



Tetracarpidium conophorum for Fibroid Treatment in Southeastern Nigeria

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Abstract: Background: Gynecological uterine leiomyomas commonly called uterine fibroids are smooth muscle benign tumors of the uterus that occur in women of reproductive age. Prevalence is estimated at 20-80% globally, depending on geographical location, diagnostic methods, age, race and ethnicity, and modern treatment is beyond the reach of the poor and middle class. Objectives: To determine evidence and separate myths from facts, clear the air about superstition, encourage appropriate use, and make summary evidence available for easy access and use for busy healthcare professionals and policy makers. Design of the Study: Systematic Review. Place and Duration of the Study: SSD Department, Federal University of Technology Owerri from January 2026-August 2026. Methods: A qualitative systematic review methods were used for data collection, analysis, interpretation and synthesis of relevant peer reviewed evidence regarding *Tetracarpidium conophorum*. Search engines including google scholar were used for data mining. Results: Chemical and phytochemical concentration evaluation showed moderate to high levels and clinical evaluation suggested a very strong correlation between oral administration of ethanol and other extraction substances of *Tetracarpidium conophorum* leaves extracts to be significantly effective in shrinking benign uterine leiomyomas in study animals. Conclusion: *Tetracarpidium conophorum* leaves extract is high in phytochemical compounds and it is a fact that *Tetracarpidium conophorum* leaves extract is strongly potent in controlling uterine leiomyomas in study animals, and more evidence is necessary. Finding will be beneficial to academia, healthcare, public health, community, and policy decision.

Keywords: *Tetracarpidium conophorum*, herbal fibroid treatment, phytochemical compound, systematic review, fibroid clinical trial.

INTRODUCTION

In search of affordable, accessible and less adverse effect sustainable solution for benign gynecological leiomyomas, also called uterine fibroids, this study was considered worthwhile (14). Uterine fibroids occur to women of reproductive age, with high prevalence of 20-80% across the world based upon race, ethnicity, age, geographical location and methods of diagnosis. Uterine fibroids is not a cancerous disease, however, it cause serious morbidity, infertility, pelvic pain, abnormal uterine bleeding, loss of pregnancy, reduced quality of life and anemia (27).

Existing treatment requires sophisticated tools that is painful, inaccessible with high adverse effect and in some cases can result in patient losing the capacity to bear children (14). High prevalence and growing burden and complications associated with modern treatment, notwithstanding, it is not affordable particularly, for women in sub Sahara

Africa, where healthcare is generally beyond the reach of the poor and middle class and health insurance unaffordable. And yet, herbal plants such as *Tetracarpidium conophorum* traditionally used for treating diseases including uterine fibroids have limited evidence to support its native appropriate use for disease control. Other than the study of Onyinloye, et al., 2021, which performed clinical on the use of *Tetracarpidium conophorum* for uterine fibroids management, the rest of the studies investigated *Tetracarpidium conophorum* for fertility enhancement, reproductive tissue protection, phytochemical, and antioxidant capacity (5, 7, 8, 9). Also there is a growing demand on plant-based medicine across the globe (26, 27).

The main objective of this research is to determine and synthesize existing evidence about the native use of *Tetracarpidium conophorum* for effective treatment of uterine leiomyomas, phytochemical composition, pharmacological functions, and other therapeutic application of *Tetracarpidium conophorum* for reproductive health. Through this systematic review, it was determined that clinical evidence of efficaciousness, and safety, of *Tetracarpidium conophorum* for uterine leiomyomas control is limited; and also determined was the critical role of *Tetracarpidium conophorum* for fibroids treatment; however, since evidence is limited, more clinical animal and human Model trial is highly encouraged. The significance of this research will be manifested in addition to the body of knowledge, researchers, farmers, beneficial to healthcare, public health policy decision. This qualitative systematic review study design is grounded by ethnopharmacological theory that posited that native medicine knowledge is the fundamental basis for implicating bioactive plant agents and for uncovering of new plant-based therapeutic potent agents.

Results and data presentation will take thematic categorization and narrative comparisons, and major findings organized into themes. Data interpretation will evaluate the strength of evidence supporting use as traditional medicine, and suggest areas for further studies. Discussion will involve synthesis that mirror patterns, recurring results, inconsistencies and limitations. Then, the conclusion to acknowledge, predominant level of phytochemical compounds, evidence of efficacies of *Tetracarpidium conophorum* leaves extract use for microbial, diabetic, inflammation, cancer control and wound healing.

