



Hunteria Umbellata Folk Medicine's Potency for Treating Obesity and Metabolic Syndrome Diseases

E. N. Ahajumobi ^{a*} and Peter B. Anderson ^b

^a College of Health Science, Walden University, Canada.

^b Department of Public Health, College of Health Science, Walden University, Minneapolis, USA.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJMAH/2022/v20i1030502

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/88351>

Systematic Review Article

Received 11 April 2022
Accepted 22 June 2022
Published 25 June 2022

ABSTRACT

Background: For ages, people from Eastern and Western Nigerian have used Hunteria umbellata (HU) as an effective folk medicine for treating various diseases, and in recent times there is growing evidence from clinical studies performed on humans and animals showing its efficacy in providing treatments for several diseases owing to its macro and micronutrients composition as well as phytochemical, anti-nutritive constituents, and nutraceutical components.

Study Design: A Systematic review.

Aim: to investigate peer-reviewed evidence that used epidemiological standards of study to investigate claims and justification of the efficaciousness of using HU in treating diseases, essentially metabolic syndrome diseases that are claiming millions of lives, causing pain, disabilities, and economic burden.

Methodology: A systematic review-community approach to preventive services was used to study peer reviewed literatures, which supported or debunked the claims of use of HU as a potent agent for treating diseases. Only epidemiological peer reviewed studies were selected, assessed, reviewed, and analyzed in synthesis with some traditional claims as effective medicine for diseases. Sample size $n = 22$ studies. Google scholar, google, Firefox search engines were used to search for scientific evidence. Search words were, Hunteria Umbellata, proximate composition of hunteria umbellata, phytochemical composition of Hunteria umbellata. The summary of the findings reviewed consists of the title, objectives, findings, and conclusions

*Corresponding author: E-mail: eahajumobi@gmail.com;

Results: Studies conducted locally and internationally strongly support that HU is rich in macro and micronutrients, phytochemical, and nutraceutical components that suggest it to be an effective medicine for treating various diseases.

Conclusion: HU is a potent agent for treating obesity and metabolic syndrome diseases.

Keywords: *Hunteria umbellata*; obesity control; obesity treatment; metabolic syndrome disease control; metabolic syndrome disease treatment.

ABBREVIATIONS

HU: *Hunteria Umbellata*

1. INTRODUCTION

Why conduct this study on *Hunteria umbellata*? *Hunter umbellata* has been used in Africa as an ancient folk medicine for treating a range of diseases such as metabolic syndrome-related diseases namely obesity, diabetes, cholesterol, and hypertension [1,2,3,4,5]. Today metabolic syndrome-related diseases remain a pandemic plague to humanity, claiming lives, causing pain, disabilities, and economic burden [6,7]; any affordable source of significant and sustainable overweight and obesity intervention remedy is a necessary global public health problem-solving intervention that should be encouraged. HU is a small tree of West African origin, precisely Southern Nigeria that grows on average up to 10-15 meters high. It belongs to a family of plants called Apocynaceae, English name is *perinari excelsa*, [1,8,9,10,11]. The plant's stem has a diameter that ranges from 40 - 55 cm. HU extract is used in Nigeria as native medicine for treating a wide range of diseases, curable and incurable ones alike. The fruits, leaves, stem, bark, and root have medicinal values [1]. Though a highly medicinal plant, all parts of the plant have been linked with some fatalities incurred out of wrong or misuse. Thus, clinical evidence about this plant and its use for medicine, including facts and fictions need to be clearly established to educate and discourage or encourage not just use but proper use. The purpose of this community guide to preventive intervention services is also called a systematic review saves the clinicians time to go through many related studies to determine the facts and make informed decisions [7,12,13,14,15,16]. It will also help to make the facts about the claims succinctly available and accessible to consumers [17]. In 2010, an estimated 3.4 million lives were lost to overweight and obesity [2,3,8]. Also, overweight and obesity caused 3.8% years of life lost to disability globally [2,8]. The continuous increase in obesity has prompted a global call for

