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Assessing the Minerals, Phytochemical and Proximate Compositions of *Ficus ovata* leaves in Nigeria

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ABSTRACT:

This research evaluated the minerals, phytochemical and proximate compositions of *Ficus ovata* leaves in Mubi-North Local Government Area, Adamawa State, Nigeria. High Performance-Liquid Chromatography was utilized for quantitative phytochemical analysis. Atomic Absorption Spectrophotometer and flame photometer were employed to determine mineral content. Proximate analysis revealed a high content of crude fibre at 27.53±0.005%, followed by carbohydrate at 26.86±0.025%, crude protein at 21.36±0.010%, ash content at 11.26±0.010%, moisture content at 9.25±0.000% and crude fat at 3.75±0.000%. Phytochemical screening indicated the presence of flavonoids tannin, alkaloids, glycoside, saponin, and terpenoids, Quantitative phytochemical analysis showed significant amount of tannin at 18.34±0.025 mg/100 g, alkaloids (8.46±0.010 mg/100g), glycoside (8.16±0.005 mg/100g), saponin (4.56±0.015 mg/100g), flavonoids (3.92±0.010 mg/100g) and terpenoids (2.76±0.010 mg/100g). Additionally, the concentrations of mineral elements were: sodium at 71.26±0.010 mg/100g, potassium at 653.27±0.015 mg/100g, calcium at 61.26 0.010 mg/100g, magnesium at 324.54±0.015 mg/100g, phosphorus at 845.22±0.005 mg/100g, zinc at 12.32±0.010 mg/100g, iron at 2.43±0.010 mg/100g and manganese at 14.54±0.015 mg/100g. This indicates that the plant could serve as a supplement for humans and livestock.

Keywords: *Ficus ovata*, minerals, phytochemistry, proximate analysis.

INTRODUCTION

Medicinal plants are highly valued as a natural and beneficial source of health for humanity due to their abundant therapeutic properties [1]. These plants have been extensively utilized throughout history to obtain a wide array of bioactive compounds that effectively address various

human health conditions. Additionally, medicinal plants possess significant therapeutic value, making them an essential component in the treatment of numerous ailments.

The dependence on plants and plant extracts for healthcare purposes is substantial, with over 70% of the global population relying on them [1]. Throughout history, more than 35% of plant species have been utilized at some point for their medicinal properties. Recognizing their efficacy and safety, the World Health Organization has endorsed the integration of proven natural herbal remedies into primary healthcare. The employment of plants and plant extracts in medicinal remedies has long been an unmissable component of African cultural lifestyle, and it is likely to continue for decades or more. Over the years, natural herbal medicines have emerged as a significant global concern, exerting a profound influence on both world health and international trade [2].

Medicinal plants have been and continue to be vital components of healthcare systems, particularly in developing countries with a rich history of utilizing natural herbal medicine. The extensive reliance on herbal remedies by a significant portion of the global population in these regions can be attributed, in large part, to the prohibitively high expenses associated with western pharmaceutical medications and healthcare products [3]. The recognition and endorsement of the medicinal and economic benefits of these medicinal plants are growing in developing as well as in industrialized nations. Furthermore, natural medicinal herbal are highly accepted by the populace of those countries looking from their cultural and spiritual standpoints. [4].

Phytochemicals are chemical compounds that naturally occur in various parts of plants, including the roots, stems barks, and leaves. These compounds are responsible for the distinct colors and other sensory properties of specific plants, such as the deep purple color of blueberries or the characteristic smell of garlic [5]. Phytochemicals are a broad term used to describe chemical compounds found in plants that have the potential to exhibit significant biological properties, although they are not considered essential nutrients [6]. These non-nutritive plant compounds are renowned for their protective and disease-preventing activities [7]. Moreover, phytochemicals are nonessential nutrients which mean they are not required by the body to support life [6]. More so, phytochemicals are bioactive molecules that occur naturally. These amazing phytochemical compounds make available the food resources for human cells. Consuming leafy foods that contain phytochemicals have been scientifically proven to help in

abating the process of aging and also reducing the risk of many health conditions such as: heart disease, urinary tract infections, stroke, cancer, cataracts, high blood pressure, diabetes and osteoporosis [8]. There are numerous phytochemicals, each possessing distinct medicinal properties.

