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Short communication

## Biochemical changes in serum of Rat treated with aqueous extract of the fruit of *Telfairia Occidentalis*

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### ABSTRACT

The effects of the ethanolic fruit extract of *T. Occidentalis* on some enzymes and biochemical parameters were evaluated in rats. 100,500, and 1000mg/kg of the extract were administered orally and once daily to three different groups of rats, respectively, for 28days. The fourth group which served as Control received distilled water only. On the 29<sup>th</sup> day, the rats which had been fasted overnight were dissected under Chloroform anaesthesia and blood was collected directly from their hearts. The blood was allowed to clot and centrifuged to obtain the serum which was kept in a refrigerator at -4 °C until used for analysis of the following parameters :alanine and aspartate transaminases, alkaline phosphatase, cholesterol, Triglycerides, creatinine, high density lipoproteins, total and conjugated bilirubin, and total proteins. The fruit extract of the plant significantly elevated the serum concentrations of cholesterol, triglycerides, total proteins, at the three dose levels. The 500 and 1000mg/kg doses increased the concentrations of HDL and conjugated bilirubin. While only 100 and 500mg/kg doses of the extract reduced the level of total bilirubin. The hypercholesterolemic, hyperproteinemic, hypertriglyceridemic and hyperconjugated bilirubinemic effect of this extract coupled with the increased activity of alkaline phosphatase suggest that the fruit of *Telfaira Occidentalis* may not be safe for consumption. This is quite contrary to the nutritional usage of the leaf and seed of this plant. (**Afr. J. Biomed. Res. 9: 229 - 231**)

**Keywords:** *Telfaraia occidentalis*, pumpkin, fruit, enzymes, cholesterol, bilirubin, rat

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## INTRODUCTION

*Telfairia occidentalis* commonly known as fluted pumpkin is also known as fluted gourd, Costillada (Spanish), Krobonko (Ghana), and Gonugbe (Sierra Leone). The plant belongs to the Cucurbitaceae family and is cultivated across lowland humid tropics of West Africa – Nigeria, Ghana, Sierra Leone –mainly for its nutritional value (Axtell,1992). The leaves are eaten as vegetables while the seeds are either roasted or ground for other food preparations. Apart from the nutritional (Okoli,et al,1983), agricultural and industrial importance (Akoroda,1990) the plant is also medicinally useful. It possesses anti-inflammatory(Oluwole,2003), antibacterial (Odoemena,1995), erythropoietic (Ajayi et al,2000), anticholesterolemic (Eseyin et al,2005a),and antidiabetic (Eseyin et al, 2000; Eseyin et al,2005b) activities.

The fruits of *T.Occidentalis* are among the largest known . The ripe fruit contains up to 13% oil. While various investigations have been carried out in the leaf, stem, seed and root of this plant, very little work has been done on the fruit. This work is therefore an attempt to kickstartresearches on the fruit of *Telfairia Occidentalis* so as to explore its medicinal value

## MATERIALS AND METHODS

**Plant Collection and Extraction:** The fruits of *Telfairia Occidentalis* were obtained from the medicinal plant farm of the Faculty of Pharmacy ,University of Uyo, Nigeria .The fruits were sliced open and the pulp and seeds evacuated. The fruits were then chopped into small bits. 4Litres of 96% ethanol was poured into a container containing 2.5kg of the fruit material and left for 72hours. The extract was filtered and concentrated in vacuo. The residue was dried in a dessicator.

**Administration of Extract to Animals :**Twenty Wistar albino rats of both sexes obtained from the animal house of the University of Uyo were used. The rats had free access to water and standard palletized feed, and they were kept in the care of experienced animal technicians. Prior to the administration of extract, the rats were fasted overnight. They were divide into four equal groups.

100,500, and 1000mg/kg of the fruit extract was orally administered once daily for 28days to groups 1,2, and 3, respectively. While group 4 (control) received distilled water only instead of the extract.

**Collection of Blood:** On the 29<sup>th</sup> day, blood was collected from the heart of the overnight fasted rats under chloroform anaesthesia. The blood collected was allowed to clot and centrifuged to obtain the serum. The blood serum was kept in a refrigerator at 0-4°C until it was used.

**Estimation of Biomolecules:** Appropriate commercias kits (Randox Laboratories, U. K.) were used to determine the concentrations of alanine and aspartate transaminases (ALAT and ASAT), alkaline phosphatase, cholesterol, Triglycerides, creatinine, High density lipoproteins (HDL), total and conjugated bilirubin, and total proteins.