regular monitoring of overweight and obesity prevalence across all populations and age demographics [6,17,18,19]. Scientific information about obesity trends and concentration in children and adults from 1980 to 2013 [20,21,22] was conducted to determine its effect on population health and to support decision making and prioritization of action and plans [6,15,1]. In search of affordable solutions to obesity and metabolic syndrome diseases we deemed this investigation worthy to determine whether there is sufficient evidence to support HU as an effective medicine for treating obesity, and metabolic syndrome-related diseases. Regardless of the large amount of obesity, and metabolic syndrome diseases interventions performed globally, the prevalence of obesity across the globe remains resilient, and all human demographics are affected; so, any affordable, accessible, less harmful agent to control or prevent it is a noble and lifesaving course [8,23,24]. This is essentially critical because obesity and overweight is linked with many chronic diseases namely, cancer, type II diabetes Mellitus, dyslipidemia (fat elevation in the blood), ischemic heart diseases that have claimed millions of lives across the globe [25]. Also, the cost of treatment is not affordable for poor and rich countries alike. The highest impact of lack of affordability is largely experienced among poor countries, which cause unspeakable pains, disability, loss of scarce income spent on its expensive treatment and millions of preventable deaths [8,26,25,27]. Globally, between 1980 and 2013, adults who have body mass index (BMI) of 25 kg/m² or higher rose from 28.8% in 1980, to 36.9% in 2013 [8,18,19,20]. This figure represents 29.8% among men and 38.0% among women [6,21]. There is high prevalence among children and adolescents from rich countries with 23.8% prevalence overall: boys accounting for 22.6% and girls accounting for nearly 24.7% of overweight and obesity in 2013 [6,21]. In poor or developing countries overweight and obesity prevalence among children and adolescents ranged from 8.1% in 1980 to 12.9% in 2013, with boys rising from 8.4% in 1980 to 13.4% in 2013, and girls

13.0% in 1980-13.9% in 2013 [6,21,22]. The above data may seem obsolete however, the 2016 facts sheet of WHO on obesity and overweight is not different. WHO in 2016 suggested that the global obesity has nearly tripled since 1975, with 1.9 billion adults, which is 39% aged 18 years and above having overweight, and 650 million out this figure were overweight, which is 13% of the global population, and larger population of the global communities live in countries where the cause of death is more of overweight and obesity than underweight [23]. Sad enough children were not left out. In 2020, 39 million children aged 5 and below were either overweight or obese, and higher than 340 million of children and youth aged 5-19 years were either overweight or obese in 2016 [40]. It is clear that there is no significant success story globally in dealing with the obesity plague, which is totally preventable. In this systematic review, the objective of the authors is to conduct a review of all relevant and accessible epidemiological studies so far performed about HU and the justification of its use as effective medicine for treating various diseases traditionally.

2. METHODS

This study is a systematic review also known as a community guide to preventive Intervention services used to investigate peer reviewed studies performed by researchers following epidemiological methods of qualitative and quantitative studies [24,25,26]. The objective was to review and assess supporting or debunking claims of use of HU as a potent agent for treating diseases, the purpose is to encourage or discourage its use for obesity and metabolic syndrome disease control. Criteria for inclusion were, epidemiological peer reviewed studies that examined the HU plant including, leaf, seed, bark, and root, that indicated study limitations, and respected ethics were included. The abstracts of the selected studies were pre-assessed and ranked first then, the final selections were reviewed, and analyzed, and the results presented, discussed and a conclusion drawn. A traditional claim of using HU as an effective medicine for treating obesity and metabolic syndrome diseases was investigated for scientific evidence to buttress or debunk claims. Sample size $n = 22$ studies minimum. Non-peer reviewed studies were excluded [27,28]. Google scholar, google, Firefox search engines were used to search for scientific evidence. Search words were, Hunteria

Umbellata, proximate composition of hunteria umbellata, phytochemical composition of hunteria umbellata. There were two phases of this study, pre-assessment phase and ranking of the articles were performed on the abstracts to select relevant quality studies. Randomized studies and systematic reviews were rated as high quality with two (++), all qualitative and observational studies were rated good quality with one plus (+) and studies that failed to indicate methodology, limitations, bias, and did not respect ethics were rated as low quality [29]. In phase II, selected studies were analyzed to determine the results upon which the discussion was synthesized, and conclusion drawn.

3. RESULTS

Chemical composition of ten medicinal plant seeds in West Nigeria. In this study, the proximate, mineral and phytochemical components of ten plant seeds, including Hunteria umbellata traditionally used as medicines were analyzed. Results showed that HU compositions included, moisture, carbohydrates, protein, fat, fibre and ash. HU was also rich in inorganic micronutrients namely, potassium (K), Sodium (Na), Calcium (Ca), Magnesium (Mg), iron (Fe), and manganese. The investigated HU was rich in phytochemicals namely, Flavonoids, Phenols, steroids, tannins, steroids, reducing sugar, alkaloids, glycosides-saponins, anthraquinone, saponins, and alkaloids. Conclusion: rich phytochemical composition of HU namely alkaloids, glycosides, reducing sugar, ployphenols, phenols and flavonoids suggests a strong pharmacological properties making it a suitable medicine for treating diseases in human and animals, and its macronutrients composition offers hope for food for humans and animals. Similar studies were performed, and similar outcomes suggested by [22,30]. Rated as high quality ++ [25].