Herbs and plants that grow naturally contain a multitude of phytonutrients that are highly beneficial for our overall health and well-being. Among the most valuable and relevant phytonutrients are natural minerals like iron, zinc, copper, calcium and other essential elements [9]. Traditional medicinal herbs have been utilized for enhancing the body's immune system and for therapeutic purposes, as they are also recognized for their rich content of essential nutrients [10].

The plant *Ficus ovata* belong to the *Ficus* specie and is discovered in: the river sides, forest edges, savanna woodland, forest and secondary forest, this plant grow reaching to an altitude of about 2050 m, it is found in the subtropical Africa including Cameroon [11]. Leaves of *Ficus Ovata* are employed for treatment of various diseases and are also known to aid in childbirth. Additionally, the stem bark could be utilized as a decoction for treating disease such as diarrhea, gastrointestinal infections, and as an antidote. The fruits are employed to stimulate milk production in cows, while the stem bark is used for chewing. Although extensive research has been conducted on this plant worldwide, the current study focuses solely on investigating the phytochemicals, minerals, and proximate composition of *Ficus Ovata* leaves in Mubi metropolis, Adamawa State, Nigeria.

MATERIALS AND METHOD

Sample Collection

Fresh leaves of *Ficus ovata* was collected from Mubi-North Local Government Area, Adamawa state and was authenticated by a staff of Botany department Adamawa State University, Mubi, Nigeria.

Plate. 1: *Ficus ovata* Plant

Plate 2: Dried *Ficus ovata* Leaf

Area of Study

The Mubi metropolis is a geo-political zone which is made up of two Local Government Areas: Mubi-North and Mubi-South respectively [12]. Location of Mubi is between latitudes 10^0 07' and 10^0 30'N of the equator and between longitude 13^0 09 and 13^0 30'E of the Greenwich meridian. The two local government areas have an area of 192,307 km^2 and the population of these two local government areas was 260,009 people according to National Population Census, 2006. Mubi metropolis shares a boundary with Maiha Local Government Area in the south, Hong Local Government Area in the west and Michika Local Government Area. The vegetation of Mubi and its entirety fall within the Sudan savannah belt of Nigeria. The vegetation zone is referred to as cambretaceous woodland savannah. About 70 % or more of the 34 vegetation is grasses and weeds with few scattered woody plants which make up part of the natural vegetation and the exotic which were brought from other areas into the region [13].

Mineral Content Determination

The pulverized plant sample was used for elemental analysis using AAS and flame photometer. AOAC [14] was adopted and modified Approximately 5.00 g of powdered leaf sample was weighed and transferred into a porcelain crucible and placed into a furnace while increasing the temperature ponderously until temperature reaches 550 ℃.The sample was allowed until a white ash was observed in the crucible. The ash was dissolved by adding 2 ml of concentrated nitric acid to the crucible and it was transferred into 100 ml volumetric flask. The dissolved ash was dissolved and made up to mark with distilled water. The resultant mixture was shaken and

filtered. Standards and unknown samples were run using AAS for all mineral elements and flame photometer for sodium and potassium using air acetylene flame integrated mode and quantification of unknown from the calibration curve of standards.

Qualitative Analysis of Phytochemicals

Standard procedures were used to analyse the presence of alkaloids, terpenoids, steroids, saponin, tannins, flavonoid and glycoside.

Test for Alkaloids

Mayer's test: Filtrates was treated with potassium mercuric iodide. 1ml of the filtrate was added to 0.5 ml potassium mercuric iodide in a test tube. Brown precipitate formed indicated the presence of alkaloids [15].

