

**STUDIES ON SOME ASPECTS OF OIL AND PROTEIN CONTENT OF
CONOPHOR NUT (*Tetracarpidium conophorum*)**

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TP01/02/R/2693**

**A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF A DOCTOR OF PHILOSOPHY
DEGREE IN FOOD SCIENCE AND TECHNOLOGY
AT THE FACULTY OF TECHNOLOGY
OBAFEMI AWOLOWO UNIVERSITY
ILE-IFE, NIGERIA.**

2008

ABSTRACT

The functional properties, solubility profile, *in vitro* digestibility and antioxidant properties of *Tetracarpidium conophorum* (conophor nut) were studied. The storage stability and thermal oxidative changes of its oil were also evaluated with a view to increasing the underutilized nut as food ingredient.

A portion of fresh conophor nuts was processed to obtain defatted flour, concentrate and isolate by a combination of solvent extraction, isoelectric precipitation, and lyophilization. The flour, protein concentrate and isolate were then subjected to chemical analyses using standard methods. Crude and purified oils were also obtained from another portion of the nuts subjected to cooking, shelling, drying, milling and solvent extraction. Samples of crude and purified oils were stored at ambient and refrigeration temperatures and the acid value, peroxide value, p-anisidine value and fatty acids composition were monitored as indices of oxidation. Thermal oxidative changes of conophor oil used for frying plantain slices were evaluated by determining changes in viscosity, colour, conjugated dienes and trienes, peroxide and p-anisidine values. Samples of plantain chips obtained by frying in conophor oils were compared with those obtained when fried in soy oil by sensory evaluation. Data obtained were subjected to appropriate statistical analysis.

The results showed that conophor flour, concentrate and isolate exhibited high oil (2.35 - 2.95 g oil/g sample) and water (4.03 - 4.88 g water/g sample) absorption capacities but low emulsion (3.00 - 7.50 mL oil/g sample) capacities. The foam capacities for isolate, flour and concentrate were 5, 20 and 27%, respectively. The least gelling concentrations (flour, 8%; concentrate 10%, isolate, 12%) were also low. The most effective conophor protein solubilizer was 0.1M NaOH while water and 0.1M potassium phosphate buffer were the least effective protein solubilizers. The protein fractionation revealed that glutelins and globulins accounted for the major proteins of conophor nut. Moist heat and dry heat increased digestibility of conophor nut but moist heat was found to be more effective than dry heat. The total phenolic content was significantly ($p < 0.05$, LSD) higher in 100% methanolic extract (1.49 g/100 g crude extract) than in 100% acetone extract (0.85 g/100 g crude extract). The methanolic

extracts exhibited a high radical scavenging effect (59.85%) compared to value of 44.67% in acetone extracts. Both primary and secondary oxidation products were low at low temperature but were found to be high at elevated storage temperatures. Apart from refractive index which remained almost constant, other physical and chemical characteristics of the oils such as acid value, peroxide value, conjugated dienes and trienes, and p-anisidine value increased with increasing frying sessions. Taste panel analysis showed plantain chips obtained by frying in purified conophor oil were preferred (5.70) to those fried in crude conophor oil (3.10) on 7-point hedonic scale.

The study has shown that conophor nut flour, concentrate and isolate are useful as ingredient in food formulation.