

## The Proximate Analysis and Organoleptic Property of *Ocimum gratissimum* and *Murraya koenigi* Leaves Mixture

AZEEZ A. ADENIJI<sup>1</sup> & OLUDAYO O. ODUWOBI<sup>2\*</sup>

Science Laboratory Technology Department,

The Federal Polytechnic, Ilaro, Ogun State

\*Corresponding Author: dwheazy2012@gmail.com

**ABSTRACT** Spices are pleasant to the senses even in very little amounts because they enhance the flavour, palatability and ease of absorption of food. In Nigeria, it is customary for homes and food merchants to utilize herbs, spices and condiments in connection with a person's diet. Scent leaves and curry leaves were purchased from a local market in Ilaro town. This research work revealed the proximate contents and organoleptic properties of *Ocimum gratissimum* (scent leaf) and *Murraya koenigi* (curry leaf) spices mixtures. The results obtained for the moisture content for samples A (50 g of scent leaves + 50 g of curry leaves), B (30 g of scent leaves + 70 g of curry leaves) and C (70 g of scent leaves + 30 g of curry leaves) were 9.26 %, 6.28 %, and 8.75 % respectively. The protein contents were 8.53 %, 5.49 %, and 12.39 % respectively while the crude fiber contents were 6.68%, 4.18 % and 8.61 %. The fat/lipid contents were 2.39 %, 2.04 % and, 2.28 % respectively, ash contents were 5.43 %, 7.20%, and 3.32% respectively while the carbohydrate contents were 67.71 %, 74.81 %, and 64.65 % respectively. The study revealed that the highest moisture and fat/lipid contents were recorded in sample A, the protein content and crude fiber content were highest in sample C while the ash content and carbohydrate content were highest in sample B. This study concludes that the three spices blends displayed good and acceptable sensory attributes, although differently but by slightly negligible margins.

**KEYWORDS:** Blends, Panelists, Pleasant, Spices

### I. INTRODUCTION

The human diet includes food spices, which are pungent and fragrant-dried vegetable materials that give food colour, flavour and scent (Gadekar and Yerramilli, 2006). Spices have several functions, including flavouring meals, preserving food and providing medical benefits. Altemimi *et al.* (2017) state that there is evidence supporting the value of vegetable-spice components, including seeds, fruits, roots, flowers, leaves and barks, for a variety of culinary, medical and industrial uses. Spices have a significant role in the nation's production system and foreign exchange gains. According to Dessalegn (2015), spices have a significant role in assisting farmers in transitioning from subsistence to market production. Spices also have a significant role in Nigerian cuisines. Nigerians love spices despite the fact that the majority of them are wild plants. The two main Nigerian spices that are sold internationally are ginger and African black pepper, the remaining spices are consumed domestically (Akinola *et al.*, 2021). According to Usunobun and Uwadiae (2016), chili pepper is closely followed by black pepper as the most traded spice globally, with black pepper receiving the most sum per ton. India has traditionally been referred to be the 'Land of spices,' even in modern times. They have had remarkable success in propagating spices. They have become so well-known worldwide for their propagation that no other nation can match them for the amount and quality of spices they produce. Spices are pleasant to the senses even in very little amounts because they enhance the flavour, palatability and ease of absorption of food. Spices are used in most homes and the food processing sector around the world is no stranger to the useful addition of spices (Prajapati, Rathod and Jat, 2021). In Nigeria, it is customary for homes and food merchants to utilize herbs, spices and condiments in connection with a person's diet. They are utilized for food preparation at hotels, pizzerias, chopping bars, quick food restaurants and our own houses. Word-of-mouth knowledge has been passed down over numerous generations regarding certain spices and condiments instead of being recorded.

