

Proximate analysis and sensory evaluation of two indigenous soup consumed in Owo local government, Ondo state

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Abstract

This study has provided insights into proximate analysis and sensory evaluation of two indigenous soups consumed in Owo Local Government, Ondo State. The Spices are naturally cooked and are safer and healthier for adults than the foreign Soups which are often preserved with chemicals. These spices on soups were subjected to laboratory analysis for their proximate contents using standard methods. The result revealed that obe korowu had a moisture content of 63.15% while obe erinaje had a moisture content of 64.02%, it further revealed that obe korowu had an ash content of 2.8%, fat of 9.25%, fiber content of 2.05%, protein content of 12.64%. The carbohydrate content of 10.12% while obe aje had 3.41%, 8.57%, 1.96%, 13.12%, and 8.93% for ash content, fat, fiber content, protein content, and carbohydrate content respectively. The result further revealed that obe korowu scored 4.20, 4.30, 3.35, and 4.56 while obe erinaje scored 3.40, 3.20, 3.40, and 3.94 by the panelists in terms of their taste, aroma, texture, and overall acceptability respectively. The study concludes that traditional soups can be used as vehicles or carriers of nutritional/medicinal benefits. It is believed that the production and distribution of these spices in soups can improve the nutritional status of the dependent groups.

Keywords: Traditional soups; Proximate analysis; Mineral composition; Chemical methods; Sensory evaluation

1. Introduction

Traditional dishes are one of the most ancient and deeply ingrained aspects of African culture. Nigeria is a multicultural society endowed with diverse traditional soups that are indigenous to different ethnic groups and consumed along with traditional dietary staples, obtained from cassava, yam, cocoyam, sweet potatoes, plantain, millet, rice, and maize (Kayode *et al.*, 2010). The soups are cooked utilizing varieties of indigenous vegetables, roots, fruits, tree backs, and seeds which are not only known for their rich food nutrient content but are also health-promoting (Asaolu *et al.*, 2012).

There has been a gradual resurgence of interest in the use of various plants in the preparation of local beverages and soups that have beneficial medicinal properties and no negative side effects (Ifesan *et al.*, 2013; Usunobuns and Egharebva, 2015). Cottonseed soup, also known as 'obe korowu' or 'koowu' by the locals, and scent leaf 'ewe lufe' by the locals are popular in Owo Ondo State, while 'black soup' and 'cashew leaf soup' are popular in Edo State. Aside from the fact that traditional soups are indigenous to various ethnic groups soups have medicinal values as gathered from consumers and tribes (Kayode *et al.*, 2010). Soups such as 'irihibo-toh,' 'iribo-erharhe,' and 'afiaefere,' 'kontomire,' 'ofensala,' and 'igbagba' consumed in the Southeast, and 'kiaat' bark (*Pteropcarpus angolensis*) soup popular in Ondo State (Ifesan, 2016; 2018).

In the past, the average Nigerian relied on indigenous or wild plant leaves as vegetables, particularly among low-income rural dwellers, to meet their dietary needs at least for their immediate family (Flyman and Afolayan, 2006). Forest

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resource exploitation is an important source of food and income, particularly for rural dwellers. Many of these resources, particularly edible leaves, are consumed primarily for their nutritional value, with little regard for their medicinal value (Iheke and Eziuche, 2016). However, the age of civilization, which influenced the drastic migration of people to urban centers, has had a significant impact on the selection and use of these edible leaves as food.

Interestingly, Eaton and Konner (1995) studied dietary shifts in Africa over millennia. They concluded that the Paleolithic hunting and gathering subsistence of humans was far superior to modern dishes based primarily on processed and manufactured foods. Changes in African dishes were brought about by external influences (Western lifestyles). This has never been more evident than in modern-day Nigeria, and particularly in Ondo State (Ejoh *et al.*, 2019). The faster people adopt new eating habits, the less likely it is that traditional dishes will be passed down to the next generation (Sproesser *et al.*, 2019).

