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**Phytochemical composition and acute toxicity study
of the ethanol seed extract of *Sunflower***

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ABSTRACT

This study is aimed at investigating the phytochemical composition and acute toxicity study of the seed extract of *Sunflower*. Sun flower seeds were obtained from Minna shopping mall Niger State, Nigeria and processed. The phytochemical composition and acute toxicity of the seeds were determined using standard methods. The phytochemical screening of sunflower seed extract indicated the presence of tannin, flavonoids, total phenol, saponins, phytate, oxalate, alkaloids and steroids. The phytochemical composition of sunflower seed extract revealed that alkaloids had the highest value $11.80 \pm 0.02\%$ followed by steroids $2.80 \pm 0.01\%$ and phenol $0.02 \pm 0.00\%$. In conclusion, the major phytochemicals found in sunflower seed were flavonoids, alkaloids, tannins, phenol, saponins, glycosides, oxalates, and phytate. These phytochemicals may contribute to its antioxidant properties.

Keywords: Phytochemical, acute toxicity, seed extract and *Sunflower*

INTRODUCTION

The regular sunflower (*Helianthus annuus* L.) is a types of the Asteraceae family developed financially overall contribution an assortment of nourishing and therapeutic advantages. The sunflower seed, albeit utilized as a tidbit, salad embellish, and in some pastry shop merchandise, is fundamentally collected for oil creation, positioning in fourth situation at world level. The sunflower seed contain significant cancer prevention agent, antimicrobial, mitigating, antihypertensive, injury recuperating, and cardiovascular advantages found in its phenolic compounds, flavonoids, polyunsaturated unsaturated fats, and nutrient. It is utilized in ethno medication for treating various illness conditions including coronary illness, bronchial, laryngeal and pneumonic contaminations, hacks and colds and in beating hack. These striking therapeutic, dietary, and culinary advantages have brought about authentic and developing prevalence of the sunflower and its constituent parts around the world. Oilseeds have been found with expanding request as diet from most recent couple of many years attributable to their rich photochemistry basically liable for giving since they have been demonstrated to be wealthy in segments gainful for human health [1] Many researchers have worked about the piece and science of oilseeds [2]; [3] however now the scientists have completely explored that the photochemical like tocopherols and phenolic compounds addresses the minor segments of oilseeds [4]. These compound represses lipid oxidation [5]; [6] and can forestall cardiovascular sicknesses [7]; [8] and these gainful impacts of tocopherols and phenolic compounds are because of cancer prevention agent action when they balance out oil [9]. Sunflower (*Helianthus annuus* L.) is quite possibly the main oilseed crop filled on the planet [10]. A small sunflower seed is a bundle of solid unsaturated fats, protein, fiber and other significant supplements like nutrient E, selenium, copper, zinc, folate, iron and phytochemicals. After

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palm, soy and rapeseed oil, sunflower oil positioned fourth with an overall creation of about 10.6 million metric tons during 2006 [11].

Aim of the Study

To evaluate the phytochemicals and acute toxicity of the seed extracts of *Sunflower*



PLATE 1

MATERIALS AND METHODS

Plant Materials

Sunflower seeds were gotten from Minna Shopping Mall in Niger state, Nigeria and was identified by a taxonomist Dr G.O Ogbuozobe of Botany division Unizik.

Animals

Thirty-three (43) male Wistar rodents were brought from the Animal unit of the Department of Zoology and Environmental Biology, University of Nigeria, Nsukka and permitted to adjust for seven days. Toward the finish of acclimatization, each rodent was gauged and arbitrarily isolated into gatherings of eight for various examinations. The creatures got water and feed promotion libtium and were kept up under standard lab condition.

METHODOLOGY

Preparation of sunflower seed

The sunflower seeds were dried under room temperature and ground. Known loads (200g) of sunflower seeds were washed with clean water to eliminate soil and sand, depleted, and cleaved. The coriander seed was macerated in 500 ml of ethanol and afterward sifted to get homogenous ethanol concentrates.

Preliminary Phytochemical Screening

Phytochemical analyses were done using modified methods of [12]; [13].

