

## Elemental and Amino Acid Status of Cucurbita Pepo Seed

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**Abstract:** The element and amino acid status of cucurbita Pepo seed were determined using standard method of analyses. The elemental composition of cucurbita Pepo seed showed sodium with 344.10mg/100g to be the highest followed by calcium with 214.60± 0.020mg 100g. Other elements determined were magnesium 12.60±10mg/100g, potassium 94.80±0.20g/100g, Iron, 14.20±0.50mg/kg; copper 4.10±0.2mg/kg and manganese 4.64±0.04mg/kg. The vitamin content (mg/100g) of seed was found to be 14.663±0.001. The amino acid profile of Cucurbita pepo seed (g/16gN) was found to range from 0.940±0.001 to 4.12±0.002 for cystein and leucine respectively. The result of the analysis reveals that the seed is edible and still be utilized industrially in the formulation of food, food supplement and cosmetics.

**Keyword:** Cucurbita pepo, elemental analysis, amino acid, supplement, cosmetics.

### I. Introduction

Cucurbita pepo is perhaps the most variable species for fruit characteristics in the plant kingdom (Duchesne, 1786; Naudin, 1856). It is native to North America, where it has been cultivated for at least 100,000 years (Smith, 1997), but was introduced to Europe only about 500 years ago (Whitaker, 1997) this species includes edible fruited forms, known as pumpkin and squash, and small fruited, often bitter, non-edible forms known as gourds.

Cucurbita pepo is among the economically most important vegetable crops worldwide and is today widely cultivated as food and for decorative purpose in all warm and temperate regions of the globe. The seeds have been used in traditional medicine as an antihelmintic and taenicide, demulcent, diuretic and tonic. A tea made from the seeds has been used as a remedy for hypertrophy of the prostate gland.

The production of pharmaceutical product from the pumpkin seeds obviously demands the use of botanically defined species, so as to obtain reproducible form from a chemical point of view. The biologically active compounds include 3% to 5% oil, proteins (31%-51%). The carbohydrate content is between 6% and 10% while that of mineral is between 4% and 5%. Main fatty acid are linoleum acid (43%-55%) and oleic acid (27%-38%). The aims of this work is to investigate the elemental composition and the amino acid profile of the Cucurbita pepo seed in rote to provide an attractive source in replacing the already existing element and amino acid sources which could not meet up with demand of the increasing population.

### II. Material And Method

Seed sample were obtained from commercial market Ila Orangun, Osun State.

The seeds were de-hulled washed, drained and sun-dried for about two weeks for proper drying and to aid easy removal of the shell. The seeds were sun-dried again for 5 days before grinding into fine powder using laboratory mortar and pestle. The sample was then sieved through a mesh of aperture 2mm and later in air tight polythene bag ready for analysis.

### III. Methodology

Mineral contents (Ca, Mg, Fe, Cu, and Mn) were determined on aliquots of the solution of ash by established Atomic Absorption Spectrophotometer while Na and K were determined by flame photometer. The amino acid analysis was done by ion exchange chromatography IEC (FAO/WHO1991). The ascorbic acid content was determined spectrophotometrically using the modified methods of Adyogmus and cetin (2002)

### IV. Results And Discussion

#### Results;

Table 1 : Elemental Composition of Cucurbita pepo seed

Parameter	Na	K	Ca	Mg	Fe	Cu	Mn	Vit. C
Value±S.D	344.10 ±0.10	94.80 ±0.20	214.60 ±0.20	12.60 ±0.10	14.20 ±0.20	4.10 ±0.20	4.64 ±0.04	14.663 ±0.003

Note = mg/100g \*\* = mg/kg

Table 2: Amino acid profile of Cucurbita pepo seed (g/kgN)

Parameter	Note. Levc- Leucine				Isolev- Isoleucine				
	Leuc.	Isole u.	Cyst.	Lys.	Meh	Tryt.	His.	Arg.	Phenyl
Value	4.124	3.140	0.940	1.680	2.0	1.060	1.227	2.174	2.740
±S.D	±0.02	±0.00	±0.00	±0.002	±0.005	±0.00	±0.00	±0.010	±0.050
		1	1			2	1		

