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Comparative Nutritional And Phytochemical Compositions Of Five Species Of Family Solanaceae (Eggplants Fruits) In Ado Ekiti, Ekiti State, Nigeria.

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ABSRACT
The nutritional and phytochemical compositions of the fruits of five species of eggplants (Solanum melongena L., Solanum macrocarpon L., Solanum gilo L., Solanum aethiopicum L. and Solanum anguivi L.) were evaluated using standard procedures. The fresh fruit samples showed high moisture content, ranging from 5.12 ± 0.22 to 83.22 ± 4.11 %. The high moisture content in S. melongena, S. macrocarpon, S. gilo and S. aethiopicum is responsible for the low crude protein, crude fat, crude fibre, ash and carbohydrate, while the low moisture content of S. anguivi is responsible for the comparatively high proximate contents in the eggplants species. There were significant differences (p < 0.05) in the moisture, fibre, ash and carbohydrate content among the species. The five species of eggplants fruits were rich in minerals. The potassium content in all the species were higher than other elements, ranging from 750.22 ± 6.75 to 782.20 ± 8.67 mg/100 g. There were no significant differences in potassium content in S. aethiopicum and S. anguivi. Sodium was comparatively higher in all the species, ranging from 390.20 ± 5.77 to 440.40 ± 6.78 mg/100 g. There were no significant differences (P < 0.05) between the concentration of sodium in S. macrocarpon and S. gilo. S. aethiopicum has the highest sodium. Calcium content ranged from 18.50 ± 2.48 to 45.64 ± 2.99 mg/100 g. S. anguivi has the highest calcium (45.64 ± 2.99 mg/100 g). The five species recorded low copper content, ranging from 1.02 ± 0.12 to 4.50 ± 0.34 mg/100 g. The highest copper (4.50 ± 0.34 mg/100 g) was detected in S. aethiopicum. Iron content ranged from 18.60 ± 1.11 to 30.10 ± 2.40 mg/100 g. S. macrocarpon and S. aethiopicum had the highest concentration of iron. The concentration of Phosphorus ranged from 72.10 ± 2.14 to 110.10± 4.11 mg/100 g, where the highest was found in S. macrocarpon. Manganese was only detected in traces, ranging from 0.74 ± 0.08 to 0.99 ± 0.070 mg/100 g. Nickel, Lead and chromium were not detected. The concentrations of alkaloids, tannins, and saponins were high among the five species of eggplants. Also, the concentration of flavonoid, phytate and oxalate were moderate and that of phenols was low. In conclusion, the result revealed that eggplants are rich in minerals and phytochemicals which must have accounted for their medicinal properties.

Keywords*: Eggplants, minerals, proximate, Phytochemicals, Solanum spp., medicinal properties.*

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I. INTRODUCTION

Egg plants, Solanum species belong to the family Solanaceae [1], plant genus solanum and the sub genus Leptostemonum [2]. It is a large and diverse genus of flowering plants, which comprises of about 1,500 species worldwide. They are known as garden eggs in Nigeria. They are medicinal plants and at the same consumed as food, either raw or cooked, most especially in the preparation of stew [3]. Egg plants fruits comprise of different species and varieties which vary in shape, fruit colour and size [4].

Solanum nigrum commonly known as black nightshade usually grows as weed in moist habitat in different kind of soil. *Solanun nigrum* has been extensively used traditionally to treat various ailments such as hepatitis, pains, inflammation and fever [6]; [7]. *Solanum melongena* is small and white in colour, having two varieties that are round and oval in shape; yellow and red in colour, when they are ripe or overripe respectively. They are either eaten raw as dessert or cooked and used for preparation of stews, soups and sauces and can be eaten with yam and plantain, most especially in Nigeria.

Eggplants are commonly used in indigenous medicine for the treatment of several ailments, such as asthma, skin infection, gonorrhea, bronchitis, dysentery, and hemorrhoids [8]. These medicinal properties has been attributed to the presence of certain compound in the plants such as crude fibre, phenol, flavonoids, terpenes,

coumarins, carotenoids, ascorbic acid and alkaloid [9];[10];[11] Some have been reported with anticancer, antioxidants, antidepressants, antihypertensive, hypoglycemic, hepatoprotective, anti-diabetic and anti-obesogenic property [12]; [13]; [11]

Saponins are glycosidic compound consisting of an aglycone (sapogenin) linked to one or more oligosaccharide moieties. Most saponins cause a bitter taste and astringency. Solanum are recognized for its alkaloid and anti-proliferative effects and can be used for treating neurodegenerative disorder such as Huntington disease, Parkinson's disease, epilepsy, schizophrenia, and Alzheimer's disease [12];[13]

Incidentally, it was noted that little research works have been carried out on the nutritional and phytochemical composition of the different species of Solanum species in the study area. Therefore, this research work was conducted to determine the nutritional and phytochemical composition of the aforementioned species of solanium fruits.