Acute toxicity test of aqueous extracts of the Sunflower seed

The method of [14] was used for the acute toxicity test of the aqueous extracts of Sunflower seed. Thirteen (13) albino rat were utilized in this study. The test involved two stages. In stage one, the animals will be grouped into three (3) groups of three rats each and were given 10, 100 and 1000 mg/kg body weight of the extracts respectively. The second stage involved the number of death that occurred in the different groups in stage one.

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RESULTS

Phytochemical screening of sunflower seed extract

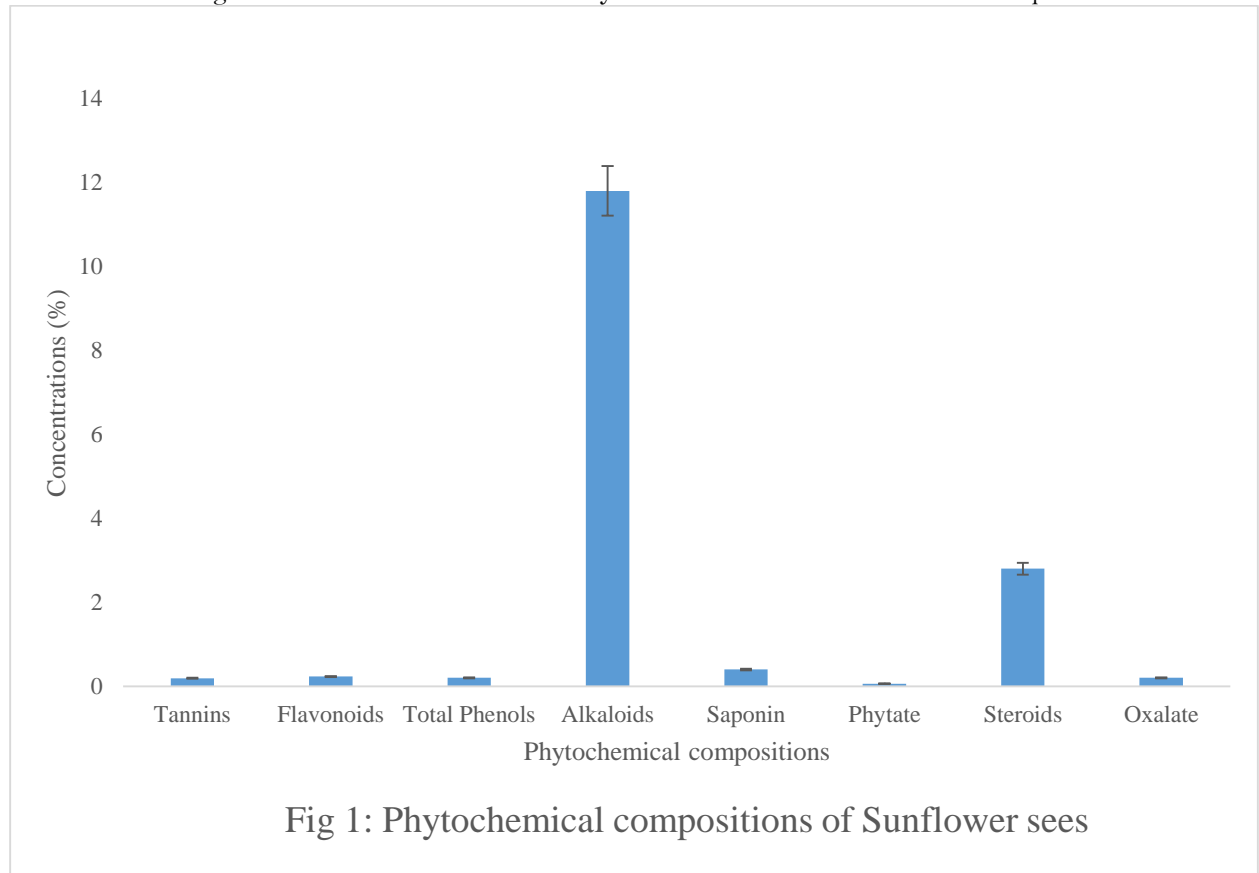
The result of phytochemical screening of sunflower seed extract shown in table 1 shows the presence of tannin, flavonoid, total phenol, saponin, phytate and oxalate however, alkaloids was highly present while steroids was moderately present.

