STUDIES OF ANTIOXIDANT ACTIVITY OF BIOACTIVE COMPOUNDS DERIVED FROM *ARDISIA CRISPA*

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ABSTRACT

In recent times, researches have focused on medicinal plants in order to extract natural and low cost antioxidants that can help protect the human body against oxidative stress, and replace the synthetic additives that might be carcinogenic. In present study, the crude extracts of leaves and fruits from *Ardisia crispa* were investigated for their chemical constituents and antioxidant activity.

Preliminary phytochemical screening of the crude extracts via TLC analysis revealed the presence of several secondary compounds mainly, terpenoids and phenolic compounds in addition to alkaloids and saponins. HPLC analysis showed the possibility of presence of gallic acid in the fruits and leaves of *Ardisia crispa*.

Antioxidant activities of crude extracts were evaluated with three different methods DPPH radical scavenging activity, ferric reducing power assay, and metal chelating assay. DPPH assay results revealed that the crude extracts from *Ardisia crispa* exhibited high scavenging activity; the highest capacity was shown by fruits and leaves methanol extracts, 90.16±0.0% and 82.24±0.02% respectively at concentration of 5mg/ml. The IC_{50} values for them were 0.9mg/ml and 1.5mg/ml respectively. Ferric reducing power assay results confirmed the results obtained by DPPH radical scavenging assay. Fruits and leaves methanol extracts exhibited the highest reducing power toward ferric ion. The metal chelating activity of crude extracts was very low in this study comparing to EDTA standard. All crude extracts showed chelating capacity lower than 50%. Fruit water extract presented the highest chelating activity with 41.94±0.0% at 1mg/ml.

Total phenolic content results revealed that there is a positive correlation between the antioxidant activity and total phenolic content of a sample. Fruits and leaves methanol extracts presented the highest phenolic contents 3.14±0.0 mg GAE/ml and 2.57±0.0 mg GAE/ml respectively. The presence of phenolic compounds might be attributed to the antioxidant capacity of crude extracts. The highest flavonoid content was revealed by fruits and leaves chloroform extracts, their total flavonoids contents were 2.73±0.01 mg QE/ml and 2.06±0.0 mg QE/ml respectively. In the present study, there is no correlation between total flavonoid content and antioxidant activity of crude extracts. Antioxidant activities results along with total phenols and flavonoids content indicate that this plant may be utilised as a source of health promoting antioxidants.

Brine shrimp lethality assay results showed that the majority of crude extracts had low toxic effects on brine shrimp larvae. The highest effect was exhibited by fruits hexane extract with mortality of 50% at 1000 µg/ml and LC_{50} value of 381.93 µg/ml, all other crude extracts showed toxic effects lower than 50% mortality. Further analyses are needed to confirm that *Ardisia crispa* has no toxic effects.

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LIST OF SYMBOLS AND ABBREVIATIONS

%	Percent
°C	Degree Celsius
ROS	Reactive Oxygen Species
RNS	Reactive Nitrogen Species
DNA	Deoxyribonucleic Acid
α	Alpha
BHA	Butylated Hydroxyanisole
BHT	Butylated Hydroxytoluene
cm	centimetre
m	meter
UM	University Malaya
hr	Hour
TLC	Thin Layer Chromatography
HPLC	High Performance Liquid Chromatography
Mm	millimeter
UV	Ultra Violet
g	Gram
ml	milliliter
nm	nanometer
DPPH	diphenyl-2-picrylhydrazyl
mg	milligram
µg	Microgram
µl	Microliter

FRAP	Ferric Reducing Antioxidant Power
M	Molar
EDTA	Ethylenediaminetetraacetic Acid
ddH_2O	Double – distilled water
BSLA	Brine Shrimp Lethality Assay
&	And
NMR	Nuclear magnetic resonance