UNIVERSITI TEKNOLOGI MARA

EFFECTS OF SPRAY DRYING TOWARDS PHENOLIC CONTENTS AND ANTIOXIDANT ACTIVITY IN ANANAS COMOSUS (JOSEPHINE)

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ABSTRACT

Antioxidant was usually acts as human first line defend for any affected diseases. Antioxidant will avoid form of free radical that can cause cancer when the cell produces without limits. Lack of knowledge by human to know an advantage of antioxidant will affect their immune system and encourage dangerous disease later. Many types of antioxidant in Ananas Comosus will help defense human body such as defence of respiratory system, protect liver, maintain healthy vision and improve reproductive function. Examples of food and vegetables that contain antioxidant are broccoli, strawberries, potatoes, pineapples, sun flower seed and raw cabbage. In this experiment, Josephine Ananas Comosus will be chosen as sample. . Sample was prepared by blend to get pure juice before through spray drying for powder formation. 27% of maltodextrin concentration at temperature 140°C was set due to optimum parameter to form powder. Two different spray drying temperature and percentages of maltodextrin will be chosen for parameter comparison. Maltodextrin concentration at 17 % and 27% while, 140°C and 160°C for spray drying temperature. Different analysis such as 2.2-diphenyl-1-picrylhydrzyl (DPPH) free radical scavenging assay and total phenolic content (TPC) analysis was selected. During the analysis of TPC, all samples were changes from yellow to dark purple. For flesh sample, highest TPC was showed at temperature 140°C with 27% of maltodextrin concentration, 0.7395mg/20g fruit. Then, for peels sample, TPC reading highest at temperature 140°C with 27% concentration (0.5734mg/20g fruit), By using DPPH scavenging assay, for antioxidant analysis will changes colour from dark blue into yellow when presented of antioxidant contains in the sample . Flesh sample at temperature 140°C and 27% concentration contains highest reading of scavenging assay (% inhibiton), 35.21%. While for peels sample, the highest % inhibition at 140°C with 27% concentration (34.47%) . In conclusion, flesh contains higher TPC and percentages of inhibition at temperature 140°C with 27% of maltodextrrin concentration compared with peels sample. The lowest result of both analysis determined at temperature 160°C at 27% maltodextrin for flesh and peels sample. These due to amount of fiber that contains by flesh with lot of component and nutrient such as phenolic, flavanoid and antioxidant compound. Compared with peels sample, antioxidant activity may be present in the sample but at low concentration. For optimum spray dryer temperature and maltodextrin concentration to produce antioxidant powder were setting at 140°C with 27% respectively.

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TABLE OF CONTENTS

CHAPTER ONE

INTRODUCTION

1.1 RESEARCH BACKGROUND

Antioxidants are compounds in foods that neutralize chemicals also known as free radicals. These chemicals linked to heart, liver disease and cancer. Antioxidant will increase human immune system from any dangerous disease. Oxygen at high levels will generate oxidative stress, a deleterious process that can damage cell structures, including lipids, proteins, and DNA (Nafiu et. al., 2013).

Oxygen in human body is required at correct level because it works to metabolize nutrients and will use it back as energy. Oxygen will metabolize fats, protein, and carbohydrates to produces back in form of energy. High level of oxygen will form unpaired electron and then lead too free radical. When there is lack of antioxidants, oxidative stress also will damage DNA, protein and other macromolecules. To protect these diseases, human body needs antioxidant such as linoleic acid or ascorbic acid..

Ananas Comosus is one of tropical fruits where it was originating from Southern Brazil and Paraguay, that also can found in Malaysia (Suzihaque et. al.,2015). With suitable temperature dry and wet every year in Malaysia, it can growth and live here. Bunch of *Ananas Comosus* was harvest in farm such as in Pontian, Johor that lead to the production of pineapple juice, jam, food additives and also for pharmaceutical product. Many types of pineapple can be found in Malaysia such as Gandul, Morris, Mauritius, Josaphine and Sarawak (Suzihaque et. al.,2015).

Ananas Comosus contains lot of substances that give advantages to human body. From the stem and pineapple fruits, antioxidant can be extracted. Besides antioxidant, pineapple also contains compound that important for digesting enzymes in human body. It will help the digestion system in intestinal, also reduce the excessive inflammation, blood coagulation and stop tumour growth that can lead to