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Comparative quality evaluation of nigerian local oha dish produced with the selected spices; Dawadawa *(Parkia biglobosa)*, UDA *(Xylopia aethiopica)*, Uziza *(Piper guineense)* AND Ehuru *(Monodora myristica)*

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Abstract
Four selected local spices; *parkia biglobosa* (Dawadawa), *piper guineense* (Uziza), *Xylopiaaethiopica* (Uda) and *Monodora myristica* (Ehuru) gotten in their dry state from Eke ukwu market Owerri in Owerri municipal L.G.A of Imo State, Nigeria were used in flavouring the local oha soup and evaluated organoleptically using twenty (20) member panelists. Also the nutrient content, anti-nutrient and other chemical components of these spices were analysed. Results showed that there were no significant difference ($p>0.05$) on the organoleptic attribute of the spiced soup, apart from the overall acceptability which ranged between 6.35 and 7.90 for dawadawa *(Parkia biglobosa)* and Uziza *(piper guineense)* respectively. Panelists liked the oha soup flavoured with dawadawa (6.35) uda (6.50) ehuru (6.65) but very much like Uziza (7.90). The nutrients and antinutrient content of theses spices showed high crude protein (7.35 to 26.53%), crude fat (11.40 to 19.10%), crude fiber (0.34 to 4.80%) and carbohydrate (36.05 to 66.43%) respectively. Local spices were predominant, in minerals; calcium (161.41 to 286.07mg/100g) potassium (41.54 to 314.08 mg/100g) manganese (2.62 to 9.43 mg/100g), zinc (2.81 to 6.41 mg/100g), but low in phosphorus (182.11 to 257.05 mg/100g). However, vitamin C value ranged from (0.97 to 1.83 mg/100g), the antinutrients present were also low in phytic acids (1.11 to 10.95%), saponins (0.10 to 0.14%), flavonoids (0.002 to 0.31%), tannins (0.001 to 0.002%) and Alkaloids (1.34 to 2.12%) respectively. Hence this study showed that these spices are nutritionally qualitative and with low anti nutrient content.

Keywords: quality evaluation, spices, local oha dish

Introduction
In Nigeria, a high proportion of the rural and urban population resort to natural food ingredients, particularly because of their availability. Spices are a large group of such natural ingredients, and include dried seeds, fruits, roots, rhizomes, barks, leaves, flowers and any other vegetable substances used in a very small quantity as food additives to colour flavour or preserve food (Birt, 2006) [5]. Spices are generally defined as dried seed, fruit, root, bark, or vegetable substances primarily used for flavoring, colouring or preserving food (Parry, 2000) [22]. The story of spices and other flavouring's materials is one of the most interesting chapters in the history of vegetable products (Obadoni and Ochuko, 2002) [17]. The cravings for spices have been one of the great factors in human progress and have done much to change the course of history and geography and to promote international relations (Akindahunsi and Salawu, 2005) [2].

Plants used as spices normally have strong pungent and aromatic smells that make dishes very delectable. They are not limited by what part of plant they are but rather by what they do and how they are used. According to Nwachukwu *et al.,* (2010) [15] 'Uziza' is suitable for treating infertility in women and low sperm count in men. Good nutrient from eating a healthy diet is the foundation of all natural health healing therapies. Cooking with spices is a quick way to add diversity to your diet (Martinez-Tome, 2001) [13]. Poor awareness to this in the society has lead to poor utilization of indigenous spices. In biblical poem song of Solomon, the male speaker compares his beloved to many forms of spices. With modernization and development of patent medicines, the use of natural spice decrease in popularity (Broadhurt *et al.*, 2002). Studies have shown that indigenous spices are contributory factors to health improvement and maintenance of the human body (Ninfali *et al.*, 2007).