Known by most as curry leaves, *M. koenigii* L., a member of the Rutaceae family, has been touted as "The ultimate cure" for a variety of illnesses. According to a report by Longvah, Ananthan, Bhaskarachary and Venkaiah (2017), the fresh leaves have a high nutritional value and are exceptionally rich in anti-oxidant vitamins, minerals, carbazole alkaloids, polyphenols, tannins and saponins. The necessity of the hour is to promote curry leaves in a way that shows maximal consumption (Parnami and Varma, 2019). The majority of frequently used vital spices are imported and not entirely natural due to extensive chemical preservation, which might have an impact on the body's systems when ingested. Nigeria is home to a large number of medicinal plants; thus, it is important to promote the use of regional spices as well as the creation of novel and distinctive spices. The aim of this study is to determine the proximate contents and organoleptic properties of *Ocimum gratissimum* (scent leaf) and *Murraya koenigi* (curry leaf) spices mixtures. The growing interest in natural products and traditional remedies cannot be over-emphasized, as they are potent, easily available and cheaper alternatives. Trado-medicine has been in existence since time immemorial when humans used herbs, based on their intrinsic phytochemical components, to curb and ward-off infections before the advent of orthodox medicine and *Ocimum gratissimum* and *Murraya koenigi* are no exception. They offer exceptional nutritional and health benefits and are commonly used in Nigerian cuisines and soup preparation as they provide some useful macro minerals such as calcium, phosphorus, potassium, and iron, they also provide vitamins such as A, B, and C. Their health benefits are therapeutic in nature as they are antimicrobial and antimalarial in nature. Some reports also suggest that they can be anticonvulsant and be used to treat diabetes, as they contain several bio-active compounds. It would then be noteworthy to suggest that the potential synergistic effect of the blend of the two spices, namely *Ocimum gratissimum* and *Murraya koenigi* could be tremendous as portrayed in this research, more so, there are not so many articles or comprehensive studies on the combined use of the two spices, if any yet. The dearth of such comprehensive studies, thus, necessitated the need to conduct a scientific evaluation on their proximate composition and organoleptic property especially when combined. Therefore, this article sought to address that lacuna. The two spices were prepared in three different blends of varying proportions to determine their proximate composition and a 9-point hedonic scale was adopted to reveal their sensory properties. At the end of the study, the three spices blend gave appreciable results but with one giving the best appreciable result. Further research to analyze the spices blend for the potential presence of heavy metals could be subsequently followed-up. A recent study of Dawodu *et al.* (2023) also assessed the production and sensory evaluation of mixed spices from selected local spices but retailed in Ede, Osun State, Nigeria.

## II. MATERIALS AND METHODS

### A. SAMPLE COLLECTION

Scent leaves and curry leaves were purchased from a local market called Sayedero market, in Ilaro town. The leaves were taken to a botanist in the department of Science Laboratory Technology for verification and then the Microbiology laboratory of The Federal Polytechnic, Ilaro for analyses.

### B. SAMPLE PREPARATION

The purchased spices were prepared accordingly; sorting→washing→oven-drying→grinding dried leaves→packaging. They were thoroughly washed, oven-dried at 50 °C for 12 hours to remove inherent water molecules and afterwards, pulverized with an industrial grinder to form fine powder. Each powdered sample was placed in an airtight plastic container, labeled and kept at room temperature until usage. The sample preparation was conducted aseptically to minimize contamination by strictly adhering to laboratory guidelines and in such a manner to maintain consistency.

### C. PREPARATION OF MIXED SAMPLES

The mixed samples were prepared as follows;

Sample A: 50 g of scent leaves + 50 g of curry leaves

Sample B: 70 g of scent leaves + 30 g of curry leaves

Sample C: 30 g of scent leaves + 70 g of curry leaves

#### D. PROXIMATE ANALYSIS

The proximate analysis was conducted to determine the moisture content, ash content, protein content, fat/lipid content, crude fibre content and carbohydrate content, according to the method described by Rampersad *et al.* (2003). For instance, the moisture content was determined by;

- (a). To remove moisture from the plates, the crucibles were dried in the oven for 30 minutes at  $105 \pm 5^\circ\text{C}$ .
- (b). After being placed in a desiccator, the crucibles were left to cool for around 20 minutes at room temperature.
- (c). The empty crucibles' weights were measured and recorded as  $W_0$ .
- (d). To enhance the surface area, the samples were ground into powder using a high-speed grinder.
- (e). 1 g of the sample (recorded as  $W_1$ ) was weighed using an analytical balance, and it was then dried in the oven at  $105 \pm 5^\circ\text{C}$  for about two hours.
- (f). The samples' crucibles were left in the oven to cool for around ten minutes.
- (g). The crucibles were placed in a desiccator using a crucible tongue, and they were left to cool for roughly thirty minutes at room temperature.
- (h). The crucibles and substance were weighed at the end and recorded as  $W_2$ .
- (i). % moisture =  $\frac{(W_0+W_1)-(W_0+W_2)}{W_1} \times 100$

