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Toxicological evaluation and cytotoxic activity of Gumamela (*Hibiscus rosa-sinensis*) Methanolic extract using Brine Shrimp (*Artemia salina*) Lethality bioassay

Introduction

Global cancer burden has been estimated to have risen and named to be the second leading cause of death among individuals resulting in an increase in the cases of mortality rate worldwide. Population growth and ageing are some of the factors affecting the changing absolute cases of cancer that are linked to socio-economic development. Thus, safe treatment with natural plant products have recently been the center of research in the development of anti-tumor drugs and molecular diagnostic tools for both pharmacology and toxicology fields.

Methods

Brine shrimp lethality bioassay is known to be one of the most effective methods for preliminary assessment of toxicity of the plant extracts. The present study established the use of brine shrimp lethality bioassay to evaluate the cytotoxic activity of the *Hibiscus rosa-sinensis* methanolic extracts using different concentrations (100%) 25mg/mL, (75%) 18.75mg/mL, (50%) 12.5mg/mL and (25%) 6.25mg/mL.

Results

A total of 180 brine shrimp nauplii were used in the study as experimental animals. It was observed that there were substantial changes in terms of toxicity index and mortality rate of *Artemia salina* reacted with the methanolic extract of *Hibiscus rosa-sinensis*. Data analysis revealed significant difference in the mean mortality rate of *Artemia salina* ($p=0.00<0.05$) between the different methanolic extract concentrations, negative control (DMSO) and positive control (chloroform). Post-hoc Tukey-Kramer was used to verify which among the treatment groups were significant. Probit analysis determined $LC_{50}=596.544$ at 95% confidence level.

Conclusion

Toxicological evaluation results showed that the *Hibiscus rosa-sinensis* exhibited cytotoxic activity effectively using brine shrimp lethality assay.

Keywords: cytotoxic, brine shrimp lethality bioassay, anti-tumor, *Hibiscus rosa-sinensis*, *Artemia salina*