

CYTOTOXICITY DETERMINATION OF *AERVA LANATA* METHANOLIC EXTRACT USING BRINE SHRIMP LETHALITY ASSAY FOR TREATMENT OF URINARY TRACT INFECTIONS

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Plant toxicity studies play a crucial role in ensuring the safety of herbal medicines, evaluating potential risks associated with plants. The Brine Shrimp Lethality Assay (BSLA) is a widely used and cost-effective preliminary screening tool for assessing the toxicity of various substances, including plant extracts and compounds. Objectives of this study were to explore innovative methods for assessing the toxicity of methanolic extract of *Aerva lanata* using the BSLA for treatment of Urinary Tract Infections and to provide a foundational understanding of the toxicity of *Aerva lanata* extract and its potential implications for medicinal use. *In-vitro* experimental study was conducted at KIU laboratory, Koswatte. *A. lanata* whole plant and its extraction were considered as the sample used. Concentration of plant extract known to be the independent variable and Brine shrimp (*Artemia salina*) mortality as an indicator of extract toxicity was known to be the dependent variable. Data analysis was carried out using toxicity index values (LC50) of the *Aerva lanata* extract were used to find out whether the extract is toxic or non-toxic. Stock solution was prepared by dissolving 10 mg of plant extract (soluble in water) in 1 ml of water. Concentrations of 1 mg/ ml, 100 µg/ ml, 10 µg/ ml and 1 µg/ ml were prepared by serial dilution from the stock solution. 1 ml of prepared solution was taken into the respect test tubes containing 10 live nauplii of *A. salina* and 1 ml of seawater. After 24 hours of incubation at 25 °C, the live nauplii were counted in each test concentration of the tube. Live nauplii were move towards the light source. The 1% dimethyl sulfoxide without extract was used as a negative control. The results were recorded as the percentage of mortality after 24 hours and 50% Lethal Concentration (LC50) values were calculated using Graph Pad prism 9 software. Then it compared with the toxicity scale of LC 50 < 1000ug/ml is considered toxic and if LC 50 > 1000ug/ml considered as non-toxic. The resulting LC50 was 59.34µg/ml. Therefore, *A. lanata* methanolic extract is considered to be toxic since LC 50 < 1000ug/ml; according to the brine shrimp lethality assay. The research on the cytotoxicity of *A. lanata* using the brine shrimp lethality assay provided valuable insights into the safety evaluation of medicinal plant extracts. The study effectively fulfilled its objectives by demonstrating the potential utility of the brine shrimp lethality assay in evaluating toxicity of *A. lanata* plant extract; lay the groundwork for further comprehensive evaluations, offering promise in the development of safer and more efficient herbal treatments in traditional medicine.

Keywords: Toxicity, BSLA, UTI, *Aerva lanta*, *Artemia salina*

Financial assistance from KAATSU International University (KIU) Research Grant is acknowledged.