

Exploring the Culinary and Medicinal Significance of Gnetum Africanum

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Abstract:

This investigation looked at the iron and vitamin E levels in wistar rats given extracts of Gnetum Africanum. In four groups of six rats each, twenty-four mature male rats weighing between 100g and 120g were divided. The healthy Control group was Group A. For 28 days, the extract of Gnetum Africanum was given to Groups B, C, and D at dose concentrations of 40 mg/kg, 80 mg/kg, and 120 mg/kg body weight, respectively. The findings demonstrated that, when compared to the control group, Gnetum Africanum supplementation significantly increased serum iron and vitamin E levels ($P < 0.05$). These adjustments to the blood levels of vitamin E and iron were dose-dependent. This finding suggests that Gnetum Africanum extract might be helpful in the treatment of anemia and reproductive problems.

Key Words: Gnetum Africanum, iron, vitamin E.

Introduction

The type species of the genus Gnetum is Gnetum Africanum. It's a part of an edible plant. [1]. It is used often in UmuAmucha Njaba LGA of Imo State, Nigeria, due to its nutritive qualities, flavor, and purported medical properties [2]. Gnetum africanum has numerous common names and is grown in various countries across Africa, including: Cameroon (Eru, okok, m'fumbua, or fumbua), Angola (KoKo), Nigeria (ukazi leaf, okazi leaf or afang), Gabon (KoKo), Central African Republic (KoKo), Congo (KoKo), and the Democratic Republic of Congo (m'fumbua or fumbua). 'Wild spinach' is another name for Gnetum africanum that has been used in English.

It is a leafy green vegetable that is used to make a variety of dishes in Nigeria and other African nations like the Congo, Gabon, and Angola as well as in Asia and South America. The treatment of enlarged spleens, sore throats, and nausea are just a few of the health advantages of ukazi (afang), also known as Gnetum Africanum. Additionally, ukazi helps persons with diabetes manage their blood

sugar levels and relieves constipation. The high antioxidant, vitamin, and mineral content of ukazi contributes to their health advantages [3].

An indigenous vine gymnosperm species called Gnetum africanum (also known as eru or African jointfir) may be found all over equatorial Africa. Despite having leaves, the gymnosperms in the genus Gnetum are linked to pine and other conifers [4].

A shade-loving plant called ukazi, also known by its botanical name Gnetum africanum, flourishes in deep tropical forests. It is indigenous to Nigeria, Angola, Cameroon, the Central African Republic, the Congo, and Gabon. This plant's seeds and leaves can both be consumed [5].

Protein and fiber content in Gnetum Africanum varies. Iron and the antioxidant tocopherol are also present. As a result, it helps the immune system and minimizes harm to cells and tissues. Their vitamin D concentration rises as a result of UV exposure[6]. The body needs the mineral iron for a variety of purposes. For example, iron is a component of hemoglobin, a protein that transports oxygen from the lungs to every cell in the body[7]. It aids in storing and using oxygen in the muscles. Numerous additional proteins and enzymes also contain it. It encourages a healthy pregnancy and improves physical performance while also boosting vitality. Most often, iron insufficiency is prevalent in female athletes. However, too much iron can raise your risk of diabetes and liver cancer. The primary uses of iron are to prevent and treat anemia brought on by

low iron levels. It is also used to treat anemia brought on by unusually high menstrual bleeding[8].

Similar to that, vitamin E is essential for a healthy immune system. It is a potent antioxidant that aids cells in warding off disease. This vitamin E may be able to shield cells from free radical damage and safeguard eyesight. Because it promotes blood flow and oxygen to the genitalia, vitamin E is sometimes known as the "sex vitamin." Vitamin E can enhance cervical mucus in females, which helps sperm survive longer[9].

Gnetum Africanum has historically been associated with having the capacity to boost immunity because it helps shield the cell membrane from harm. Vitamin E enhances immunity, according to studies [10].

Gnetum Africanum has been demonstrated to possess some therapeutic characteristics that can aid in improving blood production. As a result, it aids in preventing blood loss and preserving the balance of blood circulation. They are veggies that offer a number of crucial nutrients[11].

Gnetum Africanum is essential to ensuring that one consumes an adequate amount of vitamins and minerals [10].

Scientific studies on the usage of Gnetum Africanum in the management of anemia have been published. These investigations unequivocally demonstrated that Gnetum Africanum could be useful in treating anemia[8]. However, nothing is known about the application of Gnetum Africanum in the management of infertility and anemia.

The purpose of the current study was to evaluate the efficacy of Gnetum Africanum extracts in rats.

Materials And Method

Material:

Between October 10 and November 18, 2022, in UmuAmusa Njaba LGA, Imo State, Nigeria, the Gnetum Africanum was harvested from the surrounding vegetation. Imo State University Owerri, Nigeria's botanist, identified and verified the leaves.

