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Evaluation of Medicinal and Nutritional Values of Mistletoe leaves (*Loranthaceae*) in Bida Metropolis, Niger State Nigeria

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Abstract

Mistletoe plays an important role in the life of rural people as it has nutritional and medicinal values for livestock and human respectively. The present study evaluates the medicinal and nutritional values of mistletoe leaves (Loranthaceae). The qualitative phytochemical result revealed that phenols, flavonoids, tannins, saponins, alkaloids, terpenoids and cardiac glycosides were present in the methanol extract of the mistletoe leaves while anthraquinones, sterols and phlobatannins were absent. The result of the quantitative phytochemical properties revealed that phenols was the highest phytochemical with 235.58±0.84mg/100g, followed by saponins (123.15±1.21 mg/100 g), tannins (76.04±0.55 mg/100g), flavonoids (18.03±0.82 mg/100 g) while the least was found to be alkaloids with amount of 13.02±0.08 mg/100g. The proximate result showed that moisture had the highest (49.91±1.39%), followed by carbohydrates (34.31±2.10%), crude protein (8.64±0.54%), ash (3.87±0.24%) and fats (2.78±0.09%) while crude fiber was found to be the least nutrient (0.54±0.03%). This research underscores the medicinal value of mistletoe and its vast nutritional characteristics for the treatment of some ailment and as feed for animals.

Keywords: Phytochemical properties, Nutritional value, Methanol extract, Qualitative

INTRODUCTION

A hemi-parasitic plant, mistletoe grows on a variety of trees, including cocoa, mango, guava, and kola nut trees. Its nutritional makeup includes carbs, protein, fat, fiber, and ash. Because

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of its high nutrient content, it has a major impact on the health of both humans and animals. Mistletoe leaves have been used as a diuretic and to treat a number of ailments, such as diabetes, cancer, arthritis, hypertension, and infertility, according to Tabe *et al.* (2019).

Mistletoe grows wild in Nigeria on a variety of commercial trees, most of which are fallen and killed. This happens because of the damage they cause to their host trees, which costs a substantial amount of money. Mistletoes attach themselves to their host tree by means of adventitious roots that penetrate through the tissues and hinder the host tree's ability to grow and bear fruit. Mistletoe only requires water and minerals from its host, even though it can produce carbohydrates through photosynthesis (Inusa *et al*., 2018).

Mistletoe is used in ceremonies by Germans and Americans, although Greeks believe it to have magical qualities (Falowo et al., 2023). Druids utilize mistletoe in religious ceremonies, to greet the New Year, and to treat a variety of chronic conditions, including diabetes, epilepsy, and infertility (Saleh et al., 2015).

Mistletoes grows on a number of economically significant tree crops in West Africa, such as the rubber (Hevea brasiliensis Muell Arg), citrus species, particularly sweet orange (Citrus sinensis L.) and grape (Citrus paradisi L.), neem tree (Azadirachta indica L.), and shea butter tree (*Vitellaria paradoxa Gaertn.* f.) (Inusa *et al*., 2018). Numerous species of these hemi-parasitic plants can be found on a variety of cultivated, medicinal, and commercial trees, such as the brimstone tree (*Morinda lucida* Benth) and the hog-plum (*Spondias monbin* L.). The African Rauwolfia (Rauwolfia vomitoria Afzel), the sand paper tree (Ficus exasperata Vahl), the teak (Tectonia grandis L. f.), the African Rauwolfia (*Cola nitida Vent. Schot* and *Endl.),* the bread fruit tree (Artocarpus utilis Parkinson), and other forest trees (*Terminalia glaucescens Planch* ex *Benth*, *Ficus mucus* (Welw.) ex Fichalo, etc.) have also been discovered. The Yoruba proverb that mistletoes have no roots and are instead related to all tree hosts seems to be supported and validated by these data.It is rarely used by Nigerians to cure a wide range of conditions in humans and animals, such as diabetes, dysentery, wounds, diarrhea, cancer, and hypertension (Odunayo & Ibrahim, 2016). Numerous studies have demonstrated the strong antioxidant potential of mistletoe, hence bolstering its therapeutic use in herbal medicine (Saleh *et al*., 2015). Aqueous mistletoe extract has been shown by Tabe *et al*. (2019) to be able to bring rats' blood sugar and cholesterol levels back to normal. The lectins in mistletoe have the potential to bind to carbs and reduce blood sugar levels, as suggested by Inusa *et al*. (2018). A few remote subsistence farmers use the leaves to feed their recently given-birth goats. But most people don't know about its nutritional and health benefits, or they could be skeptical because of its little-known chemical makeup, hence the need for this research. The number of chemical components in mistletoe leaves varies depending on where they are from (Odunayo & Ibrahim, 2016). Examining mistletoe, researchers discovered that its active constituents included lecithin, viscotoxin, polysaccharides, and various phytochemicals (Inusa *et al*., 2018). Tabe *et al*. (2019) claim that because it reduces blood glucose levels and affects the prevention of weight loss in individuals with diabetes mellitus, it possesses hypoglycaemic properties. Inusa *et al*. (2018) state that mistletoe has also been used to treat epilepsy, rheumatism, menopausal syndrome, and infertility in both sexes. Mistletoes are viewed by the average farmer or gardener as infamous and destructive parasites that seriously harm economically valuable fruit trees such as cocoa, rubber, kola nuts, and medicinal plants like Rauwolfia vomitoria and Morinda lucida, regardless of whether they are grown in gardens, orchards, or wild forests (Saleh *et al.,* 2015). According to Tizhe et al. (2016), mistletoes' success stunts the growth and productivity of their host plants, ultimately leading to their demise. This is

