

Characterization and antimicrobial activities of two *Streptomyces* isolates from soil in the periphery of Universiti Putra Malaysia.

ABSTRACT

This study was to assess the identification and antimicrobial activities of two actinomycete isolates. The two isolates designated as B8 and C2, were isolated from a patch of soil in the peripheral area of Universiti Putra Malaysia by streaking on starch casein agar after standard serial dilution procedures. Their antimicrobial activities were first evaluated against eight clinical laboratory strains namely *Bacillus* sp., *Enterococcus* sp., *Escherichia coli*, *Klebsiella* sp., *Pseudomonas* sp., *Salmonella* sp., *Staphylococcus aureus*, and *Staphylococcus epidermidis* by perpendicular streak method on Mueller Hinton and Tryptic Soy agar. In both media, a broad-spectrum antibacterial activity was observed for both isolates, with B8 against all the test bacteria and C2 against five of them (*Bacillus* sp., *E. coli*, *Pseudomonas* sp., *S. aureus* and *S. epidermidis*). Re-assessment against *E. coli* ATCC 25922 and *S. aureus* ATCC 25923 strains by similar method showed antibacterial activities by isolate B8 against both ATCC strains while C2 only against *S. aureus* ATCC 25923. *Streptomyces griseus* ATCC 10137 was included in the later experiment and showed antibacterial activity against both ATCC strains. Subsequently, the two isolates were identified by PCR/sequencing techniques and phylogenetic analysis to be *Streptomyces* species (>93% homology based on 16S rRNA and *rpoB* genes). Characterization on cultural characteristic and viable count at different temperatures (37°C and 28°C), on different microbiological media (AIA, ISP-2, MHA, NA, PDA and TSA), were performed. More morphological features were observed on ISP-2 for both isolates. A higher growth yield was also observed at 28°C in all media but in comparing that between the two isolates, isolate B8 outnumbered C2 at all experimental conditions. The observed variation in cultural traits and growth yield indicate unique properties between the two antibiotic-producing isolates.

Keyword: *Streptomyces*; Soil; Media; 16S rRNA.