#### E. DETERMINATION OF ORGANOLEPTIC PROPERTY

Five untrained volunteer panelists of the Department of Science Laboratory Technology at The Federal Polytechnic, Ilaro, Ogun State, evaluated the sensory properties of the mixed samples on a 9-point hedonic scale (Ebuehi, Ikanone and Nwamadi, 2004). Taste, odour, texture (mouth-feel and hand-feel), flavour, colour, and general acceptance were among the sensory qualities evaluated. The panelists were instructed and guided to fill-out sensory evaluation questionnaires with their observations.

### III. RESULTS AND DISCUSSION

The two spices blends were prepared using scent leaves and curry leaves. Table 1 shows the outcome of their proximate analyses. The results obtained for the moisture content for samples A, B, and C were 9.26 %, 6.28 %, and 8.75 % respectively. The protein contents were 8.53 %, 5.49 %, and 12.39 % respectively while the crude fiber contents were 6.68 %, 4.18, % and 8.61 %. The fat/lipid contents were 2.39 %, 2.04 %, and 2.28 % respectively, ash contents were 5.43 %, 7.20%, and 3.32% respectively while the carbohydrate contents were 67.71 %, 74.81 %, and 64.65 % for samples A, B and C respectively. The prepared spices blends were subjected to sensory evaluation using a 9-point hedonic scale. Figures 1 to 4 show the outcomes of their organoleptic properties. The results revealed that most of the panelists liked the two spices mixtures.

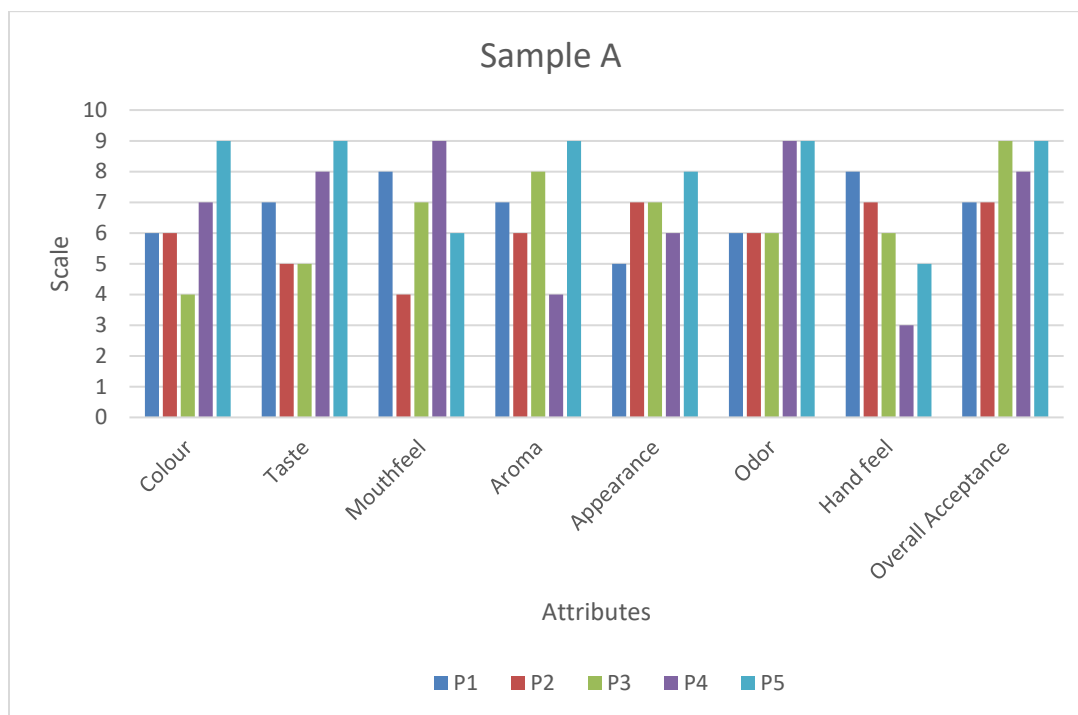
The spices mixtures used in this study are blends of scent leaves and curry leaves. Table 1 shows the proximate values of the spice's blends of the scent leaves and curry leaves. The study revealed that the highest moisture and fat/lipid contents were recorded in sample A, the protein content and crude fiber content were highest in sample C while the ash content and carbohydrate content were highest in sample B. The moisture content, crude fiber content, protein content, carbohydrate content and ash content values in this study are at variance with the study of Abu *et al.* (2023) who revealed higher values than those of this study. The moisture content, ash content, crude fiber content and protein content of the study of Abasiokong *et al.* (2020) also recorded higher values than those of this study but lower carbohydrate content, in their study. The differences might be attributable to the types of leaves used and the quantities/ratios of the mixtures.