Some Common Herbs and Spices Used for soup in Owo and their Characteristics. *Terminalia Glaucescense* Planch. (Ewe Achara), *Piper Guineenss* (Iyere), *Flagellaria Indica* (Ireke Oju Odo), *Ocimum Gratissimum* (Scent Leaves), *Xylopii aethiopia* (grains of Selim), *Syzygium aromaticum* (cloves), *Clerodendrum Volubile* (Marugbo, Ewe Ata), *Aframomum melegueta*, *Curcuma longa* (Turmeric), *Allium sativum* (Garlic), *Gossypium herbaceum* (Cotton Seed). *Gossypium herbaceum*, also known as Levant cotton (Bvenura and Afolayan, 2015), is a cotton species native to the semi-arid regions of Sub-Saharan Africa and Arabia, where it grows as a perennial shrub. *Gossypium herbaceum* has tall stems that reach 60 to 180 centimeters (2 to 6 feet) in height and have wide, hairy leaves. Their flowers are small, yellow, and have a purple center. Extrafloral nectaries are present on the plant (Dressler *et al.*, 2014).

Cotton has medicinal uses and can be grown traditionally in backyards for women's menstrual cycle pains and irregular bleeding, for example. It has also been used postpartum to expel the placenta and increase lactation, as well as for gastrointestinal issues such as hemorrhages and diarrhea, nausea, fevers, and headaches.

Ocimum gratissimum, also known as African basil or sweet basil, is a Lamiaceae family plant. It has been used as folk medicine for centuries. It is a traditional herb and food spice that has been recommended for the treatment of a variety of diseases (Efiong *et al.*, 2014).

Xylopii aethiopia, also known as the grains of Selim, Ethiopian pepper, or African grains of Selim, is an evergreen, aromatic tree with a smooth grey bark that can grow up to about 20m in height. It has a 25-70 cm diameter, a straight bole, and a many-branched crown (Earnest and Erhirhie, 2014). *Xylopii aethiopia* has high nutritional and medicinal value, and all parts are useful medicinally, though the fruits are the most commonly used. It can be taken as a decoction, concoction, or even chewed and swallowed to relieve aches and pains. *Xylopii aethiopia* is used to treat a variety of ailments such as cough, malaria, constipation, uterine fibroid, and amenorrhea.

Syzygium (S.) aromaticum, also known as clove, is a dried flower bud from the Myrtaceae family that is native to the Maluku islands in Indonesia but has recently been farmed in various places around the world (Cortés-Rojas *et al.*, 2014; Batiha *et al.*, 2019). The clove tree is made up of leaves and buds (the tree's commercial part), and flowering bud production begins four years after plantation. Following that, they are collected by hand or with the help of a natural phytohormone during the pre-flowering stage (Cortés-Rojas *et al.*, 2014).

Residents are ill informed about the nutritional value of some foods they consume (including fruits, vegetables, spices, etc.).

Several studies on many Nigerian traditional foods, including soup, have been conducted in this regard (Ifesan *et al.*, 2013, Usunobuns and Egharebva 2015, Osaretin *et al.*, 2021). There is, however, a scarcity of information on the major indigenous soups of Owo, Owo Local Government, Nigeria in terms of their proximate, mineral, vitamin, and phytochemical properties. Indigenous edible leaves have the potential to provide a valuable source of nutrition to the body of humans. As a result, the purpose of this study is to examine the proximate and sensory evaluation of two major indigenous soups in Owo.

2. Material and method

2.1. Source of Materials

The raw materials used in this study were wholesome and edible green leafy vegetables, seeds, nuts, backs, and roots and they were purchased from Oghwagbe Market (Oja Ikoko), in Owo, Ondo State.

2.2. Material Used

The raw materials used for the preparation of the Indigenous soups are;

2.2.1. Obe Ogun (Cotton Seed Soup)

Koroowu (cottonseed), scent leaves, ariwo (African nutmeg), turmeric, garlic, irema, aru, chili pepper, dry fish, beef, Maggi, palm oil, water, salt, locust beans, and ponmo.

