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DETERMINATION OF ANTIOXIDANT PROPERTIES OF SYNTHETIC COMPOUNDS

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TABLE OF CONTENT

ABSTRACT

Oxidative stress is one of the major problems which lead to many chronic diseases such as cancer, diabetes mellitus, atherosclerosis and others. Thus, to combat this problem, antioxidants properties from natural sources and synthetic compounds were investigated to find new promising compounds. In this study, 27 synthetic compounds from Schiff bases compounds were tested for their antioxidant activities by using 2,2-diphenyl-1-picrylhydrazyl (DPPH), a stable free radical or called as DPPH assay. In this assay, different concentration of each compounds from serial dilution were added into DPPH solution in 96-well plate which then incubated for around 30 minutes. The discoloration of the DPPH from purple colour to yellow in colour could be observed due to the scavenging effect of antioxidant. The intensity of the discoloration also reflects the ability of the compounds as antioxidant. After the results were obtained, percentage of the DPPH reduction for each compound were calculated and the concentration at which the compound showed 50% of DPPH inhibition (IC50) also were evaluated. Results showed that from all of the compounds tested, only 12 compounds showed moderate to good antioxidant activity and the rest only showed weak antioxidant activity. This activity was believed due to the presence of substituent such as hydroxyl group which had increased the activity of the Schiff bases compound. As a conclusion, further investigation on these compounds should be done to market them as antioxidant.

CHAPTER 1

INTRODUCTION

1.1 Antioxidant

One of the essential elements that is vital in performing the biological functions in the body are oxygen, which is responsible for the metabolism of fats, carbohydrates and proteins, which then generate energy for growth and other cellular activities. However, oxygen also can be the one that brings harmful effects to the living tissues as it involves in a variety of reactive oxygen species, abbreviated as ROS (Makhmoor, 2005).

As reviewed by (Anchuri et al., 2012) examples of reactive oxygen species found in the body are hydroxyl, nitric oxide, superoxide anion and peroxyl. These molecules are very reactive and produced constantly in human body during the normal condition of physiological events or aerobic metabolism in our body. These ROSs can be deactivated and eliminated by antioxidant defense mechanisms (Anchuri et al., 2012). The defense mechanism consists of some compounds and enzymes that are responsible to remove the free radicals before they can cause damage to the tissues. These antioxidants can be found naturally in the body or obtained from supplements and diets (Makhmoor, 2005). For instance, fruit juices, coffee, tea, honey are a few of sources that are rich in