

In-vitro Anti-Microbial and Brine-Shrimp Lethality Potential of the Leaves Extract of Nahar (*Mesua ferrea*) Plant

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Introduction: The waxing interest in human health, concern over pathogenic and spoilage microorganisms in foods, increase in outbreaks of food borne disease and increasing bacterial resistance to antibiotics among others have culminated into a succinctly growing interest in the exploration of both the essential oils and other plant extracts in the food and pharmaceutical industries. Nahar (*Mesua ferrea*) is a species in the family Guttiferae (Clusiaceae). The plant is named after the heaviness of its timber and cultivated in tropical climates for its form, foliage, and fragrant flowers. It is native to tropical Sri Lanka but also cultivated in Assam, southern Nepal, Indochina, and the Malay Peninsula. Brine shrimp lethality bioassay is a recent development in the assay procedure of bioactive compounds which indicates cytotoxicity as well as a wide range of pharmacological activities (e.g. anticancer, antiviral, insecticidal, pesticidal, AIDS, etc.) of the compounds.

Aims and Objectives: This work, as part of on-going work on the plant, was aimed at evaluating the antimicrobial activity, minimum inhibitory concentration as well as the cytotoxicity of the leaves extract.

Methodology: The dry leaves were grinded and extracted in an oven shaker set at 37⁰C and 200rpm for 24 hours using ethanol and methanol as solvents. The agar disc diffusion method was used for the evaluation of antibacterial property of the leaves extract, the micro broth dilution for the determination of minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) while Brine shrimp (*Artemia salina*) lethality bioassay was employed of cytotoxicity assay.

Results: Ethanol gave higher extract's yield (6.20%) than methanol. The extract showed a remarkable antibacterial property against all the selected microbes (*Escherichia coli*, *Pseudomonas aeruginosa*, *Bacillus subtilis* and *Staphylococcus aureus*) with the inhibition zones ranging from 16.0±0.5mm to 18.0±0.5mm for all the tested bacteria. The active extracts were found to be both

bacteriostatic and bactericidal with the gram-positive bacteria showing less resistance. The MIC ranges of 2.5- 0.625 mg/ml with MCB value of 5mg/ml was obtained for the gram-negative bacteria while MIC ranges of 1.3- 0.313mg/ml with MCB value of 2.5mg/ml was obtained for the gram-positive bacteria. The leaves extract was found to be toxic to the Brine shrimps with LC₅₀ of 500ppm.

Conclusion: The antimicrobial and cytotoxic activities of Nahar leaves extracts, found in this study, may explain some of the traditional medicinal uses of the plants. These could also be of particular interest in relation to find out its untapped efficacy and can also be a potential of chemically interesting and biologically important drug candidates.

Key words: Nahar (*Mesua ferrea*) leaves extract, Minimum Inhibitory Concentration (MIC), Minimum Bactericidal Concentration (MBC), Brine Shrimp Lethality Bioassay, Cytotoxicity Assay.