UNIVERSITI TEKNOLOGI MARA

QUANTIFICATION OF TANNINS IN WET FERMENTED COCOA BEANS BY UV-VIS SPECTROPHOTOMETRIC ANALYSIS AT 500NM TO 800NM

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ABSTRACT

Cocoa (Theobroma cacao L.) plant are commonly planted in tropical regions around the world such as Malaysia. The cocoa bean samples obtained from Malaysia Cocoa Board, Hilir Perak for each pod storage (PS) with different fermentation hour (0 hour, 24 hours, 48 hours, 72 hours, 96 hours and 120 hours) were analyzed by using UV-Vis Spectrophotometer. The UV-Vis Spectrophotometric analysis of the cocoa samples were done at 500nm to 800nm wavelength in increment of 10 interval absorbance reading. This study was conducted to quantify the tannins content in the wet fermented cocoa beans and determine the relationship of the total polyphenol content with the different color intensity of the extracted cocoa samples colour. The best wavelength for the quantification is at 520nm because of the tannins in the extracted samples express their highest intensity at this wavelength. The highest total polyphenol content from all the samples is PS4 48hr with 83.26 mg/L absorbance and the lowest is at PS6 0hr with 3.44 mg/L absorbance.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Cocoa (Theobroma cacao L.) plant are commonly planted in the West Africa, South America and some other tropical regions around the world (Ardhana & Fleet, 2003) such as Malaysia. In West Africa, cocoa is broadly planted in many countries, where Cote d'Ivoire being the first and Ghana being the second largest producers of cocoa beans in the world (Ghana Cocobod, 2015). Cocoa beans are the major economic part of the cocoa fruit where its role in the manufacture of chocolate are main ingredients.

Tannins exist as polyphenolic secondary metabolites of upper plants and also can be either galloyl esters. Tannins' derivatives are attached to a variety of polyol-, catechin- and triterpenoid cores, or they can be condensed tannins that can possess different interflavanyl coupling and substitution patterns which are oligomeric and polymeric proanthocyanidins. (Khanbabaee & Ree, 2001).

1.2 Problem Statement

Recent studies are focusing more on enhancing the cocoa flavour and beneficial effects of polyphenols toward human health. However, research on relationship between fermentation degree, total polyphenol content and colour changes of cocoa beans are still new. Threfore, this study was conducted to quantify the tannins content and the relationship of the total polyphenol content with the different color intensity of the extracted cocoa samples.