especially true if the host plant is a small shrub or tree and the climate is adverse (Inusa *et al*., 2018). Since mistletoe provides therapeutic and nutritional benefits for both humans and livestock, it is a vital part of rural life. The purpose of this study is to assess the nutritional and therapeutic benefits of mistletoe leaves.

MATERIALS AND METHODS

Collection of Samples

Mrs. Obi P. U. of the Department of Biological Sciences at Federal Polytechnic Bida, Niger State, identified the mistletoe (Loranthaceae) leaves that were taken from the staff quarters of the institution. After being allowed to dry for 21 days at room temperature, it was ground into a powder using a mortar and pestle. The powder that was produced was kept for later examination in a plastic container.

Extraction of phytochemical components

The Loranthaceae family of mistletoe leaves were dried in a forced fan oven at 50 °C. Thirty milliliters of methanol (MeOH) were used three times to extract two grams of dried mistletoe (Loranthaceae) leaves. Evaporation was used to vacuum-dry the MeOH extract. After being extracted with MeOH, the residue was dried in a forced fan oven that was heated to 50°C. Four times, for fifteen minutes each, the dried residues were boiled in fifty milliliters of water to remove them. According to Singh and Kumar (2017), the water extracts were dried in a forced fan oven at 50°C till their weight didn't change.

Qualitative phytochemical screening

Test for Flavonoids

In each case, 0.1 g of sample was cooked in a test tube over a steam bath for three minutes using 10 ml of ethyl acetate. After the mixture was filtered, 1 mL of diluted ammonia solution was mixed with 4 ml of the filtrate. The presence of flavonoids was shown by the yellow coloring. (Gul *et al*., 2017).

Test for Phenols

In a test tube, about 0.5g of the material was cooked in 20 mL of distilled water before being filtered. A solution of 0.1% ferric chloride (FeCl3) was subsequently added to the filtrate. The presence of phenols and tannins was indicated by the emergence of brownish green or a blue-black hue (Gul *et al*., 2017).

Tannins

In a test tube, about 0.5g of the material was cooked in 20 mL of distilled water before being filtered. A solution of 0.1% ferric chloride (FeCl3) was subsequently added to the filtrate. The presence of phenols and tannins was indicated by the emergence of brownish green or a blue-black hue (Gul *et al*., 2017).

Saponins Test

In a test tube set over boiling water, around 0.2 g of the material was cooked in 20 mL of distilled water and then filtered. After adding 5 mL of distilled water to 10 mL of the filtrate, the mixture was rapidly agitated to produce a stable, long-lasting foam. Drops of olive oil were added to the foam, and it was vigorously shaken to create an emulsion that revealed the presence of saponins (Gul *et al*., 2017).

Alkaloid Test
On a steam bath, around 0.5 g of the sample was agitated with 5 cm3 of 1% aqueous HCl. A few drops of picric acid solution were added to 2 cm3 of each extract. Preliminary evidence for the presence of alkaloids was the production of a reddish-brown precipitate (Singh and Kumar, 2017).

Test for steroids
Approximately 0.5 g of the material was combined with 2 mL of sulfuric acid and 2 mL of acetic anhydride. When a color changed from violet to blue or green, steroids were present. In 2017, Singh and Kumar

Phlobatannin Test
A portion of the sample (0.1 g) was cooked in 1% aqueous hydrochloric acid; the presence of phlobatanins was revealed by the production of a red precipitate (Hatzade *et al*., 2022).

