

Evaluation of the Phytochemical Content and Antibacterial and Antioxidant Activity of *Lasia spinosa* in Sri Lanka

Costa W.D.S.N.* , Dias S.

School of Science, Business Management School, Colombo 06, Sri Lanka

*sashrikacosta@yahoo.com

Abstract

The usage and exploration of novel drugs and dietary supplements have been accelerated due to the emergence of multidrug resistance which causes by inappropriate use of antibiotics. Natural fruits and vegetables have recognised as preferable sources for natural antioxidants against free radicals and as an antimicrobial agent. *Lasia spinosa* has been acknowledged as a natural source with antibacterial, antioxidant, cytotoxic, anticestodal and anticarcinogenic activities, where it natively grows in Sri Lanka. Due to its properties, *L. spinosa* has been used in culinary and indigenous medicine for a long time. On the account, this particular study was carried out to evaluate the phytochemical components, their contribution to total antioxidant activity and the antibacterial activity in *L. spinosa* cultivated in Sri Lanka. The whole plant; leaves, stem, rhizome and roots were collected from the local market and evaluated. Phytochemicals were extracted using methanol as the solvent. The antibacterial potential of *L. spinosa* was screened against *Staphylococcus aureus* and *Escherichia coli* by the Kirby-Bauer disc diffusion method. Folin-ciocalteu method and aluminium chloride colourimetric method was used to assess the total phenolic content (TPC) and total flavonoid content (TFC) separately while 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay and 2,20-azino-bis-3-ethylbenzthiazoline-6-sulphonic acid (ABTS) assay were carried out to evaluate the antioxidant activities. *L. spinosa* roots and rhizome had the highest antibacterial activity against *E.coli* and *S. aureus*, respectively. Sample concentration of 5 mg/mL was selected for phytochemical and antioxidant assays as that concentration showed the broad-spectrum activity. Highest TPC and TFC were recorded from *L. spinosa* rhizome (54.1 mgGAE/mL) and stem (130 mgRE/mL), respectively. Roots showed the highest DPPH (78.44%) and ABTS (80%) activity. TPC values showed positive correlations with DPPH and ABTS scavenging activities ($r=0.576$ and $r+0.722$, $p>0.05$ respectively). TFC values showed a positive correlation with DPPH ($r=0.576$, $p>0.05$) and a negative correlation with ABTS ($r= -0.497$). Hence a better correlation was observed between TPC with DPPH and ABTS than TFC which indicate that TPC would be the possible contributor for antioxidant activity. Results from this experiment concluded that the *L. spinosa* root possessed the highest antioxidant and antibacterial activity over leaves, stem and rhizome which may confirm its efficacy towards drug development.

Keywords: *Lasia spinosa*, Antioxidants, Antibacterial activity, Phytochemicals