Phytochemical analysis and anti-hyperlipidemic potential of ethanolic extract of hunteria umbellata seed.

The authors performed this study to screen, analyze, and access the anti-nutritive and phytochemical components of HU to determine its potentials for using it to treat hyperlipidemia in view of finding affordable solutions using herbal remedies to control obesity. It was a double blinded study. Results revealed that HU is composed of rich phytochemical and anti-nutrient factors occurring within allowable limits. Thirty rats were examined. They were split into groups,

in the control group were normal rats fed with a normal rat diet, the experimental group was split into groups and fed a high fat diet (HFD). Of the four experimental groups, one group did not receive HU ethanol extract or cholesterol lowering medicine, while the study lasted. One group received standard clinical cholesterol treatment medicine called Orlistat, the remaining two groups received 200 mg/kg, and 400 mg/kg respectively of HU.

The HFD rats that did not receive HU ethanol extract showed significant increases in their body weight and cholesterol concentration but those treated with 200 mg/kg and 400 mg/kg of body weight ethanol extract of HU showed significant reduction in their body weight as well as triglycerides, cholesterol, LDL (low density lipoprotein), and total cholesterol, and those treated with 200 mg/kg body weight showed significant reduction in creatinine levels in the urine, while those not treated with HU ethanol extract did not. There was higher reduction in cholesterol levels, body weight and creatinine concentrations in the urine among those treated with HU extract than those treated with standard medicine- Orlistat. Conclusion: Rats treated HU ethanol extract showed the highest significant reduction in cholesterol. HU was deemed to be a safe composition of phytochemical and anti-nutrient factors with the potential to be used as an anti-hyperlipidemic agent, while macro and micronutrient minerals offer further nutrients for health and wellbeing to the body, Rated as high quality ++ [31].

A systematic review of medicinal plants used in Nigeria for hypertension management.

This was a systematic review study. The authors performed it in search of evidence about the efficacy of plants used as medicine for treating hypertension in Nigeria because of the prevalence and growing incidence of hypertension in Nigeria and globally, and its poor management in Nigeria. The authors investigated a total of 136 plants used for treating hypertension and other diseases in Nigeria. The findings were, that most of those plants including HU are predominantly rich in a wide range of health protective phytochemical and anti-nutritive agents such as, alkaloids, flavonoids, saponins, terpenoid, tannins, glycosides, steroids, phenols, polyphenols, anthraquinone, and some paleobotanics, which explains why people use them traditionally to treat hypertension and other diseases; however, there is not sufficient evidence on clinical trials to

determine the mode of each plant's activities in preventing or controlling hypertension. More studies were recommended to determine clinically how the phytochemical components function to control hypertension and other diseases.

Conclusion: Plants used to treat hypertension and many other diseases in Nigeria are many. Available studies on the mechanism of these plants' phytochemical components' mode of action on hypertension were conducted outside Nigeria, and because of variations in plant compositions owing to difference in species, soil composition and fertilizer, as well as environment, authors recommended that more studies be sponsored and conducted in Nigeria to buttress the facts about the efficacies of medicinal plants in treating diseases including hypertension [32]. Rate as good quality + Anti-obesity and antihyperlipidemic effect of *Hunteria umbellata* seed extract in experimental hyperlipidemia.

The objective of these authors was to investigate the justification of using water extract of HU as a native medicine for hyperlipidemia and obesity treatment and the goal was to encourage its use if justification was found. In this double blinded study the authors examined the hypolipidemic and anti-obesity functions of HU extract on rats as well as the mechanism of action of lowering lipids concentration in the body and preventing or reducing obesity in comparison with standard medicine used for lowering obesity and lipids in the body. The normal, triton-induced, and olive-induced hyperlipidemic rats were placed in various groups and treated with three levels of HU extract starting from 50 mg/kg, 100 mg/kg, and 200 mg/kg. Also one group was treated with the standard medicine simvastatin, 20 mg/kg and another control group treated with 10 ml/kg of distilled water. The treatment lasted for 28 days and 24 hours. The results showed that various mgs 50, 100, and 200 per kg significantly lowered the body weight, coronary artery, atherogenic and Lee's indices. The mechanisms of function were through intestine lipid and triglycerides absorption, and inhibition of cholesterol synthesis by the liver. Conclusion. HU extract through inhibition of fat and triglyceride absorption in the intestine and prevention of cholesterol synthesis in the liver, manifested the potential for using it as therapy for obesity, hyperlipidemic control as well as for cardiovascular diseases prevention such as atherogenesis [8]. Rated as high quality double blinded study ++

Further evaluation of antihyperglycaemic activity of *Hunteria umbellata* (K. Schum) Hallier f. Seed extract.