II. MATERIALS AND METHODS

Collection of Plant materials

Fresh fruit samples of five species of eggplants namely, *Solanum melongena L.*, *Solanum macrocarpon L.*, *Solanum gilo L.*, *Solanum aethiopicum* L. and *S. anguivi* L., were obtained from Shasha market, Ado, Ekiti State, Nigeria. The species were authenticated at Department of Plant Science and Biotechnology, Ekiti State University, Ado Ekiti, Nigeria.

The wholesome fruits were selected and washed with clean water. The fruit stalks and all unwanted particles were removed. The fruits were diced and portion of the fresh samples was isolated for the moisture content determination, while the rest samples were air-dried for 20 days. The air-dried samples were pulverized, using an electric grinder. The powders were stored in air-tight polythene bags at room temperature 3 days after which the proximate and mineral and phytochemical analyses were carried out.

PHYTOCHEMICAL SCREENING

Aqueous extract of the sample was prepared by soaking 100 g of the powdered samples in 200 mL of the distilled water for 12 hours. The extracts were filtered using Whatman No1 filter paper. Chemical tests were carried out on the aqueous extract and on the powdered samples to identify the constituents using standard procedures. Colour intensity was used to categorize the presence of each photochemical into present, moderate or slightly present.

Determination Tannins

Determination of the presence of tannins in the test sample was carried out using ferric chloride ($FeCl_s$) described by [14];[16] and reported by Osagie (2011). Two grams (2g) of powdered sample was added into 10 mL of distilled water. The mixture was shaken for 30 minutes and the filterate washeated into ash with a porcelain crucible in a muffle furnace at 500^{o}C for 24 hours. The resulting ash was cooled in a desiccator and weighed. The ash was treated with 10 mL of 50% HCL. The quantification was carried out using 5 series atomic absorption spectrophotometer.

Determination Saponins

Saponin composition was determined using gravimetric method of [15] Hudson and El-Difrawi (1979). Two hundred and twenty millilitres of 20% ethanol was added to 10g of the pulverized Solanum species fruit samples and stirred using magnetic stirrer for 12 hours at 55^{o}C. The solution was filtered using Whatman No 1filter paper and the extract was reduced to 40 mL under vacuum and 20 mL Diethyl either was added in a separating funnel and shaken vigorously. The ether layer was discarded while the pH of the aqueous solution was adjusted to 4.5 by adding NaOH. Sixty millilitres (60 mL) of n-butanol was finally used for extraction. The Butanol extracts were washed twice with 100 mL of 5% NaCl and evaporated to dryness in a fume cupboard to give a crude saponins which was weighed

Determination Alkaloids

Alkaloids were determined by gravimetric method of Harbone (1973). Five grams (5 g) of the pulverized *Solanum* species samples were weighed into a conical flask containing 50 mL of 10 % NH_4OH, the mixture was stirred and allowed to stand for 4 hours, before filtering. The filtrate was evaporated to one quarter of its original volume on a hot plate and concentrated ammonium hydroxide solution was added drop-wise to the mixture in order to precipitate the alkaloids. The precipitate was filtered using a weighted filter paper and washed with 10 % ammonium hydroxide solution. The precipitate was dried with the filter paper in an oven at 60^{o}C for 30 minutes and then re-weighed.

Determination Phytate

Spectrophotometric method was used in the determination of phytate. One gram (1 g) of each pulverized *Solanum* fruit samples were dissolved in 25ml of 0.5 M HNO_3 and centrifuged at 4,00 rpm for 10 min. One milliliter (1 ml) of 0.03 M Ferric solution was added to the supernantant and left to stand for 15 min in order to allow chelation of the iron molecules by the indigenous plant phytate. At the end of incubation, it was capped and heated for 20min, 7.5ml of distilled water was added to it and vortexed. Thereafter, 0.1 mL of 1.33 M NH_4SCN (Ammonium sulphocyanide) solution was added and absorbance read 465 nm. The amount of phytate was extrapolated from a standard calibration curve for calcium phytate.