Table 1 Phytochemical Screening of Sunflower Seed

Phytochemical Compositions (%)	Availability
Tannins	+
Flavonoid	+
Total Phenol	+
Alkaloids	+++
Saponin	+
Phytate	+
Steroids	++
Oxalate	+

Legend: + = slightly present, ++ = moderately present, +++ = highly present,

Figure 1 showed the result of phytochemical composition of sunflower seed extract. The result showed that alkaloids has the highest value $11.80 \pm 0.02\%$ followed by steroids $2.80 \pm 0.01\%$ and the least was phenol $0.02 \pm 0.00\%$



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Acute Toxicity Test

The result of acute toxicity in table 4.5 showed that in phase one no mortality was observed as the extract was administered at 1000 mg/kg b.w to the rats. However in phase two at a dose of 4000 mg/kg b.w of the extract to the rat, palpitation was observed in the rats though no death was recorded but at 5000 mg/kg b.w one death was recorded after 24hrs.

Table 2 Phase 1 of Acute Toxicity (LD₅₀) of ethanol Extract of Sunflower seeds

Groups	Dosage(mg/kgb.w)	No of Mortality	Behaviour
1	10	Nil	Normal
2	100	Nil	Normal
3	1000	Nil	Normal
Phase 2			
1	2000	Nil	Palpitation
2	4000	Nil	Palpitation
3	5000	1 death	1 Death

DISCUSSION

From the result of the experiment, it was observed that the ethanol extract of Sunflower seed contained important Phytochemicals (Alkaloids, Tannins, Flavonoids, Saponins, Steroid, Total phenol, Phytate, Oxalate). Phytochemicals (alkaloids, flavonoids, saponins, total phenols and phytate) are plant-derived chemical compounds that thrive or thwart predators, competitors, or pathogens [15]. The major phytochemicals found in sunflower seed studied are flavonoids, alkaloids, tannins, phenol, saponins, glycosides, oxalates, and phytate. From the result in figure 1 which indicated high level of alkaloid, steroid and flavonoid in sunflower seed may contribute to its antioxidant properties. Studies have shown that antioxidants capacity of plants is tightly correlated with phenolic compounds [16] and [17]. Flavonoids are prevalent plant secondary metabolites which include flavones, flavonols and condensed tannins that modulate lipid peroxidation [18]. They occur as glycosides and contain several phenolic hydroxyl groups on their ring structure. Previous studies have shown that flavonoids possess antibacterial, antiviral, anti-inflammatory, anticancer and anti-allergic abilities [19]; [20]. Alkaloids are nitrogen containing naturally occurring compounds found to have antimicrobial properties due to their ability to intercalate with DNA of the microorganisms [21]. Figure 4.1, showed that the alkaloids content was highest in sunflower seed Alkaloids are beneficial chemicals to plants. They help in repelling predators and parasites. However, when ingested by animals, they affect glucagon, thyroid stimulating hormone and inhibit certain mammalian enzymatic activities [22]. Glycoside has anticancer effect and helps to increase the tone, excitability and contractility of the cardiac muscles, and also helps to exert diuretic effect due to increased renal circulation [23]. Tannins are significant water soluble plant secondary metabolites gotten by the condensation of simple phenolics resulting to condensed tannins which are divided into hydrolysable and condensed proantho-cyanidins [24]. They also have powerful biological activities and nutritional effects. The acute toxicity study showed that the lethal dose (LD₅₀) of the extract at 5000 mg/kg b.w resulted to death of a rat.

CONCLUSION

The major phytochemicals found in sunflower seed are flavonoids, alkaloids, tannins, phenol, saponins, glycosides, oxalates, and phytate. These phytochemicals seed may contribute to its antioxidant properties.

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