This researcher investigated the ethnopharmacological relevance of African traditional medicine seeds of water extract of HU to treat diabetes mellitus. The objectives of this study were to examine the effects of using water extract of HU seeds to treat diabetes using epidemiological standards of testing efficacy of potential medicine. The experiment animals- hyperglycemic rats were induced with alloxan, high fructose as well as dexamethasone and orally administered a single dose of HU water extract per day with 50 mg/kg, 100 mg/kg, and 200 mg/kg, and standard medicine for treating hyperglycemia 1 mg/kg of glibenclamide for two weeks, three weeks, and eight weeks. There were six groups; group I was a control group called normoglycemic, which means that the rats were normal and had no sugar problem and were treated with 10 ml/kg of distilled water daily only. Group II was another control hyperglycemic group not treated but administered with 10 ml/kg per body weight of distilled water daily. Group III were hyperglycemic groups treated with standard medicine - 1 g/kg of glibenclamide. Groups IV, V, and VI were treated with 50 mg/kg, 100 mg/kg, and 200 mg/kg of HU daily while the study lasted. Alloxan monohydrate injection 120 mg/kg raised the fasting blood glucose (FBG) of untreated rats, and same rats when treated with standard medicine glibenclamide and HU extract showed significance reduction on FBG concentration, with 200 mg/kg HU extract showing the most significant reduction. The group that received subcutaneous injection of dexamethasone sodium phosphate daily showed a significant increase in FBG and serum triglycerides and total cholesterol higher than the group that did not receive this injection. When this group was treated with a daily oral dose of HU extract 200 mg/kg and glibenclamide FBG, triglycerides, and total cholesterol concentrations were reduced although glibenclamide reduction was highest in this test. The outcome of these treatments as well as that with high fructose treatment on glycosylated hemoglobin level suggests that HU seed extract possess strong hypoglycemic and hypolipidemic properties through insulin resistance reduction functions mediated by HU rich concentration of phytochemical namely, flavonoids, alkaloids, tannins, and saponins and hypoglycemic and hypolipidemic properties. Conclusion: HU seed extract has hypoglycemic and hypolipidemic

properties achieved by increase in sugar absorption and reduction in insulin resistance thus, its use as native medicine for treating diabetes is justified. Double blinded study rated as high quality ++ [22]. In similar studies performed by [33,34] HU seed extract effectively controlled diabetes.

GC-MS and molecular docking studies of *Hunteria umbellata* methanolic extract as a potent anti-diabetic. Informatics in Medicine Unlocked.

These authors used Gas Chromatography Mass Spectrometry (GC-MS) and molecular docking to determine phytochemical components of HU, particularly to examine the peroxisome proliferator-activated receptor gamma (PPAR-Y) agonists concentrations of the phytochemical compounds because those compounds are known to be effective for treating diabetes and sugar through insulin sensitization and inhibition of sugar production in the liver. The results showed that 21 phytochemical compounds were detected from seed and leaf extract including 2,2-Benzylidenebis (3-methylbenzofuran). The 2,2-Benzylidenebis of the seed scored 11.3 kcal/mol for fitness and this compound has strong anti-diabetic property. Conclusion. The 2,2-Benzylidenebis and phytochemical compounds of HU seed extract showed a significant anti diabetic effect on PPAR-Y, and the molecular binding interaction recorded in the in-silico data confirms specifically that 2,2-Benzylidenebis binds to PPAR-Y suggesting it to be a potent compound for treating diabetes. More In-vitro and in-vivo studies to determine mechanisms of action on type II diabetes was recommended. [34].

Hypoglycaemic effects of the aqueous seed extract of *Hunteria umbellata* in normoglycemic and glucose and nicotine-induced hyperglycemic rats.

Africans used dry seeds of *Hunteria umbellata* K. Schum as a native medicine for treating different types of diseases namely, obesity, diabetes, hypertension, and other diseases. These researchers examined the science behind using HU seed extract to treat hyperglycemia and obesity. In this study, rats with normal sugar scientifically called normoglycemic rat, and rats whose high blood sugar was caused by high fructose diet or high alcohol consumption were tested. The rats were given 50 mg/kg, 100 mg/kg and 200 mg/kg doses of Hu extract daily for a period of the study.