Determination Oxalate

The titrimetric method of Day and Underwood (1986) was used in the determination of oxalate in the eggplants varieties. One hundred and fifty (150 mL) of 15 N H_2SO_4 was added to 5 g of the pulverized *Solanum* fruits samples and the solutions were carefully stirred intermittently with a magnetic stirrer for 30 minutes and filtered using Whatman No 1 filter paper, after which 25 mL of the filtrate was collected and titrated against 0.1 N $KMnO_4$ solution until a faint pink color appeared that persisted for 30 seconds.

Determination Flavonoids

The determination of the presence of flavonoids in the sample was done using the acid-alkaline test by [16] Osagie (2011). Two millilitres (2mL) of the aqueous extract was added into a test tube and a few drops of concentrated ammonia were added. The formation of a yellow coloration shows the presence of flavonoids.

Determination Phenol

This was investigated using [17] methods. The free fat sample was boiled with 50 mL flask and 10 mL of distilled water was added to it. To the solution, 2 mL of ammonium hydroxide and 5 mL of conc. Amlyl alcohol was added. The mixture was allowed to react 30 minutes for color development.

Proximate Analysis

Proximate composition (moisture, crude protein, lipid, crude fiber, ash, carbohydrate) of the fruit samples were determined using the Official Method of the Association of Official Analytical Chemist (AOAC) 1990.

Data Analysis

All data were subjected to one way analysis of variance at 5% significance level and were separated using Duncan's Multiple Range test

Mineral Analysis

The mineral content was analyzed using standard procedure as described by [17]. Atomic absorption spectrophotometer was used to determine Ca, Mg, Fe, P and Zn, while flame photometer was used for the determination of Na and K.

III. RESULTS

Nutritional composition of the five eggplants species

The nutritional composition of the five eggplants species is shown in Table 1. The fresh samples of *S. melongena*, *S. macrocarpon*, *S. gilo* and *S. aethiopicum* showed high moisture content, ranging from 83.22 ± 4.11 to 89.57 ± 3.88 % while the moisture content in *S. anguivi* is exceptional low (5.12 ± 0.22 %). Protein content ranged from 2.39 ± 0.02 % to 33.18 ± 1.88 %. The highest protein content (33.18 ± 1.88 %) was found in *S. anguivi*, while the least (2.39 ± 0.02 %) was found in *S. aethiopicum*. There were no significant differences ($P < 0.5$) in the protein content of *S. macrocapon* and *S gilo*. The five species of eggplants fruits have low crude fat, ranging from 0.39 ± 0.02 to 5.72 ± 0.07 %. *S. anguivi* has the highest fat content of 5.72 ± 0.07 %. Crude fibre content ranged from 3.11 ± 0.04 to 4.33 ± 0.32 %, which was highest in *S. anguivi*. Carbohydrate and ash were highest (30.42 ± 1.38 % and 3.11 ± 0.04 %) respectively in *S. anguivi*.

Table 1: Proximate composition of the five species of eggplants fruits

	Species of Eggplants				
Proximate composition (%)	***S. melongena***	***S. macrocarpon***	***S. gilo***	***S. aethiopicum***	***S. anguivi***
Moisture	83.22 ± 4.11^{c}	86.24 ± 4.12^{b}	$86.20 \pm 4{,}43^{b}$	89.57 ± 3.88^{a}	5.12 ± 0.22^{e}
Crude protein	5.12 ± 0.21^{b}	3.12 ± 0.03^{c}	3.50 ± 0.22^{c}	2.39 ± 0.02^{d}	$33.18 \pm 1\ 88^{a}$
Crude fat	0.55 ± 0.02a	0.39 ± 0.02c	0.44 ± 0.03^{b}	0.41 ± 0.04^{c}	5.72 ± 0.07^{a}
Crude fibre	4.33 ± 0.32^{b}	3.44 ± 0.11^{c}	3.15 ± 0.32^{c}	3.11 ± 0.04^{c}	16.50 ± 0.88^{a}
Ash	0.77 ± 0.03^{a}	0.41 ± 0.43^{c}	0.51 ± 0.04^{b}	0.42 ± 0.03^{c}	3.11 ± 0.04^{c}
Carbohydrate	6.14 ± 0.41^{d}	6.40 ± 0.43^{b}	6.95 ± 0.04^{a}	5.22 ± 0.41^{c}	30.42 ± 1.38

Each value is the mean ± standard error of four replicates. Means in the same row followed by the same letter are not significantly different at $p < 0.05$.