Test for Tannin

The powdered leaf sample (0.30 g) was weighed and transferred into a test tube and boiled for 10 minutes in a water bath which contained 30 cm^3 of water. The solution was filtered after boiling using number 42 (125 mm) Whatman filter paper. 3 drops of 0.1 % ferric chloride was added to 5 cm^3 of the filtrate. Appearance of brownish green or blue black colouration showed a positive test [16].

Test for Flavonoids

Approximately 0.30 g of the sample was weighed into a 100 cm^3 beaker and extracted with 30 cm^3 of distilled water for 2 h, the solution was filtered with Whatman's filter paper number 42 (125 mm). Approximately 5 cm^3 of 1 M dilute ammonia solution was added to 10 cm^3 of the aqueous filtrate of the leaf extract added followed by the addition of 5 cm^3 of concentrated tetraoxosulphate (VI) acid. Appearance of yellow colouration which disappeared on standing shows the presence of flavonoids [17].

Test for Saponin

About 30 cm^3 distilled water was added to the powdered leaf sample (0.30 g) and boiled for 10minutes in water bath and filtered using Whatman's filter paper number 42 (125 mm). The resultant mixture (distilled water (5 cm^3) and filtrate (10 cm^3)) was agitated vigorously for a

stable persistent froth. The formation of and emulsion after adding three drops of olive oil indicated a positive result.

Test for Glycoside

Exactly 5 ml of distilled water was added to 2 ml of the leaf extract. 2 ml of the tetraoxosulphate (VI) acid was added to the mixture, boiled in water bath for 15min and then allowed to cool. The mixture was neutralized with 20 % potassium hydroxide solution. 1 ml of equal parts of Fehling's solution A and B (each) were added to the mixture and boiled for 15minutes in water bath. The brick red precipitate formed indicated that glycoside is present [17].

Test for Terpenoids

The powdered leaf sample (0.30 g) was weighed and transferred into a 100 cm^3 beaker, extracted using 30 cm^3 and extracted for 2 hours. A mixture of chloroform (2 cm^3) and concentrated tetraoxosulphate (VI) acid (3 cm^3) was added to 5 cm^3 of the extract to form a layer. The appearance of a reddish brown colour at the interface showed the presence of terpenoids [16].

Test for Steroids

Analytical method used was according to Ejikeme *et al*. [16]. Approximately 0.30 g of the leaf sample was weighed into a beaker and mixed with 20 cm^3 of ethanol. The component was extracted for 2 hours. To the ethanolic extract (5 cm^3) 2 cm^3 of acetic anhydride was added followed by the addition of 2 cm^3 of concentrated tetraoxosulphate (VI) acid. A violet colour change indicated the presence of steroids [3].

Determination of Phytochemicals

Estimation of Alkaloids

To 1 cm^3 of the extract 5 cm^3 pH 4.7 phosphates Buffer was added and 5 cm^3 Bacille calrnette Guerin (BCG) solutio. The mixture was shaken with 4 ml of chloroform. The extract was collected in a 10 cm^3 volumetric flask and then diluted to adjust volume with chloroform. The absorbance of the complex in chloroform was measured at 470 nm against blank prepared as above but without extract. Atropine was used as a standard material and compared the assay with Atropine equivalents [15].

Estimation of Flavonoids

Catechin was used as standard to determined total flavonoid content by aluminium chloride method. 1 ml of the sample and 4ml of water were measured and transferred into to a volumetric flask (10 ml volume). Exactly 0.3 ml of 5 % Sodium nitrite and 0.3 ml of 10 % aluminium chloride was added after 5 min. After 6 min incubation at room temperature, 2 ml of 1 M Sodium hydroxide was added to the reaction mixture. Immediately the final volume was made up to 10ml with distilled water. The absorbance of the reaction mixture was measured at 510 nm against a blank spectrophotometrically [17]. Expression of results was done as catechin equivalent as shown below.