RESEARCH QUESTION

1. Using *Tetracarpidium conophorum* leaves to treat gynecological leiomyomas is it a myth or facts?
2. Any clinical evidence to support?
3. Is evidence sufficient?

Backgrounds

Fibroid of the uterus is scientifically called uterine leiomyomas. It is a noncancerous benign growth or tumor that occurs on the smooth muscles of the uterus of women of child-bearing age. Globally, the prevalence is estimated 20-80% depending on age, race, ethnicity, geographical location and methods of diagnosis. Benign uterine fibroid cause serious morbidity, pelvic pain, excessive bleeding, infertility or difficulty of conception, loss of pregnancy, reduced quality of life and anemia (27). This study is about if *Tetracarpidium*

conophorum leaves can provide socur of healing of uterine fibroid, since is very high in phytochemical and nutraceutical compound concentration and used traditionally for other health restoration including reproductive organ healing. Is there clinical evidence to support its use as native medicine for fibroid treatment or debunk it. In Eastern Nigeria *Tetracarpidium conophorum* is called Ukpa, or and nationally called African Walnut.

Uterine fibroid pathogenesis involve multiple variables, causes, chronic inflammation, genetic sustainability, oxidative stress, deposit too much extracellular matrix, hormonal stimulation, and growth factor signalling (13, 14, 27). Existing treatment options include hysterectomy, uterine artery embolization, pharmacological therapies, magnetic resonance-guided focused ultrasound surgery, uterine artery embolization, and adverse effect that can cause a woman to loss capacity to bear children (14).

Over the years plant-based medicine has gained a persistently rising demand for alternative treatment of certain diseases essentially the ones that have defiled modern treatment or has unbearable adverse effect from modern treatment. Plant-based medicine is rich in phytochemical compounds, affordable, accessible, and it usually possess no or minor adverse effects if appropriately utilized (23, 24, 25, 26). it is a native medicine plant to West and Central Africa used for controlling diseases such as, inflammation, reproductive disorders, male and female infertility and other metabolic syndrome diseases (5, 25, 26).

High prevalence of chemical and phytochemical compound concentrations in Ukpa namely, tannins, flavonoids, phenolic compounds, phlobatanins, proanthocyanidin and alkaloids, and it possess high antioxidant capacity and protect the reproductive system, body cells and tissues against oxidation and oxidative stress is supported by scientific evidence from clinical animal Model (4, 5, 6, 17, 25, 26). And high inflammation and oxidative stress offers conditions for easy fibroid development; so, this study seeks to determine if these attributes of Ukpa could offer the highly critically desired safe, accessible and cost effective solution for uterine fibroids disease affecting a significant population of women of child-bearing age locally and globally.

In Nigeria fibroids of the uterus represent a large amount of gynecological illnesses among child-bearing women in Nigeria, aged 30-39, and Nigerian ultrasound study suggested 45.1% prevalence, and nearly, one in two women of productive age are predicted to experience uterine fibroids in life time (2). Uterine fibroids account for 7.1% of gynecological admissions and 21.2% of key gynecological surgeries (1,). Aside the clinical burden of uterine fibroids, it also cause a huge financial overstretch to affected women and their families, worse is the out-of-pocket cost of treatment in most cases ranging from N700,000-N2.5 million naira for surgical procedures such as embolization, hysterectomy, and myomectomy, which is a major hinderance to seeking for medical care in timely manner on grounds of affordability (27).

Canada is not exempted from fibroids of the uterus, contributing to a significant level of gynecological illness. In Registry data, about 20-40% of women of child-bearing age are suffering from uterine fibroids and at age 50, uterine fibroids incidence is estimated at 70%, as against 80% in Nigeria (20, 24), population, which is higher than the global population of 20-30%; however, some conditions do not manifest symptoms, only 30% show symptoms that required medical procedures (21, 23). Unlike in Nigeria where the economic burden is mostly bore by individuals and families, in Canada the economic burden fall upon the government and healthcare system scaling the treatment cost above board, and creating

conditions of individuals undergoing treatment from skipping work, causing reduction in productivity, and causing overall high clinical and socioeconomic down turn (18, 19).