2.2.2. Obe Ogun (Obe erinaje)

Ewe tale, ire/uda (negro pepper), uziza (piper-guineense), erinaje (*Mirabilis jalapa*), ganagu (cloves), scent leaves, ewe ata (*Clerodendrum volubile*), dry fish, beef, Maggi, palm oil, water, salt, locust beans, and ponmo. Other materials like kitchen scale, water, bowl, plastic, and grinding machine were used.

2.2.3. Preparation of Sample

The leaves were sorted out and identified. The edible parts were detached from the stem and put in a bowl, and the turmeric; and garlic were peeled and cut into smaller sizes. Then the leaves and turmeric/garlic were washed inside a bowl in a running tap to ensure it cleanses well. It was grind and cooked. The beef, crayfish, and fish were washed and the seasoning was added to it altogether. It was allowed to simmer together for 15 minutes. The cooked samples were taken for proximate analysis, using standard methods and sensory evaluation.

2.2.4. Sensory Evaluation

A commonly consumed local soup was prepared without the addition of any sauce. A twenty-member panel (10 males, 10 females) comprising of students from the Hospitality and Management Technology Department, Rufus Giwa Polytechnic, Owo evaluated the samples using the 5-points hedonic scale method. Sensory evaluation was based on appearance, color, aroma, flavor, taste, and general acceptability and was carried out by panelists. The panelists were instructed to taste the samples and rinse their mouths with water after each sample tasted.

2.2.5. Proximate composition analyses

The crude protein, crude fat, crude fiber, carbohydrate, total ash, and moisture content of the seasoning were determined according to the Association of Official Analytical Chemists procedures (AOAC, 2013).

2.3. Statistical Analysis

The data was analyzed using SPSS version 21, and the mean and standard error of the mean (SEM) of the duplicate analysis were calculated. The T-test was performed to determine the significant differences between the mean.

3. Results and discussion

3.1. Proximate Characteristics of Two Indigenous Soups Consumed in Owo

Table 1 Proximate characteristics of two Indigenous soups consumed in Owo

	Moisture (%)	Ash (%)	Fat (%)	Fibre (%)	Protein (%)	CHO (%)
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Obe Korowu	63.15 ± 0.030 ^a	2.80 ± 0.009 ^a	9.25 ± 0.004 ^a	2.05 ± 0.014 ^a	12.64 ± 0.014 ^a	10.12 ± 0.043 ^a
Obe erinaje	64.02 ± 0.015 ^a	3.41 ± 0.003 ^a	8.57 ± 0.005 ^a	1.96 ± 0.009 ^a	13.12 ± 0.003 ^a	8.93 ± 0.025 ^a

Mean ± SD with different letter superscript in the same horizontal line are significantly different ($p < 0.05$) while means with the same letter superscript in the same horizontal line are NOT significantly different ($p > 0.05$.)

Table 1 above reveals the result of the proximate characteristics of two Indigenous soups (obe korowu and obe erinaje) consumed in Owo. The result from the table showed that obe korowu had a moisture content of 63.15% while obe erinaje had a moisture content of 64.02%, it further revealed that obe korowu had an ash content of 2.8%, fat of 9.25%, fiber content of 2.05%, protein content of 12.64%. The carbohydrate content of 10.12% while obe aje had 3.41%, 8.57%, 1.96%, 13.12%, and 8.93% for ash content, fat, fiber content, protein content, and carbohydrate content respectively.

The result however showed no significant difference in any of the proximate characteristics between the two indigenous soups (i.e. obe korowu and obe erinaje).

3.2. Sensory Evaluation of Two Indigenous Soups Consumed in Owo

Table 2 shows the sensory evaluation of two Indigenous soups consumed in Owo (i.e. obe korowu and obe erinaje). The result as presented in the table showed that Obe Korowu scored 4.24 on average while Obe Erinaje scored 3.65 by the panelists in terms of their colour. The result further revealed that obe korowu scored 4.20, 4.30, 3.35, and 4.56 while obe erinaje scored 3.40, 3.20, 3.40, and 3.94 by the panelists in terms of their taste, aroma, texture and overall acceptability respectively. However, the result showed no significant difference in any of the sensory characteristics assessed between obe korowu and obe erinaje as far as the judgment of the panelists is concerned concerning their sensory characteristics.

