

1. Title of thesis : *The effect of adding yeast tape, Lactobacillus plantarum, Acetobacter aceti, the enzyme papain and cysteine inhibitors during fermentation of cocoa beans to the content of free amino acids, polyphenols and cocoa flavor*
2. Subject :
 1. Fermentation
 2. Cacao beans
 3. Free amino acids
 4. Polyphenol
 5. Flavor

ABSTRACT

Indonesia is one of the largest country in the world's cocoa exporter. However, the quality of the cocoa beans of Indonesia is still very low. Fermentation is a process for improving and forming a good chocolate taste and fun as well as reduce the bitter taste in the beans. The Cocoa has been identified as foods rich of polyphenols as the antioxidants, it is very good for human health. But, the fermentation process will lead to decrease levels of the polyphenols in the cocoa beans. Therefore it is needed to inhibit of polyphenol oxidase activity. The purpose of this study was to obtain an optimal fermentation results, increase the free amino acid levels and prevent a decrease of polyphenols content. The study was designed with a completely randomized design with seven treatments and three repetitions. Treatment: (1) unfermented, (2) natural fermentation, (3) fermentation by the addition of the enzyme papain on day-3, (4) fermentation by the addition of cysteine inhibitors on day-3 (5) fermentation with the addition of yeast of tape on day-0, L. plantarum on day-1, A. aceti on day-2, (6) fermentation with the addition of yeast of tape on day-0, L. plantarum day-1, A. aceti on day-2, and the enzyme papain on day-3 (7) fermentation with the addition yeast of tape on day-0, L. plantarum on day-1, A. aceti on day-2, the enzyme papain and cysteine inhibitors on day-3. Next, the fermented cocoa beans were dried and free amino acids were analyzed by paper chromatography and HPLC method, total polyphenol content was analyzed by Ciocalteu method and the flavors by organoleptic method. The results obtained that the fermentation with the addition of yeast of tape treatment, L. plantarum, A. aceti, the enzyme papain and cysteine inhibitors could increase the levels of free amino acids. Fermentation with the addition of cysteine inhibitors treatment decreased levels of polyphenols. Fermentation with the addition of yeast of tape treatment, L. plantarum, A. aceti, the enzyme papain, and cysteine inhibitors could increase the aroma of cocoa beans, cocoa flavor, aftertaste flavor, sour taste and color of cocoa and lowered sense of bitter and a sense of off-flavor. Conclusion the study showed that the addition of yeast of tape, L. plantarum, A. aceti, the enzyme papain, and cysteine inhibitors during the fermentation of cocoa beans can

increase levels of free amino acids, polyphenols prevent the decline, and improve the flavor of cocoa.