Global disease burden estimate is 226 million population in 2019, prevalence is approximately 20-30% and lifetime prevalence of 70-80% at 50 years and above (15, 16). From 1990 to 2019, incidence and prevalence showed a steady rise in most countries of the world, and highest burden fall upon women of less than 44 years old and above 35 years old (25). Beyond clinical challenges, fibroids of the uterus cause a significant economic burden on all nations of the world, and in the United States, disease treatment expenditure is approximately USD \$34.4 billion dollars, excluding the indirect costs amounting from increased work absenteeism and low productivity (19, 21).

Worldwide, the overall prevalence and incidence of uterine fibroids showed variations based upon race, ethnicity, region posing a consistent significant economic burdens, and high prevalence observed in Nigeria is a pointer to the impact of racial and genetic variables, Whereas the Canadian factors explains the challenges amounting from cost of treating the symptoms in high income healthcare settings.

The ever rising burden of uterine fibroids disease among women in sub-Sahara Africa and the entire world notwithstanding, the existing modern treatment, which is very painful with high adverse effect is beyond the reach of the average and poor families and success very limited, and so, signals a need for more clinical investigation, to detect symptoms early, easy and affordable access to treatment and policies to lower the clinical, and socioeconomic burden (18, 19, 21, 27). Although, Ukpa plant is generally used for treating reproductive disorders and infertility, sufficient clinical evidence to support practice and appropriate use remain limited and scarce. Other than the clinical study of Oyinloye et al., 2021, and Amaneze , et al., 2011, other studies on Ukpa focused mostly on fertility enhancement, reproductive tissue protection, antioxidant, anti-peroxidation, and anti-inflammation capacities, diminishing the more value presented for uterine fibroids treatment (8, 9).

This systematic review of the available literature on Ukpa sought and determined that limited clinical evidence that suggested that ukpa leaves alcohol extract is effective for fibroid management; however, clinical evidence for using ukpa leaves for fibroid treatment is existing in animal Models of clinical. Previous clinical studies on the safety of *Tetracarpidium conorphorum* (mull. Arg) leaves extract and other plant parts have been determined. Thus, through this systematic review, identified gaps were highlighted to attract more clinical studies on the use of Ukpa leaves and other parts for fibroid control.

RESULTS

The data presentation of the results consisted of the summaries and annotated bibliographies of the findings of secondary clinical data of evidence evaluated and used for analysis in this systematic reveiew.

Study I

The objective of this study was to determine the anti-peroxidative activity of *Tetracarpidium conorphorum* (mull. Arg) leaves extract on male adult rats by evaluating its

capacity to decrease malondialdehyde (MDA) level in male reproductive organs. Extract was administered orally and results showed a significant ($p < 0.001$) dose-dependent, decrease of lipid peroxidation level, whereas, there was no reduction among the control counterparts. There was lipid peroxidation maker, malondialdehyde (MDA) significant reduction ($p < 0.001$) in the rat testis, and other accessory glands based upon dose and concentration of extract. MDA was reduced by 66.35% at the highest administered concentration, against 27.43% recorded by standard drug in the same trial. Similar result occurred on other reproductive organ parts. Seminal vesicle based upon concentration showed, 62.50%, 28.78% and 28.14% reduction, and prostrate 63.36%, 36.26%, and 27.73%, at doses of 1000 mg/kg, 500 mg/kg and 50 mg/kg, whereas the control was not significant different. Also, there was low amount of MDA in epididymis in both experiment and control rate groups at lower doses of 50 mg/kg, and 500 mg/kg recording 19.41% and 27.58% reduction and a weak significant score of 42.68% at a high dose of 1000 mg/kg. The amount of MDA in testis was less than level in epididymis, seminal vesicle and prostrate gland compared with the control. The results showed a significant increase ($p < 0.05$) in the amount of functions antioxidant enzymes namely, superoxide dismutase (SOD), Catalase (CAT), of glutathione peroxidase (Gpx), and glutathione-S-transferase (GST) and the levels of GSH, vitamin C, and total protein of reproductive and accessory organs in dose-dependent manner against no difference shown among the control group. In comparison analysis of food intake and weight gain of rats treated with extract and standard drug and control, results revealed a normal appetite or eating pattern, ($p < 0.05$), which is contrary to the control group. Testis weight was highest when 1000 mg/kg was administered, ($p < 0.05$), while control showed no difference, but in all concentration of extracts administered, epididymis weight increased more than in rats treated to drug and the control group. Seminal vesicle and prostrate showed a non-significant increases and increase was not different from control group. The finding showed a two-fold improvement more than the standard drug at increasing the functions of antioxidant enzymes, protein and vitamin C. Overall the results showed that *Tetracarpidium conorophorum* (mull. Arg) leaves extract had a greater potency at reducing lipid peroxidation in reproductive rat organs and accessory organs, therefore is an effective agent for managing reproductive cell damage caused by reactive oxygen species. The presence of chlorophyll, xanthonenes and carotenoids reinforce the anti-oxidation potency (3). Below is a table containing the quantitative evaluation *Tetracarpidium conorophorum* (mull. Arg) leaves extract on male adult rats's capacity to decrease malondialdehyde (MDA) level in male reproductive organ in Comparison With Control and Modern Medicine.