Table 2 Sensory Evaluation of Two Indigenous Soups Consumed in Owo

	COLOUR	TASTE	AROMA	TEXTURE	OVERALL ACCEPTABILITY
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Obe Korowu	4.25 ± 1.020 ^a	4.20 ± 0.834 ^a	4.30 ± 0.733 ^a	3.35 ± 1.268 ^a	4.56 ± 0.629 ^a
Obe erinaje	3.65 ± 1.182 ^a	3.40 ± 1.046 ^a	3.20 ± 1.105 ^a	3.40 ± 1.314 ^a	3.94 ± 0.929 ^a

Mean ± SD with different letter superscript in the same horizontal line are significantly different ($p < 0.05$) while means with the same letter superscript in the same horizontal line are NOT significantly different ($p > 0.05$.)

4. Discussion

There has been a growing resurgence of interest in the use of various plants in the preparation of local soups with strong therapeutic properties and no detrimental side effects. This present study reveals that the moisture content of obe korowu is 63.15% while obe erinaje had a moisture content of 64.02%. These moisture contents are higher than those found by Mustapha (2013), who reported that the moisture content of some traditional soups, consumed by postpartum mothers to ranged from 2.71 – 4.40% and higher than the value obtained by Aighogun *et al.*, (2018) who found the moisture content of black soup to be 11%. This may probably be because these soups were not evaporated before the proximate analysis. It is however similar to but slightly higher than 52.49% - 57.88% obtained by Obiakor–Okeke *et al.*, (2014) in their research on Nutrient and Sensory Evaluation of Traditional Soups.

The similarity in the moisture content of the two soups as revealed in the result of research with no significant differences could be because the two soups were prepared with similar ingredients. Further, the carbohydrate content of 10.12% and 8.93% is within the range (2.85 – 9.82%) obtained by Mustapha (2013) but lower than what was obtained by Obiakor–Okeke *et al.*, (2014) and Aighogun *et al.*, (2018) for other traditional soups. The ash content of 2.8% and 3.41, fat of 9.25% and 8.57%, the fiber content of 2.05% and 1.96%, and protein content of 12.64% and 13.12% for obe korowu and obe erinaje respectively were lower than what was obtained by other researchers (Mustapha, 2013; Obiakor–Okeke *et al.*, 2014; Aighogun *et al.*, 2018; Buraimoh *et al.*, 2021). The difference is probably because of the very high moisture content of the soups. The result however showed no significant difference in any of the proximate characteristics between the two indigenous soups (i.e. obe korowu and obe erinaje). The insignificance difference is probably due to the similarities between the ingredients used in preparing the two indigenous soups.

The result obtained for the sensory evaluation showed that the panelists scored obe korowu and obe erinaje an average of 4.24 and 3.65, 4.20 and 3.40, 4.30 and 3.20, 3.35 and 3.40, and 4.56 and 3.94 for color, taste, aroma, texture, and overall acceptability respectively. Statistically, no significant difference in any of the sensory characteristics assessed between obe korowu and obe erinaje could be because of the similar nutrient contents in the two soups occasioned by the similar ingredients used in preparing the two soups. This result is similar to the result of Obiakor–Okeke *et al.*, (2014) who discovered no significant difference in the sensory properties of four different indigenous soups in their research.

5. Conclusion

This study seeks to establish the proximate and sensory characteristics of the Indigenous soups commonly consumed in Owo (obe korowu and obe erinaje). From the result of this study, it can be concluded that both soups are high in moisture content, they both contain high protein and fat content. However, they both have low carbohydrate, ash

content, and crude fibre content. Furthermore, it could be concluded that both soups have similar proximate characteristics as there is no significant difference between their proximate characteristics. It also revealed that they are both similar in terms of their sensory characteristics.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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