

Peningkatan Konsentrasi Monomer Polifenol Kakao Melalui Pemecahan Oksidatif Oligomernya dalam Sistem Butanol-Asam

A Study on the Improvement of Monomeric Polyphenol Concentration in Cocoa Beans through Its Olygomer Oxidation in Acid-Buthanol System

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Ringkasan

Biji kakao mengandung polifenol cukup tinggi, yaitu 120–180 g/kg; 37% di antaranya dalam bentuk monomer *flavan-3-ol*, 58% dalam bentuk oligomer dan 5% sisanya berupa antosianin dan polifenolik lainnya. Bentuk monomer lebih mudah diserap dalam sistim pencernaan tubuh. Satu penelitian telah dilakukan untuk mengkaji kemungkinan peningkatan konsentrasi monomer polifenol melalui oksidasi dalam sistem butanol-asam. Suhu dan konsentrasi HCl dipantau pengaruhnya terhadap hasil reaksi menggunakan rancangan *Response Surface Methodology*, masing-masing pada rentang 40–90°C dan 0,5–5,0N. Hasil penelitian menunjukkan bahwa konsentrasi monomer dalam polifenol biji kakao dapat ditingkatkan melalui reaksi oksidasi dalam butanol-asam. Suhu dan konsentrasi HCl berpengaruh nyata terhadap total absorbansi pada 500–600 nm, konsentrasi monomer dan derajat kecerahan hasil reaksi. Pengaruh secara interaktif antara suhu dan konsentrasi HCl terjadi pada parameter konsentrasi monomer, derajat kecerahan dan derajat kekuningan. Konsentrasi dimer, trimer, tetramer dan pentamer serta derajat kemerahan tidak dipengaruhi oleh suhu maupun konsentrasi HCl. Peningkatan konsentrasi monomer melalui oksidasi sebaiknya didahului dan diselingi dengan pengambilan monomer dari campuran, suhu reaksi tidak melebihi 74,5°C dan konsentrasi HCl antara 0,5–4,7N.

Summary

Cocoa beans are rich in polyphenolic compounds. These compounds constitute of 120–180 g/kg, in which 37% of them are in form of monomeric of flavan-3-ols, other 58% are in olygomer ones and the rest 5% are anthocyanins and other polyphenolic compounds. The former are absorbed in the intestine system much more than the later. A study has been conducted to elaborate the possibility in converting cocoa procyanidins into monomeric forms through an oxidation in acid-buthanol system. Effects of temperature and HCl concentration on

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the reaction were monitored by using Response Surface Methodology design in the range of 40–90°C and 0.5–5.0N, respectively. Results of the study showed that monomeric concentration could be improved through the acid-butanol oxidation. Temperature of the system and HCl concentration significantly affected total absorbance in the range of 500–600 nm, monomeric concentration and lightness of the resultant culture. Furthermore, interactive effects of the two factors exhibited on the monomeric concentration, lightness dan yellowness parameters. Concentration of dimers, trimers, tetramers and pentamers were not significantly influenced by neither temperature nor HCl concentration. This study also clearly indicated that improvement of monomeric concentration through oxidation should be initialized by and alternated with a collecting of the monomeric compounds from the mixture. Temperature of the system could be arranged not to exceed 74.5°C with HCl concentration of 0.5–4.7N.

Key words : Cocoa bean, polyphenol, procyanidin, monomeric, oligomeric, extraction, oxidation, conversion.

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