Table 1: Quantitative evaluation result of *Tetracarpidium conorophorum* (mull. Arg) leaves extract on male adult rats's capacity to decrease malondialdehyde (MDA) level in male reproductive organ in Comparison With Control and Modern Medicine.

Treatment Groups	Testis	Epididymis	Seminal vesicle	Prostrate gland
Control (MDA level) *	2.37 ± 0.50	0.24 ± 0.11	0.41 ± 0.02	0.38 ± 0.02
II	39.60	27.58	28.14	27.73
III	43.09	19.41	28.78	36.26
IV	66.35	42.68	62.50	63.36
V	27.43	32.11	63.04	37.90

* μ mol MDA/mg protein, II, III, IV: treated with 50, 500, and 1000 mg/kg. BW/kg of extract, V: Treated with 1.04 mg/kg. BW/day of clomiphene citrate

From the table, other than seminal vesicle clomiphene treatment score of, 63.04, which is higher than the treatment groups II, III, and IV, 28.14, 28.78, and 62.50 respectively, the rest of the results scores are significantly higher than clomiphene treatment score in other parameters measured. Showing that *Tetracarpidium conorophorum* leaf extract is more effective.

Study II

In this study effect of *Tetracarpidium conorophorum* leaf extract on the fertility of male rate induced with ethanol. Using random sampling six groups, 1-6, were assigned five study animals each. Group I, the control group received 0.9% of saline solution, group II, received only ethanol constituting of 30% concentration at a dose of 7 ml/mg body weight three times per a day for one week orally, whereas, the groups III, IV, V received ethanol as described as well as 50, 500, 1000 mg/kg of *Tetracarpidium conorophorum* leaf extract in that order. But group VI received ethanol and co-treated with fertility drug, named clomiphene citrate. Results revealed a treatment with ethanol resulted in significant ($p < 0.05$) reduction in LDH, and G-6PDH functions, like wise glycogen content, 3B and 17B HSD activities and the concentration of zinc (Zn) and Selenium (Sn) levels in testis and epididymis, and the sperm count of the testis, viability. There was a remarkable rise in the total abnormalities the sperm, and reduction in the male reproductive hormone levels. The adverse conditions created by ethanol administration were significantly ameliorated among rates co-treated with *Tetracarpidium conorophorum* leaf extract and fertility drug, clomiphene citrate; however, *Tetracarpidium conorophorum* leaf extract showed a stronger positive outcome. Both treatment increased the rats' seminal fluid qualities. Evidence supported that plant extract treatment was effective in reversing the abnormalities in reproductive dysfunction of male rate (4).

Study III

Oyinloye et al., (2021) examined the anti-fibroid potential of *Tetracarpidium conorophorum* leaf extract on diethylstilbestrol-induced fibroid of the uterus of Wistar rat Model clinical study in Nigeria. Result showed that *Tetracarpidium conorophorum* leaf water extract of 200 mg/kg, and 400 mg/kg, reduced uterine enlargement and histology deformation caused by the fibroid that *Tetracarpidium conorophorum* leaf extract treatment reduced uterine fibroid and improved the histology of the uterus, lowered serum prolactin, and raised progesterone. Diminished fibroid collagen deposition, reduced oxidative stress markers, and inflammation. Improvement caused by 200 mg/kg and 400 mg/kg was not significant suggesting that African Walnut (Ukpa in Igbo) possesses anti-fibroid properties and improve cell health and extracellular deposition (5).

