



Research Article

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Polyphenol content in powder and purified extract of unfermented cocoa beans from enrekang regency of South Sulawesi Indonesia

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ABSTRACT

The processing of cocoa bean can be done by method of fermented or unfermented. This research aims to determine the content of polyphenols in powder and purified extract of unfermented cocoa beans. The cocoa beans obtained from Enrekang regency of South Sulawesi Indonesia. The unfermented cocoa beans were made by removing the enzyme. Furthermore, made dried simpliciathen made into powder. The purified extract was produced by using the solvent acetone: water (7:3) by eliminating firstly the fat contained in the cocoa bean. Polyphenol content was measured using UV-Vis spectrophotometry with a wavelength of 750 nm. The results show the content of polyphenols from cocoa powder is 151 mg/g tannic acid while cocoa purified extract is 373.57 mg/g calculated as tannic acid.

Keywords : cocoa, unfermented, powder, purified extract, polyphenol

INTRODUCTION

Cocoa is one of plantation commodity which is continuously developed, especially to increase non-oil exports. It is also used to meet the needs of some domestic industries, such as food and beverage, pharmaceutical and cosmetics. The industries use cocoa product as raw materials such as: powder, paste, and cocoa butter. Benefits of chocolate have gained attention from a number of scientists and nutritionists in recent years [1,2]. Consuming of chocolate containing cocoa (high- cocoa-content) has been associated with various health benefits for the body, which is closely related to the function as antioxidants [3].

The processing cocoa beans comprises two methods: fermented and unfermented. Fermentation of cocoa beans is basically aimed to destroy the pulp and as a form of effort so that chemical and biochemical reaction occur inside the seed. Destruction the pulp make the cocoa beans cleaner and faster drying, while the chemical and biochemical reactions form the precursor of compounds for flavour and color in cocoa. During the fermentation process, the cocoa beans experience some change, such as: pulp decomposes, fermenting sugars in the layer of pulp to alcohol, increasing temperature, oxidation by bacteria, changing the alcohol into acetic acid, death of the seed, lose germination, diffusion of the dye from the pockets of cells, destruction anthocyanin dye, the formation of flavour and color precursors [4].

Many factors affect the polyphenol content of the cocoa beans, including fermented and unfermented conditions and geographic location [5]. Researches of different polyphenol content in ethanol extract from several clones of cacao beans from South Sulawesi have been done [6]. Therefore, this study was conducted to determine the total polyphenols of unfermented cocoa beans from Enrekang regency of South Sulawesi Indonesia in the form of powder and purified extract.

EXPERIMENTAL SECTION

Material

The cocoa beans obtained from Enrekang regency of South Sulawesi Indonesia. They are made in unfermented condition.

Preparation of Material

The enzymes found around the cocoa beans were eliminated then made dried simplicia. The simplicia then made into powder. Some cocoa powder were processed to produce purified extract by using solvent acetone:water (7:3) with first eliminating the fat contained in the cocoa beans.

Measurement of Polyphenols Total

0.2510 g of cocoa powder and 0.2507 g of purified extract were added Folin - Ciocalteu and 7.5 % sodium carbonate. Furthermore, the absorbance was measured at 765 nm [7-8].

RESULTS AND DISCUSSION

Fermented and unfermented condition of cocoa beans affect the compounds contained in the cocoa beans. This research uses cocoa beans from Enrekang regency of South Sulawesi Indonesia. The samples were made under condition unfermented then determined the content of polyphenols compounds of the cocoa powder and the extract that has been purified. Table 1 and Figure 1 show the raw standard of tannic acid for concentration and the absorbance. Table 2 shows the concentration and the absorbance of the samples of the powder and the purified extracts. Absorbance measurements use a set of Spectrophotometry.

Table 1. Concentration and absorbance of tannic acid raw standard

Concentration (x)	Absorbance (y)
0	0,055
5	0,363
10	0,603
15	0,826
20	0,946

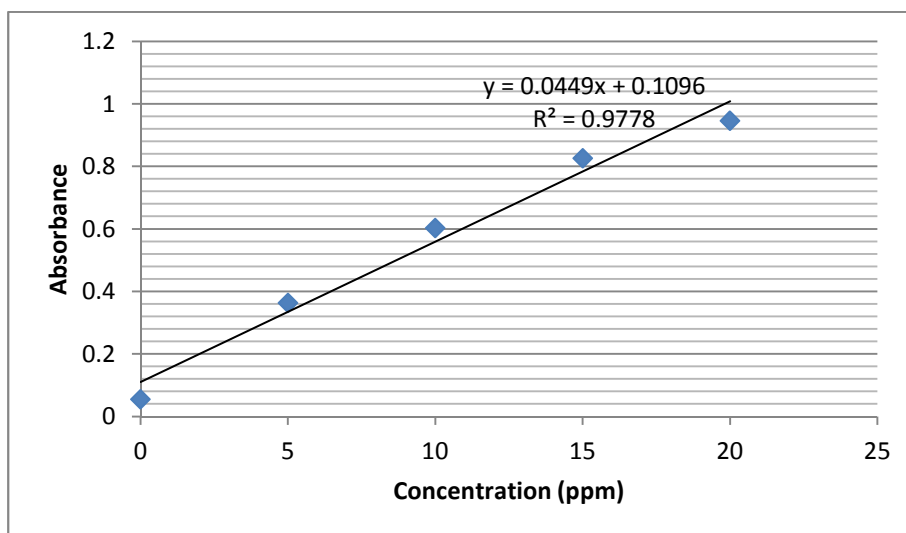


Figure 1. Calibration curve of tannic acid standard

Table 2. Powder and purified extract of cacao bean

Sample	Concentration	Absorbance (750 nm)
Powder	7,588	0,450
Purified Extract	18,731	0,951

Table 2 indicates the cocoa powder at the concentration of 7.588 ppm with absorbance 0.450 obtained level of polyphenol is 151 mg/g tannic acid, the result is higher than a previous study of ethanol extracts from fermented cocoa beans [6]. The spectrophotometry measurement of purified extract with concentration 18.731 ppm

and absorbance 0.951 shows the polyphenol content is 373.57 mg/g tannic acid. The results describe that the purification gives much higher polyphenol content than the powder.

CONCLUSION

Based on the results and the discussion it can be concluded, unfermented cocoa beans in a form of purified extract produce much higher polyphenol content compared to cocoa powder.

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