According to Achinewhu (2005), indigenous spices are used to prepare pepper soups which are consumed during cold season. Also used in preparation of soups for nursing mothers as they aid lactation and contribute to a baby's rapid growth (Roger, 2002). Spices may be in several forms; such as fresh, whole dried and pre-ground dried, each have a distinctly unique aroma and flavour.Ehuru, dawadawa and Uda are among the Nigerian several indigenous spices resources among others (Adelaja *et al.*, 2008).

Materials and Method
Sample Collection
Spices were all purchased from Eke Ukwu Owerri, in Owerri Municipal L.G.A of Imo State Nigeria. All the test samples were identified by the appropriate authorities and were procured in their dry state and analysis performed at the central service laboratory of Imo State polytechnic Umuagwo Imo State of Nigeria. The facilities or apparatus used for the preparation of samples were obtained from food laboratory of Nutrition and Dietetics Imo State University, Owerri.

Sample Preparation
Preparation of the spices (Dawadawa, Uda, Ehuru and Uziza)
Five hundred grams (500g) of the selected sample seeds were thoroughly cleaned and manually peeled with kitchen knife. The

samples were subjected to drying process using oven-drying at 70% to obtain moisture ranges between 10-12% then milled into powder separately using manual grinding machine. The powder was sieved with a 0.45mm sieve aperture and the fine powder from each sample was packaged in a polyethylene bag for further analysis.

Preparation of Oha soup flavoured with spices

Five hundred (500g) of Oha leave was properly washed and divided into five (5) equal parts, then labeled accordingly as part A to D each part was flavoured with a table spoon of each powdery form of spices (Dawadawa, Uda, Uziza and Ehuru) respectively. The control sample was prepared without any spice addition.

Procedure

1. In a cleaned pot, the properly washed stock and dried fish and meat was steamed for 25mins.
2. Water was added, stirred and allowed to boil for 2minutes
3. Red oil was added and allowed to cook
4. Add offor, stirred and allowed to cook
5. Add one table spoon of each spice to the divided portions and cook for a minute,
6. The properly washed and shredded oha leave was added, stirred and cook for 2 minutes.
7. The soup was served with garri (Eba)

Proximate Analysis

1. The standard method of the AOAC (2000) [4] was used for the analysis of proximate composition

Mineral Profile

The method described by Onwuka, (2005) [21] was followed in the determination of mineral content of the spice samples. 0.5g of the dried grounded samples was weighed into a pre-acid rinced digest tube. 10cm^3 of 6m HCL was added and heated to dryness in a water bath. The residue was dissolved in a mixture of 10cm^3 of 6m HNO_3 acid, warmed on a water bath and filtered using a whatman filter paper into a 100cm^3 calibrated flasks. The filter pepper was washed with distilled water and the filtrate diluted with the distilled water and made up to the 100cm^3 mark. The digest was for the determination of potassium, calcium, magnesium by the flame photometry method. The heavy metals such as zinc and phosphorus.

Determination of antinutrients

The method of AOAC (2000) [4] was used for the determination of flavonoid, tannin and phytate. Alkaloid was determined using the alkaline precipitation method as described by AOAC (2000) [4]. While saponin was determined by the spectrophotometric method as described by AOAC (2000) [4].

Sensory evaluation of spices

The method of 9-points hedonic scale in scoring test was described by (Mellgaard *et al.*, 2007) was used in evaluating the sensory characteristics of the products such as taste, flavour, aroma, and general acceptability were also determined by a team of (20) twenty semi-trained panelists. Samples presentation was randomized and presented to each panelist at the same time using the containers that are the same. The sensory booth was lightened which support visual judgment of the panelists on the side of colour attribute of the products. The panelists were asked to score the coded samples based on a 9 points hedonic scale as

9 = extremely like and
1 = extremely dislike

Statistical analysis

All data obtained were statistically analysed with simple descriptive mean, standard deviation and analysis of variance (ANOVA),

Duncan's multiple test also was used in separating the means and Pearson's correlation and the samples attributes determined using SPSS 20.0 software.

