UNIVERSITI TEKNOLOGI MARA

TOTAL PHENOLIC CONTENT FLAVONOID CONCENTRATION AND ANTIOXIDANT ACTIVITY OF INDIGENOUS HERBS, PHYSALIS MINIMA LINN

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ABSTRACT

Physalis minima linn is a plant that listed under the family of *Solanaceae* that has many biological effects such as antioxidant activity that is good for health. However, it is not widely used in medicinal area. Antioxidant is important to be supplied to our body such that it acts as inhibitor to inhibit the free radical formed. Free radical formed due to oxidation process which take place in our body leading to formation of reactive oxygen species having free radical. Thus, the objective of this research is to determine the total phenolic and total flavonoid content of *Physalis minima linn* besides to evaluate the antioxidant activity of different parts (whole plant, leaves, stem, fruit, and root) of the plant. The total phenolic content and total flavonoid content of *Physalis minima linn* are determined by using Folin-Ciocalteu method and aluminium chloride colorimetric assay, respectively while antioxidant activity is determined by using DPPH assay. It was analyzed that leaves extract had the highest total phenolic content of 1125.4180 mgGAE/g while whole plant had the highest total flavonoid content with 1161.0340 mgGAE/g. The lowest concentration of half inhibition, IC_{50} belonged to whole plant and leaves extracts which signified that both possess a good antioxidant activity. In conclusion, whole plant, leaves as well as stem of *Physalis minima linn* could be a potential source of natural antioxidant.

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CHAPTER ONE
INTRODUCTION

1.1 BACKGROUND OF STUDY

Many chronic illnesses such as diabetes, cancer or cardiovascular disease among others are results from the oxidative reactions that take place in cells and tissues of human. This oxidative reaction is a factor of oxidative stress [1]. Oxidative stress is linked to an imbalance in level of free radicals and antioxidant in human body. Radical such as hydrogen peroxide is formed when oxygen molecules undergo incomplete reduction. This radical formed into free radicals when oxygen react with certain molecules. Free radicals are molecules consist of one or two unpaired electrons. Radical can be categorized into two group of reactive oxygen species and reactive nitrogen species [2]. In normal physiological conditions, reactive oxygen species (ROS) is formed at low level during oxidation process. ROS is important to retain normal cell conditions. However, in certain condition, the ROS level can be formed at high level beyond the antioxidant defence system in our body. The high level of ROS can damage many cellular functions. The unpaired electron of free radical pairs up with important cellular components such as DNA molecule or cell membrane and oxidise them. Thus, antioxidant need to be supplied since the endogenous antioxidant in our body is not sufficient to neutralize the free radicals [3].

1.1.1 Problem Statement

In the last century, synthetic antioxidants such as butylated hydroxyl anisole (BHA) and butylated hydroxytoluene (BHT) have been used widely. However, the use of synthetic antioxidant is reported to have some side effects such as carcinogenesis and related to possibility of toxicity. Thus, the amount used of these synthetic antioxidants are restricted [4]. The health concerns due to the usage of synthetic antioxidants have caused an increase of interest to produce natural based antioxidant from plant material [5]. The presence of phenolic compounds such as flavonoids, anthocyanins etc., are responsible for the antioxidant activity in most plants [6].