

CS-009

THE ACTIVITY VALUES OF CLA (CONJUGATED LINOLEIC ACID) SYNTHESIZED FROM CASTOR OIL BY USING VISIBLE SPECTROFOTOMETER WITH DPPH AS FREE RADICAL

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ABSTRACT

The antioxidant activity values of CLA (conjugated linoleic acid) synthesized from ricinoleic of castor oil was conducted by using Visible Spectrofotometer with DPPH (2,2 – difenil -1- pikrilhidrazil) as free radical. Activity determine with 30 minute stability time on 514 nm as maximum wave length (λ_{max}). The activity of synthesized's CLA was equivalent with α -Tocopherol, that on 2 ppm or more was more than 90%.

Keywords: activity value, CLA, Visible Spectrofotometer and α -Tocopherol

INTRODUCTION

Vitamine E or α -Tocopherol was usually used as an antioxidant but It was very limited, so It's prospect to look for an alternative antioxidant as well as vitimine E or more.[1,2] . The characteristic structure organic molecules that can used an antioxidant was has ring phenol e.g. flavonoid and conjugated linoleic acid e.g CLA. Although CLA has only two conjugated double bond but in fact CLA used in glyceride form, so totaly has six conjugated double bond. Conjugated double bond can absorb free radical so can used as antioxidant, and It did not toxid after absorb free radical. CLA can syntesized from ricinoleic of castor oil, by dehydration reaction (eliminated water) from ricinoleic. Ricinoleic was main component of castor oil (80 – 90 %), so castor oil was potential as a source of CLA to substituted of vitamine E as an antioxidant. Castor oil was cheep and non edible oil so It's prospect as an alternative antioxidant.[3,4]

METHODOLOGY

The 40 mg of DPPH (Mr = 394,32 g/mol) diluted in 100 mL ethanol (4 ppm), shake until homogenous and stored in dark bottle. Then makes DPPH series 1,0, 2,0 3,0 ppm and 4 ppm used to determina (λ_{maks}) between 400 – 700 nm, with time stability various of dpph 10, 15, 30, 45 dan 60 minute. Solution series of CLA and α -Tokoferol (Vitamine E) as a control on 1, 2,3 dan 4 ppm each added of DPPH 4 ppm in the same volume. Then determine absorbance of each on 514 nm with 30 minute time stability. The antioxidant activity determine by:
Antioxidant activity = $[(A_{Control} - A_{sampil})/A_{Control}] \times 100 \%$

RESULTS

DPPH compound was free radical violet colour can absorb by antioxidant compound with equation of reaction in Figure 1.

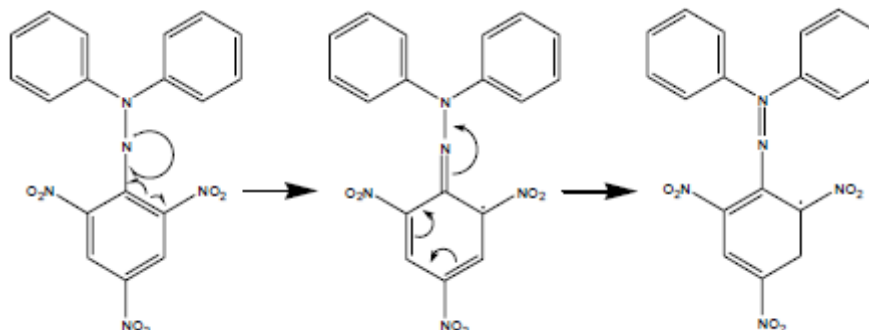


Figure 1. Absorbtion of DPPH by antioxidant compound

The maximum of wave lenth (λ_{maks}) was 514 nm and various time ditermine from Table 1.

Tabel 1. Time stability vs Absorbans

Time (minutes)	10	15	30	45	60
Absorbance	0.7557	0.7475	0.7551	0.6413	0.6235

Based on Table 1, the stability of time DPPH without decomposition was 30 minute and absorbance CLA and Vitamine E with DPPH complexed was on Table 2 and Figure 2.

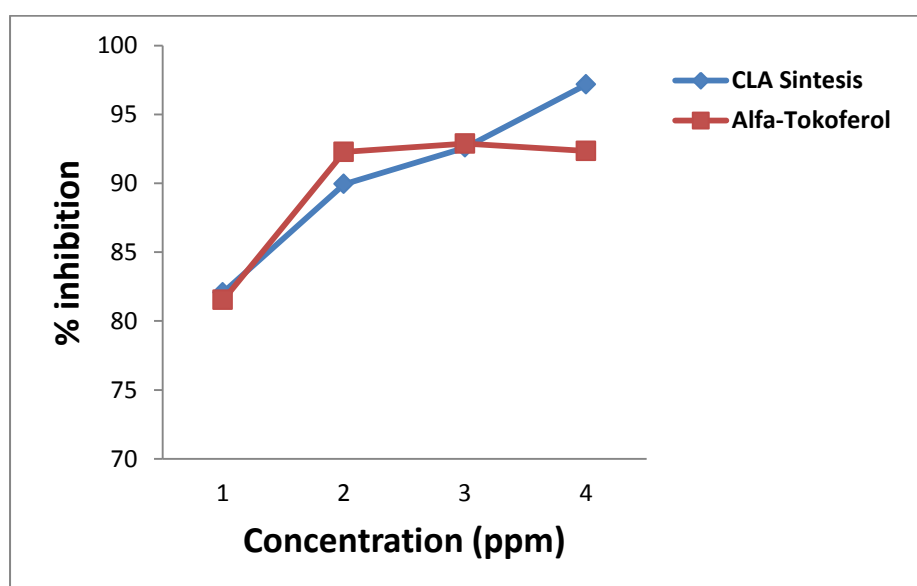


Figure 2. Absorbance of α -Tocopherol and CLA by using Vissible Spectrophotometer with DPPH as Free Radical

Table 2. Absorbansi α -Tokoferol dan CLA hasil Sintesis Dengan Metode DPPH Dengan Cara Spektrofotometer Tampak.

Cons. [ppm]	CLA: A Control = 0,7018 ^a			α -Tokoferol: A Control = 0,8384 ^b		
	A	ΔA^c	Inhibition (%)	A	ΔA^c	Inhibition (%)
1,0	0,1258	0,5760	82,07	0,1549	0,6838	81,52
2.0	0,0706	0,6321	89,94	0,0648	0,7736	92,27
3.0	0,0521	0,6497	92,58	0,0589	0,7786	92,87
4.0	0,0199	0,6819	97,16	0,0642	0,7742	92,34

^aAbs. blanco of CLA, ^bAbs. blanco of α -Tocopherol, ^cAbs blanco – Abs of sample

Based on Table 2 and Figure 2 antioxidant activity of CLA and α -Tocopherol was identically, so CLA can be used as an alternative antioxidant to substitute α -Tocopherol. Castor oil is cheap and also non-edible oil, so it has potential for development.

CONCLUSIONS

The activity of synthesized CLA from ricinoleic acid of castor oil was equivalent with α -Tocopherol. It was on 2 ppm or more was more than 90% and prospect to substitute α -Tocopherol as an antioxidant.

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