3. Results

Proximate compositions of the spices

Table 1 showed the proximate content of the spices. *Pakia Biglobosa* had a significantly ($p<0.05$) higher moisture, protein and fat contents than all other samples analysed, 9.40±0.02%, 26.53±0.02% and 19.10±0.01% while *monodora myristica* and *piper guineense* had the least, 7.09±0.02%, 7.35±0.02% and 1140±0.2%. *Monodora myristica* had a significantly ($p<0.05$) higher total ash content 9.20^a±0.02 compared to 4.13±0.02 which was the least for *parkia Biglobosa*. *Parkia Biglobosa* had a significantly ($p<0.05$) higher crude fiber content 4.8±0.04 while *Xylopia aethiopica* had the least 0.34±0.02. Nitrogen free extract (carbohydrate) content of *piper Guineense* 66.43±0.08 was significantly higher compared to 36.05±0.04 for *parkia biglobosa* as the least.

Table 1: Proximate Compositions of the powderized local spices

Samples	Moisture %	Protein %	Fat %	Ash %	Crude fiber %	Nitrogen free extract (NFE)%
Powderized Uziza	8.76^c±0.05.	7.35^d±0.02	11.40^d±0.02	5.53^c±0.02	0.52^c±0.01	66.43^a±0.08
Powderized Uda	9.14^b±0.03	8.15^c±0.03	11.92^c±0.01	8.42^b±0.02	0.34^d±0.02	62.02^b±0.04
Powderized Ehuru	7.09^d±0.02	10.24^b±0.02	15.03^b±0.01	9.20^a±0.02	0.65^b±0.01	55.79^c±0.05
Powderized Dawadawa	9.40^a±0.02	26.53^a±0.02	19.10^a±0.01	4.13^d±0.02	4.80^a±0.04	36.05^d±0.04
LSD ($p<0.05$)	0.03500	0.02669	0.02318	0.02500	0.02291	0.05937

(±) = standard deviation, mean scores in the same column with different superscript letter are significantly different ($p<0.05$). Key: samples: A = Oha soup flavoured with powderized piper guineense 'Uziza' : B = Oha soup flavoured with powderized parkia biglobosa 'Dawadawa'.: C = Oha Soup flavoured with powderized Xylopia Aethiopica 'Uda': D = Soup flavoured with powderized monodora myristica 'Ehuru': E = (Control sample) = Unspiced oha soup

The minerals and vitamin c composition of the selected spices

Table 2 showed the mineral and vitamin C contents of the selected spices. The result showed varied quantity of the parameters examined and the variation was significant ($p<0.05$). calcium, potassium, zinc, manganese, and phosphorus were discovered from the powderized spices with *piper guineense*

being the highest in calcium, potassium and zinc for 286.07±0.03, 314.08±0.04 and 6.41±0.03mg/100g sample and *monodora myristica* the least 161.41±0.3mg/100g, 41.54±0.06 and 2.81±0.09mg/100. *Xylopia aethiopica* had the high manganese content 9.43±0.03mg/100 while *piper guineense* had the least 2.62±0.04. Phosphorus content of *monodora myristica* is the highest 257.05±0.6mg/100g compared to *parka biglobosa* which is the lowest 182.1±0.02 mg/100m. All the samples had vitamin C content with *piper guineense* being the highest 1.83±0.04mg/100g and *parkia biglobosa* the least 0.97±0.02mg/100g.