**Table 1:** Proximate Analyses of the Scent Leaves and Curry Leaves Mixtures

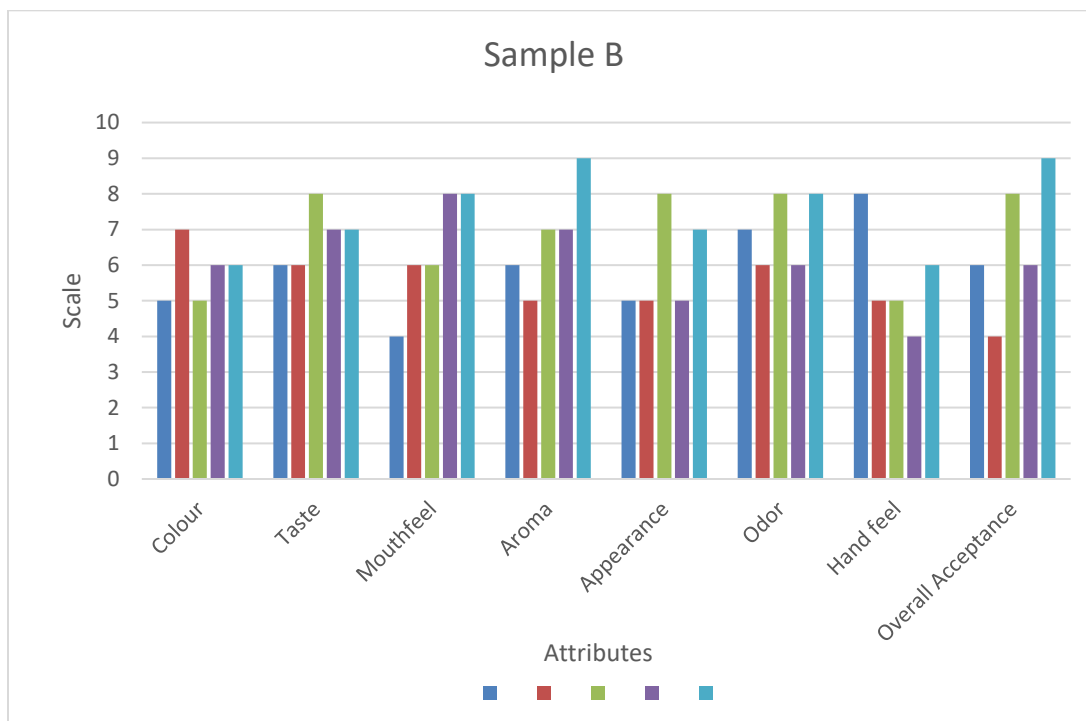
Parameter/Sample	A	B	C
Moisture (%)	9.26	6.28	8.75
Protein (%)	8.53	5.49	12.39
Crude fiber (%)	6.68	4.18	8.61
Fat/lipid (%)	2.39	2.04	2.28
Ash (%)	5.43	7.20	3.32
Carbohydrate (%)	67.71	74.81	64.65

Keys: Sample A = 50 g of scent leaves + 50 g of curry leaves, Sample B = 30 g of scent leaves + 70 g of curry leaves, Sample C = 70 g of scent leaves + 30 g of curry leaves