Test for Cardiac glycosides (Keller-Killani test)
One drop of ferric chloride (FeCl3) solution was added to 5 mL of sample, which was then combined with 2 mL of glacial acetic acid and 1 mL of concentrated sulfuric acid. Approximately 0.2 g of the sample was dissolved in 10 mL of distilled water. Cardenloides' deoxysugar properties were shown by brown ring development at the interface (Singh and Kumar, 2017).

Test for Anthraquinones (Borntrager's test)
5 mL of chloroform was mixed with around 0.5 g of sample to separate the chloroform layer. A 0.5 mL solution of 10% ammonia was added to the chloroform layer. After giving the combination a good shake, anthraquinones were found when a pink/violet or reddish-yellow color formed in the ammonical phase (Gul et al., 2017).

Total Phenol Determination
The extract's total phenol content was ascertained using the Singleton *et al*., 1999 technique. 10 mL of distilled water was used to dissolve 0.01g of the extract, and 2.5mL of 10% Folin-Ciocalteu's reagent was used to oxidize 0.5 mL of the extract. This was then neutralized with 2mL of 7.5% sodium carbonate. For forty minutes, the reaction mixture was incubated at 450C. Using a twin beam Shimadzu UV spectrophotometer, UV-1800, the absorbance was measured at 765 nm. The calibration curve was made with regular garlic acid.

Determination of Total Flavonoids
The extract's total flavonoid content was calculated using the technique described in (Chang et al., 2002). A test tube with 1.5 ml of 100% methanol, 0.1 mL of 10% aluminum chloride, 0.1 mL of 1M sodium acetate, and 2.8 ml of distilled water was filled with 0.5 ml of the extract and left to stand at room temperature for half an hour. Utilizing a twin beam Shimadzu UV-spectrophotometer, UV-1800, the absorbance was measured at 415 nm. The calibration curve was created using standard quercetin.

Determination Total Alkaloid
The Oloyed (2005) method was used to determine the extract's total alkaloid content. This was used to weigh 0.5g of the crude extract, dissolve it in 5ml of a 96% ethanol:20% H2SO4 (1:1) combination, and filter the liquid. After that, 1 milliliter of the filtrate was added to 5 milliliters of 60% H2SO4 in a test tube, and it was let to stand for 5 minutes. After adding 5 milliliters of 0.5% formaldehyde, the mixture was left to stand at room temperature for three hours. A

wavelength of 565 nm was used to measure the absorbance. According to Shaikh and Patil (2020), vincristine's extinction coefficient (E296, ethanol (ETOH)= 15136M-1cm-1) served as the reference alkaloid.

Tannin Determination

The method of (AOAC, 1984) was used to determine the crude extract's tannin concentration. A 50 ml beaker containing 0.2g of the extract was filled with 20ml of 50% methanol, covered with parafilm, and heated in a water bath at 800C for one hour. To guarantee consistency, the reaction mixture was given a good shake. After filtering the extract into a 100 ml volumetric flask, the following ingredients were added and thoroughly mixed: 20 ml of distilled water, 2.5 ml of Folin-Denis reagent, and 10 mL of sodium carbonate. After that, the reaction mixture was left to stand at room temperature for 20 minutes in order for the bluish-green color to form. The absorbance was measured at 760 nm with a Shimadzu UV-1800 double beam spectrophotometer. The calibration curve was created using standard tannic acid (Shaikh and Patil, 2020).

Saponin Determination

The extract's saponin content was ascertained by applying the methodology described by Oloyed (2005). After weighing and dissolving 0.5g of the crude extract in 20ml of 1N HCl, the mixture was heated for four hours at 800C in a water bath. After cooling, the reaction mixture was filtered. After adding 50 milliliters of petroleum ether, the ether layer was recovered and dried by evaporation. After that, 10 minutes were spent standing after adding 5 milliliters of acetone-ethanol (1:1), 6 milliliters of ferrous sulphate, and 2 milliliters of concentrated sulfuric acid. At 490 nm, the absorbance was measured. The calibration curve was created using standard saponin (Shaikh and Patil, 2020).

Proximate Analysis

According to Onwuka (2005), the proximate analysis of the sample was conducted using the techniques of the AOAC, (1990).