Table 2: Minerals and Vitamin C composition of the four powderized spices

Powderized spices samples	Calcium my/100g	Potassium my/100g	Manganese my/100g	Zinc my/100g	Phosphorus my/100g	Vitamin C my/100g
piper guineense	286.07^{a}±0.03.	314.08^{a}±0.04	2.62^{d}±0.04	6.41^{a}±0.03	208.21^{c}±0.02	1.83^{a}±0.04
Xylopia aethiopica	176.13^{c}±0.02	235.10^{b}±0.02	9.43^{a}±0.03	2.99^{c}±0.02	231.43^{b}±0.02	1.25^{c}±0.04
Monodora myristica	161.41^{d}±0.03	41.54^{d}±0.06	4.24^{c}±0.05	2.81^{d}±0.09	257.05^{a}±0.06	1.67^{b}±0.01
Parkia biglobosa	197.15^{b}±0.09	217.04^{c}±0.07	4.96^{b}±0.06	3.82^{b}±0.03	182.11^{d}±0.02	0.97^{d}±0.02
LSD (p<0.05)	0.05420	0.05557	0.05232	0.05123	0.03905	0.03500

(±) = standard deviation, mean scores in the same column with different superscript letters are significantly different (p<0.05). Key: samples: A = Oha soup flavoured with powderized piper guineense 'Uziza' : B = Oha soup flavoured with powderized parkia biglobosa 'Dawadawa'.: C = Oha Soup flavoured with powderized Xylopia Aethiopica 'Uda': D = Soup flavoured with powderized monodora myristica 'Ehuru': E = (Control sample) = Unspiced oha soup

Anti-nutrient content of the selected spices

Table 3 below, shows the antinutrient contents of the spices used. The results revealed that phytic acids, saponins, flavonoids, Tannins and Alkaloids were detected on the spice samples at varied quantity. The observation from the result indicated that there was significantly difference (p<0.05) on the level of the antinutrients discovered. *Xylopia aethiopica* was found to be rich in phytic acid, saponin and flavonoids content 10.95±0.09%, 0.14±0.01% and 0.31±0.01 compared to *parkia biglobosa* which had the least content 1.11±0.02, 0.10±0.004 and 0.002±0.001%. *Piper guineense* had the highest in Tannin and alkaloid 0.02±0.02% and 2.12±0.02% while *xylopa aethiopica* had the least content of tannin 0.001±0.001% and *monodora myristica* the least of alkaloid content 1.34±0.06%.

Table 3: Anti-nutrient Composition of the selected spices

Powderized spices samples	Phytic acid %	Saponin %	Flavonoids %	Tannin %	Alkaloid %
piper guineense	4.41^{b}±0.03.	0.12^{b}±0.02	0.04^{c}±0.003	0.02^{a}±0.02	2.12^{a}±0.02
Xylopia aethiopica	10.95^{a}±0.09	0.14^{a}±0.001	0.31^{a}±0.01	0.001^{d}±0.01	1.94^{b}±0.03
Monodora myristica	2.25^{c}±0.03	0.11^{c}±0.01	0.23^{b}±0.003	0.004^{c}±0.004	1.34^{d}±0.06
Parkia biglobosa	1.11^{d}±0.02	0.10^{d}±0.004	0.002^{d}±0.001	0.005^{b}±0.005	1.52^{c}±0.04
LSD (p<0.05)	0.0646	0.00250	0.00426	0.01120	0.04528

(±) = standard deviation, mean scores in the same column with different superscript letter are significantly different (p<0.05). Key: samples: A = Oha soup flavoured with powderized piper guineense 'Uziza': B = Oha soup flavoured with powderized parkia biglobosa 'Dawadawa'.: C = Oha Soup flavoured with powderized Xylopia Aethiopica 'Uda': D = Soup flavoured with powderized monodora myristica 'Ehuru': E = (Control sample) = Unspiced oha soup

Sensory evaluation of oha soup flavored with selected local spices

Table 4 showed the mean sensory scores of oha soup flavored with four different local spices. The statistical analysis showed that significant difference, (p<0.05) was discovered on the oganoleptic attributes of the flavoured soup with exception of overall acceptability. The mean scores of the sensory properties among the samples varied. The colour mean scores ranged between 7.40 sample B and 7.95 sample E (control sample). The flavour mean scores also ranged from 6.35 sample B to 7.55 sample A.