Mineral composition of five species of eggplants fruits

The mineral values of the five species is shown in Table 2. It was revealed that *S. aethiopicum, S. aethiopicum, S. anguivi* were having the highest levels of potassium, sodium and calcium (782.20 ± 8.67, 440.40 ± 6.77 and 45.64 ± 2.99 mg/100 g)) respectively. The highest level of copper and iron (4.50 ± 0.34 mg/100 g and 30.10 ± 2.40 mg/100 g) was found in *S. aethiopicum* and *S macrocarpon* respectively. There was no significant difference ($p < 0.05$) in the concentration of copper in *S. melongena*, *S. macrocarpon* and *S. gilo*. The concentration of manganese in the five species is generally low, ranging from 0.74 ± 0.08 to 0.99± 0.070 mg/100 g, where their levels are significantly different. *S. macrocarpon* has the highest Phosphorus concentration of 111.10 ± 4.11 mg/100g which is not significantly different from that of *S. aethiopicum*. The least phosphorus level (72.10 ± 2.14 mg/100 g) was recorded in *S. anguivi*. Nickel, Lead and Chromium were not detected.

Table 2: Mineral composition of five species of eggplants fruits

	Species of Solanum				
Minerals mg/100 g	***S. melongena***	***S. macrocarpon***	***S. gilo***	***S. aethiopicum***	***S. anguivi***
Potassium	750.22 ± 6.75^{c}	770.87 ± 7.65^{b}	750.89 ± 8.30^{c}	780.28 ± 8.44^{a}	782.20 ± 8.67^{a}
Sodium	400.10 ± 5.33^{b}	390.20 ± 5.77^{c}	391.30 ± 7.54^{c}	440.40 ± 6.77a	401.50 ± 8.11^{b}
Calcium	18.50 ± 2.48^{e}	20.20 ± 1.22^{d}	23.10 ± 2.33^{c}	32.30 ± 3.15^{b}	45.64 ± 2.99^{a}
Copper	1.05 ± 0.14^{c}	1.02 ± 0.12^{c}	1.12 ± 0.14^{c}	4.50 ± 0.34^{a}	2.84 ± 0.03^{b}
Iron	28.52 ± 2.72^{b}	30.10 ± 2.40^{a}	27.10 ± 3.43^{c}	30.20 ± 2.40^{a}	18.60 ± 1.11^{e}
Manganese	0.74± 0.08^{c}	0.96± 0.070^{a}	0.88± 0.071^{b}	0.99± 0.070^{a}	0.74 ± 0.03^{c}
Phosphorus	102. 66 ± 4.61^{c}	111. 10 ± 4.11^{a}	104. 35 ± 3.14^{b}	110. 10 ± 4.11^{a}	72.10 ± 2.14^{d}
Lead	ND	ND	ND	ND	ND
Chromium	ND	ND	ND	ND	ND

Key: ND= Not detected

Each value is the mean ± standard error of four replicates. Means in the same row followed by the same letter are not significantly different at $p < 0.05$.

Table 3: Qualitative phytochemical composition of five species of eggplants fruits

Parameter	***S. melongena***	***S. macrocarpon***	***S. gilo***	***S. aethiopicum***	***S. anguivi***
Alkaloids	++	+++	+++	+++	+
Flavonoids	+	++	+	+	++
Tannins	++	++	++	++	+
Phenols	+	+	+	+	++
Saponins	++	+++	+++	++	++
Phytate	+	+	+	+	-
Oxalate	+	+	+	+	-
Terpenoid	+	+	-	+	+

Key: Absent (-), Slight present (+), moderately present (++), highly present (+++)

Table 4: Quantitative phytochemical composition of five species of eggplants fruits

