

**TITLE:** EVALUATION OF FILTER PAPER TO TRANSPORT INACTIVATED RAPIDLY GROWING NONTUBERCULOUS MYCOBACTERIA FOR IDENTIFICATION USING THE MALDI-TOF MS SYSTEM

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The identification of mycobacteria is problematic in terms of the complexity involved in the sample preparation process and to the time taken to obtain satisfactory results. Usually, the differentiation of species belonging to the *M. tuberculosis* complex from Non-Tuberculous Mycobacteria (NTM) is carried out at State Center for Health Surveillance in Rio Grande do Sul state. However, to species-level identification of NTM is carried out at Professor Hélio Fraga in Rio de Janeiro state. Therefore, alternatives are needed to improve the identification of the NTM. The use of sterile filter paper impregnated with a previously inactivated bacterial biomass is an option to the transport of microorganisms between laboratories. In addition, identification by MALDI-TOF MS would significantly reduce the time to obtain a result. This study aimed to evaluate the use of filter paper for transporting rapidly growing nontuberculous mycobacteria (RGM) for its identification using MALDI-TOF MS. A total of 32 isolates of RGM were evaluated and the identification of each isolate was performed as follows: a) directly from original bacterial colony in solid media; b) after extraction procedure; and c) in filter paper after procedures of inactivation, impregnation and extraction. Meaning of score values were assigned: 2.00-3.00, high-confidence identification (+++); 1.70-1.99, low-confidence identification (+); 0.00-1.69, no organism identification possible (-). A total of 7 isolates were identified as (+++), 23 isolates as (+) and 2 isolates were not identified

(-) directly from original bacterial colony. Twenty-six isolates were identified as (+++) and 6 isolates as (+) after the extraction procedure. After filter paper disk transportation, a total of 29 isolates were identified as (+++) and 3 isolates as (+). RGM present biohazard associated to their transport, as it has the ability for biofilm formation and a safe method for identification is essential. Therefore, the inactivation of these microorganisms followed by impregnation in filter paper would make it possible for a large portion of RGM to be identified locally through support laboratories that provide identification service through the MALDI-TOF MS, and exempting the biohazard associated with these isolates transportation. Filter paper as a means to transport and storage of inactivated RGM can be considered a potential tool for faster, more accurate, biosafe and less expensive identification.

**Keywords:** Rapidly Growing Nontuberculous Mycobacteria, MALDI-TOF MS, filter paper, means of transportation

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