Mg catechin/g dried extract

Estimation of Saponins

The *Ficus ovata* leave extract was dissolved in 80 % methanol and 2 ml of vanilinin ethanol was added. The mixture was agitated well and then 2 ml of 72 % sulphuric acid solution was added. The resultant solution was heated at 60 ^{0}C for 10 min on a water bath. The absorbance was measured at 544 nm against the reagent blank. Diosgenin was used as a standard material and the assay was compared with Diosgenin equivalents [8].

Estimation of Steroids

Exactly 1 ml of the extract solution was measured and transferred into a 10 ml volumetric flask. 4N, 2 ml Sulphuric acid and iron (III) chloride (0.5 % w/v, 2 ml), solution were added, followed by the addition of potassium hexacyanoferrate (III) solution (0.5 % w/v, 0.5 ml). The mixture was heated in a water-bath which was maintained at 70±2 ^{0}C for 30 minutes shaking the mixture occasional. The solution was diluted to the mark with distilled water. Afterwards, the absorbance was measured at 780 nm against the reagent blank [12].

Estimation of Tannins

Estimation of total tannin content of the leave was carried out by using Folin-Ciocalteu Spectrophotometric method. To a volumetric flask containing 7.5 ml of distilled water 0.1 ml of the Plant extract was added, 0.5 ml of Folin-Ciocalteu-phenol reagent and 1 ml of 35 % Na_2CO_3 solution and the resultant solution was diluted with 10ml of distilled water. The mixture was well

shaken and kept at room temperature (25±2 ^{0}C) for 30 minutes. Subsequently, standard curve was plotted using a set standard solution of gallic acid. Thereafter, absorbance for the test and standard solutions were measured against blank at 725 nm using UV/Visible spectrophotometer. Expression of the tannin content was done in terms of mg of GAE/g of leave extract [12]

Estimation of Glycoside

Methodology for the determination of glycoside used in this study was that by Adebayo, *et al.* [12]. The powdered leaf sample (1 g) was weighed into 250 cm^3 round bottom flask, 200 cm^3 of distilled water was added to the sample and allowed to stand for 2hours for autolysis to occur. Full distillation was performed in 250 cm^3 conical flask containing 20 cm^3 of 2.5 % sodium hydroxide (NaOH) in the sample after the addition of tannic acid (an antifoaming agent). 100 cm^3 of cyanogenic glycoside, 8 cm^3 of 6M ammonium hydroxide (NH_4OH), and 2 cm^{3}of 5 % potassium iodide (KI) were added to the distillate and titrated with 0.02 M silver nitrate ($AgNO_3$) against a black background using micro-burette. Continuous turbidity indicated the end point.

Estimation of Terpenoids

Dried plant extract (100 mg) was obtained and soaked in 9ml ethanol for 24 hours. It was extracted with 10 ml of petroleum ether using separating funnel. The ether extract was separated in pre-weighed glass vials and allowed to dry (wf). After the ether was evaporated, the percentage yield of total terpenoids contents was calculated using the formula below;

Percentage yield = wi-wf/wi × 100

Proximate Analysis

The moisture content, crude fibre, crude fat, crude protein, Ash content and carbohydrate of *Ficus ovata* leave was determined using the methods described by AOAC [14].

Determination of Moisture Content

Exactly 3 g of the plant material was weighed and transferred into a pre-weighed petri dish and placed in an oven, which was maintained at 105 ^{0}C for 1 h; the sample was then removed and placed in a desiccator to cool. After cooling, the sample was weighed and the loss in weight after drying was expressed as percentage moisture.

Calculations:

Weighing of empty Petri dishes WI

Weight of Petri dish + sample before drying W2

Weight of Petri dish + sample after drying, W3

Weight of sample before drying W2 — WI'

Weight of sample after drying W3 — WI,

Moisture content= (W2 —WI) — (W3 — WI) i.e. weight of sample before drying minus weight of sample after drying.

