Comparative Studies on Nutritional Values of Four Varieties of Cucumber

Onimisi, Agnes Ozohu, and Ovansa, Jimoh Umar

Abstract---The proximate composition and selected minerals of four varieties of Cucumber (Cucumis sativus) were determined using standard methods of analysis (AOAC, 1980). The results revealed that poinsett 76 (V1), Ashley (V2), Market more (V3) and supermarket (V4) contained 8.88, 5.81, 6.13 and 11.75% of protein respectively. The lipid content was at a range of 0.34 (Ashlay) to 0.36% (Supermarketer), Moisture and Ash contents were compared with values of some literatures cited. As usual micro nutrients (Ca, P and Mg) were higher in value than the micro nutrients (Fe and Zn). The nutrient with the highest value was Mg as observed in Marketmore variety followed by P in Ashley while values observed in Fe and Zn are lower. The final result revealed that Supermarketer (V4) had higher values for protein, fibre, fat and ash with Carbohydrate than the other three varieties. It is hoped that these results would add to existing nutritional data.

Keyword--Proximate, Cucumber species, Nutritional composition.

I. INTRODUCTION

Cucumber (Cucumis sativus) belongs to the gourd family Cucurbitaceae. It is a creeping vine that bears cylindrical fruits that used as culinary vegetables. It can be eaten raw in salads or cooked in more exotic dishes [1]. It is a widely cultivated plant of the family Cucurbitaceae and they are the forth most cultivated vegetable in the world. There are literally hundreds of different varieties of Cucumis sativus, but the edible types can be classified into two basic types: Slicing and Pickly cucumbers [2]. Slicing cucumbers include all that are cultivated for consumption in fresh form. These varieties are usually larger and have thicker skins. Commonly planted varieties of slicing cucumbers as reported by [2] include Dasher, Conquistador, Slicemaster, victory, Comet, Burpee hybrid and Sprint. While, Pickly cucumber include all varieties that are cultivated not for consumption in fresh form, but for processing into pickles. They are usually smaller and have thinner skins. Common examples are Royal, Calypso, Pioneer Bounty, Regal, Duke and Blitz. Other examples that are found in Africa especially in Nigeria are Marketmore, Belt alpha, Centriolo marketer, Poisett 76, Ashley, supermarket.

Cucumbers thrive in both temperate and tropical environment, and generally require temperatures between 15-33°C. for this reason they can be grown in many regions of the world including African countries

In origin, cucumbers were found in Western Asia and specifically in India. China is by far the largest producer of cucumbers, and provides about two-third of the global supply. Iran, Turkey, Russia, Egypt, Spain, Mexico, the Ukraine, Japan, Indonesia, and United States all participate in the world cucumber market, with an especial high number of exports coming from Iran, Mexico, and Spain. Annual production of cucumbers worldwide is approximately 84 billions pounds.

Cucumbers are good sources of phytounitrients (plant chemicals that have protective or disease preventive properties) such as flavonoids, lignans and triterpenes, which have antioxidants, anti-inflammatory anti-cancer benefits according to World’s Healthiest Food as reported by [3]. The peel and seeds have been found to be the most nutrient-dense parts of the cucumber. They contain fiber and beta-carotene, a form of vitamin A that is good for eyes. A study has also shown that cucumber seeds were a good source of minerals and contained calcium. Minerals found in cucumbers are potassium, magnesium which is useful in regulating blood pressure. [4] also reported that cucumber juice contains insulin which is needed by the cells of the pancreas for producing insulin which has been found to be beneficial to diabetic patients. Researchers found that a compound called sterols in cucumber may help reduce cholesterol levels.

Studies have been carried out on Cucumis sativus but there is dearth of studies in our locality. The aim of this report therefore, is to deal with nutritional composition of the four varieties of cucumbers in Zaria, Kaduna state, Nigeria. It is hoped that these results would add to the existing knowledge on this fruit.

II. MATERIALS AND METHODS

Four cucumbers (Cucumissativus) varieties ; Poinsett 76 (V1), Ashley (V2), Marketmore (V3), and Supermarket (V4) used for this analysis were bought from a local market in Zaria, Kaduna state, Nigeria and the proximate analysis was done in Amadu Bello University (ABU) Zaria. They were washed in distilled water, dried between filter paper, separated into its varieties. The cucumbers were oven dried at 60°C ground in Kenwood blender, sieved (45mm wire mesh) and stored in airtight plastic container.

