2. ABSTRACT

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Title of diploma thesis: Mechanisms of action of 2nd line antitubercular agents and activity screening of novel antituberculotics

The aim of the diploma thesis was to describe the characteristics of mycobacteria, tuberculosis, and the mechanism of action of second line antituberculotics used in the treatment of resistant forms of *Mycobacterium tuberculosis* and to experimentally verify the *in vitro* antimycobacterial activity of newly potentially effective compounds. The work also included the assessment of the relationship between the chemical structure of the tested substances and their biological activity.

Antimycobacterial activity was evaluated using the microdilution broth method on five testing strains of the genus *Mycobacterium* (*M. smegmatis*, *M. aurum*, *M. avium*, *M. kansasii*, and *M. tuberculosis* H37Ra). The minimum inhibition concentrations (MIC) were determined both visually and fluorometrically using the Alamar Blue indicator.

The tested compounds were divided into five groups based on their chemical structure. Out of a total of 70 tested compounds, 40 compounds showed significant antimycobacterial activity against at least one of the testing strains. The highest sensitivity was observed in the *M. kansasii* strain, and the lowest in *M. smegmatis*. The most effective potential antituberculotics were AP9, AZV-JZ-A10, AZV-JZ-A14, and AZV-JZ-A32, which were active against all testing strains. To confirm the efficacy and biological profile of these compounds, further *in vitro* and *in vivo* testing should be conducted, including extension to a virulent strain of *M. tuberculosis*.

Keywords: Mycobacteria, Tuberculosis, 2nd line antituberculotics, Microdilution broth method, Minimum inhibition concentration