

## Antioxidant activities in extracts of five plant sources on stabilization of stripped sunflower oil and egg yolk homogenate

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Antioxidants are important in stabilization of foods. The present study was carried out to evaluate the antioxidant potential of five natural sources namely, coconut cake (A), *Psidium guajava* L. leaf (Guava) (B), *Psidium guineense* Sw. leaf (Ambul guava) (C), rice bran (D) and sesame cake (E) in both chemical and food model systems (stripped sunflower oil and egg yolk homogenate). Phenolic substances from the test plant materials were extracted using ethanol:water (70:30) solvent system. Total phenolic content (TPC) was determined using Folin-Ciocalteu method and expressed as gallic acid equivalents (GAE) per kilogram of sample. Antioxidant activities of extracts and butylated hydroxytoluene (BHT) were evaluated using deoxyribose degradation assay after adjusting the concentration to 30  $\mu\text{g mL}^{-1}$ . Antioxidant activities of phenolic extracts on stripped (antioxidant free) sunflower oil were determined by comparing the induction time (IT) using the Rancimat Apparatus at 100 °C. Effect of phenolic antioxidants on the inhibition of thiobarbituric acid reactive substances (TBARS) formation was evaluated using egg yolk homogenate as the food model system. Results of TPC as GAE vary in the order, C (195.25 $\pm$ 9.56 g/kg) > B (68.83 $\pm$ 3.74 g/kg) > D (4.14 $\pm$ 0.46 g/kg) > E (2.11 $\pm$ 0.29 g/kg) > A (0.77 $\pm$ 0.03 g/kg). Phenolic extract of C showed a significantly ( $p < 0.05$ ) higher percentage inhibition of deoxyribose degradation (76.5 $\pm$ 1.5 %) than other phenolic extracts and BHT. Inhibition percentages obtained for A, B, D, E and BHT were 39.5 $\pm$ 1.4 %, 71.0 $\pm$ 2.7 %, 46.1 $\pm$ 3.1 %, 42.1 $\pm$ 2.5 % and 32.6 $\pm$ 2.1 % respectively. Results of IT of stripped sunflower oil and inhibition % of TBARS formation were stated in Table 1.

Table 1: IT of stripped sunflower oil and % inhibition of TBARS formation in egg yolk homogenate

Phenolic extract	IT (h)*	% Inhibition of TBARS formation**
Coconut cake extract	3.58 $\pm$ 0.02	71.21 $\pm$ 2.22 <sup>a</sup>
<i>Psidium guajava</i> L. leaf	3.72 $\pm$ 0.02	73.60 $\pm$ 1.35 <sup>a</sup>
<i>Psidium guineense</i> Sw. leaf	3.83 $\pm$ 0.09	80.05 $\pm$ 1.35 <sup>b</sup>
Rice bran extract	3.60 $\pm$ 0.14	68.60 $\pm$ 1.45 <sup>c</sup>
Sesame cake extract	3.24 $\pm$ 0.08	56.78 $\pm$ 2.65 <sup>d</sup>
BHT	3.15 $\pm$ 0.07	66.92 $\pm$ 5.60 <sup>c</sup>

\* mean  $\pm$  SD, n=2 \*\* mean  $\pm$  SD, n=6 a, b, c, and d assessed significance at  $p < 0.05$

Among the natural sources studied, phenolic extract of *Psidium guineense* Sw. leaf showed antioxidant activities that were superior to that of synthetic antioxidant BHT in both chemical and food model systems. Test plant sources could be potential sources of natural antioxidants effective in preserving food.

**Keywords:** Deoxyribose degradation assay, Food model systems, Rancimat, Thiobarbituric acid reactive substances, Total phenolic content

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