**Alanine Transaminase (ALAT):** The method involves the monitoring of the concentration of pyruvate hydrazone formed with 2,4-einitrophenyl hydrazine

**Aspartate aminotransferase(ASAT):** The principle of the method used involved monitoring the concentration of oxaloacetate hydrazone formed with 2,4,-dinitrophenyl hydrazine

**Alkaline phosphatase (Phenolphthalein Monophosphate method):** This method is based on the principle that serum alkaline phosphatase hydrolyzes a colourless substrate of phenolphthalein that results in phosphoric acid and phenolphthalein at alkaline PH.values. The pinkly coloured product is measured colorimetrically at 550nm.

**Triglycerides:** This involves the enzymatic colorimetric test of glycerol phosphate oxidase method

**Total Cholesterol:** This was carried out by the enzymatic colorimetric chod-PAP method

**HDL-Cholesterol:** high density lipoprotein (HDL) separated from chylomicrons. Very low density lipoproteins (VLDL) and low density lipoproteins (LSL) by the addition of a phosphotungstic and magnesium chloride (precipitating reagent) to the serum. After centrifugation, the cholesterol content was determined by the enzymatic colorimetric method.

**Total Protein:** This was done using the Biuret method.

**Table 1 :**Effects of the fruit extract of *Telfairia Occidentalis* on some biochemical parameters in rat ( $n = 5$  \*  $P < 0.05$ )

Biomolecules	Control	1000mg/kg	500mg/kg	100mg/kg	F
Cholesterol (mmol/L)	4.262±0.214	5.9772*± 0.139	6.3156*± 0.21	5.5916± 0.562	39.7
Triglycerides mmol/L)	1.578±0.166	1.8308*± 0.0356	1.7824*± 0.06	1.9132*± 0.0949	8.34
Creatinine (mmol/L)	126.4 ± 49.67	65.2± 18.0	112.2 ± 39.19	81.6± 38.2	2.21
ALAT (U/L)	22.2± 8033	19.4 ± 7.90	28.2 ± 1.60	25.0 ± ±5.06	1.70
ASAT (U/L)	18.0 ± 3.35	22.0 ± 4.38	18.0± 3.35	21.6 ± 5.20	1.47
HDL (mg/kg)	1.422 ± 0.118	1.802 *± 1.55	1.314 ± 0.136	1.566 ± 0.228	7.54
Total Bilirubin (µmol/L)	13.026 ± 1.997	19.31± 8.33	7.40*± 1.74	8.07*± 3.33	5.16
Conjug. Bilirubin (µmol/L)	3.986 ±0.63	21.09* ± 10.09	6.74 *± 2.11	5.965 ± 3.159	7.76
Total Proteins (g/L)	49.402± 1.112	67.868*± 1.89	65.168* ±3.229	64.424* ± 3.70	51.55
Alkaline Phosphatase (U/L)	27.2 ± 1.60	35.6* ±1.019	33.6*± 2.87	34.0* ± 2.83	11.85

**Creatinine:** Modified Jaffe's method was used. Creatinine which is a hydride of creatine reacts with alkaline sodium picrate to form a red complex which can be determined photometrically.

**Total and Conjugated Bilirubin:** This was based on colorimetric method

**Statistical Analysis:** Data were expressed as Mean + SEM and were analysed by two way ANOVA and Scheffe's post test.  $P < 0.05$  was taken as significant.

## RESULTS AND DISCUSSION

As could be seen from Table 1: 100,500, and 1000mg./kg of the extract significantly elevated the serum concentration of Cholesterol (5.5916, 6.3156, and 5.9772 mmole/L), Triglycerides (1.9132, 1.7824, and 1.8308mmol/L), total proteins (64.424, 65.168, and 67.868mmol/L), and alkaline phosphatases (34.0, 33.6, and 35.6 U/L). HDL was elevated significantly only by 1000mg/kg dose (1.802mmol/L), conjugated bilirubin by 500 and 1000mg/kg doses (6.74 and 21.09mmol/L, respectively). Only the 100 and 500mg/kg doses significantly reduced serum level of total bilirubin (i.e. 8.07 and 7.40mmol/L) compared to control (13.03mmol/L). It is obvious from the above data that the fruit extract caused hypercholesterolemia, hypertriglyceridemia and increased alkaline phosphatase level. While hyperproteinemia is indicative of inflammatory process, conjugated bilirubinemia is indicative of lockage of the hepatic or common bile ducts. Elevated serum level of alkaline phosphatase is diagnostic of bone disorders while cholesterolemia occurs in affected liver.

It could therefore be concluded that the fruit extract had a damaging effect on the rat liver and bones, and may therefore not be safe for consumption for a prolonged period, except probably at very low dose.

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