Also, investigated was the oral toxicity of HU seed extract. Preliminary or pre-test as well as intervention test of that employed OECD/OCDE Up and Down Procedures Test Guidelines to determine oral toxicity. The results revealed that the extract was rich in phytochemical compounds namely, flavonoids, tannins, alkaloids, and glycosides. There was progressively significant decrease in the blood glucose of the Hu extract treated animals based upon dose. The higher the dose, the greater the blood sugar level reduction, and Hu sugar reduction was significantly higher than that caused by standard diabetes medicine-glibenclamide. HU lowered sugar concentrations through inhibition of sugar absorption in the intestine and hepatic synthesis of sugar. At treatment doses no toxicity was observed but at extremely high doses of LD50 1020 mg/kg were slightly toxic. Conclusion. Based upon the outcome of this study, there is scientific evidence behind the use of HU seed extract for treating obesity and type II diabetes, HU extract caused significant reduction in blood sugar concentrations and weight of the experimental animals. Toxicity did not occur with the experimental doses but, only slightly occurred on extremely high dose of 1020 mg.kg thus, the use of HU as a native medicine for treating type 2 diabetes and obesity is justified [6]. The studies of [22,35] suggested similar outcome. Rated as high quality ++

Alpha-glucosidase inhibitory activities of 1beta-D-glucopyranosyl-8-methyl-3-iridene-4, 7-carbolactone and N4-chloromethylakuammine isolated from seeds of *Hunteria umbellata* K. Schun. (Apocynaceae).

These authors studied the anti-diabetes claims of HU seeds extract because they believed that at the time of their study and based upon the information available to them that anti diabetic claims on HU seeds extract were based upon opinion and investigations on this claim were yet to be completed. Thus these authors thoroughly investigated the scientific evidence behind the claim of HU seeds extract as an antidiabetic agent, with particular focus upon two compounds scientifically known to be potent inhibitors of alpha-glucosidase namely, N4-chloromethylakuammine and 1beta-D-glucopyranosyl-8-methyl-3-iridene-4, 7-carbolactone. The authors noted that these two compounds were isolated from HU extract. Thus, a clear indication on a molecular basis of HU seeds extract having the capability to prevent diabetes, and that justifies its native use as native medicine, and in the author's own words, HU seeds extract "could

serve as templates for new antidiabetic alpha-glucosidase inhibitors". The results of this study indicate that HU seeds extract has the established potential to promote diabetes inhibition [36]. Rated as high quality study ++
Hunteria umbellata Fruit Picture.



Fig. 1. *Hunteria umbellata* fruit

4. DISCUSSION

From the 22 studies selected as core evidence for this investigation, which actually involved over one hundred other previous studies it was established that HU extract be it from the seeds, husks, leaves, stems or root barks are efficacious Nigerian native medicine for treating various diseases namely obesity, diabetes and sugar reduction, cholesterol and fat reduction, and it is relatively non-toxic to the body, except in extreme case of overdose or prolong use. Conversely to the general statement of [37,38] about insufficient clinical studies on the efficacies of herbal plants, although that could be true at the times of those studies; it is now evident that there is sufficient scientific data to support HU's efficacy. These researchers hope to eliminate fears, educate, and encourage proper use of HU extract for disease treatment [39]. In Nigeria, HU seed extracts are used as native medicine for treating diabetes [1,6,15]. Two compounds established by evidence that inhibit alpha-glucosidase function which cause diabetes namely, N4-chloromethylakuammine and 1beta-D-glucopyranosyl-8-methyl-3-iridene-4, 7-carbolactone, were isolated from HU extract. Thus, a clear indication on molecular basis that HU seeds extract has a capability of preventing diabetes (anti diabetes), and that justifies its use as native medicine for treating diabetes, and in the author's own words, HU seeds extract "could serve as templates for new antidiabetic alpha-glucosidase inhibitors". However, phytochemical

concentration of HU seed extract is very high, containing LD50 of 1020mg/kg, which is slightly toxic. The phytochemical compounds in HU seed extract are Alkaloids, flavonoids, tannins and glucosides, which explains why it is traditionally used in Africa to treat diabetes type II and obesity [20]. Its consumption significantly lowers blood sugar level and increases the activities of glucose digesting enzyme called glucokinase. HU is rich in alkaloid, when tested- orally administered on hyperglycemic rat it showed significant hyperglycemic potency action. It significantly decreased fasting blood sugar level on the tested rat for oral glucose tolerance [2,11]. Sugar and cholesterol have been a huge threat to humanity, causing overweight and obesity to individuals. A person with obesity has a disorder of fat and carbohydrate or sugar metabolism. A disorder of fat and carbohydrates metabolism results in deposition of fat in adipose (fat) tissue, and major internal organs namely, heart, liver, pancreatic islet, and muscles of the skeleton [3,4,12]. HU seeds extract lower blood glucose levels by preventing sugar absorption in the intestine and by inhibiting sugar digestive enzyme activity called alpha-glucosidase [2,4,6,11]. The use of HU extract as folk medicine for treating diabetes is justified.