% moisture content = (W2-Wl)

% dry matter = 100% - % moisture content

Determination of Ash Content

Silica dish was obtained and heated at 600 °C, cooled in desiccator and then weighed. Exactly 2 g of the dried sample was transferred into the silica dish. The sample and dish was weighed. The dish and sample was heated so that the volatile organic materials were burn off. This is referred to as pre-ashing. The heating was stopped when smoking has stopped. The dish was placed in a cool muffle furnace, after which the temperature of the furnace was increased to 600 °C, the temperature was maintained until a whitish-ash remains. Afterward, the silica dish was placed in a desiccator and allowed to cool and then weighed. The residue which remained after the evaporation of volatile organic matter (VOM) of the sample is referred to as ash [14].

Calculation:

$$\% \text{ Ash} = \frac{\text{weight of dish+ash-weight of dish}}{\text{Weight of sample used}} \times 100$$

Determination of Crude Protein (Kjeldahl Method)

The dried sample (2 g) was weighted and transferred into a Kjeldahl flask and the catalyst tablet was added. The sample was heated with gentle swirling until frothing stops; then swirled more strongly until a nearly clear solution resulted. The digested sample was allowed to cool and transferred quantitatively into 250 ml volumetric flask [14]. The distillate apparatus was steamed out for 10 min. The flask was shocked properly and 25 ml of sample digest was transferred into

Kjeldahl flask and it was mixed with 25 ml of 40 % solution of sodium hydroxide (NaOH). The mixture was mounted unto the distillation unit and was heated with constant flow of water. The ammonia liberated was collected with 10 ml boric acid indicator solution in a conical flask placed at the condenser of the Markham distillation unit. The distillation was allowed to go for another extra 5 minutes after the boric acid indicator solution has turned to green colour. The conical flask was removed and the content titrated with 0.01N Hydrochloric acid until the original colour of the boric acid indicator mixture is restored [14].

Calculation:

$$\% N = \frac{0.00014 \times \text{titre} \times 50}{\text{Weight of sample taken}} \times 100$$

Determination of Crude Fat

Exactly 2 g of the powdered leaf was weighed and wrapped in filter paper; the round bottom flask was also weighed and placed on an electro thermal heater. Approximately 25 ml of petroleum ether (BP 65 °C) was poured into the flask. The wrapped sample was placed into a soxhlet extraction apparatus and connected to the flask and the condenser was connected to the soxhlet which was tightly connected to a running water top. The electro thermal heater was then switched ON and the extraction was done within a period of three hours at the specific temperature mentioned above. After 3 hours, the Soxhlet was disconnected, the wrapped sample was removed and the Soxhlet reconnected to recover the petroleum ether used. The round bottom flask containing the lipid sample was placed in an oven to dry off any trace of organic compound at 100 °C for 30 minutes [14].

Weight of flask only W_1

Weight of flask + lipid extracts W_2

Weight of lipid $W_2 - W_1$

% Lipid = Weight of lipid x 100

Determination of Crude Fibre

About 50 ml of digestion mixture was measured and added to the leave sample in a conical flask. The sample was digested for 45 min in a fume cupboard until a yellow colour was obtained. The digested sample was filtered using an ashless filter paper with hot distilled water and washed the

residue with acetone (to wash down traces of fat). The filter paper and residue were placed in a hot air oven for 30 minutes at 105 °C. The new weight was taken and recorded. The residue was transferred into a pre-weighed crucible and ashed in a muffle furnace at 600 °C for 4hrs. It was then removed and transferred to desiccators to cool. The final weight was taken and recorded [14].

Determination of Carbohydrates

This is also known as Nitrogen Free Extract (NFE). The total of ash content, moisture content, protein and lipid content subtracted from 100 % gives the carbohydrate this is also referred to as estimation by difference. The different percentages were added and the difference from 100 % was recorded as percentage carbohydrate, calculated as follows;

%carbohydrate = 100 - (%lipid + %Crude protein + %ash + %Moisture + %Crude fibre) [14].