Study IV

In 2015, Akomolafe et al., through experiment demonstrated that *Tetracarpidium conorophorum* leaf extract treatment can control oxidative damage to reproductive tissues. Potency attributed significantly to phenolic compounds, as a major capacity for anti-oxidation function making the extract a potent agent for reproductive health. Also. It

ameliorated alcohol induced reproductive toxicity in experimental rat Model causing diminishing of oxidative stress markers and improvement in reproductive tissue toxicity caused by alcohol (6, 7).

Study V

Further in 2017, Akomolafe et al., used *Tetracarpidium conorophorum* leaf extract to effectively treat and reverse ethanol-induced infertility. Outcome of this experiment on on study rat Model revealed improvement of sperm counts, sperm viability, testicular enzyme functions and the concentration of reproductive hormones on rate exposed to alcohol. Results showed improvement in fertility and restoration of reproductive system (8).

Study VI

Amaeze et al., in (2011), antioxidant experiment of *Tetracarpidium conorophorum* leaf extract of experimental rat on the characteristics of revealed *Tetracarpidium conorophorum* leaf extract antioxidant potency and isolated a significant amount of phenolic compounds and flavonoids, which were attributed to the antioxidant potentials of *Tetracarpidium conorophorum* leaf extract to inhibit uterine fibroid oxidation pathways. Authors further determined the bioactive and phytochemical content of and isolated many compounds namely, tannins, flavonoids, alkaloids, and phenolic compounds, which have clinical evidence for anti-fibrotic and anti-inflammatory potency, which is yet a pointer that *Tetracarpidium conorophorum* leaf extract is effective agent for fibroid treatment (9, 12).

Study VII

In this research, aqueous extract of *Tetracarpidium conorophorum* (TC) nut, called African walnut nut traditionally used for inocephene, pain-relieve, improve sperm count and enhance sexual performance and for nerve tonic was examined for psychopharmacological impacts on dressed experimental rat or rat forced swim test performed including induced sleep, amphetamine-induced stereotype, formaline-induced pain and acetic acid rat Model.

Experimental animals received *Tetracarpidium conorophorum* nut extract orally, 50-200 mg/kg body weight, at the end of the study period, on dose-dependent criteria, nut extract lowered the immobility, analgesic effects were diminished by by lowering abdominal constrictions and formalin-induced pain reactions; but treatment did not reduce sleep duration caused by thiopentone or lower behaviour stereotype caused by amphetamine induction; thereby supporting the native use of *Tetracarpidium conorophorum* nut for pain relief and anti-depression purposes. More studies recommended to ascertain role in treating depression (11).

There is ethnobotanical literature suggesting that various parts of African Walnut namely, seeds, bark, leaves and fruit are potent for enhancing fertility, diminishing reproductive disorders as well as improving the general health and well being. It is worthy of note that there exist limited clinical studies on roots and bark so, more clinical studies may be necessary for the bark and root potency for sexual dysfunction management. Various traditional use of *Tetracarpidium conorophorum* are:

Study VIII

Fertility and Reproductive Health: Boiled seeds and leaf juice extract for menstrual flow regulation, boost sperm count and quality and reduce miss carriage. And leaves can be chewed to relief diarrhea and toothache

Oral Health and gastrointestinal health: Stem bark brewed to make tea for treating stomach disorders, and natural laxative. While Nut and leaves extract relieve inflammation and asthma. Hiccups, anti-helminth, and snake-bite anti-dote were other traditional uses of *Tetracarpidium conorophorum* (12).

The traditional use of seed, bark, leaves and fruit of African walnut for general health maintenance, fertility enhancement, and reproductive disorders is reported in ethnobotanical literature, but fewer studies were done on the bark and root than on leave and seed. So, more studies are encouraged on *Tetracarpidium conorophorum* parts listed above on the pharmacological benefits for general body healing including uterine fibroid.