HU seed extract has anti-obesity and overweight properties achieved through anti-glycemic and anti-lipidemic actions. Through lowering blood sugar and cholesterol levels, and inhibition of their absorption, weight gain is prevented and controlled [2,4,6,7,11]. Anti-obesity and anti-lipidemia potency is achieved by preventing fat absorption in the intestine, and inhibition of fat production. It is high in phenol compounds, and alkaloids, their combined action contributed to sugar and fat lowering actions [2,6,7]. Weight loss was achieved through a high fiber diet, and herb rich in phytochemical compounds namely, alkaloids and phenols, the latter is true with HU. Alkaloid concentration in HU is higher than other phytochemical compounds [2,6,11]. HU seed extract resulted in decreasing liver enzyme, hydroxyl-3-methylglutanyl-coenzyme A called reductase and acetyl coenzyme A or cholesterol acyltransferase, which significantly raise the activities of adipose tissue fat digestive enzyme called lipase, to increase fat digestion and weight loss [6,11]. The use of HU extract as folk medicine for weight loss is justified. HU seed extract treatment did not only reduce the blood plasma cholesterol, also, it decreased the triglycerides level and increased the ratio of high-density cholesterol/total cholesterol in the blood

[22,23]. This effect prevents atherogenesis - building up of fat plaques in the arteries [6,7]; thereby exhibiting significant protective action on the cardiovascular system and coronary arteries. High concentrations of alkaloids lowers blood sugar concentration, which is a strong hypoglycemic activity, and alkaloid potency against blood sugar forms synergy when combined with other phytochemical compounds and minerals that occur in high concentrations in HU, making it more efficient [6,15]. The use of HU extract as native medicine for treating cholesterol, atherogenesis, and cardiovascular diseases shows significant potential. Just like every other medicine, overdoses cause body reactions and adverse effects, HU can only cause thrombosis, or slight tissue proliferation on over dose or prolonged usage [6,30,32,34,37], which can only be a rare occurrence. It is non-toxic to the body at treatment, moderate and non-prolonged doses, and it is hepatoprotective [37]. HU extract is safe for treating diseases if safely used under professional supervision [6,38,40].

5. CONCLUSION

In this review, a series of studies performed to examine the efficacies of HU extracts for treating obesity and metabolic syndrome diseases was investigated to gain knowledge about the claims of HU high potency against diseases. The nutritional, chemical, phytochemical composition of HU Fruit, seeds, leaves, bark, and root of HU were studied to generate a link between HU composition, and its efficaciousness against sugar, fat, diabetes Mellitus type II, weight gain, atherogenesis, cholesterol, and results showed that HU components and properties offered it the capacity to prevent, control or treat the acclaimed diseases and indeed it is a potent medicine for treating obesity, and metabolic syndrome diseases, thus, justifying its use as native medicine for treating various diseases.

NOTE

The study highlights the efficacy of "Hunteria Umbellata" which is also an ancient tradition, used in some parts of India. This ancient concept should be carefully evaluated in the light of modern medical science and can also be utilized if found suitable. Giving attention to Hunteria umbellata tree planting and care is recommended because it could open doors to a new world order or innovations in healthcare and economy.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

