World Academy of Science, Engineering and Technology
International Journal of Pharmacological and Pharmaceutical Sciences
Vol:10, No:02, 2016

The Effect of Different Concentrations of Extracting Solvent on the Polyphenolic Content and Antioxidant Activity of Gynura procumbens Leaves

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Abstract : Gynura procumbens (G. procumbens) leaves, commonly known as 'sambung nyawa' in Malaysia is a well-known medicinal plant commonly used as folk medicines in controlling blood glucose, cholesterol level as well as treating cancer. These medicinal properties were believed to be related to the polyphenolic content present in G. procumbens extract, therefore optimization of its extraction process is vital to obtain highest possible antioxidant activities. The current study was conducted to investigate the effect of different concentrations of extracting solvent (ethanol) on the amount of polyphenolic content and antioxidant activities of G. procumbens leaf extract. The concentrations of ethanol used were 30-70%, with the temperature and time kept constant at 50°C and 30 minutes, respectively using ultrasound-assisted extraction. The polyphenolic content of these extracts were quantified by Folin-Ciocalteu colorimetric method and results were expressed as milligram gallic acid equivalent (mg GAE)/g. Phosphomolybdenum method and 1, 1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assays were used to investigate the antioxidant properties of the extract and the results were expressed as milligram ascorbic acid equivalent (mg AAE)/g and effective concentration (EC50) respectively. Among the three different (30%, 50% and 70%) concentrations of ethanol studied, the 50% ethanolic extract showed total phenolic content of 31.565 ± 0.344 mg GAE/g and total antioxidant activity of 78.839 ± 0.199 mg AAE/g while 30% ethanolic extract showed 29.214 ± 0.645 mg GAE/g and 70.701 ± 1.394 mg AAE/g, respectively. With respect to DPPH radical scavenging assay, 50% ethanolic extract had exhibited slightly lower EC50 (314.3 ± 4.0 µg/ml) values compared to 30% ethanol extract (340.4 ± 5.3 µg/ml). Out of all the tested extracts, 70% ethanolic extract exhibited significantly ($p < 0.05$) highest total phenolic content (38.000 ± 1.009 mg GAE/g), total antioxidant capacity (95.874 ± 2.422 mg AAE/g) and demonstrated the lowest EC50 in DPPH assay (244.2 ± 5.9 µg/ml). An excellent correlations were drawn between total phenolic content, total antioxidant capacity and DPPH radical scavenging activity ($R2 = 0.949$ and $R2 = 0.978$, respectively). It was concluded from this study that, 70% ethanol should be used as the optimal polarity solvent to obtain G. procumbens leaf extract with maximum polyphenolic content with antioxidant properties.

Keywords : antioxidant activity, DPPH assay, Gynura procumbens, phenolic compounds
Conference Title : ICNPDD 2016 : International Conference on Natural Products and Drug Discovery
Conference Location : Kuala Lumpur, Malaysia
Conference Dates : February 11-12, 2016