Quantitative and Qualitative Compositional Profile of *Tetracarpidium conorophorum* (African Walnut)

Highlight of the composition of *Tetracarpidium conorophorum* (African Walnut) plant parts, namely, Seed both cooked and uncooked nut, leaf, and root. The nutritional/chemical (vitamins and minerals) and phytochemical compositions were discussed because this study seeks to support healing potency and underlying pharmacological properties behind diseases treatment capacity.

Quantitative Phytochemical Composition of *Tetracarpidium conorophorum* (African Walnut)

There is a variation in the phytochemical composition of *Tetracarpidium conorophorum* based upon the plant parts, namely leaf, seed, fruit and root and bark. Type of soil/geography, method of extraction, raw and cooking also affects the amount of compounds present.

Table 2

Phytochemical	Raw seed (mg/100 g)	Cooked seed (mg/100 g)
Alkaloids	1.34	7.95
Flavonoids	3.19	4.50
Saponins	3.43	2.35
Tannins	1.10	1.80
Phytate	2.63	0.44
Oxalate	3.09	7.95

(26, 28, 29, 30, 31, 32).

Quantitative Mineral Composition of the Seed

Processing altered the concentration of the minerals, either raised the level or lowered it. Example cooking moderately raised sodium (Na) level from 17.09 mg/100g to 20.10 mg/100g, and calcium (Ca) from 97.50 mg/100g to 102.00 mg/100g, whereas, cooking

slightly reduced zinc concentration from 2.27 mg/100g to 1.21 mg/100g, Iron (Fe) concentration rose more than double from 7.36 mg/100g to 18.36 mg/100g.

Table 3

Mineral (mg/100 g)	Raw seed	Cooked seed
Phosphorus	265.97	NR
Sodium	17.09	20.10
Potassium	582.00	501.00
Calcium	97.50	102.00
Magnesium	53.49	54.00
Iron	7.36	18.36
Zinc	2.27	2.21
Manganese	1.31	1.02
Copper	21.57	36.23

(26, 28, 29, 30, 31, 32).

Tetracarpidium conorphorum is rich in minerals that have high pact on health and well being, namely, phosphorus, (P) which is essential for bone mineralization and energy metabolism; magnesium (Mg) important for enzyme function, nerve transmission, and muscle concentration, potassium (K) for regulation of fluid balance, blood pressure and nerve impulse, calcium (Ca) for teeth and bone health, and Zinc (Zn), copper (Cu), and manganese (Mn) for oxygen transportation around the body cells, immune functions, protection from disease invasion, many metabolic processes

Qunatitative Vitamin Composition of Tetracarpidium conorphorum Seed

Table 4

Vitamin	Concentration (mg/100 g dry weight)
Vitamin A (Retinol equivalent)	9.64 ± 0.01
Vitamin C (Ascorbic acid)	6.98 ± 0.02
Vitamin D	0.43 ± 0.02
Vitamin E (Tocopherol)	96.42.00 ± 0.02
Vitamin K	0.08 ± 0.01
Vitamin B ₁ (Thiamine)	0.20 ± 0.01
Vitamin B ₂ (Riboflavin)	0.89 ± 0.06
Vitamin B ₃ (Niacin)	0.14 ± 0.01
Vitamin B ₅ (Pantothenic acid)	0.02 ± 0.01
Vitamin B ₆ (Pyridoxine)	0.06 ± 0.04
Vitamin B ₉ (Folate)	0.07 ± 0.01
Vitamin B ₁₂ (Cobalamin)	0.38 ± 0.02

(26, 28, 29, 30, 31, 32).

Vitamin in highest and staggering concentration is vitamin E, 96.42.00 mg/100g, Vitamins C and A, 6.98 and 9.64 mg/100g were presence in moderate levels, while vitamins D, K, and B-group showed very low concentrations. Vitamin E protects the cell membranes

from oxidative damage, Vitamin A is important for vision, healthy epithelial tissues and vitamin C aids collagen synthesis, promote iron absorption and enhance immune function.