Phytochemical constituents (mg/100 g	***S. melongena***	***S. macrocarpon***	***S. gilo***	***S. aethiopicum***	***S. anguivi***
Alkaloids	142.12 ± 8. 34^{e}	172.22 ± 4.12^{c}	402.45 ± 7.22^{a}	292.10± 12.41^{b}	190.32± 4.53^{d}
Flavonoids	15.67 ± 1.11^{b}	18.44 ± 1.03^{a}	13.32 ± 1.02^{d}	14.67 ± 1.03^{c}	10.22 ± 0.42^{e}
Tannins	234.43 ± 9.58^{d}	611.50 ± 6.34^{c}	995.66 ± 8.12^{a}	820.18±13. 68^{b}	988.55 ± 7.13^{a}
Phenols	6. 58 ± 0.14^{b}	6.44 ± 0.16^{b}	6.19 ± 0.41^{b}	4.43 ± 0.23^{a}	4.52 ± 0.08^{a}
Saponins	388.23 ± 10. 13^{d}	462.32 ± 7.45^{c}	1288.11± 40.12^{a}	670.34 ± 6.88^{b}	387.21 ± 4.88^{d}
Phytate	25.78 ± 2.88^{d}	28.64 ± 3.11^{b}	24.43 ± 2.13^{d}	32.50 ± 3.11^{a}	26.30 ± 1.10^{c}
Oxalate	56. 54 ± 3.11^{b}	39.54 ± 2.77^{c}	27.67 ± 3.55^{d}	59.10 ± 3.33^{a}	60.12 ± 2.11^{a}

Each value is the mean ± standard error of four replicates. Means in the same row followed by the same letter are not significantly different at $p \geq 0.05$.

Phytochemical composition of the five eggplants fruit species

Phytochemicals (alkaloids, flavonoids, tannins, phenols, saponins phytate and oxalate) were detected in the species as shown in Table 3. Alkaloid concentration ranged between 142.12 ± 8. 34 to 402.45 ± 7.22 mg/100 g. *S. gilo* had the highest (402.45 ± 7.22 mg/100 g) alkaloids concentration followed by *S. aethiopicum* (292.10 ± 12.41 mg/100 g) while the least (142.12 ± 8. 34 mg/100 g) was recorded in *S. melongena*. Flavonoids concentration in the species ranged from 10.22 ± 0.42 mg/100 g to 18.44 ± 1.03 mg/100 g. The highest flavonoid

concentration (18.44 ± 1.03 mg/100 g) was found in *S. macrocarpon*, while the least (10.22 ± 0.42 mg/100 g) was found in *S. anguivi*. Tannins concentrations were generally high in the five species of eggplants investigated, ranging from 234.43 ± 9.58 mg/100 g to 988.55 ± 7.13 mg100 g. *S. anguivi* recorded the highest (988.55 ± 7.13 mg/100g) tannins concentration followed by *S. gilo* (995.66 ± 8.12 mg/100 g), while the least (234.43 ± 9.58 mg/100g) tannins concentration was recorded in *S. melongena*. Phenol has the least concentration in all the species analyzed, ranging from 4.43 ± 0.23 mg/100g to 6. 58 ± 0.14 mg/100 g. Saponins concentration was highest in all the species of eggplants ranging between 387.21 ± 4.88 to 1288.11± 40.12 mg/100g. The highest concentration of saponins (1288.11± 40.12 mg/100 g) was found in *S. gilo*, followed by *S. aethiopicum* (670.34 ± 6.88 mg/100 g) and then *S. macrocarpon* (462.32 ± 7.45 mg/100 g). The least saponins concentration (388.23 ± 10. 13 mg/100g), which is not significantly different from that of *S. anguivi*, was recorded in *S. melongena*. Phytate concentration was moderate, ranging from 24.43 ± 2.13 to 32.50 ± 3.11 mg/100 g. *S. aethiopicum* recorded the highest concentration (32.50 ± 3.11 mg/100 g) folowed by *S. macrocarpon* (28.64 ± 3.11 mg/100 g) while the lowest (24.43 ± 2.13mg/100 g) was recorded in S. gilo. Oxalate was present in all the species analyzed, ranging between 27.67 ± 3.55 to 60.12 ± 2.11 mg/100g. *S. anguivi* has the highest concentration (60.12 ± 2.11 mg/100 g) of oxalate which is not significantly different ($p < 0.05$) that of *S. aethiopicum*. The least oxalate (27.67 ± 3.55 mg/100 g) was detected in *S. gilo*.