- Hallier F, Tropical Plant database, Ken Fern. Tropical. Theferns. Info. 2021;04-02. Accessed on April 02, 2021. Available:<https://www.tropical.theferns.info/viewtropical.php?id=Hunteria+umbellata>
- Morakinyo AE, Oladeji OA, Fajobi AO, Adelowo JM, Babarinde SO, Adepoju AE. Phytochemical analysis and anti-hyperlipidemic potential of ethanolic extract of hunteria umbellata seed. IOSR Journal of Pharmacy And Biological Sciences (IOSR-JPBS), 2020;15(4) Sur. (1): 01-09.
- Okukwe CO, Abiodun HA, Conrad AO, Omolara FY. A systematic review of medicinal plants used in Nigeria for hypertension management. International Journal of Pharmaceutical Research. 2020 ;Oct. - Dec. (04):142 2233. DOI. 10.31838/ijpr/2020.12.04.142.
- Khall MF. Quaternary Alkaloids of the stem and root bark of Hunteria Eburnea Pichon. 1970; 9(1). Accessed pdf on September 25, 2021. Available:https://scholar.google.com/scholar?start=10&q=Hunteria+umbellata&hl=en&as_sdt=0,5
- Emmanuel A, Adegoke EA, Alo B. Abereamines, water-soluble seed alkaloids from Hunteria umbellata. Journal of Phytochemistry. 1986;25(6):1461-1468. DOI: 10.1016/S0031-9422(00)81308-6.
- Adeneye AAA, Adeyemi OO, Agbaje EO, Sofidiya. The novel antihyperglycaemic. Action of hunteria Umbellata seed fractions mediated via intestinal glucose uptake inhibition. African Journal of Traditional Complement Alternative Medicine. 2012;9(1):17-24 DOI: 10.431/ajtcam.v9i1.3.
- Ahajumobi EN.Nutritional Factors to Mental Illness: Systematic Review. International Journal of advanced Research. 2017;5(9):460-477. DOI: 10.21474/IJAR01/5350.
- Onawumi OOE, Olagunji EO, Afolabi SO. Comparative study and nutritional assailment of dehulled and whole hunteria umbellate seed. Elixir International Journal of Applied Chemistry. 2017;109:48056-48058.
- Ajayi, IA, Ojelere OO. Chemical composition of ten medicinal plant seeds in West Nigeria. Journal of Advances in Life Science and Technology. 2013;10 (Online):2225-062X.
- Ajayi IA, Ojelere OO. Phytochemical Analysis and mineral composition of ten medicinal plant seeds from South-West Nigeria. New York Science Journal. 2013;6(9). Accessed on September 15, 2021. Available:https://www.sciencepub.net/new_york
- Abubakar, AN, Akanya HO, Egwim EC, Saidu AN. Antioxidant and hypoglycaemic effect of some medicine plants. GSC Journal of Biological and Pharmaceutical Sciences. 2019; 8(2): 070-080. DOI. 10.30574/gscbps.2019.8.2.0124.
- Adeneye AA, Adeyemi OO. Hypoglycaemic effects of the aqueous seed extract of hinter umbellate in normoglycemic and glucose and nicotine-induced hyperglycaemic rats. International Journal of Natural Products Research. 2009a;2(1):9-18.
- Marie NG, Tom Fleming, Margaret Robinson, Blake Thomson, Nicholas Graetz, Christopher Margono et al. Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: A systematic analysis for the Global Burden of Disease Study 2013. The Lancet. 2014;384(9945): 766-781. DOI: 10.1016/S0140-6736(14)60460-8.
- Ahajumobi EN.Nutritional Factors to Mental Illness: Systematic Review. International Journal of advanced Research. 2017;5(9):460-477. DOI: 10.21474/IJAR01/5350.
- National Institute for Health and Care Excellence (NICE). The Guidelines manual: Process and methods [PMG6]. Published, 2012; November 30. Accessed on September 13, 2021.

- Available:<https://www.nice.org.uk/process/pmg6/chapter/reviewing-the-evidence#selecting-relevant-studies>
16. Center for Disease Control. Guide to community preventive service: Community guide methodology; 2021; September 2. Accessed on November 27, 2021. Available:<https://www.thecommunityguide.org/about/community-guide-methodology>
 17. Uman LS. "Systematic reviews and meta-analyses." *Journal of the Canadian Academy of Child and Adolescent Psychiatry*. 2011;20(1):57-9.
 18. Wang HH, Obesity: A growing threat to health in China. *The Lancet*. 2014; 384(9945):716.
 19. Adeneye AA, Adeyemi, OO, Agbaje EO. Anti-obesity and anti hyperglycaemic effect of Hunter umbellata seed extract in experimental hyperlipidemia. *Journal of Ethnopharmacology*. 2010;130(2):307-314.
 20. Ahajumobi EN. *Nutrition for Chronic Disease Prevention and Control*. Lulu Press, U.S.A; 2018. Available:<http://www.lulu.com>
 21. Woo MN, Bok SH, Lee MK, Kim HJ, Jeon SM, Do GM, et al. Anti-obesity and hypolipidaemic effects of proprietary herb and fibre combination (S&S PWH) in rats fed high-fat diets. *Journal of Medicinal Food*. 2008;11():169-178. DOI: 10.1089/jmf.2007.082.
 22. Adeneye AA, Crooks PA, Weight losing, antihyperlipidemic and cardioprotective effects of alkaloid Fraction of Hunter umbellata seed extract on normal and triton-induced hyperlipidemic rats. *Elsevier, Asian Pacific Journal of Tropical biomedicine*. 2015;5(5):387-394.
 23. World Health Organization. Facts-Sheet details: Obesity and Overweight. World Health Organization International News-Room; 2016. Accessed on February 18, 2022. Available:<https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>
 24. Harvard TH, CHAN: School of Public Health. *The Nutrition Source N.D*. Accessed on September 13, 2021. Available:<https://www.hsph.harvard.edu/nutritionsource>
 25. Ojewere OO. Phytochemicals, proximate, mineral element composition and microbial activity of some of some selected medicinal plant seeds. *Pure and Applied Chemistry, LUTECH Ogbomoso*. 2014;v(i): 22-28.
 26. Adeneye A, Adeyemi O. Further evaluation of anti hyperglycaemic activity of Hunteria Umbellata (K. Schum) Hallier f. Seed extract in experimental diabetes. *Elsevier Journal of Ethnopharmacology*. 2009;126(2009): 238-243.
 27. Olusola Abiola Ladokun, Aminu Abiola, Durosinslorun Okikiola, Famuti Ayodeji, GC-MS and molecular docking studies of Hunteria umbellata methanolic extract as a potent anti-diabetic. *Informatics in Medicine Unlocked*. 2018;13(2018):1-8. DOI: 10.1016/j.imu.2018.08.001.
 28. Ibeh IN, Idu M, Ejimadu IM. Toxicological assessment of 'Abeere seed hunteria umbellata K. Schum (Apocyanaceae). *Journal of BIOCIENCIAS, Porto Alegre*. 2007;15(1): 04-07.
 29. Adeneye OO, Adeyemi O, Agbaje EO, Banjo AAF. Evaluation of the toxicity and reversibility profile of the aqueous seed extract of hunteria umbellata (K. Schum) Hallier F. In *Rodents. African Journal of Traditional Complementary and Alternative Medicines*, 2010;7(4):350-369. DOI: 10.4314/ajtcam.v7i4.5604.
 30. Ogunlana OO, Ogunlana OE, Adelani IB, Adebayo AOI, David OL, Adeleye OJ et al. Assessment of the hepatoprotective activity of the seeds of hunteria umbellata (hillier F) on carbon tetrachloride (CCI4) induced liver damage in Wistar albino rats. *AIP Conference Proceedings*. 2018; 1954(1). DOI: 10.1063/1.5033397.
 31. Ajala AS, Ogah CA, Adelekan TA. Alpha-glucosidase inhibitory activities of 1beta-D-glucopyranosyl-8-methyl-3-iridene-4, 7-carbolactone and N4-chloromethylakua-mmine isolated from seeds of Hunteria umbellata K. Schun. (Apocynaceae). *West African Journal of Pharmacy*. 2018;29(1): 101-109. Accessed on September 28 2021. Available: [WAJP OLUSEGUN AJALA.pdf](#)
 32. Oboh, Ganiyu, Adebayo, Adeniyi A, Ademosun, Ayokunle O. "Erection-stimulating, anti-diabetic and antioxidant properties of Hunteria umbellata and Cylicodiscus gabunensis water extractable phytochemicals" *Journal of Complementary and Integrative Medicine*. 2018;15(1): 20160164.
 33. Adeneye AA, Adeyemi OO. Hypoglycemic effects of the aqueous seed extract of