RESULTS AND DISCUSSION

The mineral composition revealed that magnesium, phosphorus, sodium, calcium, zinc, manganese, potassium and iron are present in significant quantities (Table 1). These preclude that the leaf can be an important nutritive source for body building and also boost the immune system. Phosphorus content was lower in *Ficus Asperifolia* and *Ficus Exasperata* as reported by Ojo *et al.* [5] and Ajayi *et al*. [13] but higher in *Ficus ovata* leaf. Phosphorus as phosphate plays a major in structure and function of all living cells. Phosphorus was reported to be pertinent for the formation bones and teeth. It also contributes to the production of energy by participating in the breaking down of carbohydrate, fats and protein. Phosphorus is also needed for the balance and metabolism of minerals and vitamins such as calcium, vitamin D, magnesium, iodine and zinc. Furthermore, the concentration of iron is significant in the leaf, which can be helpful in the formation of blood. Many studies have indicated that deficiency of iron may lead not only to behavioral abnormalities but also to biochemical changes in the brain. Iron plays an important role in several intracellular reactions involved in the transport of oxygen. It brings about the oxidation of proteins, carbohydrate and fats [5]. The concentration of sodium and potassium were 71.265±0.010 mg/100g and 653.27±0.015 mg/100g respectively which exceeded the value reported by Ajayi *et al* [13]. This showed that the leaf of *Ficus ovata* can be used to control glucose absorption, pH of the body, regulate muscle and nerve irritability and maintain osmotic

balance of the body fluids. The presence of calcium at 61.26±0.010 mg/100g explains that the leaf is pertinent in muscle contractions, blood clotting and in certain enzymatic metabolism [5]. Zinc content of *Ficus ovata* was found to be lower at 12.321±0.010 mg/100g compared to 66.3±0.45 mg/100g in *Ficus exasperata* as reported by Ajayi *et al*. [13]. Zinc plays very important role in the expression gene and in regulation of cellular growth. Phosphorus, calcium, and magnesium are activators of many enzymatic systems and also maintain the electrical potential in the nerves [17].

Table 1: Mineral composition of *Ficus ovata* leaves

Element	Composition (mg/100g)
Sodium (Na)	71.26±0.010
Potassium (K)	653.27±0.015
Calcium (Ca)	61.26±0.010
Magnesium (Mg)	324.54±0.015
Phosphorus (P)	845.22±0.005
Zinc (Zn)	12.32±0.010
Iron (Fe)	2.43±0.010
Manganese (Mn)	14.54±0.015

Values are means of two determinations ± S.D

Phytochemical screening of *Ficus ovata* leaf (Table 2) shows that the leaf contained an appreciable amount of tannins, moderate amount of glycoside and alkaloids, trace amount of flavonoids, saponins and terpenes. Alkaloids are known to possess antimalarial activity, analgesics properties and can also act as stimulant. Glycoside moieties such as; saponins, cardiac glycosides as well as flavonoids can inhibit the growth of tumor, act as anti-parasite, and can also serve as an anti-depressing agent. Flavonoids have been found to possess important biological and pharmacological activities in invitro studies. Examples of such include: anti-inflammatory, antioxidant, anti-allergic, antibacterial, antifungal, anti-cancer, anti-microbial, antiviral, and anti-diarrheal activities [7].

