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Impact of Gongronema Latifolium on Serum Selenium and Lipid Fractions in Wistar Rats

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ABSTRACT

The highly nutritious leaf of the edible vegetable Gongronema latifolium is meaty and delicious. The purpose of this study was to ascertain how Gongronema latifolium may affect the serum selenium level and lipid profile in wistar rats. Four sets of six adult male rats each were created from the twenty-four adult rats, all weighing between 100 and 120 grams. As a healthy control group, Group A was used. For 28 days, the Gongronema latifolium extract 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. One-way analysis of variance (ANOVA) was used to analyze the data, and then the student's t-test was used. When compared to the control group, the administration of Gongronema latifolium resulted in a substantial decrease in low density lipoprotein, triglycerides, and total cholesterol ($P<0.05$). As serum In comparison to the control, there was a significant rise in serum selenium and high density lipoprotein. The alterations in the lipid profile and selenium were contingent on the dosage. This finding suggests that gongronema latifolium extract may be helpful in the management of arteriosclerosis.

INTRODUCTION

The leaves of Gongronema latifolium are thought to offer a number of health advantages in traditional medicine. Among other things, they are utilized for their possible anti-inflammatory, anti-diabetic, and digestive qualities. These applications, however, need more validation and scientific investigation. [1]. Large, glossy, dark green leaves define the leafy green plant Gongronema latifolium, also referred to as Utazi. The leaves are aromatic and have a slightly bitter flavor. They are heart-shaped and have sharp edges. When fully grown, the plant can grow as a shrub or vine and reach heights of up to five meters. The portion of Gongronema latifolium that is used the most frequently is its leaves.

The leaves of the utazi plant are used in many African recipes, especially those from Nigeria. To give soups, stews, and sauces a unique bitter flavor, they are added to the mixtures. In the Imo State of Nigeria, Gongronema latifolium is referred to as Utazi in UmuAmucha Njaba LGA. In addition to their purported therapeutic benefits, it is extensively consumed for its flavor and nutritional value[2].

This Gongronema latifolium has variable amounts of fiber and protein. Antioxidant and vitamin C are also present. As a result, it strengthens immunity and lessens tissue and cell damage. [3]. According to traditional medicine, Gongronema latifolium may be able to prevent cancer by shielding cells from DNA damage and reducing the growth of tumors[4,5].

This could be helpful in the monitoring and treatment of neurodegenerative diseases such as Alzheimer's. Research has demonstrated that gongronema latifolium contains phytonutrients that can help prevent blood vessel walls from adhering to cells, hence avoiding the creation of plaque build-up, as well as some therapeutic qualities that can aid in weight loss in adults who are overweight[6]. Consequently, by preserving appropriate blood pressure and circulation, it aids in protecting the cardiac tissue. It's categorized as a vegetable in the culinary world. They are veggies that offer a number of vital nutrients[7].

Eating the leaves of the Gongronema latifolium plant is the key to ensuring that your diet has adequate vitamins and minerals. It provides a detailed analysis of the nutrients and looks at the potential health benefits of including more Gongronema latifolium in the diet[8].

Gongronema latifolium has been mentioned in a few scientific publications as a possible treatment for arterosclerosis. These investigations unequivocally demonstrated that Gongronema latifolium may, in fact, be beneficial in the treatment of arterosclerosis[9]. On the other hand, not much is known about the potential value of Gongronema latifolium in the management of arterosclerosis.

The goal of the current study was to evaluate the Gongronema latifolium extracts' efficaciousness in rats.

MATERIALS AND METHODS

Gongronema latifolium

The *Gongronema latifolium* was collected from the bush in UmuAmusa Njaba LGA Imo State, Nigeria between 16th and 18th July, 2020. The leaves were identified and authenticated by Botanist Imo State University Owerri, Nigeria.

Preparation of *Gongronema latifolium*

The Gongronema latifolium was properly cleaned to get rid of any dust or sand particles. Thereafter, it was sun-dried for seven days. Using an electric blender, the dried Gongronema latifolium was ground into a powder. For 48 hours, with sporadic shaking, 400 grams of the dried, ground Gongronema latifolium were macerated in distilled water. After that, it was filtered at 40 degrees Celsius using what man filter paper and a rotary evaporator. For later usage, the extract was refrigerated at 4oC.

