THE ANTIOXIDANT ACTIVITY OF PHENOLIC AND FLAVONOID FROM ORANGE PEEL EXTRACT

NUR EZATUL IDAYU BINTI NOOR AZIZI

BACHELOR OF SCIENCE (Hons.) BIOLOGY

FACULTY OF APPLIED SCIENCES

UNIVERSITI TEKNOLOGI MARA

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Mr. Muhammad Syukri bin Noor Azman
Supervisor
B. Sc. (Hons) Biology
Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

_____

Mr. Muhammad Syukri bin Noor Azman
Project Coordinator
B. Sc. (Hons) Biology
Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

_____

Mrs. Zalina binti Zainal Abidin
Head of Programme
B.Sc. (Hons) Physic
Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

Date: _____

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ABSTRACT

THE ANTIOXIDANT ACTIVITY OF PHENOLIC AND FLAVONOID FROM ORANGE PEEL EXTRACT

Natural antioxidant may present in several citrus fruits such as *Citrus sinensis* or also known as sweet orange peel. This antioxidant are molecules that can prevent, postpones or limit the oxidation of the other molecules by becoming oxidized themselves, thus avoiding the development of excessive ROS and cell degeneration. In addition, the antioxidant also can scavenge the free radical in human body and can prevent the free radical from damaging the human cell body. The objective of this study was to measure the total content of phenolic and flavonoid (TPC and TFC) and which method will produce the highest antioxidant from the orange peel extract. The second objective is to determine the antioxidant activity using DPPH free radical scavenging assay and scavenging of hydroxyl radicals. TPC from the orange peel can be measured by using the Folin-Ciocalteu method and the gallic acid was used as a standard. Then, the absorbance will be measured at 760 nm against blank using UV-Vis's spectrophotometer. Other than that, for the TFC the orange peel can be measured by using the $AlCl_3.6H_2O$ reagent method. In this test the quercetin was used as a standard and the absorbance was measured at 430 nm using UV-Vis's spectrophotometer. For the determination of antioxidant activity, two assays were conducted which are DPPH free radical scavenging assay and scavenging of hydroxyl radicals. Ascorbic acid was used as the standard for both assays. Total phenolic content of the orange peel extract was 0.0193 mg GAE/g while Total flavonoid content of the orange peel extract was 0.01228 mg QE/g. Moreover, for the DPPH the value of 50% inhibitory concentrations (IC_{50}) of the ascorbic acid was 1.124 μg/mL while for the orange peel extract the IC_{50} value was 1.474 μg/mL. Other than that, the IC_{50} value of the scavenging of hydroxyl radical for the ascorbic acid was 4.499 μg/mL while for the orange peel extract the IC_{50} value was 8.181 μg/mL. Thus, the lower the value of the IC_{50}, the stronger the ability of the extract to scavenge free radical. Although the result showed that the IC_{50} value of the standard was higher compared to the extract, the orange peel extract still can prevent the harmful consequences of oxidative stress as it produces the natural antioxidant.