IV. DISCUSSION

The results obtained from the proximate composition of the five species of fruits of eggplants (*S. melongena*, *S. macrocarpon*, *S. gilo*, *S. aethiopicum* and *S. anguivi*) revealed that *S. anguivi* has low moisture content (5.12 ± 0.22 %) which is significantly lower ($p < 0.05$) than that of other species. That is, *S. melongena (*83.22 ± %) , *S. macrocarpon (*86.24 ± 4.12%) *S. gilo (*86.20 ± 4.430 %), *Solanum aethiopicum* (89.57 ± 3.88 %) and *Solanum anguivi* (5.12 ± 0.22 %). The results obtained from the moisture content is in agreement with the one obtained by [19] who submitted that eggplants fruits are generally rich in moisture. The low moisture content (5.12 ± 0.22 %) recorded in *S. anguivi* is in agreement with the value obtained by [20] where a low moisture content (4.58 ± 0.11 %) was detected in *S. anguivi.* The low moisture content serves as an hindrance to the growth of microorganisms which may cause biodegradation of the fruits. Therefore, the low moisture in *S. anguivi* tends to increase the shelf life of the fruits [21]. The moisture content of any food is an index of its water activity [22] and it used as a measure of stability and susceptibility to microbial contamination.

Crude protein content is higher (33.18 ± 1.88) in *S. anguivi* but lower in other species analyzed in this research work, which agrees with the results obtained by [20]; [23]. As a result of the low protein content, eggplants fruits may not be ideal fruit for protein supplementation. All the five species of eggplants fruits analyzed in this study recorded low fat content, ranging from 0.39 ± 0.02 to 5.72 ± 0.07%. The presence of low fat in eggplants has been reported by [4] who elucidated that vegetables contain very little fats. Dietary fats are essential for the make-up and biological functions of cells as well as increasing the taste of food by absorbing and retaining flavor [23]. The carbohydrate content recorded was also low, ranging from 5.22 ± 0.41 to 6.95 ± 0.04 %, except for *S. anguivi* which recorded a higher value which may be due to the low moisture content. The low carbohydrate content makes it sutable for recommendation for diabetic patients and individuals watching their weights [24];[25]. The ash level determines the degree of inorganic matter in the eggplants. The value of ash obtained in *S. anguivi* was higher than other species in this research work. The eggplants species recorded a moderate amount of crude fibre, ranging from 3.11 ± 0.04 to 16.50 ± 0.88 %. This may be helpful in preventing diseases such as constipation [26]. The eggplants species recorded crude fibre content ranging from 3.11 ± 0.04 to 4.33 ± 0.32 %. Crude fibre in fruits, such as pectins reduces the rate of sugar uptake and play a vital role in gastric emptying [27].

The five species of eggplants analyzed in this study contained some important minerals needed by the body in moderate and large quantity. The minerals are important in daily functioning of the body which includes formation of bones and teeth and general body health [28], examples include calcium, phosphorus and magnesium [29]. They also take part in energy production and nerves and muscles formation [30].

All the species examined contained some phytochemicals. The presence of these phytochemicals constituents is an indication that they have medicinal property. It was reported by [31] Sofowora (1993) that these phytochemicals play lots of effective roles as analgesic, anti-inflammatory, anti-hypertensive and anti-microbial. Saponins and tannins also exhibit cytotoxic effects and growth inhibition making it suitable as tumor inhibiting agent and that Tannins also show anti-viral, anti-bacterial and anti-parasitic effect [32]. Tannins also show anti-viral and anti-parasitic effect. The flavonoids level ranged from 10.22 ± 0.42 to 18.44 ± 1.03 mg/100 g. *S. macrocarpon* has the highest flavonoids (18.44 ± 1.03 mg/100 g) from the result obtained from this research. The result indicated that Solanum species are good sources of flavonoid, which when combined with saponins are also adjuvant in vaccine production.

V. Conclusion

The presence of bioactive phytochemicals and essential minerals in all species of eggplants investigated in this study has justified it medicinal usage. Lead and Chromium were not detected, which is an indication that eggplants are not poisonous for human consumption. The presence of proximate constituents such as crude protein, crude fat, crude fibre and carbohydrate is an indication that the species of eggplants are good sources of energy, enhancements of growth and good health to humans.

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