Comparative study of proximate and pesticide residue analysis of local and imported Rice (*oryza sativa*)

Osifeko, O.L., Onwordi, C.T., Ogunoye, T. B., Adesanya, A. R., Peters I. G., Adeko, S. O.

Department of Chemistry, Faculty of Science, Lagos State University, LASU P.O Box 0001, Ojo, Lagos, Nigeria

corresponding author's e-mail address:olawale.osifeko@lasu.edu.ng

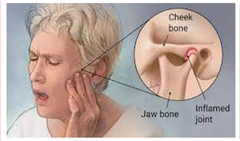
INTRODUCTION

Rice is the seed of a grass specie called *Oryza*
It occur in variety of size, colour, and types. They can also be prepared in diverse ways.

Pesticides are considered a vital component of modern farming, playing a major role in maintaining high agricultural productivity

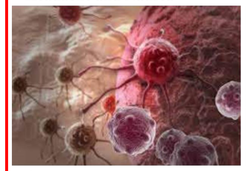
Every usage of pesticides have some associated risks. The health effect could range from a simple skin irritation to more severe effects like cancer or even death

HUMAN HEALTH RELATED CONCERNS



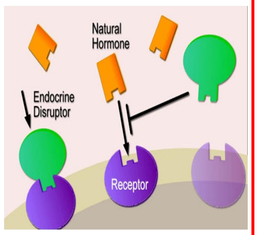
Headache and Nausea

Birth Defect



Cancer

Mutant sperms



Endocrine Disruptor

The aim of this study is to determine the proximate analysis and levels of pesticide residues in local and imported rice available in the Nigerian market. It centres on creating awareness on the proximate nutritional composition (moisture, protein, ash, fat, crude fibre, carbohydrate, and energy values) of each rice samples as well as the amount of the pesticide residues found in them.

MATERIALS AND METHODS

The rice samples (four local and four imported) were subjected to the standard technique for the proximate analysis while the. pesticide residues were extracted from the samples using Quick, Easy, Cheap, Effective, Rugged and Safe (QuEChERS) extraction method and quantified by Gas Chromatography Mass Spectrometer (GC-MS).

RESULTS AND DISCUSSION

PROXIMATE PARAMETER	LOCAL				IMPORTED			
	A	B	C	D	A	B	C	D
Moisture Content	11.69 ± 0.61	13.83 ± 0.42	12.54 ± 0.03	10.53 ± 0.05	11.01 ± 0.04	14.17 ± 1.36	12.56 ± 0.02	10.46 ± 0.04
Protein Content	9.32±0.07	6.02 ± 0.08	8.83 ± 0.18	8.92 ± 0.04	8.87 ± 0.07	7.71 ± 0.12	7.79 ± 0.21	7.57 ± 0.08
Fat Content	11.96 ± 0.07	6.48 ± 2.00	7.41±0.01	11.38 ± 0.04	8.98 ± 0.06	3.48 ± 0.01	10.41 ± 0.02	12.9 ± 0.03
Crude fiber content	4.98 ± 0.06	5.78 ± 0.17	7.35 ± 0.12	6.98 ± 0.07	6.31 ± 0.02	5.34 ± 0.04	6.45 ± 0.05	6.69 ± 0.16
Ash content	0.69 ± 0.01	0.73 ± 0.06	0.71 ± 0.04	0.77 ± 0.01	0.59 ± 0.01	0.59 ± 0.06	0.60 ± 0.05	0.54 ± 0.01
Carbohydrate content	61.36	65.18	63.16	61.4	64.25	68.63	62.20	61.8

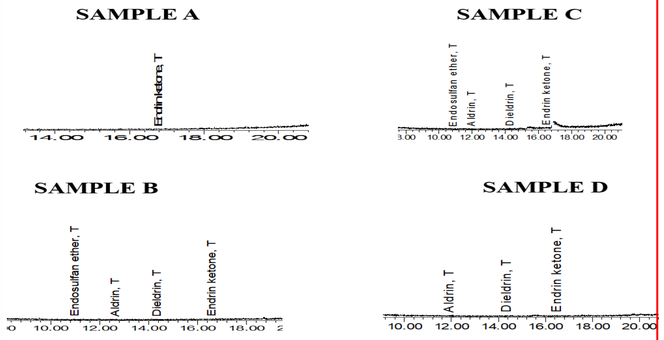


FIG. 1: CHROMATOGRAM OF LOCAL RICE

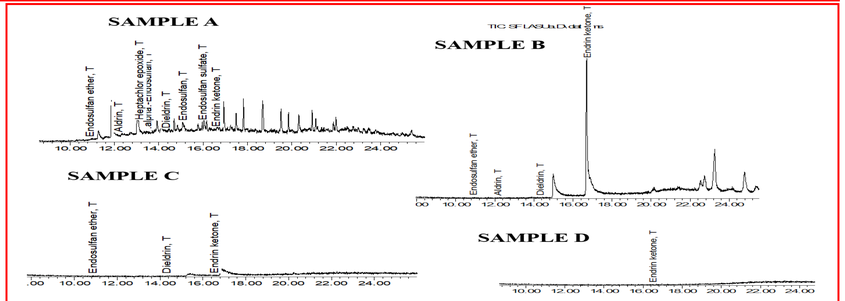


FIG. 2: CHROMATOGRAM OF IMPORTED RICE

The proximate composition of the rice show that the local rice has higher protein, fat, crude fibre, moisture content and ash content at (8.01 to 9.32)%, (6.48 to 11.96)%, (4.98 to 7.35)%, (10.53-13.82)% and (0.69 to 0.77)% than the imported rice at (7.79 to 8.88)%, (3.48 to 12.9)% (5.34 to 6.69)%, (11.01 to 12.56)% and (0.54 to 0.59)% respectively while the carbohydrate content of the imported rice is higher than the local rice at a range of (61.80 to 68.63)% and (61.36-65.18)% respectively. The GC/MS screening of 17 pesticide detect availability of 4 residues namely Endosulfan ether, Aldrin, Dieldrin and Endrin ketone pesticide residues in trace amount in both local and imported rice. Heptachlor epoxide, α-Endosulfan, Endosulfan and Endosulfan sulfate are detected only in imported rice samples

CONCLUSION

It could be deduced from the study that the local rice has more nutritional value than the foreign rice, and there is safety concern regarding the detection of some pesticide residue above the maximum residue level (8 mg/kg). which might lead to potential health hazards.

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