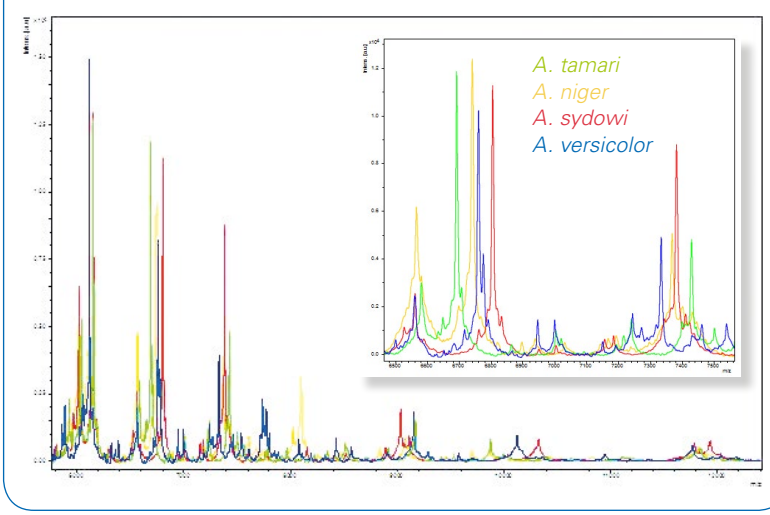
Top spectrum is achieved after liquid cultivation of *Asgergillus flavus* and the bottom spectrum is achieved by direct harvesting of *Asgergillus flavus* from agar. Note from the image that the "front mycelium" is both clearly visible and can be easily harvested.

International fungi consortium

The goal of this consortium was firstly to test the reliability of liquid based cultivation and sample preparation and then to provide securely identified fungi strains for the creation of the Filamentous Fungi library.

Currently, contributions have been received from over 20 laboratories across 8 countries.

Different species of the genus *Aspergillus*



MALDI Biotyper spectra overlay of various species of *Aspergillus*.

Filamentous Fungi Library

127 species entries

Absidia coerulea	*Cladosporium sp*	*Monilinia laxa*	*Phaeoacremonium sp*
Acremonium strictum	*Cunninghamella elegans*	*Mucor circinelloides*	*Phialemonium sp*
Alternaria alternata	*Curvularia clavata*	*Mucor ramosissimus*	*Phialophora bubakii*
Arthrinium phaeospermum	*Curvularia lunata*	*Paecilomyces farinosus*	*Phoma glomerata*
Arthrographis_kalrae[ana]# (Eremomyces_langeronii[teleo])	*Curvularia pallescens*	*Paecilomyces lilacinus*	*Phoma herbarum*
Aspergillus candidus	*Curvularia verruculosa*	*Paecilomyces marquandii*	*Phoma sorghina*
Aspergillus clavatus	*Epicoccum nigrum*	*Paecilomyces variotii*	*Rhizomucor pusillus*
Aspergillus flavus	*Epidermophyton floccosum*	*Penicillium brevicompactum*	*Rhizopus microspores*
Aspergillus fumigatus	*Fennellia flavipes*	*Penicillium chrysogenum*	*Rhizopus oryzae*
Aspergillus glaucus	*Fusarium aquaeductuum*	*Penicillium citreonigrum*	*Rhizopus stolonifer*
Aspergillus niger	*Fusarium cerealis*	*Penicillium citrinum*	*Scedosporium prolificans*
Aspergillus nomius	*Fusarium chlamydosporum*	*Penicillium commune*	*Scedosporium_apiospermum[ana] Pseudallescheria_boydii[teleo]*
Aspergillus ochraceus	*Fusarium culmorum*	*Penicillium corylophilum*	*Schizophyllum commune*
Aspergillus oryzae	*Fusarium dimerum*	*Penicillium crustosum*	*Scopulariopsis acremonium*
Aspergillus parasiticus	*Fusarium equiseti*	*Penicillium daleae*	*Scopulariopsis brevicaulis*
Aspergillus sclerotiorum	*Fusarium incarnatum*	*Penicillium dierckxii*	*Scopulariopsis brumptii*
Aspergillus sydowi	*Fusarium moniliforme*	*Penicillium digitatum*	*Scytalidium lignicola*
Aspergillus tamarii	*Fusarium oxysporum*	*Penicillium discolor*	*Sporothrix schenckii*
Aspergillus terreus	*Fusarium proliferatum*	*Penicillium expansum*	*Syncephalastrum racemosum*
Aspergillus unguis	*Fusarium solani*	*Penicillium funiculosum*	*Thanatephorus cucumeris*
Aspergillus ustus	*Fusarium tabacinum*	*Penicillium glabrum*	*Trichoderma koningii*
Aspergillus versicolor	*Fusarium verticillioides*	*Penicillium italicum*	*Trichoderma longibrachiatum*
Aspergillus_amstelodami[ana] Eurotium_amstelodami[teleo]	*Geomyces pannorum*	*Penicillium lanosum*	*Trichophyton eboreum*
Aspergillus_nidulans[ana] Emericella_nidulans[teleo]	*Geosmithia argillaceae*	*Penicillium olsonii*	*Trichophyton equinum*
Aureobasidium pullulans	*Lecythophora hoffmannii*	*Penicillium pseudostromaticum*	*Trichophyton interdigitale*
Beauveria bassiana	*Lichtheimia corymbifera*	*Penicillium purpurogenum*	*Trichophyton rubrum*
Botrytis cinerea	*Microsporum cookie*	*Penicillium roqueforti*	*Trichophyton tonsurans*
Chaetomium funicola	*Microsporum equinum*	*Penicillium rugulosum*	*Trichophyton violaceum*
Chaetomium globosum	*Microsporum fulvum*	*Penicillium sp*	*Trichophyton_mentagrophytes_ var_erinacei[ana] Arthroderma_benhamiae[teleo]*
Chrysosporium keratinophilum	*Microsporum gypseum*	*Penicillium striatisporum*	*Trichurus sp*
Cladosporium cladosporioides	*Microsporum persicolor*	*Penicillium turbatum*	
Cladosporium herbarum	*Microsporum praecox*	*Penicillium verrucosum*	

"The identification of multicellular fungi to the species level is one of the most challenging tasks of many microbiological laboratories in medicine, hygiene as well as food industries. In cooperation with Bruker's dedicated microbiology team we worked as part of an international group of fungi experts on the identification of filamentous fungi using the MALDI Biotyper approach.

Based on Bruker's existing development on fungi sample preparation procedure, we contributed, established and validated a reference library of a large panel of the most important fungal strains. Our common efforts during the last years have shown that MALDI-TOF based molecular fingerprints of filamentous fungi provide a high differentiation power both at species and strain level.

The analytical performance of the MALDI Biotyper when used with the Filamentous Fungi library is a major technological breakthrough and practical improvement when compared to more conventional approaches and technologies using microscopy and sequencing methods only."

Prof. Dr. med H. Hof, Mycology Lab
Laboratory of Limbach, Heidelberg, Germany

Order information

Part No. 1829014 **MBT Filamentous Fungi Library**

For research use only. Not for use in diagnostic procedures.

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