

## Antioxidant activities of phenolic extracts of guava leaf, coconut cake, rice bran and sesame cake obtained using subcritical water and ethanol:water (70:30 v/v)

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Subcritical water (SCW) extraction is an environmentally friendly technique that has been used to extract phenolic substances. For the present study, guava leaves (GL), coconut cake (CC), rice bran (RB) and sesame cake (SC) were selected as the natural sources of antioxidants. The study aims at the comparison of the efficiency of the extraction of phenolic substances from these natural sources by SCW and ethanol:water, 70:30 v/v (EW). Phenolic substances from the above sources were extracted under high pressure (20 bar) and at 200 °C (SCW200) and with the EW. Total phenolic contents (TPC) of the extracts were determined using Folin-Ciocalteu method. Antioxidant activities of SCW200 and EW extracts and butylated hydroxy toluene (BHT) were evaluated using 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assay. Phenolic antioxidants were subjected to a heat treatment at 180 °C for 2 hours and their effect on the oxidative stability of stripped sunflower oil was determined by evaluating the induction time (IT) using the Rancimat apparatus. Results of the TPC and Rancimat test are given in Table 1. In DPPH assay EW extracts exhibited higher inhibition percentages than their respective SCW200 extracts and BHT in the phenolic concentrations of 10, 15, 20, 25 and 30 µg/mL.

Table 1: TPC and IT of phenolic antioxidant extracts

Phenolic extract	TPC (g GAE/kg)		IT (h) at 100 µg of phenolic antioxidant/g of stripped oil	
	SCW200	EW	SCW200	EW
Guava leaf	66.36±3.18	68.83±3.74	2.21±0.12	2.63±0.07
Coconut cake	0.73±0.03	0.78±0.03	2.72±0.11	2.80±0.11
Rice bran	3.75±0.12	4.14±0.46	2.48±0.03	2.78±0.04
Sesame cake	1.83±0.06	2.11±0.29	2.67±0.04	2.72±0.08

The results indicate that both EW and SCW200 can be effectively use to extract phenolic substances from the studied plant materials. Even though TPC yield of CC is the smallest it shows the highest efficiency in protecting oils against oxidation.

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