

## Phytochemical Screening and Evaluation of *In Vitro* Antioxidant and Biological Activities on Sri Lankan Polyherbal Drug “Neelagiri Padmana”

G.V.C.P Lakshman, L.W.N Madhushanka, and N.D.A Wageesha\*

Department of Biochemistry, Faculty of Medicine, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka.

\*[awageesha@med.sab.ac.lk](mailto:awageesha@med.sab.ac.lk)

“Neelagiri Padmana”, a traditional polyherbal formulation is being prescribed by traditional medical practitioners in Sri Lanka to treat abscesses, wounds, and cancers. In this study, the aqueous extract of the drug was screened for chemical fingerprinting and bioactivity to access its therapeutic potential. GC-MS fingerprinting analysis was carried out to investigate the presence of the chemical compounds following National Institute of Standards and Technology (NIST 3.0) libraries. Total Phenolic Content (TPC) was determined using the Folin-Ciocalteu assay and results were expressed as Gallic Acid Equivalents (GAE). DPPH radical scavenging activity was used to evaluate antioxidant activity followed by half maximal Inhibitory concentration ( $IC_{50}$ ) using ascorbic acid as the standard. Cytotoxicity followed by lethal concentration at 50% ( $LC_{50}$ ) was determined using a Brine shrimp lethality assay, while the *in vitro* hemolytic activity was measured photometrically (Compared to Triton X100). Statistical significance between bioactivities was accessed by Pearson’s correlation. All statistical analysis was performed using R statistical software (version 4.2.2). The GC-MS fingerprinting analysis revealed the presence of bioactive compounds including Carbamic acid derivatives, Butanoic acid derivatives, Azetidin-2-one 3,3-dimethyl-4-(1-aminoethyl), and Phenol, 2,6-bis(1,1-dimethyl ethyl) (> 90% similarity score). The TPC content of the drug was  $3.40 \pm 0.24$  GAE. The DPPH radical scavenging ( $IC_{50} = 66.33 \mu\text{g/ml}$ ) exerted significant ( $p < 0.05$ ) antioxidant capacity compared to standard Ascorbic acid ( $IC_{50} = 37.42 \text{ ppm}$ ). Cytotoxicity was reported as  $LC_{50} = 23.1 \mu\text{g/ml}$ . The hemolytic activity ranged from a minimum; of  $12.75 \pm 3.08\%$  to a maximum; of  $94.88 \pm 2.36\%$  for the concentrations of  $100 \mu\text{g/ml}$  and  $400 \mu\text{g/ml}$  respectively. A significant positive correlation ( $p < 0.05$ ) was experienced between antioxidant activity and cytotoxicity. In conclusion, the results demonstrate the aqueous extract of the drug manifests certain phytochemicals with pharmaceutical importance, high TPC, significant anti-oxidant, and cytotoxicity besides dose-dependent hemolytic activity.

Keywords: Neelagiri Padmana, Antioxidant Activity, Cytotoxicity, Hemolytic Activity