# ANTIOXIDANT PROPERTIES OF OLASIMAN (Portulaca oleracea) AGAINST OXIDATIVE RANCIDITY OF ROASTED PEANUTS

KRISTAN DIANE B. CANTA, KYLENE MICHELE L. BALBUENA, CHYNNA MAE MARIE S BAUTISTA, AMIE LAWRENZ CASTILLO, LOUISE CLAIRE P. RIVERA AND ASHLYN REIGN R. SARCE

#### **ABSTRACT**

Peanuts, a widely cultivated crop in the Philippines, are susceptible to oxidative rancidity due to its high fat content. Antioxidants are commonly applied to inhibit oxidation in peanuts. This study assessed the effectiveness of adding Portulaca oleracea extract to roasted peanuts to combat oxidative rancidity. The Portulaca oleracea extract known for its antioxidant and omega-3 content, was evaluated for its pH (4.6), total soluble solids (56°Bx), and color (yellow-brown). Different concentrations of the extract (10%, 15%, and 20%) were incorporated into roasted peanuts. After a two-week storage period, rancidity indices such as moisture content, peroxide value, and free fatly acid were measured. Roasted peanuts with 10% extract exhibited the lowest moisture content (mean rank 3.67), while the control group had the lowest peroxide value and free fatly acid (mean rank 4.50 and 4.17, respectively). Microbiological analysis revealed compliance with FDA and FSAI standards. Furthermore, sensory evaluation with 96 panelists was conducted after thirty-eight days of storage favored the roasted peanuts with 10% P. oleracea extract. Further research is recommended to explore the potential of Portulaca oleracea as a food antioxidant comprehensively. antioxidant comprehensively

Keywords: Portulaca oleracea, Antioxidant, Roasted Peanut, Oxidative Rancidity



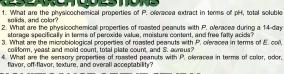
#### INTRODUCTION

The oxidative reactions in peanuts (Arachis hypogaea) lipids decrease its shelf life which gives an undesirable flavor that can reduce the consumers' acceptance towards roasted peanuts. Various factors, including light, water activity, lipid content and composition, temperature, relative humidity, and the level of oxygen in the packaging, have an impact on the oxidation of lipids in roasted peanuts. On the other hand, P. oleracea is a good source of vitamins and minerals, high in dietary fiber, and has antioxidants. It contains omega-3 fatty acids, vitamin C, alphatocopherol, and beta-carotene.

### JECTIVE

The study analyzed the possibility of adding Portulaca oleracea extract, a succulent plant high in antioxidants and omega-3, to roasted peanuts to improve their resistance to oxidative rancidity. The main objective of the study is to determine the effect of P. oleracea on the oxidative rancidity of roasted peanuts.

#### RESEARCH QUESTIONS





Three formulations were prepared and coded as: RP01 (10%), RP02 (15%), RP03 (20%) and RP04 (0%) as the control sample. All samples were subjected to physico-chemical analysis. The three samples (RP01, RP02, and RP03) were subjected to microbiological and sensory evaluation. Roasted peanuts with *P. oleracea* were compared against a reference sample which is the commercially available roasted peanuts for sensory evaluation.

Physico-chemical tests for roasted peanuts with *P. oleracea* extract were statistically analyzed using the Kruskal Wallis test while the sensory evaluation results were analyzed using one-way ANOVA and Tukey's test.

#### SIGNIFICANCE OF THE STUDY

Food Industry – This study could help in product development enhancing the shelf-life of roasted peanuts and potentionally increasing n Government – To discover other applications for *P. oleracea* as well as to utilize *P. oleracea* as a weedy vegetable.

Students – To explore the functional and nutritional aspects of roasted peanuts enriched with *P. oleracea*.

Consumers - To give insights when it comes to the product quality, reduction of rancidity, and prolonging of shelf-life in roasted peanuts.

Farmers - To help farmers with additional income from the potential buyers. - This study could help in product development enhancing the shelf-life of roasted peanuts and potentionally increasing market competitiveness

P. oleracea

earchers - For future studies on natural antioxidants in food preservation and its effect on shelf life

#### RESULTS and DISCUSSION



#### emical Prop of P. oleracea Extract

pH 4.6 TSS 56°Bx Color HUE (7.5 YR) VALUE (2) CHROMA (2)

CHROMA (2)
Indicating that *P. oleracea* extract was c and very concentrated. The color of the act is yellow brown which may be due to protenoid content.





# cochemical Propertico oasted Peanuts with P. oleracea Extract

All samples of roasted peanuts with P. oleracea extract were tested for their physicochemical properties at day 0, 7, and 14 of storage. Roasted peanuts with 10% ranked first for the moisture content with the lowest mean rank of 3.67. As for peroxide value, a free fatty acid control sample ranked first with a mean rank data of 4.50, 4.50 and 4.17 respectively.

Peroxide Value (meg/kg)	Sto	rage T (Days)	ime	Mean Rank
(meq/kg)	0	7	14	
0%	0.19	0.09	0.45	4.50
10%	0.47	0.23	0.00	5.17
15%	0.74	0.47	0.29	9.50
20%	0.19	0.54	0.28	6.83

Moisture Content	Sto	Mean Rank		
%	0	7	14	
0%	3.89	2.42	3.33	10.00
10%	1.49	2.44	1.53	3.67
15%	2.36	2.31	2.57	6.67
20%	3.07	2.22	1.93	5.67

Free Fatty Acid %	Storage Time (Days)					Mean		
			7		14		Rank	
	As lauric	As oleic	As Isuric	As oleic	As lauric	As oleic	As lauric	As oleto
0%	0.94	1.33	0.96	1.35	0.77	1.08	4.50	4.17
10%	0.96	1.36	0.97	1.36	0.94	1.33	7.67	8.17
15%	0.97	1.36	0.97	1.37	0.92	1.30	8.33	8.33
20%	0.96	1.35	0.77	1.09	0.96	1.35	5.50	5.33

# Microbiological Analysis

All levels of roasted peanuts with *P. oleracea* has a result of 10 cfu/g for total plate count, less than 10 cfu/g for *E. coli*, total coliform count has less than 10 cfu/g, operate count and mold count has less than 10 cfu/g, and *S. aureus* has less than 10 cfu/g. Therefore, all formulations for roasted peanuts passed the microbiological standard for food making it safe for consumption, based on the regulation (FDA Standards 2022, and FSAI Standards 2020).



# Sensory Evaluation

Sensory evaluation of the roasted peanuts with *P. oleracea* extract was conducted during day 38 and showed significant differences in odor, flavor, texture, and overall acceptability. However, there was no significant difference in color and off-flavor between samples. Roasted peanuts with 10% *P. oleracea* extract were preferred on all attributes excluding odor and

#### CONCLUSION AND RECOMMENDATION

The study showed that the rancidity indicators such as peroxide value, free fatty acid and moisture content of roasted peanuts were not affected by the addition of *P. oleracea* extract during a two-week period of testing. However, sensory evaluation that was done during the thirty-eight days of storage of roasted peanuts shows a favorable result for 10% roasted peanuts with *P. oleracea* extract where off-flavor was not detected. Therefore, it can be concluded that *P. oleracea* extract can maintain the quality of peanuts according to its sensory attributes.

Further application of *P. oleracea* as an antioxidant in foods might help in the exploration of its potential in the food industry. To support future studies, the following are recommended: Antioxidant test for *P. oleracea* extract, a longer storage period of testing, and other methods of extraction.

# REFERENCES