Cyst-Cystein

Meth-Methionene

His-Histidine

Pheny-Phenlalanine

Lys-Lysine

Trypt-Tryptohan

Ars-Arsine

## V. Discussion

Table 1 Showed the elemental Composition of Cucurbita pepo. Sodium (Na) was found to be the abundant mineral with 344.10±0.1 mg/100g. Copper (Cu) with 4.10±0.20mg/kg the least. The 344.10±0.01mg/100g obtained for sodium (Na) was found higher than 236.20±2.4mg/100g of Pentaeclethra Macrophylla seed reported by Odoemelam (2005). The 94.80±20mg/100g obtained for potassium (K) was found higher than 8.2mg/100g obtained from cashew nut kernel (Akintokun et al 2008). The 214.60±20mg/100g obtained for calcium (Ca) was lower than 415.38±3.14/100g reported for sesamum indicum L seed (Nzioku et al, 2009). Calcium is of benefit in blood clotting, metabolic process and also in bone formation (Aremu et al.2006).

The Magnesium which is useful in activating many enzymatic systems and maintain the electrical potential many in nerves (Ferao et al, 1987) was found to be 12.60±0.10mg/100g this value is lower than 71.05±0.02mg/100g for *C. pulcherrima* seed (Oyeleke, 2009b) but higher than 3.60±mg/100g of palm kernel oil (Akin hanni et al 2009). The 14.20±0.50mg/100g obtained here for iron (Fe) is lower than 225.000Ng/g of Cucurbita Pepo L. seed and 206.32ppm of *Monodora myristica* seeds.(Idouraine et al,1996). It is the major component of and chlorophyll responsible for greenish coloration of the plants and enhance phosynthesis to take place. Iron is also of the hemoglobin and myoglobin molecules involved in oxygen transport to and within the cells. (Burabai et al 2009). The 4.10±0.20mg obtained here for copper (Cu) is higher than 0.30mg/kg of pumpkin seed. Copper (Cu) is good for health but very high can cause health problem such as live and kidney damage (ATSDR,2004) The upper tolerable intake level of copper for children (1-3year) and male/female (19-70years). Is 1 and 10mg/g respectively (Institute of Medicine, 2003).

The 4.64±0.04mg/kg obtained for manganese (Mn) is lower than 11.53 ppm in *Mondora myristical* seeds and 117.00 ug/g Cucrbita pepo L. seeds reported by Burubai et al, (2009) and Indouraine et al, (1960) respectively.

The Vitamin C (Ascorbic acid) content in mg/100g of the seed to be 14.63±0.003mg/100g, this value is low compared to 83.33mg/100 and 260mg/100g reported for fresh pawpaw and guava seed respectively 9Ashaye et al,2005) the value obtained in this study is also lowest than the vitamin C recommended daily allowance (RDA) foe adult daily which is 36.6mg/100g (USDA,2004).

Table 2 showed the Amino acid profile of Cucurbita seed oil. The essential amino acid in Cucurbita pepo seed were leucine 4.124±0.002/16gN. Isoleucine Lryophan (1.060±0.0002gN) Meethionine (2.075±0.005g/16gN) (1.227±0.001g/16gN). The non-essential amino acids in Cucurbita pepo were cystine (0.940±0.001g/16gN) and arginine (2.174±0.010g/16N). Cucurbita pepo seed oil exhibits lower amino acid content compared to *Lophira lanceolata* seed oil that have its essential amino acids value to be Leucine (.5.29g/16gN) Lysine (4.39/16gN) and isoleucine (3.16g/16N). Other amino compared well with FAO reference protein reported by Uaboi et al., (2008) with cystine showing the lowest value 0.940g/16gN protein.

## VI. Conclusion

From elemental and amino acids composition of seed analyzed Cucurbita Pepo seed flour can therefore be used as food fortification in human food.

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