

P2204 The similarities and differences of *Aspergillus* and *Penicillium* strains detected by MALDI-TOF mass spectrometry of the hyphal extracts

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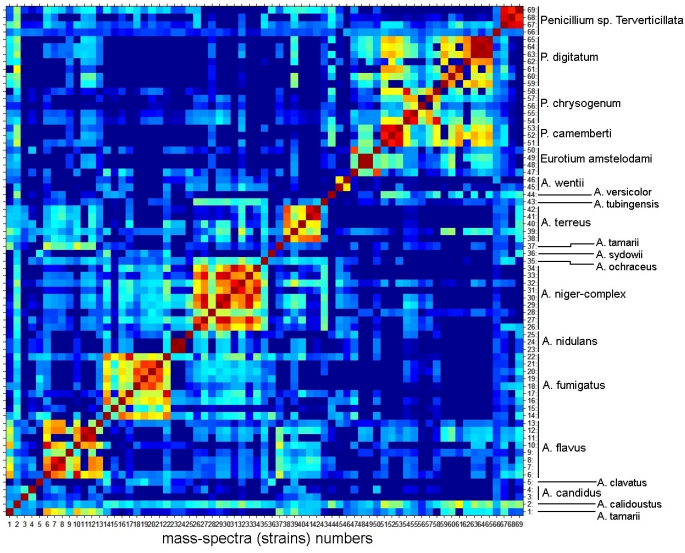
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Background: Penicilli are the closest related micromycetes of invasive aspergillosis causative agents. They have a different morphology, but similar mass-spectra (MS) of polypeptide metabolites, so that individual strains of penicilli can be misidentified as aspergilli by using MALDI-TOF-MS. The purpose is to compare the hyphal-extracts-MS of *Aspergillus* spp. and *Penicillium* spp. representatives to reveal similar groups of species of these fungi.

Materials/methods: MS of fungal culture extracts were obtained as described previously (Riabinin I.A. et al., 6th AAA, 2014). 70 MS from strains of 4 *Penicillium* species (*P_digitatum*, *P_chrysogenum*, *P_camemberti*, *Penicillium* sp. Terveticillata section) and 14 *Aspergillus* species (*A_fumigatus*, *A_calidoustus*, *A_flavus*, *A_niger*, *A_tubingensis*, *A_tamarii*, *A_ochraceus*, *A_candidus*, *A_sydowii*, *A_versicolor*, *A_nidulans*, *A_clavatus*, *A_wentii*, *E_amstelodami*) were extracted from MS-bank of Kashkina Research Institute (>700 MS of filamentous fungi) for comparison of micromycetes. Original strains were identified by morphology, using MALDI-TOF-MS, and by targeted DNA sequencing of the ITS and β -tubulin regions (CLSI MM18-A). Selected MS were compared by constructing of the complex-correlation-index-matrix in MALDI Biotyper OC 3.1 software.

Results: The CCI-matrix is shown in the figure. *Penicillium* spp. are generally the most similar to *A_calidoustus* by their physico-chemical properties, the similarity is less pronounced with *A_versicolor*, *A_tamarii*, *E_amstelodami* and single strains of *A_flavus* and *A_terreus*. MS-differences of *Aspergillus* spp. significantly well-marked than in the *Penicillium* spp. The groups of *A_fumigatus*, *A_niger*, *A_flavus*, *A_terreus* strains were represented by relatively homogeneous MS, and the strains of *P_digitatum* were the most heterogeneous. MS from *A_flavus* and related to them *A_tamarii* were very similar. *A_wentii* and *A_candidus* have the most specific MS, while *A_niger* and *A_ochraceus* have the least specific MS. The strains of *P_digitatum* have more coincidences in MS-composition with *P_camemberti* than with *P_chrysogenum*. The isolates of the species from which the protein-peptide-extract is easily obtained, *A_fumigatus* and *A_terreus*, turned out to be the closest to some species with rigid cell wall: *A_niger* and *A_flavus*, respectively. The correlation coefficient values confirming the found patterns were copied.

Conclusions: Our research has shown that the physico-chemical differences in the Trichocomaceae taxons are uneven, therefore a qualified microscopic examination of the microfungus isolate should always complement MALDI-TOF-MS.



The CCI-matrix reflecting the comparison of MS from Aspergillus spp. and Penicillium spp.

29TH ECCMID
 13-16 APRIL 2019 AMSTERDAM, NETHERLANDS
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