Moisture

By using the oven drying process, moisture was measured. A separate clean, dried crucible (W1) was filled with two (2 g) of the sample, which was precisely weighed. For 6 to 12 hours, each crucible was placed in an oven set to 100 to 105 degrees Celsius until a consistent weight was reached. After that, the crucible was cooled for 30 minutes in the desiccators. It was weighed once again after cooling (W2). The percentage moisture content was determined as follows:

$$\% \text{ Moisture} = \frac{W_1 - W_2 \times 100}{\text{Weight of leaf}}$$

Where

W_1 = Initial weight of crucible + Sample

W_2 = Final weight of crucible + Sample

(Source: Shaikh and Patil, 2020).

Ash

The determination of ach in the sample was carried by placing a clean empty crucible (W1) in a muffle furnace at 550^0C for an hr, cooled indesiccators. Two gram (2g) of the sample was placed in the crucible (W_2) and was ignited over a burner, until it was charred. Then the

crucible was placed in a muffle furnace for ashing at 550 ^{0}C for 2-4 h. The appearance of gray white ash indicated complete oxidation of all organic matter in the sample. After ashing the crucible was cooled and weighed (W_3). Percentage ash was determined as follows:

$$\% \text{ Ash} = \frac{\text{Difference in Weight of Ash} \times 100}{\text{Weight of leaf}}$$

Difference in weight of ash = $W_3 - W_1$

(Source: Gul *et al*., 2017)

Crude Protein

Protein content of the sample was determined by Kjeldahl method. The beetle (0.25g) was taken into a digestion flask, with 6ml of concentrated H_2SO_4 and a speck of Kjeldah1 catalyst (mixture of 10g Na_2SO_4+5g CuSO4+ 0.05g sel enium). The flask was swirled in order to mix the contents thoroughly then digested on the digestion block till the mixture became clear (colorless or greenish in color). The digest was cooled and transferred to a 100ml volumetric flask and volume was made up to mark by the addition of distilled water. Distillation of the digest was performed on a Markham Distillation Apparatus. Ten (10 ml) of digest was introduced into the distillation tube then 10 ml of 40 % NaOH was gradually added through the same way. Distillation was continued for at least 10 min and NH_3 produced was collected as NH_4OH in a conical flask containing 5ml of 4% boric acid solution with few drops of methyl red indicator. During distillation yellowish color appeared due to NH_4OH. The distillate was then titrated against standard 0.1 N HCI till the appearance of pink color. A blank (40 % NaOH; 4% boric) was also run through all steps as above. The nitrogen was determined by micro Kjeldah method and transfer to protein determination by multiplying by a factor of 6.25. All the proximate values were reported in percentage (%). Percentage crude protein content of the leaf was determined as follows:

$$\% \text{ Crude Protein} = 6.25 \times \%N_1$$

$$\%N_1 = \frac{(S-B) \times N_0 \times 0.014 \times D \times 100}{\text{Weight of the leaf} \times V}$$

Where,

S = Crude protein titre value — B = Blank titration reading

N_0 = Normality of HCI — D = Dilution factor

V = Volume of the digest taken for distillation — 0.014=Milli equivalent weight of Nitrogen

6.25 = Conversion factor from nitrogen to protein — N_1 = Nitrogen content

(Source: Shaikh and Patil, 2020).

Crude fat

Crude fat was determined by ether extract method using Soxhlet apparatus. Two gram (2g) of moisture free Mistletoe was wrapped in filter paper, placed in fat free thimble and then introduced into the extraction tube. A weighed, cleaned and dried receiving flask was filled with petroleum ether and fitted into the apparatus. The Soxhlet apparatus was assembled and allowed to reflux for 6hrs; extract was transferred into clean glass dish with ether washing which was evaporated on water bath. Then the dish was placed in an oven at 105^{0}C - 110^{0}C for 1hr and cooled in a desicator. The percentage crude fat was calculated using the following formula:

$$\% \text{ Crude Fat} = \frac{\text{Weight of ether}}{\text{Weight of plant leaf}} \times 100$$

(Source: Gul *et al*., 2017)

Crude Fibre

Two grams (2 g) of the Mistletoe were defatted according to 3.2.1.4 section; the defatted sample was subjected to reflux for 30 mins. The sample was introduced into 200 ml of solution A (2.50g of H_2SO_4 in 200 mL of distilled water). The solution was filtered through several layers of cheese cloth on fluted funnel, washed with boiling water until the washings are no longer acidic then the residues were transferred into a beaker and then boiled for 30min with 200 mL of solution B (2.50 g of carbonate free NaOH in 200 ml of distilled water). The final residues were filtered through a thin but close pad of washed and ignited asbestos in a Gooch crucible, then dried in an electric oven and weighed after which it was incinerated, cooled and reweighed. The percentage crude fibre was calculated using the following formula:

$$\% \text{ Crude fibre} = \frac{\text{Loss in weight after incineration}}{2\text{ g}} \times 100$$

(Source: Gul *et al*., 2017)

Carbohydrate Content

The carbohydrate content of the Mistletoe was determined by calculation; as percentage difference of the summation of other proximate parameters.

