

## **Antimicrobial producing microbes isolated from soil samples collected from Nanga Merit Forest in Sarawak, Malaysian Borneo**

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### **ABSTRACT**

*This study was carried out to screen for potential antimicrobial producing microbes from soil samples collected from Nanga Merit forest. After primary and secondary screening, one bacterial isolate (B17) and four fungal isolates (F10, F11, F14 and F26) produced antimicrobial activity against Staphylococcus aureus, Salmonella typhi, Escherichia coli and Enterobacter aerogenes. The minimal inhibition concentration (MIC) of the methanol extract from isolate B17 against the four tested bacteria was determined by disk-diffusion and agar well diffusion methods. The MIC values when tested against S. aureus, S. typhi, and E. coli were 25µg/µl whereas the MIC value was 12.5µg/µl when tested against E. aerogenes. In the agar well diffusion method, the respective MIC values were < 1.5625µg/µl for S. aureus, 12.5 µg/µl for both the S. typhi and E. coli, and 9.375 µg/µl for E. aerogenes. Besides, extracts from F26 cultivated on PDA, CDA, and V8 juice agar showed weak activity against E. aerogenes and was not tested further for its MIC values. The extract from B17 also exhibit antifungal activity when tested against test fungus (Fusarium sp.). Fungal isolates (F10, F11, F14 and F26) cultivated on PDA exhibited great antifungal activities.*

**Keywords:** Soil microbes, antibacterial and antifungal activity, MIC values

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### **INTRODUCTION**

Antimicrobial agents play the most important role in the treatment of bacterial infections [1] and wide spread efforts have been carried out by many scientists in order to screen for novel antibiotic producing microbes [2]. Through their efforts, many antibiotics have been discovered successfully to combat pathogenic bacteria that cause diseases. Nevertheless, the emergence of new diseases and reemergence of multiple-antibiotic resistance pathogens that render the effectiveness of existence clinically used antibiotics have spurred the needs for the discovery of new antibiotics [3].

Antibiotics can be classified according to their mode of actions. Antibiotics are classified as broad-spectrum antibiotics when they have the ability to affect a wide range of gram-positive and gram-negative bacteria while antibiotics that only effective towards certain group of bacteria are known as narrow-spectrum antibiotics. Several mechanisms of actions of antibiotics have been discovered by scientists. These actions include the inhibition of cell wall, protein and nucleic acids synthesis [4, 5, 6].

There are so many different potential sources where antibiotics can be discovered, such as medicinal herbs [7, 8, 9] and soil. However, soil, which is a naturally occurring loose mixture of mineral and organic particles [10], still