Taste values in the other hand ranged between 6.30 sample D and 7.50 sample A. the texture mean scores ranged from 6.65 sample D to 7.50 sample A while the overall acceptability mean scores ranged 6.35 and 7.90.The statistical analysis showed significant difference (p<0.05) in samples A and samples C, but no significant difference (p>0.05) in sample A and samples B as well as samples B, sample C and D respectively.

Table 4: Sensory Evaluation of Oha Soup Flavored with Selected Local Spices

Soup samples	Colour	Flavour	Taste	Texture	Overall acceptability
A	7.75^{a}±1.2	7.55^{a}±1.6	7.50^{a}±1.7	7.50^{a}±1.4	7.90^{a}±1.0
B	7.40^{a}±1.3	6.35^{a}±1.6	6.45^{a}±1.5	6.70^{a}±1.6	6.35^{a}±1.5
C	7.45^{a}±1.5	6.40^{a}±1.5	6.45^{a}±1.4	7.15^{a}±1.3	6.50^{a}±1.6
D	745^{a}±1.1	6.75^{a}±1.3	6.30^{a}±1.7	6.65^{a}±1.4	6.65^{a}±1.2
E (control)	7.95^{a}±1.2	7.40^{a}±1.4	7.20^{a}±1.5	7.20^{a}±1.3	7.80^{a}±1.2
LSD					
(P<0.05)	0.41218	0.46209	0.49979	0.44662	0.43902

(±) = Standard deviation, mean scores in the same with different superscript letter are significantly different (p<0.05) Key: samples: A = Oha soup flavoured with powderized piper guineense 'Uziza': B = Oha soup flavoured with powderized parkia biglobosa 'Dawadawa'.: C = Oha Soup flavoured with powderized Xylopia Aethiopica 'Uda': D = Soup flavoured with powderized monodora myristica 'Ehuru': E = (Control sample) = Unspiced oha soup

Discussion

Proximate composition of the powdered Spices

In table 4.2 the result showed that the spices are rich in nutrients. The moisture content of the sample ranged 7.09±0.02% to 9.40±0.02. The low moisture content of the spices agrees with Agomuo (2011) [1] stating that spice can be stored for a long period without deterioration in quality due to low moisture content.

Consumers are also seeking for food with natural preservative for healthy life style according to the Raw Materials Research Development Council (RMRDC), (2013). The protein and fat content of *parkia biglobosa* (Dawadawa) 26.53±0.02 and 19.10±0.01 is significantly ($p<0.05$) higher compared to 7.35±0.02 and 11.40±0.02 for *Piper guineense (*Uziza) respectively. Fats insulate and protect body organs and also transport fat soluble vitamins. Fats add flavour and taste to meals *parkia biglobosa*seed has been referred as a good source of fat for rural dwellers (Okpako, 2012) [19].

Regular use of plant rich in protein makes a valuable addition to a diet (Wardlaw and Kassel, 2002) [29].

Ash content of *monodora myristica* (Ehuru) 9.20±0.2% is significantly ($p<0.05$) higher comparedto 4.13±0.02% and 5.53±0.02% for *parkia biglobosa* (Dawadawa) and *Piper guineense(*Uziza)respectively which is an indication that the spices are rich in minerals (Ukegbu *et al.,* 2011) [27].

Crude fiber content is equally higher (0.34±0.02%) for *Xylopia aethiopica(*Uda*)*as theleast and *parkia biglobosa* (Dawadawa) having a significantly ($p<0.05$) higher content of 4.80±0.04% compared to the others. Dietary fibers are structural parts of plants and thus are found in plant derived foods. They aid in the digestive system by easing elimination. Spices are often referred to as food accessories for adjuncts because of their unique ability to stimulate appetite and increase the flow of gastric secretions, thus aiding digestion (Dalziel, 2009) [6].

