

**PENGEMBANGAN METODE PENAPISAN
ANTI TUBERKULOSIS BERDASARKAN
PROFIL ESTER METIL ASAM LEMAK *Streptomyces* sp.**

DISERTASI

Untuk memperoleh Gelar Doktor
dalam Program Studi Doktor Ilmu Kedokteran
Fakultas Kedokteran Universitas Airlangga
dan Dipertahankan Di hadapan Panitia Ujian Doktor Terbuka

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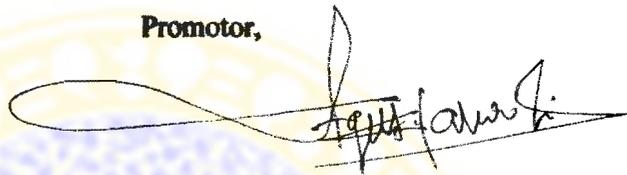
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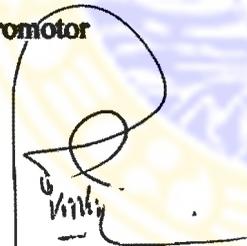
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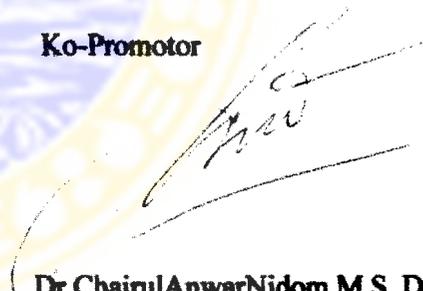
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ABSTRACT

ANTI TUBERCULOSIS SCREENING METHOD USING
FATTY ACID METHYL ESTER PROFILES OF *Streptomyces* sp.

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Background and Objectives: Tuberculosis (TB) is a chronic infectious disease that remains a public health problem in the world including Indonesia. TB cases increased in line with increased antibiotics resistance to *Mycobacterium tuberculosis* therefore the use of new anti-TB drugs is an alternative. Many studies have been conducted to discover bioactive materials as an anti-tuberculosis drug either from both herbal or antibiotic-producing microbes mainly *Streptomyces* sp. *Streptomyces* sp. can produce more than 3000 antibiotics. A species of *Streptomyces* sp. can produce more than 2-3 antibiotics naturally. The aim of this study was to utilize fatty acid methyl ester (FAME) profiles of *Streptomyces* sp. for screening an antiTB activity.

Materials and methods: *Streptomyces* sp. was isolated from home compost soil in Bratang, Surabaya. This research consisted of 3 steps. The first step was to identify the *Streptomyces* spp. isolated from home compost soil. The second step was to screen the activity profiles of *Streptomyces* sp. against *M. tuberculosis*. The third step was to profile fatty acid methyl ester (FAME) which has an activity as antiTB and to implement the FAME profiles on *Streptomyces* sp. samples isolated from soil by using a gas chromatographic-mass spectrophotometry.

Results: *Streptomyces* spp. isolated from home compost soil showed that they had an activity against *M. tuberculosis* with varied potential activities. According to the phylogenetic tree and homology analysis of 16S rRNA gene sequences of *Streptomyces* spp. isolates, *Streptomyces* Sp-D, Sp-Ep, G and Sp-Sp-I were new species. These isolates had shown specific fatty acid methyl esters (FAME) profiles based on retention time and peak area proportions. The FAME profiles revealed that all species produce TIC with varies peaks between 14 and 18. The profiles indicated two dominant peaks at retention time about 8.65 and 9.69 minutes were pentadecanoic acid 14-methyl-methyl ester and heptadecanoic acid methyl ester respectively. Therefore, cyclopropanoic acid methyl ester and heptadecanoic acid methyl ester can be proposed as biomarkers of an antiTB activity of *Streptomyces* sp. The FAME profiles of *Streptomyces* isolates derived from the model of Hierarchical Cluster Analysis and Principal Component Analysis showed that the majority isolates were predicted to have an antiTB activity.

Conclusion: The fatty acid methyl ester (FAME) profiles of *Streptomyces* sp. isolated from home compost soil in Bratang, Surabaya revealed an antiTB activity. Thus, it can be used to develop a screening method to identify potential antiTB activity by using fatty acid methyl esters as biomarkers.

Key words: fatty acid methyl ester profile, *Streptomyces* sp., Tuberculosis