

# METHOD OF NON-TUBERCULOSIS MYCOBACTERIA SPECIES IDENTIFICATION IN THE PRESENCE OF ACID-RESISTANT MYCOBACTERIA IN THE SPUTUM OF THE PATIENT

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## Abstract

The aim of study was to improve the efficiency and standardization the methods of laboratory diagnostics of mycobacteriosis by developing a method for the specific accelerated identification of non-tuberculosis *Mycobacterium tuberculosis* (NTMB) at bacteriological laboratories.

**Materials and methods.** The object of the study was sputum from patients with suspected tuberculosis/mycobacteriosis.

For the phenotypic identification of NTMB, two approaches were used: the classical – using biochemical and cultural identification, and the modern – using the BD MGIT TBc ID or STANDARD Q TB MPT64 Ag Test identification immunochromatographic test (manufactured by SD Biosensor INC., Korea) to determine the MPT64 antigen specific for the complex *M. tuberculosis*.

Genotypic species identification of NTMBs was performed using DNA strip technology by Hain Lifescience (Germany) using the GenoType® *Mycobacterium* CM kit.

**Results.** A method has been developed for the specific identification of NTMBs in the presence of acid-resistant mycobacteria in the sputum of the patient, in which, using modern genetic methods, a reduction in the period of their identification was achieved. To solve the problem, two molecular genetic systems were used - GeneXpert Ultra and GenoType *Mycobacterium* CM. The use of the GeneXpert Ultra system makes it possible to detect only tuberculosis complex mycobacteria very quickly within 1.5 hours. In the presence of acid-resistant mycobacteria in the test sediment, according to the results of light microscopy and a negative test result in the GeneXpert Ultra system, inoculation of sputum sediment in the Middelrooc 7H9 liquid nutrient medium in the WASTEC MGIT system to obtain a pure mycobacterium culture followed by examination in the GenoType *Mycobacterium* CM system allowed the identification of DNA probes linear analysis method (LIPA), which was designed for DNA by amplification and subsequent hybridization on nylon membranes, the so-called DNA-strips with marker oligonucleotide probes. The application of the diagnostic systems, proposed in this study algorithm can significantly reduce the study time - up to 2 working days and identify NTMB types that are frequently encountered and clinically significant.

**Conclusion.** A method for the specific identification of NTMB in the presence of acid-resistant mycobacteria in the sputum of the patient has been developed. It allows to shorten the identification period of NTMB from 4 weeks to 2 working days.

**Key words:** mycobacteriosis, diagnostics, non-tuberculous mycobacteria, identification, GenoType *Mycobacterium* CM/AS, DNA-strips.

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