Soluble fiber in fenugreek seeds slows carbohydrate absorption and boost insulin activity (Hannan, 2002) [8]. Nitrogen free extract ranged between 36.05± 0.04 to 66.43±0.08% with *Piper guineense(*Uziza) having a significantly ($p<0.05$) higher content of 66.43±0.08% compared to the others. High carbohydrate, low fat diet aids control of hypertension and prevent obesity (Ukegbu *et al.,* 2011) [27].

Ekeanyanwu *et al.,* (2010) opined the high protein and carbohydrate content of Uziza spice indicates that uziza could be a rich source of energy in diet. Whereas the low content of carbohydrate of *Parkia biglobosa*(Dawadawa) could be of importance, Karou (2011) [11], stated that *Parkia biglobosa*was one of the highest cited plants used for treating hypertension.

Minerals and vitamin C composition of the selected spices

In Table 2, it shows that these spices are rich in minerals and vitamin C. Calcium seems to be high in all the samples with *Piper guineense(*Uziza) 286.07±*0.03mg/100g having a significantly ($p<0.05$) higher concentration compared to 161.41*±0.03mg/100g for *Monodora myristica(*Ehuru*).* Potassium content was also high in all the spices ranging from 41.54±0.06 mg/100g to 314.08±0.04. The value of 314.08±0.06mg/100g potassium for *Piper guineense (*Uziza) is significantly ($p<0.05$) higher compared to 41.54±0.06mg/100g for Monodora *myristica(*Ehuru*).* Concentration of manganese in the spices is between 2.62^{a}±0.04mg/100g for*Piper guineense(*Uziza) to 9.43±0.03mg/100g for *Xylopia aethiopica(*Uda*), Piper guineense(*Uziza) contain significantly ($p<0.05$) high concentration of manganese. The zinc content of the spices ranging from2.81±0.09mg/100g for *Monodora myristica (*Ehuru*)* to 6.41±0.03mg/100g for *Piper guineense (*Uziza). The value for *Piper guineense(*Uziza) was significantly ($p<0.05$) higher compared to that of Monodora *myristica(*Ehuru*)* value.

Phosphate content was also high in all the spices ranging between 182.11± 0.02mg/100g to 255.05±0.06mg/100g for *Parkia biglobosa* (Dawadawa) and *Monodora myristica(*Ehuru*).*in which phosphate content for *Monodora myristica*is significantly ($p<0.05$) higher compared to phosphate content for *Parkia biglobosa* (Dawadawa). However, minerals are absolutely necessary for most metabolic processes. Traditionally, some minerals believed to have contract the womb to its normal size after birth, useful in cleaning the uteral lining after child birth (Rimbach *et al.,* 2010) [26]. Again some minerals in spices are involve in energy metabolism, contributes to the structure of the bones, keeping the heart beat steady, interacts with platelets in blood clothing which agree with Inyang (2003) [9] that the spice *Xylopia aethiopica(*Uda*)* are widely used to prepare pepper soup for nursing mothers to accelerate blood flow leading to the elimination of blood clots from her blood system. Rimbach *et al.,* (2010) [26] opined that the prevention of cancer and cardiovascular diseases has been associated with the ingestion of these spices because they are rich in antioxidants. The spices are rich in vitamin C, *Piper guineense (*Uziza) had a significantly ($p<0.05$) higher vitamin C content 1.83^{a}± 0.04mg/100g compared to the evaluated spices. Wright, (2000) stated that vitamin C has anti-infective properties, promotes wound healing may boost the immune system and may help ward off infections. Spice is good for eyesight and may help to prevent the growth of cataracts (India times, 2012). The Nigerian food condiments are known to supply the needed minerals which are very important for human health and they are the most affordable source of minerals to African (Akwaowu *et al.,* 2000) [3]. Natural compounds have attracted considerable attention as preventive therapeutic agents against cancer (Nobili, 2009) [16].

