PS6: 54

Is MALDI-TOF ICMS better than molecular biology in the identification of *Trichophyton rubrum*?

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Dermatophytoses are the most common fungal infection worldwide with a non-despicable impact in health-care costs. *Trichophyton rubrum* is an antropophilic dermatophyte species very well adapted to human host causing chronic and slowly progressing disease on keratinized tissues. It is the causative agents of about 70% of all human dermatophytoses. Besides their distribution all over the world this species is by far, the most frequently isolated species on onychomycosis and *tinea pedis*. Identification of individual species remains important from an epidemiological point of view and also for therapy administration. Molecular Biology tools have been widely used for accurate organism identification, solving problems concerning morphology-based identification of dermatophytes and improving knowledge on the epidemiology of dermatophytes. Recently a spectral technique analysis by Matrix Assisted Laser Desorption Ionization Time of Flight Intact Cell Mass Spectrometry (MALDI-TOF ICMS) has been increasingly used as a rapid technique in the identification and classification of microorganisms. It has proved also to be a valuable tool being incorporated in the polyphasic approach to improve the accuracy of the microbial identification issue. In this study, eighteen clinical isolates of *T. rubrum* from human nails were analysed using primers M13, $(GACA)_4$, $(AC)_{10}$ and ITS 1-4 sequencing data and MALDI-TOF ICMS analyses. *Trichophyton interdigitale* and *Aspergillus flavus* were used as two outgrouping isolates. All *T. rubrum* identifications were confirmed by molecular and spectral techniques. For molecular approach 16 isolates were clustered in a single group with 100% of genotypic homology of the ITS1-4 region, except for isolate MUM 08.11 and MUM 10.133 that were found having 98% of homology in this region. Same clusters were found with M13 and $(GACA)_4$. MALDI-TOF ICMS analysis corroborated molecular identification. Moreover nine isolates were clustered on a single group by evidencing 100% similarity and remaining isolates were distributed in the MALDI dendrogram showing phenotypic variability. Both approaches have shown the same accuracy, however spectral analysis suggested a better discriminating tool for intraspecific variability determination. MALDI-TOF ICMS is faster and inexpensive when compared with molecular biology techniques. As a consequence, it is suitable as point-of-care diagnostic for dermatophytoses.