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Extraction of Extracellular Compounds from Freshwater Cyanobacterium *Oscillatoria* sp. and Screening their Antimicrobial Activity against Human Pathogenic Microbes

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Abstract

Cyanobacteria are considered as a rich source of bioactive compounds as they are able to produce a great variety of secondary metabolites characterised by a broad spectrum of biological activities including antiviral, antibacterial, antifungal, and anticancer properties. In the present study, cyanobacterium *Oscillatoria* sp. was isolated from Senanayaka Samudraya reservoir, Sri Lanka. Extraction of extracellular compounds were carried out using culture medium partitioning with ethyl acetate following Solid Phase Extraction (SPE). Antimicrobial activity of extracellular extracts of cyanobacteria species were qualitatively screened using antimicrobial susceptibility test (Disc diffusion), and quantitatively screened using Minimum Inhibition Concentration (MIC) and Minimum Bactericidal Concentration (MBC) methods against human pathogenic Gram-positive bacteria; *Staphylococcus aureus* (MRSA) ATCC 25923, *Bacillus* sp., Gram-negative bacteria, *Escherichia coli* ATCC 25922, *Salmonella Typhi*. Ciprofloxacin (5 µg/disc) was used as a positive control. Thin Layer Chromatography (TLC) was employed to separate the bioactive compounds and bioautochromatography was carried out to identify the antibacterial active bands. Chemotaxonomic identification of antibacterial active compounds were carried out using TLC spray reagents. The antimicrobial activity was recorded against *Bacillus* sp. (14±1 mm) *S.Typhi* (11±1 mm) and *S. aureus* (13±1 mm) and no visible inhibition was recorded against *E. coli*. MIC and MBC assay results showed that the highest antibacterial activity against *S. aureus* (MIC-156.24±1.25 mgL⁻¹, MBC-624.96±2.1 mgL⁻¹) whereas the lowest antibacterial activity was recorded against *S. Typhi* (MIC-312.48±1.23 mgL⁻¹, MBC- 1249.92±2.12 mgL⁻¹). Further, antibacterial active bands gave positive result for alkaloids and anthroquinonglycosides compound classes.

Keywords: Antibacterial activity, Minimum Inhibition Concentration, Thin Layer Chromatography