- Hunteria umbellata in normoglycemic and glucose and nicotine induced hyperglycemic rats. *Journals of Planta Medica*. 2008; 74(9):245-245.
DOI:10.1055/s-0028-1084243.
34. Ajiboye TO, Hussaini AA, Nafiu BY, Ibitoye OB. Aqueous seed extract of *Hunteria umbellata* (K. Schum.) Hallier f. (Apocynaceae) palliates hyperglycemia, insulin resistance, dyslipidemia, inflammation and oxidative stress in high-fructose diet-induced metabolic syndrome in rats. *Journal of Ethnopharmacol*. 2017;(198):184-193.
DOI: 10.1016/j.jep.2016.11.043.
35. Igbe I, Ching FP., Eromon, A. Anti-inflammatory activity of aqueous fruit pulp extract of *hunteria umbellata* K. Schum in acute and chronic inflammation. *Journal of Polish Pharmaceutical Society-Drug Research*. 2010;67(1):81-85.
36. Adeyemi OO, Adeneye AA, Alabi TE. Analgesic activity of the aqueous seed extract of *Hunteria umbellata* (K. Scum) Hallier f. In rodents. (Sept 2011). *Indian Journal of Experimental Biology*. 2011; 49(9):698-703.
37. Oboh G, Adebayo AA, Ademosun AO. *Hunteria umbellata* seed extract administration modulates activities of phosphodiesterase-5 and purinergic enzymes relevant to erection in normal male rats. *Orient Pharmacological Experimental Medicine*. 2019;11(19):167–175.
DOI: 10.1007/s13596-019-00368-y.
38. Ojelonu OC. Mechanism of aqueous extract ion the *hunteria umbekllata* seed and metformin in diabetes. *Chinese Journal reference written in China*. 2019; 7(9):418-422.
39. Oluwemimo A, Usifoh CO. The Anthelmintic activity of *Hunteria Umbellata* K. Schum (FAM. Apocynaceae) extracts. *Pakistan Journal of Science and Research*. 2001;44(5):286-290.
40. Igbe I, Eze GI, Ojameruaye O. Sub-acute toxicity of Aqueous fruit extract of *hunteria umbellata* in Albino Wistar Rats. June 2013. *Nigerian Journal of Physiological Science*. 2013;28(1):077-082.

© 2022 Ahajumobi and Anderson.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/88351>