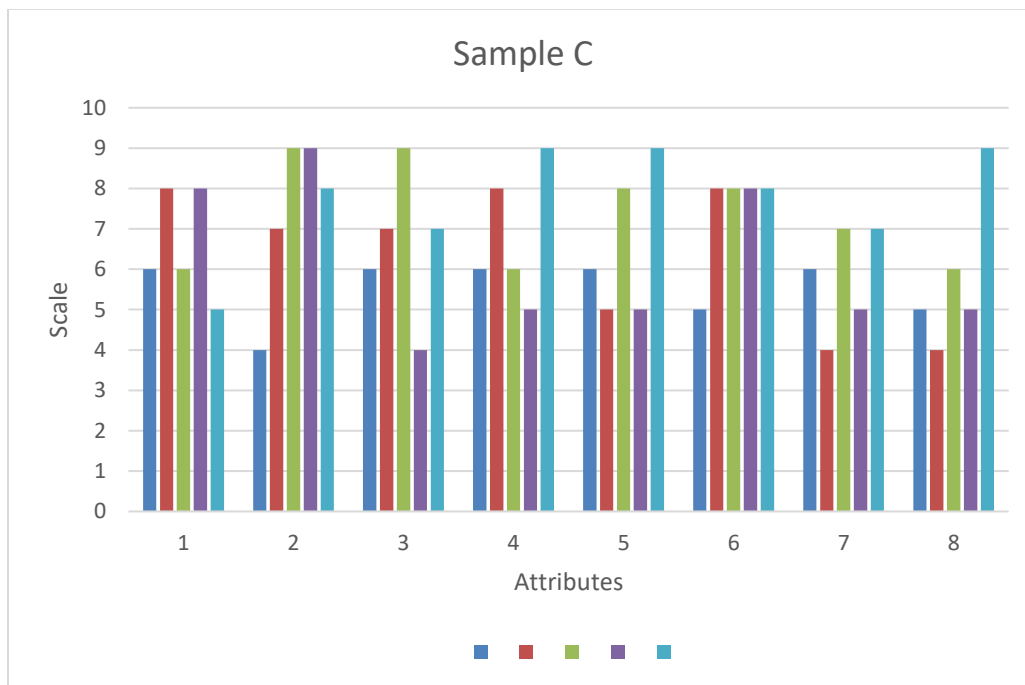
The prepared spices mixtures were subjected to sensory evaluation using a 9-point hedonic scale, to determine their organoleptic properties. Figures 1 to 3 show the results of the analyses. The sensory evaluation for samples A, B and C revealed that most of the panelists liked the spices blends. This study is in agreement with the study of Dawodu *et al.* (2023) that equally revealed that the spices blends were liked by the panelists. The general acceptability of the spices blends in this study is also in agreement with the study of Abasiokong *et al.* (2020). The study revealed that the produced mixed spices were accepted, as they displayed good and acceptable sensory attributes. Sample A showed the best overall acceptability with the highest numerical value of 9 from two taste panelists while sample C showed the least overall acceptability with the highest numerical value of 9 from just one taste panelist. Sample B showed the second-best overall acceptability, also with the highest numerical value of 9 from one taste panelist and followed by the second highest numerical value of 8 from another taste panelist.



**Figure 1:** Sensory Evaluation of Sample A (50 g of scent leaves + 50 g of curry leaves)



**Figure 2:** Sensory Evaluation of Sample B (30 g of scent leaves + 70 g of curry leaves)



**Figure 3:** Sensory Evaluation of sample C (70 g of scent leaves + 30 g of curry leaves)

#### IV. CONCLUSION

At the end, the study recorded varied appreciable values for the proximate contents of the three samples analyzed. Most of the panelists liked the three spices blends as they displayed good and acceptable sensory attributes, although differently but by slightly negligible margins. The 50 g of scent leaves + 50 g of curry leaves mixture (sample A) gave the most acceptable organoleptic property. The scent leaf (*Occimum grattissium*) and curry leaf (*Murraya koenigii*) spices mixture should be commercialized and enhanced for domestic and ceremonial usage. Further research could be carried out to analyze the mixture for the potential presence of heavy metals to safeguard public health.

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