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EVALUATION OF THE NUTRIENT POTENTIALS OF TELFARIA OCCIDENTALIS AND AMARANTHUS VIRIDIS AS AN ANTI-ANEMIC AGENT IN RATS

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ABSTRACT

This study evaluate the nutrient potentials of Telfaria occidentalis and Amaranthus viridis as an anti-anemic agent in Rats.The leaf extract were collected and supplemented with rat chow for rat feeding. Twenty male adult Rats were divided into 4 groups of 5 Rats each for a 28-days study period.One group was fed Rat chow alone, another was chow supplemented with ferrous sulphate, the third group was fed a combination of chow and T. occidentalis and last group was fed rat chow in combination of A. viridis extract. Anemia was induced in all the groups of rats for 7 days. Blood samples were drawn at day 0- 22 from ocular vein with heparinized tube into heparinized bottle for chemical analysis. The heparinized blood was centrifuged to obtain plasma for determination of haemoglobin (HB) and red blood cell count (RBC). The serum was used to determined the retinol, zinc, iron and ferritin. All the analysis were done using standard techniques. Cyanide content (6.00mg and 17.00mg) of both leaves were below toxic level (35.00mg).Oxalate (1.22g and 1.25g) were below the toxic limit (2.20g/100g).The rats fed combination of chow and T. occidentalis extract had comparable iron as those fed combination of ferrous sulphate and chow but had an edge over the other two groups of rat in iron utilization. The rats fed combination of chow and A. viridis extract diet had increased hematological indices however, the increases were below normal values (retinol 2.52µg/ml, ferritin 24.01ng/ml, iron 0.13mg/dl, zinc 0.13mg/dl and HB 13.77g/dl). It was only in RBC that their value was higher than the normal range 7.05 10^6 cell/µl of blood. The value for rats fed combination of rat chow with A. viridis was below the normal range (7.05 10^6 cell/ul of blood). However it was much higher than that of rat fed rat chow alone ($p<0.05$). The extract is rich in anti-anemic factors (iron, folate, vitamin C and vitamin E as well as protein).When taken along with meals its effect is enhanced as the Vitamin C content enhances the absorption of iron and folate in the meals thus increasing their bioavailability and hence their serum level. They could be incorporated in the complementary food to diversify food use and reduce some micronutrient deficiency diseases.

Key words: Evaluation, Amaranthus Viridis, Telfaria Occidentalis, Rats.

INTRODUCTION

Vegetables are an indispensable part of human diet. They offer the most rapid and lowest cost method of providing adequate supplies of vitamins, minerals and fibre to the people. Vegetables here means leafy outgrowth of plants used as food and include those plants and part of plants used in making soups or serve as integral of the main source of meal (Ene –Obong, 1998). One of the major nutritional problems confronting this country Nigeria is micronutrient malnutrition. This is something too few are aware of and even fewer talk about. Yet over 2 million people in the world that constitutes 35% of the population are affected by micronutrient deficiency (Viteri, 1991). Studies have shown that micronutrient deficiency is the world's most common nutritional disorder. Use of limited source of food rich in vitamins and minerals is one of the causes of micronutrient deficiency (Popkin *et al.*, 1995). The number of people affected by micronutrient malnutrition is unavoidably high (WHO, 1996). This is aggravated because it is a hidden public health problem (Micronutrient Initiative, 1997). Micronutrient deficiency leads to serious health, social and economic consequences. However, failure to ensure an adequate intake of micronutrients could lead to devastating effect (World Bank, 1994).The impact extends beyond health considerations to labour and productivity. The ability of those affected by micronutrient malnutrition to learn and to function well in the society is staggering. There is problem of lack of information on the nutritive value of the vegetables, which could be useful in the fight against malnutrition (Wilfred, 1999). The study explores the use of these leaves to improve absorption and bio-availability of micronutrients using rats.

improved stiffness capabilities. Comparison between the *Class* $1A-lppm$ and *Class* $1A-spp$, between the *Class* $1B-plpm$ and *Class* $1B-psp$, between the *Class* $2A-llpm$ and *Class* $2A-ssp$, between the *Class* $2B-lplm$ and *Class* $2B-sps$, and between the *Class* $3A-lllm$ and *Class* $3A-sss$ show an increase of 2291.90%, 2927.36%, 1007.08%, 2559.12% and 443.97% respectively in the amount of constant-force.

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METHODOLOGY

These leaves were collected from garden at No 20 Alvin Loving close University of Nigeria, Nsukka. The leaves were separately plucked and sorted by removing extraneous materials and cleaned by washing with deionized water. The vegetables were milled using electric blender until the desired particle size was obtained (150 – 850 microns) for chemical analysis.

Chemical analysis of samples

Proximate, mineral, vitamins and anti-nutrient composition of the two leafy vegetable were determined in triplicate using the standard method of AOAC (10).

Proximate Analysis.

The Crude Protein (Kjeldahl,N x6.22),Fat (Solvent extraction),ash, Crude fibre and Moisture content were determined according to AOAAC (10).Total Carbohydrate was obtained by difference (100-% moisture, % crude fibre,% fat,% protein,%Ash).

Vitamins and Mineral determination.

B-Carotene and Ascorbic acid were determined by the method described by Onimawo and Egbekun (12). Minerals weredetermined using Perkin Elmer model 303 atomic absorption spectrophotometer after ashing the sample and extracting with 0.2M Hcl solution (10).

Animal housing

Twenty male adult rats were purchased from the Department of Veterinary Pathology, University of Nigeria, Nsukka. The animals were divided into 4 groups of 5 rats each on the basis of body weight. The rats were housed individually in cages equipped to separate urine and faeces.

Animal feeding

The rats were fed on standard rat chow. The leaves extract was made to provide 0.11mg/day iron to the rats. The study lasted for 28 days. A 7- day acclimatization, a 7-day inducing ānemia and a 14 - day feeding trial. The extract was administered orally through drinking water bottles ad libitum for 14 days. Commercial hematinic - ferrous sulphate was used as control.Group 1 was fed rat chow alone, group 2 rat chow with ferrous sulphate, group 3 rat chow with *T.occidentalis* extract and group 4 rat chow with *A.viridis* extract. The weights of animals were recorded each day. Daily food intake and extract were recorded to calculate nutrient intake.

Blood sample collection

Anemia was induced to the rats by collecting 2 millilitres of blood between the hours of 8.00 – 10.00am for the second 7 days of the study. The blood was collected from ophthalmic venous plexus located in the orbital sinus of the rat using a heparinized-capillary tube. Blood was collected on day 0, 7, 12, 17 and 22 for haematological determinations.

Biochemical indices

The following biochemical indices were carried out. The haemoglobin level, red blood cell count, serum ferritin, serum iron, serum zinc and serum retinol.

Data analysis

Data collected was subjected to analysis of variance (ANOVA) Steel (11). Means was separated using Least Significance Difference (LSD) and significant was $p>0.05$