Preparation of Gnetum Africanum

To get rid of sand and dust particles, the Gnetum Africanum was properly cleaned. Then it underwent seven days of sun drying. With the aid of an electric blender, powdered Gnetum Africanum was created from the dry herb. Gnetum Africanum was dried and ground into about 300 grams, which was then macerated in distilled water for 48 hours while being sometimes shaken. The rotary evaporator was then used to filter it using what man filter paper at a temperature of 40°C. For future use, the extract was preserved in a refrigerator at 4 oC.

Experimental Animals

The study used 24 adult male Wistar rats that appeared to be in good health and weighed between 100g and 120g. They were housed in the Imo State University's experimental animal facility and kept in a tidy plastic cage. The wistar rats underwent acclimatization for 14 days while receiving a balanced diet of growers mash produced commercially by Grand Cereals Ltd. and unlimited access to purified Hemoglobin, the material found in red blood cells that takes oxygen from the lungs to carry it throughout the body, is made up in large part of iron. Approximately two thirds of the body's iron is contained in hemoglobin. The body cannot produce enough healthy red blood

water. The institutional Ethical Committee gave the study their seal of approval.

Experimental Design

The creatures were divided into four groups, each with six rats. Each group received either distilled water alone or a single dosage of Gnetum Africanum in a range of doses. These are divided into the following groups: Group A is the control, which was merely given along with the rat diet. For 28 days, the extract of Gnetum Africanum was given to Groups B, C, and D at dose concentrations of 40 mg/kg, 80 mg/kg, and 120 mg/kg, respectively.

Blood Collection: All of the animals (from Groups A to D) were weighed and put to sleep in a glass jar filled with cotton wool that had been drenched in chloroform after receiving treatment with Gnetum Africanum extract for 28 days. Cardiac puncture was used to get blood samples, and a sterile needle and syringe were used. Within 24 hours of collection, the blood samples were placed in EDTA containers with the necessary labels for analysis.

The normal procedure for an iron test was used, and determined Vitamin E levels was assayed using standard method.

Statistical Analysis: The mean and standard deviation of each result were used to express it. One-way analysis of variance (ANOVA) and a student t-test were used to analyze the data. Statistics were judged significant at P 0.05.

Results:

Table I: The levels of Iron and vitamin concentrations among different groups fed with Gnetum africana

Group	iron(mcg/dL)	vitamin E(µg/mL)
A	41.70±13.21	11.88±6.53
B	45.76±10.22	16.18±6.42
C	55.41±11.25 *	17.51±6.09
D	59.43±11.79*	19.11±6.99*

* = significantly different when compared with Control(Group A) at P<0.05

Discussion:

In wistar rats, the impact of Gnetum Africanum on iron and vitamin E was assessed. A plant known as Gnetum Africanum has therapeutic qualities [4]. The serum iron concentration of the rats in this study significantly increased after administration with Gnetum Africanum extract.

When compared to the control, it was found that administering Gnetum Africanum considerably raised the level of iron. Numerous essential bodily processes rely on iron. It functions as a transport medium for electrons within cells, a carrier of oxygen from the lungs to the tissues via red blood cell hemoglobin, and an integral component of significant enzyme systems in different tissues. Minerals like iron are necessary [1].

cells that carry oxygen if there is not enough iron in the system [5].

The majority of the body's iron is found in erythrocytes as the molecule haemoglobin, which is made up of four units, each having one heme group and one protein chain. Haemoglobin's structural

makeup enables it to be completely loaded with oxygen in the lungs and partially unloaded in tissues (such as muscles). Myoglobin, a protein that stores oxygen in muscles that contains iron, has a structure that is similar to that of hemoglobin but only contains one heme unit and one globin chain. This is consistent with the research of [10].

When compared to the control, a substantial rise in vitamin E level was seen. When fat is subjected to oxidation and during the spread of free radical reactions, vitamin E, a powerful chain-breaking antioxidant, suppresses the synthesis of reactive oxygen species molecules [11]. Even though its concentration ratio may only be one molecule for every 2,000 phospholipid molecules, it is mostly found in the membranes of cells and organelles where it can exert its maximum protective impact. It defends the cell membranes from free radical attack and serves as the initial line of defense against lipid peroxidation [12]. According to studies, a combination of tocopherols inhibits lipid peroxidation in human erythrocytes more potently than alpha-tocopherol by itself. Vitamin E improves membrane lipid packing orderliness, enabling a tighter packing of the membrane and, as a result, higher cell stability [9, 13].

Due to its position as an antioxidant, its function in anti-inflammatory processes, its inhibition of platelet aggregation, and its immune-enhancing activity, vitamin E has been discovered to be particularly beneficial in the prevention and reversal of different disease complications[14].

In conclusion, animals given *Gnetum Africanum* extract had higher levels of iron and vitamin E. Consequently, *Gnetum Africanum* extract may be helpful in the management of anemia and immunological disorders.

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