Anti-Nutrient Composition of the Spices

In Table 3, the anti-nutrient contents of the selected spices such as; phytic acids, saponins, flavonoids, Tannins and alkaloids were presented. *Xylopia aethiopica(*Uda*)* contains 10.95±0.09 of phytic acid, which seems to be on the high side. The other spices contain between 1.11±0.02 to 4.414±0.03% which is probably on the low side. Saponins, flavonoids and Alkaloids occurred in the range of 0.10±0.00% to 0.14±0.001%, 0.002±0.001% to 0.31±0.00% to 1.34±0.06% to 2.12±0.02% respectively for *Piper guineense (*Uziza) *Xylopia aethiopica (*Uda) and Monodora *myristica (*Ehuru) to *Piper guineense (*Uziza). Tannin content is low in all samples between 0.001±0.001% to 0.02±0.02 for *Xylopia aethiopica (*Uda) and *Piper guineense (*Uziza). The low concentrations of the anti-nutrients make the spices safe for consumption. In accordance to Okaka and Okaka (2001), antinutrients are required in low concentration to effect biochemical changes; hence the spices may be effective as ethnomedicine. These spices contain low toxic levels of anti nutrients making it possible for the minerals to be easily absorbed without any interference.

Sensory evaluation of oha soup flavoured with selected local spices

In Table 4, the result showed the organoleptic properties of oha soup flovoured with the selected local spices such as *Parkia biglobosa* (Dawadawa)*, Xylopia aethiopica(*Uda*), Piper guineense (*Uziza*)* and *Monodora myristica (*Ehuru*)* respectively showed no significant difference ($p>0.05$) on the oragnoleptic attributes of the soup except the overall acceptability where significant difference ($p<0.05$) was discovered in sample A and sample C. However, the mean scores of the sensory attributes ranged between 7.40 and 7.95 for *Piper guineense (*Uziza*)* and control (no spice) soup sample as for colour. Flavour was scored between 6.35 and 7.55 for *Parkia biglobosa* (Dawadawa)and *Piper guineense(*Uziza). The taste mean score also ranged from 6.30 for *Monodora myristica (*Ehuru*)* to 7.50 for *Piper guineense (*Uziza) respectively. The texture mean score ranged between 6.65 for *Monodora myristica* **(**Ehuru*)* and 7.50 *Piper guineense(*Uziza) while the overall acceptability scores is between 6.35 and 7.90 where the significant difference ($p<0.05$) was discovered, and this could be as result of individual differences in the level of acceptance towards cognizance in all the attributes of the prepared spiced soup with local spices. First impression of any food is usually visual and a major part of our willingness to accept a food depends on its appearance, food flavours arises from a subtle interaction of taste and aroma which imparts a pleasing or displeasing sensory experience to a judge. Colour, flavour and texture plays a vital role in food acceptability. Though spices prove secondary effects, "the primary functions of spices are to flavour food, provide aroma, texture and colour (Ravindran *et al.,* 2002) [24]. In agreement with Raphavan (2000), spices can meet consumers demand for "natural" colouring. Meanwhile the study indicates that the use of spice seeds in flavouring soups enhances the organoleptic qualities in the dish as Klin Kabari (2011) [12] opined " *piperguineense,* locally called 'Uziza', the seed is used in West African cuisine where it imparts 'heat' and spicy, pungent aroma to classic West African "soup". As per these spices flavour still, Okoh (2013) [20] opined that these properties compared flavourably with those of streptomycin making it a potential source of compounds used in the management of bacterial infection.

Conclusion

Spices are basically used to flavour food, to provide aroma, texture and colour. The evaluation of the nutritional significance as well as health potentials of these four (4) local spices through nutrient analysis showed that they are rich in nutrients, minerals and vitamin C. However, these spices are low in antinutrient which makes the spice safe for consumption. Again, cooking with these spices is another way to diversify our local soup diets.

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