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ANTIOXIDANT ACTIVITIES, TOTAL PHENOLIC AND FLAVONOID CONTENT IN SMALL SIZE CULTIVAR AND LARGE SIZE CULTIVAR OF *Centella asiatica*

BY

MUHAMMAD SADDAM HUSSEIN BIN ALIAS

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DECLARATION

I hereby declare that this thesis is my original work and has not been submitted previously or currently for any other degree at UiTM or any other institutions.

Signature: 

Name : MUHAMMAD SADDAM HUSSEIN BIN ALIAS

Matrix Number : 2011823576

Date : 2015

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ABSTRACT

ANTIOXIDANT ACTIVITIES, TOTAL PHENOLIC AND FLAVONOID CONTENT IN SMALL SIZE CULTIVAR AND LARGE SIZE CULTIVAR OF *Centella asiatica*

Free radicals is the unstable molecules that can damage the cells. Free radical occurs from the digestion of food or breathing in polluted air. In order to protect cells in body from free radical, antioxidant is the nutrient that help to prevent from damaging of the cells. Antioxidant can be founded in food or supplementation. The damaging of cells may increase the risk of getting cancer, heart disease, diabetes, or infections. Therefore, the need for antioxidants becomes even more critical with increased exposure to free radicals. In industries, the synthetic antioxidant is widely used such as butylated hydroxytoluene (BHT) and butylated hydroxyanisole (BHA) even thought it could lead to negative health effect. In recent years, a lot of herbal medicine is used as the alternative therapy. *Centella asiatica* has been claimed that have many physiological effect and its traditionally used. However, there was lack of data reported on antioxidant activity using *Centella asiatica* fresh extraction. Thus, in this study is focusing on antioxidant activities of 1, 1-diphenyl-2-picrylhydrazyl (DPPH), Ferric Reducing Antioxidant Potential (FRAP), total phenolic contain (TPC) and total flavonoid content (TFC) in small size cultivar and large size cultivar of *Centella asiatica*. At the end of the experiment, the TFC has shown increase in antioxidant activity of small cultivar and large cultivar with value 489.84 quercetin equivalent /g extract and 350 quercetin equivalent /g extract, compare to the control ($p<0.05$). On the other hand, the correlation study show the DPPH and FRAP is highly correlated with TPC and TFC. In conclusion, this finding suggested that *Centella asiatica* possesses antioxidant activity.

CHAPTER 1

INTRODUCTION

1.1 Research background

Nowadays, various plant are being utilized in alternative and complementary medicine especially among Malaysian. Many researchers point out that plant are known to have tremendous potential to prevent or cure various diseases. Phytochemical in the plant are seen to have a lot of intention especially on the role of prevention of the disease such as oxidative stress which are the release of reactive oxygen species for example of singlet oxygen and many radicals as damaging side effect of aerobic metabolism (Nanasombat *et al.* 2009). Even though oxygen is important in many organism in this world, it can cause toxic and mutagenic for the organism. Series of reactive oxygen (ROS) formation is the intake of the oxygen by cell. The increase number of ROS may cause the oxidative stress, which causes the imbalance between formation of ROS and the antioxidant system (Celep, Aydin, & Yesilada, 2012). A lot of plant have been used and consume because of the high antioxidant level in plant especially the extract of medical plants and natural product have become the source of antioxidant (Sumazian, Syahida, Hakiman, & Maziah, 2010). Antioxidant have the ability to scavenge free radicals in order to reduce oxidative stress.

In Malaysia the health authority has consume the *ulam,* even the species or quantity of intake is not specified. In effort to rank popular *ulam* on the antioxidant activities should be increases. *Ulam* is a fresh green salad that eat or blend of fermented sauces, aromatic herbs or spice that eat together with rice (Reihani & Azhar, 2012). An *Ulam* consist of shoots, leaves, and seeds. *Centella asiatica* is one of the plant that