

## Evaluation of the Toxicity of an Aqueous Plant Extract of *Argyrea populifolia* (Girithilla) Using Brine Shrimp Lethality Bioassay

H.D.T. Madhuranga<sup>1,2</sup> \*, K.D.M. Manthila<sup>1</sup>, R.M.T.S. Rathnayaka<sup>1</sup>, M.R.K. Farween<sup>1</sup>, D.N.A.W. Samarakoon<sup>1</sup>, N.D.K. Ranadeeva<sup>1</sup>, A.R. Jayamaha<sup>2</sup>, A.S. Hapuarachchi<sup>2</sup>

<sup>1</sup>Department of Biomedical Science, Faculty of Health Science, KIU, Sri Lanka.

<sup>2</sup>Research and Innovation Division, KIU, Sri Lanka.

\*[madurangadikkubura@gmail.com](mailto:madurangadikkubura@gmail.com) / [t\\_maduranga@kiu.ac.lk](mailto:t_maduranga@kiu.ac.lk)

*Argyrea populifolia* (Girithilla), belongs to the family Convolvulaceae is a native plant, used in a variety of ayurvedic preparations to treat for asthma, heart diseases, diabetes, neurological disorders, and animal bites in Sri Lanka. Even though the medicinal value of the plant has been extensively studied, the toxicity of the plant remains unknown. Therefore, it is important to identify the toxicity for dosage determination of formulations. The objective of this study was to determine the minimum toxic concentration of the *A. populifolia* using the brine shrimp lethality assay. The air-dried plant materials (aerial parts) were powdered and extracted into distilled water in a 1:3 ratio using the maceration technique. The dilution series was made using a two-fold dilution technique. 1g of aqueous powder diluted with 4 ml of distilled water. The concentration series started from  $2 \times 10^{-3}$  gmL<sup>-1</sup> to 1 gmL<sup>-1</sup>. Ten larvae were exposed to each concentration and the ability to kill the cultured larva (nauplii) was checked after 24 hours (Number of motile larvae). The mortality percentage and LC50 were calculated using GraphPad Prism 10 software according to concentration and mortality percentage. Results were compared with Meyer's or Clarkson's toxicity scale (If the LC50 <1000 µgmL<sup>-1</sup> consider as toxic and LC50 >1000µgmL<sup>-1</sup> consider as non-toxic). The highest mortality percentage ranged from  $31 \times 10^{-3}$  gmL<sup>-1</sup> to 1 gmL<sup>-1</sup>. The calculated LC50 value for the plant extract was 0.0205 gmL<sup>-1</sup> (20,500 µgmL<sup>-1</sup>). The results confirmed that the plant extract has not shown toxic properties according to Meyer's or Clarkson's toxicity scale. The minimum toxic concentration of the plant extract in the brine shrimp lethality assay was 0.0205 gmL<sup>-1</sup> (20,500 µgmL<sup>-1</sup>). Within the tested concentration range, *A. populifolia* (Girithilla) did not exhibit significant toxicity in this preliminary bioassay. However, as the brine shrimp assay serves only as an initial screening tool and may not directly correlate with human toxicity, further detailed toxicological evaluations, including cytotoxicity assays, animal studies, and activity-guided fractionation are recommended to identify bioactive constituents and confirm the safety profile of the plant extract for potential Ayurvedic applications.

**Keywords:** Brine shrimps, *Argyrea populifolia*, toxicity, medicinal properties, plant extract