Quantitative Phenolic Compounds in the Leaves

In a High performance Liquid Chromatography analysis of the aqueous leaves extract, the following phenolic compounds, which play a major role in anti-oxidation function were isolated Isolated:

Table 5

Compound	Amount (mg/g)
Luteolin	12.56 ± 0.01
Quercitrin	10.47 ± 0.03
Quercetin	10.28 ± 0.01
Coumarin	6.79 ± 0.03
Chlorogenic acid	6.71 ± 0.01
Caffeic acid	3.85 ± 0.02
Gallic acid	2.47 ± 0.03
Catechin	1.93 ± 0.01
Rutin	1.90 ± 0.01
Kaempferol	1.89 ± 0.02

(26, 28, 29, 30, 31, 32).

Qualitative Phytochemical Composition of the Leaves, and Roots

Table 6

Phytochemical	Leaves	Roots
Tannins	Present (higher)	Present
Flavonoids	Present	Present
Alkaloids	Present	Present
Saponins	Present	Present
Phenols	Present	Present
Oxalates	Present	Present
Gallic acid	Present	Present

(26, 28, 29, 30, 31, 32).

Quantitative Mineral Composition of the Leaves (mg/kg dry weight)

Table 7

Mineral	Concentration (mg/kg)
Calcium	33,460 ± 903
Potassium	19,390 ± 175
Magnesium	4,756 ± 304
Manganese	262 ± 0.5
Chlorine	200 ± 16
Aluminium	161 ± 21
Strontium	130 ± 17

Sodium	29 ± 1
Zinc	24.3 ± 2.8
Lanthanum	6.6 ± 0.1
Bromine	3.56 ± 0.18
Samarium	0.41 ± 0.01
Cobalt	0.11 ± 0.02

(26, 28, 29, 30, 31, 32).

Quantitative Mineral of the Bark (mg/kg)**Table 8**

Mineral	Content (mg/kg)
Calcium	29.40
Potassium	14.02
Sodium	1.42
Magnesium	0.28
Zinc	0.11
Copper	0.002

(26, 28, 29, 30, 31, 32).

DISCUSSION

Evidence from the secondary data reviewed showed that *Tetracarpidium conorophorum* leaves extract is high in antioxidant, phytochemical, phenolic compounds, flavonoids and reproductive protective properties. According to Amaeze et al., (2011), high levels of flavonoids and phenolic compounds offers it the capacity for a strong free radical scavenging properties. Evidence linked the oxidative stress caused by the free radicals' cell oxidation with the pathogenesis and progression of fibroids of the uterus; meaning that the strong antioxidant potency has direct positive impact on the prevention, development, and control of fibroids of the uterus.

The study of Akomolafe et al., (2015), revealed that aqueous leaf extract of *Tetracarpidium conorophorum* lowered lipid peroxidation, and promoted the antioxidant enzyme functions of the reproductive organs of the study animals, rise in the concentrations of endogenous antioxidant properties that defend the body from diseases caused by oxidative stress. Examples of endogenous antioxidant enzymes are, superoxide dismutase, catalase, glutathione, peroxidase.

In another study, Akomolafe et al., (2017) suggested that *Tetracarpidium conorophorum* leaves extract is potent at improving the concentration of reproductive hormone namely, quality of sperm, and other fertility parameters in ethanol-induced infertility problems of study animal models, supporting the traditional claim of its potency for reproductive health and reproductive tissues and organs.

In all only two clinical studies on *Tetracarpidium conorophorum* leaves extract provided evidence of direct positive impact in controlling Gynecological uterine leiomyomas. Also, a closely-related clinical study of Akomolafe et al., 2017, suggested the anti-peroxidation, anti-oxidation and anti-inflammation potency of *Tetracarpidium conorophorum* leaves extract on the reproductive organs of male and female study animal

Model. Just like *Dracaena trifasciata* leaf extracts, evidence exist that *Tetracarpidium conophorum* leaves extract is a potency agent for managing uterine fibroids. However, more studies are encouraged (1, 3, 4, 5, 6, 13, 15, 17, 23).

CONCLUSIONS

There is clinical evidence supportting a fact that *Tetracarpidium conophorum* leaves extract is a potent agent for a wide range of treatment for male and female sexual dysfunction and uterine fibroids, because of its high concentration of pharmacological properties amounting from high level of phytochemical compounds; however more clinical studies are encouraged using human and more animal models. Results of this study will be beneficial to academia, healthcare, public health, community, farmers, investors, and policy decision.

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