The proximate analysis of the samples for fat fibers, ash and moisture were obtained using the methods described by Association of Official Analytical Chemistry(AOAC)[5]. Nitrogen content was determined by the micro-kjeldahl method described by [6] and the Nitrogen was converted to protein by multiplying by 6.25. Carbohydrate

http://dx.doi.org/10.17758/IAAST.A1015056
was obtained by subtracting the total values of ash, fiber, fat and moisture from 100. Energy value was obtained by using the method of [7]. While moisture content was calculated by subtracting dry matter from hundred.  

III. RESULTS AND DISCUSSION

### TABLE I

**PROXIMATE COMPOSITION (100g⁻¹) OF CUCUMBER VARIETIES ANALYZED**

<table>
<thead>
<tr>
<th>Description</th>
<th>Ca</th>
<th>P</th>
<th>Mg</th>
<th>Fe</th>
<th>Zn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poinsett 76 (V)</td>
<td>0.13</td>
<td>0.39</td>
<td>0.531</td>
<td>0.029</td>
<td>0.006</td>
</tr>
<tr>
<td>Ashley (V)</td>
<td>0.13</td>
<td>0.520</td>
<td>0.453</td>
<td>0.024</td>
<td>-</td>
</tr>
<tr>
<td>0.005 Marketmore (V)</td>
<td>0.133</td>
<td>0.325</td>
<td>0.599</td>
<td>0.019</td>
<td>0.004</td>
</tr>
<tr>
<td>Supermarketer (V)</td>
<td>0.197</td>
<td>0.325</td>
<td>0.510</td>
<td>0.027</td>
<td>0.004</td>
</tr>
</tbody>
</table>

### TABLE II

**MINERAL COMPOSITION (MG KG⁻¹) OF CUCUMBER VARIETIES ANALYZED (DRY MATTER)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Ca</th>
<th>P</th>
<th>Mg</th>
<th>Fe</th>
<th>Zn</th>
</tr>
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<tbody>
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</tr>
</tbody>
</table>

The proximate compositions of the four varieties of cucumber are shown in table 1. The protein contents ranged from 5.81-11.75%. Supermarketer (V4=11.75%) had higher protein value than the other three which was significantly different (p≤0.05) from the other three samples. The protein contents in these varieties of cucumbers are higher than those reported by [8] but lower than that reported by [9]. The fat content ranged from 13.55-20.87%. Supermarketer (V4=20.87%) had highest fat value than the other three which was significantly different (p≤0.05) from the other three. The values of the fat contents of V1, V2, V3 and V4 varieties of cucumber were higher than that reported by [8] and lower than that reported by [9]. The oil content of the four varieties is relatively the same and the differences in the oil contents are not significantly different from each other.

The Ash contents ranged from 14.71-20.40%. Supermarketer (V4=20.40%) had higher Ash value than the other three which was significantly different (p≤0.05) from the other three samples. The values of the Ash contents are higher than that reported by [10] [9]. The carbohydrate contents range from 33.55-46.38%. Supermarketer (V4=46.36%) had higher carbohydrate value than the other three which was significantly different (p≤0.05) from the other three samples. The value of the carbohydrate contents are lower than that reported by [10] but higher than that reported by [9]. The moisture contents range from 95.10-95.85%. The value of the water contents in the four varieties of cucumber is very high and this agree with that reported by [9] which is supported by [4] that cucumbers are 95% water, keeping the body hydrated while helping the body eliminates toxins.

The mineral contents of the four cucumber varieties are shown in table 2. The values of the mineral contents of the four varieties are generally low compared to that reported by [8] . However the values of the macro mineral nutrients (Ca, P, and Mg) are higher than the micro mineral nutrients (Fe and Zn) analyzed. It is worthy to note that Ca in conjunction with Mg, P, Mn, Vitamin, Chlorine and proteins are involved in the formation of bone [11]. It also plays an important role in blood clotting, co-ordination of inorganic elements present in the body and balancing of Ca and P. Zn an essential element for human metabolism Anhwange etal. (2003) in [11] was present in the amount ranging from 0.004-0.006 Mg Kg⁻¹. Though, this value is low but these observation suggest that the varieties could provide significant portion of the Nigerian Food Administration for Zn, if consumed regularly[11] Zn support the health of the immune system, normal synthesis of protein and the health of reproductive organs (especially in men). The deficiency of Zn adversely affect normal physical growth, skin nerve health, natural healing ability and immune function especially in infant [12]

The variation in mineral composition could be due to the climate, species, soil type, water and cultural practices adopted during planting [13]

IV. CONCLUSION

From the results obtained Poinsett 26 (V1), Ashley (V2), Market (V3) and Supermarketer (V4) contained levels of protein, fat, oil, ash and carbohydrate, however supermarketer contained higher values of the nutrient more than the other three varieties. Minerals are present in all the four varieties with almost the same equal amount but the compositions are low.

## Reference