% carbohydrate = 100- (M+P+F+A+F_2+L).

Where

M = % Moisture P = % Protein F_1= % Fat

A = % Ash F_2= % Crude Fiber L = % Crude Lipid

(Source: Shaikh and Patil, 2020).

RESULTS AND DISCUSSION

Quantitative Phytochemical results of mistletoe leaf extract (*Loranthaceae*)

Table 4.1 shows the qualitative phytochemical composition of methanol extract of Mistletoe leaf extract (*Loranthaceae*). It was observed that phenols, flavonoids, tannins, saponins, alkaloids, terpenoidsand cardiac glycosides were tested positive which shows they are present while anthraquinones, sterols and phlobatannins tested negative which implies they are absent.

Table 4.1: Qualitative phytochemicals composition of methanol extract of Mistletoe leaf extract (*Loranthaceae*).

Phytochemical	Inference
Phenols	+
Flavonoids	+
Tannins	+
Saponins	+
Alkaloids	+
Terpenoids	+
Anthraquinones	-
Sterols	-
Cardiac glycosides	+
Phlobatannins	-

Key: + = present, - = absent.

Table 4.2 shows the phytochemical composition of the methanol extract of Mistletoe. It was observed that the extract contains appreciable amounts of phenols, flavonoids, tannins, saponins and alkaloids in varying degree. The highest phytochemical found in the extract was phenols with amount of 235.58±0.84 mg/100 g, followed by saponins (123.15±1.21 mg/100 g), tannins (76.04±0.55 mg/100g), flavonoids (18.03±0.82 mg/100 g) while the least was found to be alkaloids with amount of 13.02±0.08 mg/100 g.

Table 4.2: Quantitative phytochemical composition of methanol extract of Mistletoe

Phytochemical	Amount (mg/100 g
Phenols	235.58 ± 0.84^{e}
Flavonoids	18.03 ± 0.82^{b}
Tannins	76.04 ± 0.55^{c}
Saponins	123.15 ± 1.21^{d}
Alkaloids	13.02 ± 0.08^{a}

Values are presented as mean ± standard deviation of three replicates. Values with different superscripts are significantly different at $p < 0.05$.

Table 4.3 shows the proximate composition of leaf of Mistletoe. The leaf was observed to contain significant amounts of nutrients with moisture being the highest (49.91±1.39%), followed by carbohydrates (34.31±2.10%), crude protein (8.64±0.54%), ash (3.87±0.24%) and fats (2.78±0.09%) while crude fiber was found to be the least nutrient (0.54±0.03%).

Table 4.3: Proximate composition of leaf of Mistletoe

Proximate parameter	Percentage composition (%)
Moisture	49.91 ± 1.39^{f}
Ash	3.87 ± 0.24^{c}
Fats	2.78 ± 0.09^{b}
Crude protein	8.64 ± 0.54^{d}
Crude fiber	0.54 ± 0.03^{a}
Carbohydrates	34.31 ± 2.10^{e}

Values are presented as mean ± standard deviation of three replicates. Values with different superscripts are significantly different at $p < 0.05$.

DISCUSSION

The presence of various concentrations of phenols, flavonoids, taninnis, saponnins, alkaloids, terpenoids and cardiac glycosides was found in the phytochemical examination of mistletoe leaves (*Loranthaceae*). This is similar to the work of Nwole et al. (2022) who reported the presence of phenols, flavonoids, taninnis, saponnins, alkaloids, terpenoids and cardiac glycosides in the leaf extracts of mistletoe *(Tapinanthus bangwensis*).

In the quantitative study, alkaloids had the lowest concentrations throughout the extract, while phenols were the greatest phytochemical detected. Tannins had a fairly low value, while saponins displayed a moderately high value. Compared to saponins and tannins, the concentration of terpenoids was lower. This is in consistent with the work of Tabe *et al*., (2019) and Obi *et al*., (2024).