EXPERIMENT ANIMALS

For the investigation, 24 adult male wistar rats, weighing between 100 and 120 grams, were employed. They appeared to be in good health. They were housed in Imo State University's experimental animal home and kept in a clean plastic cage. During the 14-day acclimatization phase, Grand Cereals Ltd.'s commercially produced growers mash was fed to the wistar rats as directed, and they were given unlimited access to distilled water. The institutional Ethical Committee gave their approval to the study.

EXPERIMENTAL DESIGN

Four groups of six rats each were randomly assigned to the animals. Either distilled wistar alone or a single dosage of varying doses of Gongronema latifolium were administered to each group.These are divided into the following groups: Group A is the control group, which received simply the rat diet. For 28 days, the Gongronema latifolium extract 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.

BLOOD COLLECTION: Following a 28-day administration of Gongronema latifolium extract, each animal (Groups A through D) was weighed and put to sleep in a glass jar with cotton wool saturated in chloroform. Using a sterilized needle and syringe, cardiac punctures were used to obtain blood samples. Within 24 hours of collection, the blood samples were placed in appropriately labeled EDTA containers for analysis. Assay for Lipid Profile: The Friedwald equation was used to compute LDL cholesterol, and the conventional method was used to measure the level of the lipid profile.Using the atomic absorption spectrophotometric technique, the plasma selenium was measured[10].

STATISTICAL ANALYSIS: All results were expressed as mean ±standard deviation. The data was analyzed using one-way analysis of variance (ANOVA) followed by student's t-test. $P < 0.05$ was considered as statistically significant.

RESULTS:

Table I: The lipid profile and selenium concentrations among different groups

Group	T Chol(mg/dl)	Trig(mg/dl)	LDL(mg/dl)	HDL(mg/dl)	Se(µ/dl)
A	116.90±3.12	94.06±3.10	50.44±2.67	43.16±7.00	57.06±3.33
B	114.23±4.26	92.40±2.76	47.81±2.13	44.11±3.72	59.44±3.04
C	103.13±4.03 *	86.03±4.61*	44.32±2.22*	51.66±5.41*	60±7.83*
D	94.52±4.02*	83.21±4.06*	43.00±3.60*	56±2.11*	66.01±8.29*

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

The levels of lipid profile and selenium were significantly affected among group C and D wistar rats that received extract of *Gongronema leaf* 80mg/kg and 120mg/kg body weight respectively when compared with the control at P<0.05.

DISCUSSION

In wistar rats, the impact of Gongronema latifolium on selenium and lipid profiles was assessed. The Gongronema latifolium has lipid-lowering and cardioprotective qualities[11]. In this investigation, rats' serum lipid levels significantly decreased after receiving

Gongronema latifolium extract. When compared to the control, it was found that administering Gongronema latifolium dramatically reduced the level of total cholesterol. This may be brought on by both an increase in the secretion of bile acid from the feces and suppression of the hepatic cholesterol production [12]. It may also be linked to an increase in the liver's absorption of low-density lipoprotein (LDL) from blood and stimulation of receptor-mediated LDL-cholesterol catabolism. This aligns with the research conducted by [13, 14].

When compared to the control, it was shown that the levels of triglycerides and LDL cholesterol were much lower, especially at greater concentrations of Gongronema latifolium extract. Even though HDL was up. Therefore, the presence of certain mineral elements and essential oils may be associated with the ability to raise the blood concentration of HDL and lower that of LDL, TG, and TC. This is consistent with research [15]. This study found that the levels of low density lipoproteins and high density lipoproteins were inverse. This suggests that while HDL levels rise, LDL levels fall and vice versa [16].

Additionally, compared to the control group, wistar rats given Gongronema latifolium had higher levels of HDL. This is consistent with [17,18]' findings, which raised HDL. The level of selenium was found to be substantially higher than that of the control. As a cofactor for the reduction of antioxidant enzymes like glutathione peroxidase, which helps things deal with potentially hazardous oxidizing agents, selenium is essential. Longevity is correlated with blood glutathione function levels. Selenium levels that are adequate may be related to long lifespans.

CONCLUSION

Animals given Gongronema latifolium extract had higher levels of both HDL cholesterol and selenium. Therefore, it is likely that Gongronema latifolium extract will help treat arteriosclerosis.Eating this delectable Gongronema latifolium is the key to ensuring that your diet has adequate vitamins and minerals. It has nutritional advantages and may be utilized to treat heart-related conditions and hypercholesterolemia.

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