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SHELF LIFE STUDIES OF FERMENTED *PROSOPIS AFRICANA* SEEDS (OKPEHE)

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Introduction

Legumes constitute one of the largest plant families and include *Mimosoids*, *Caesalpinoids* and *Paillionoids*. The last group includes peanuts, garden beans, soybeans, mesquite (*Prosopis*), e.t.c., which are used for firewood, animal forage, nitrogen fixation, timber, medicine, natural fibers and flavourings [1]. *Prosopis africana* (African mesquite) trees are usually found growing wild, in some central and southern parts of Nigeria. The seeds of *Prosopis africana* can be fermented into a condiment known as *okpehe* which is indigenous to the people of Benue State. It has about 44% crude protein and rich in minerals [2]. It can be used as a protein supplement in protein poor soups. Several works have been carried out on the processing of *Prosopis africana* to produce *Okpehe* but scanty information is available on its shelf life. Therefore, the objective of this work was to determine the shelf life of the condiment by subjecting it to physicochemical analysis and microbial count at ambient temperature.

Materials and Methods

Okpehe was processed from *Prosopis africana* using the method earlier described by Frazier [3]. *Okpehe* samples were stored in ten clean labeled containers at room temperature for 120 hrs. One container was taken for analysis at 12 hrs interval. Standard methods were used to determine the pH, microbial count and proximate compositions of the samples.

Results and Discussion

There was a rise in pH of *Okpehe* from 6.95 – 8.35 at time 0 – 120 hrs. An increase in microbial count ($8.6 - 12.4 \times 10^5$ cfu/g) was observed in *Okpehe* from 0 – 72 hours while there was a decline in microbial population ($12.4 - 3.0 \times 10^5$ cfu/g) from 72hrs - 120 hours. This was probably because deterioration had started setting in. The changes observed in microbial population depend on the generation time of each microorganism. Generation time is not uniform for all microorganisms [3]. A significant decrease ($p < 0.05$) was observed in crude protein, ether extract and nitrogen free extract at the end of the period of storage (Table 1). The reduced crude protein, ether extract and nitrogen free extract during the storage period are in agreement with the work of Mbata and Orji [4] that food nutrients are lost during storage period. The shelf life of *Okpehe* observed from this study is 72 hrs. Similar result (3–5 days) was obtained for the shelf life of *ugba* [4].

Table 1: Proximate Composition of *Okpehe* Stored at Ambient Temperature

Storage Period (hrs)	Crude Protein (%)	Ether Extract (%)	Crude Fibre (%)	Total Ash (%)	Moisture Content (%)	Nitrogen Free Extract (%)
0	42.62 ^h ± 0.08	9.41 ^h ± 0.03	3.43 ^a ± 0.01	4.03 ^a ± 0.01	7.47 ^a ± 0.09	33.04 ⁱ ± 0.05
12	42.62 ^h ± 0.08	9.37 ^g ± 0.02	3.43 ^a ± 0.01	4.03 ^a ± 0.01	7.53 ^b ± 0.08	33.02 ^j ± 0.04
24	42.62 ^h ± 0.08	9.31 ^f ± 0.02	3.43 ^a ± 0.01	4.03 ^a ± 0.01	7.64 ^c ± 0.08	32.97 ^g ± 0.06
36	42.58 ^g ± 0.06	9.31 ^f ± 0.01	3.44 ^{ab} ± 0.01	4.05 ^b ± 0.01	7.68 ^d ± 0.07	32.94 ^f ± 0.05
48	42.50 ^f ± 0.10	9.27 ^e ± 0.02	3.46 ^{bc} ± 0.02	4.05 ^b ± 0.02	8.00 ^e ± 0.08	32.72 ^e ± 0.05
60	42.50 ^f ± 0.10	9.26 ^d ± 0.03	3.47 ^{cd} ± 0.02	4.08 ^c ± 0.02	8.03 ^f ± 0.09	32.70 ^d ± 0.04
72	42.36 ^e ± 0.11	9.23 ^d ± 0.03	3.47 ^{cd} ± 0.02	4.09 ^{cd} ± 0.01	8.15 ^g ± 0.10	32.70 ^d ± 0.04
84	42.34 ^d ± 0.09	9.16 ^c ± 0.02	3.49 ^d ± 0.01	4.09 ^{cd} ± 0.02	8.20 ^h ± 0.08	32.70 ^d ± 0.04
96	42.20 ^c ± 0.07	9.14 ^c ± 0.02	3.52 ^e ± 0.01	4.10 ^d ± 0.02	8.27 ⁱ ± 0.09	31.77 ^c ± 0.06
108	41.98 ^b ± 0.07	9.08 ^b ± 0.01	3.52 ^e ± 0.03	4.11 ^{ef} ± 0.01	10.01 ^j ± 0.10	31.28 ^b ± 0.08
120	41.23 ^a ± 0.06	9.01 ^a ± 0.01	3.58 ^f ± 0.02	4.12 ^f ± 0.02	10.96 ^k ± 0.07	31.10 ^a ± 0.05

Values are means of triplicate determinations ± SD on dry weight basis; means within columns with different superscripts differ significantly ($p < 0.05$),

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