According to reports, several of these phytochemicals provide important health advantages (Gul *et al*., 2017). Studies aiming at explaining the amounts of phytochemicals in medicinal plants have expanded because of their association with the bioactive principles that underlie the therapeutic activities of the majority of plants and herbs (Tabe *et al*., 2019). Phytochemicals and other extractable chemical elements of plants and vegetables determine their therapeutic efficacy, according to reports from other researchers (Shaikh and Patil, 2020).

The phytochemical characteristics showed a high concentration of phenols. Due to their widespread recognition as strong anti-oxidants and anti-inflammatory agents, flavonoids and phenolics have been discovered to be effective against tumors and malignancies (Hatzade *et al*., 2022).

Alkaloids are a naturally occurring class of chemical compounds that include nitrogen and are commonly found in the kingdom of plants (Dey *et al*., 2020). The investigations demonstrated that alkaloids were present in every spice. Alkaloids are included in many stimulant drugs and in everyday human diet and drink. They displayed anti-inflammatory, anticancer, analgesic, local anesthetic and pain relief, neuropharmacological antibacterial and antifungal properties, among many other actions. Alkaloids are used widely in human life as nutritional supplements, pharmaceuticals and food additives (Kurek, 2019).

Tannins, also known as tannic acid, are water-soluble polyphenols found in a variety of plant-based diets. Tannins are useful for wound healing because they act as both astringents and antimicrobials (Lawal *et al*., 2018).

Cardiac glycosides help regulate Na+/K+-ATPase pumps, and saponins are well known for their anti-neoplastic and immune-modulatory properties (Shaikh and Patil, 2020). The plant's ability to be effectively used in a variety of ethnomedical formulations is demonstrated by the abundant presence of phytochemicals with medicinal significance (Lawal *et al*., 2018).

According to Shiv*et al*. (2021) there is a theory that saponins interact with the cholesterol-rich membranes of cancer cells to limit their development and viability. The findings indicated that whereas turmeric lacked saponin, ginger and garlic did. Saponins have the ability to precipitate and coagulate red blood cells (Usunobun *et al*., 2015).

Compared to several therapeutic plants, Mistletoe leaves (*Loranthaceae*) have higher moisture content. However, it is rather low in comparison to Ipomoea batatas' 82.21% (Oloruntola and Ayodele 2022). According to Oluruntola and Ayodele (2022) high moisture content increases susceptibility to microbial growth and enzyme activity.

Mistletoe leaves (*Loranthaceae*) have less ash than several other popular leafy vegetables in Nigeria, such Talinum triangulare (20.05%). However, in comparison to other vegetables as *Herbiscus esculentus* (8.00%) and *Occimum graticimum* (8.00%), it is modest (Tabe *et al*., 2019). The plant's retained mineral components are reflected in the mild ash content. Thus, the result points to a substantial mineral element deposit in the leaves.

In comparison of the present study to the previous report by Lawal *et al*., (2018), *Talinum triangulare* (5.90%), Baseila alba (8.71%), *Amaranthus hybridus* (4.80%), and *Calchorus africanum* (4.20%), showed that the crude fat (2.78%) is low. The results indicate that Mistletoe leaves (*Loranthaceae*) have a low-fat content when compared to other leaf values. By absorbing and holding onto flavors, dietary fats contribute to the increased palatability of food (Oloruntola and Ayodele 2022).

Crude protein composition sometimes matched or even exceeded that of the majority of therapeutic plants. This result is in agreement with the work of Tabe et al. (2019) who reported high protein content in proximate analysis of Oil leaf extracts of Mistletoe plant.
According to Hatzade *et al*. (2022), non-starchy vegetables are sources of dietary fiber and are used in the treatment of diseases like obesity, diabetes, cancer and gastrointestinal disorders (Oloruntola and Ayodele 2022). This could explain why Mistletoe leaves (*Loranthaceae*) have a low crude fiber content of 0.54%.

CONCLUSION

The phytochemical and proximate analysis of Mistletoe leaves (*Loranthaceae*) was investigated in the study. The mistletoe leaves have varying and significant amounts of proximate and phytochemical compositions.

The phytochemical components found in the leaves has huge benefits on human health because of their widespread recognition as strong anti-oxidants and anti-inflammatory agents, flavonoids and phenolics have been discovered to be effective against tumors and malignancies. The proximate composition reveals that non-starchy vegetables are sources of dietary fiber and are used in the treatment of diseases like obesity, diabetes, cancer and gastrointestinal disorders.

The result reveals the medicinal and nutritional value of mistletoe leaves in human and livestock diet.

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