Table 2: Qualitative phytochemical screening of *Ficus ovata* leaves

Phytochemical	Extract content
Alkaloids	++
Tannin	+++
Saponin	+
Flavonoids	+
Terpenoids	+
Glycosides	++

+ = Low concentration, ++ = moderate concentration, +++ = high concentration

Quantitative phytochemical analysis of *Ficus ovata* leave presented in Table 3 shows its richness in phytochemicals. Phytochemicals have several biological functions which including: anti-inflammatory, antioxidant and antiviral properties. Some phytochemicals act as pain killers while others confer protection against platelets aggregation [9]. Tannin has the highest composition in *Ficus ovata* leaf at 18.34±0.025 mg/100g. Tannins are well known for their astringent property, they had been used as a base for several herbal treatments and also use to prevent cancer by preventing cellular damage. Alkaloids and Glycosides have the second and third highest composition. Glycosides have the ability to lower blood pressure [5]. Saponins can precipitate and coagulate red blood cells. Some characteristics of saponins include: cholesterol binding properties formation of foams in aqueous solutions and bitterness as reported by Ojo [5]. Flavonoids content was 3.92±0.010 mg/100g. This significant amount of flavoids is appreciable because flavonoid are protective agents against inflammatory disorder.

Table 3: Quantitative phytochemical analysis of *Ficus ovata* leaves

Phytochemical	Extract composition (mg/100g)
Alkaloids	8.46±0.010
Tannin	18.34±0.025
Saponin	4.56±0.015
Flavonoids	3.92±0.010
Terpenoids	2.76±0.010
Glycosides	8.16±0.005

Values are means of two determinations ± S.D

The proximate composition of *Ficus ovata* leaves (Table 4). The crude fibre at 27.53±0.005% is the highest parameter. This suggests that the leaf might serve as an important wellspring of dietary fibre and can be employed in treating obesity, diabetes as well as certain diseases related to gastrointestinal tract [5],

Sufficient taking in of dietary fibre can decrease the level of serum cholesterol and also aids absorption of trace elements in the gut as well as lower the risk of hypertension coronary heart disease and breast cancer [9].

The amount of carbohydrate estimated at 26.86±0.025% showed that this leaf could be a good source of carbohydrate in human. Carbohydrates are made use of as major wellspring of biological energy when they are oxidized in the living cells [7],

The crude protein value at 21.36±0.010% is the third highest parameter, would mediate cell responses, control growth, serve as enzymatic catalyst and cell differentiation. Ojo *et al* [5] reported that health implication of the consumption of food containing high protein level include involvement of its non-essential and essential amino acids as building blocks for protein synthesis, not only for the growth and development of children and infants but also for the constant replenishment of the whole body.

The crude fat content at 3.75±0.00% was the lowest parameter noted. Dietary fats function in adding to the deliciousness of food by absorption and retaining flavours. High consumption of fat might cause certain cardiovascular disorders such as aging and cancer [5]. The ash content of the leaf under study at 11.26±0.010% is closely related to that of *Ficus exasperate* at 11.76 % as reported by Ajayi *et al*. [13]. The variation at 0.5% could be as a result of differing climatic condition.

The moisture content at 9.25% was also noted as the fifth parameter. A higher moisture content in any sample was scientifically proved to result in caking and can also be a factor to determine the shelf life and also the ability of microorganisms to live and growth. However, the moisture content was also found to be in relation to that of *Ficus exasperate* at 10.65% as reported by Ajayi *et al*. [13]. The minor difference at 1.39% in the composition may be as a result of the geographical distribution.

Table 4: Proximate composition of *Ficus ovata* leaves

Parameters	Composition (%)
Crude protein	21.36±0.010
Crude fat	3.75±0.000
Crude fibre	27.53±0.005
Moisture content	9.25±0.000
Ash content	11.26±0.010
Carbohydrate content	26.86±0.025

Values are means of two determinations ± S.D

CONCLUSION

The findings of this study showed that *Ficus ovata* leaves contained considerable amount of nutrients including; fibres, carbohydrate, protein, and minerals. Therefore, the plant leaves might be useful as feed supplement for improving health and growth in humans and livestock. Additionally, the phytochemical constituents of this plant leaves could explain the reason for the usage of this plant leaves in traditional medicine for the treatment of infections.

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