IN-VIVO EVALUATION OF THE EFFECTS OF ETHANOLIC LEAF EXTRACT OF *Gongronema latifolia* ON ASPARTATE AMINOTRANSFERASE (AST) AND BILIRUBIN SECRETIONS IN ALBINO RATS

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ABSTRACT

Blood samples from four groups of albino rats with four rats per group were analyzed for aspartate aminotransferase and bilirubin secretions. The analysis was carried out in two phases; phase 1 and phase 2. In phase one, which is the zero analysis, the weights of the animals were taken and the blood samples were collected through the nostril after an ocular puncture to analyse for AST and Bilirubin secretions. In phase 2, group A, B, and C were administered 500 mg/kg, 250 mg/kg and 125 mg/kg of *G.latifolia* leaf extract while the control (group D) were administered only tragacant solution. After three weeks of administration, their blood samples were collected using the same method to monitor the effects of the extract on both AST and bilirubin secretions. The results showed that there was a 25 % increase in weights of the rats and a decrease in the values of AST and bilirubin secretions in the rats except in the control that were not administered the extract. This means that *G. latifolia* leaf extract may have healing effects on the liver.

Keywords: Leaf extract, *Gongronema latifolia*, Aspertate Aminotransferase, Bilirubin

INTRODUCTION

Gongronema latifolia is a forest leafy vegetable that grows in the forest of southeastern Nigeria (Akpan, 2004). The plant has been used in the production of several herbal products. This is because users of herbal products tend to believe that these botanicals are inherently safe (Ernst *et al*, 1995). At present, *G. latifolia* has been used in the treatment of stomach problems, dysentery, malaria, worm, cough, and high blood pressure (Agbo *et al*, 2005). The plant is also used in the treatment of diabetes mellitus (Gamaniel and Akah,1996) due to its bio-active compounds. Despite the enormous use of *G. latifolia*, there is little or no information on the effects of the plant on the liver functions, hence this work. Bilirubin formerly referred to as hematoidine is the yellow breakdown products of normal heme catabolism. It is a lipid-soluble substance usually carried in plasma as a plasma protein bound substance (Aka, 2004). In certain condition, the concentration of pigment increases and causes jaundice (icterus) when the skin, sclera of the eye and the body fluids become pigmented yellow (Baker and Silverton, 2001). It is produced when the liver breakdown old red blood cells. Bilirubin is removed from the body through the faeces (stool) and gives stool the normal brown colour.

Aspartate aminotranferase(AST) also called serum glutamic oxaloacetic transaminase (SGOT) is an enzyme found in diversity of tissues such as the heart, liver, skeletal muscle, pancreas, kidney and red blood cells (Gaze, 2007). It is an aminotransferse because it transfers an amino group into kitoacids. It is found predominantly in the cytoplasm and mitochondria. They are released into the blood when the organ or tissues where it is found are injured. The amount of AST is directly related to the number of cells affected by

on the length of time the blood is tested after the injury. The clinical significance of AST is that it helps to assess the probability of liver to develop myocardial infarction.

MATERIALS AND METHODS

The reagents used for this research were all analytical grades and those that were commercially prepared by Randox

Experimental Animals

Animals used were adult albino rats of different sexes. The animals were bought from Zoology Department, Faculty of the biological Sciences, University of Nigeria, Nsukka.

Collection and Preparation of *G.latifolia* Leaf

Gongronema latifolia leaves were obtained from Umunengwa in Ihe-owere Community, Nsukka Local Government Area of Enugu State and was identified in the department of Crop science, University of Nigeria, Nsukka. The leaves were air dried for about four weeks after which they were pulverized before they were extracted with ethanol. The extract was concentrated in hot air oven at 60^0c before it was used.

Administration of *G.latifolia* Leaf Extract to the Animals

The animals were divided into four groups (A, B, C and D). Each group contains four albino rats with group D serving as the control. Their respective weights were taken before and after the administration of the leaf extract. The rats were administered the dried leaf extract of *G. latifolia* orally for three weeks. Group A, B, C were administered 500 mg/kg, 250 mg/kg and 125 mg/kg of the leaf extracts respectively using 10% tragacant as the vehicle and group D (control) was administered 10 % tragacant solution only.

Determination of Aspartate Aminotranferase (AST)

Apartate Aminotransferase (AST) and Bilirubin were determined in the animal's blood before and after administration of the extract, using kits from Randox Laboratories Ltd, United Kingdom.

RESULTS AND DISCUSSION

The results of the analysis carried out on the blood samples from the albino rats for the determination of Aspartate aminotransferase (AST) and bilirubin secretions before and after the experiment are shown in table 1 and 2 below.

Table 1: Concentration of AST and Bilirubin in the Blood of the Albino Rats and their Weights at Zero Analysis

Groups	Rats	Conc. of AST (U/L)	Conc. of Bilirubin (Mg/dl)	Weights (g)
	A1	362.80	9.952	200
	A2	339.60	1.396	150
A	A3	277.20	6.372	150
	A4	234.00	10.296	200

	B1	101.00	9.310	200
	B2	207.80	0.234	250
B	B3	212.40	11.806	150
	B4	277.20	11.060	200
	C1	324.00	3.240	150
	C2	223.20	4.644	250
C	C3	384.20	4.088	150
	C4	109.20	11.932	200
	D1	46.00	8.402	200
	D2	237.60	1.804	200
D	D3	108.00	1.020	150
	D4	290.20	9.420	200

Values are replicates from four trials

Table 2: Concentration of AST and Bilirubin in the Blood of the Albino Rats and their Weights after Administering the Extract for three Weeks

Groups	Rats	Conc. of AST (U/L)	Conc. Of Bilirubin (Mg/dl)	Weights (g)
	A1	194.40	4.320	250
	A2	187.20	0.324	200
A	A3	259.20	1.296	200
	A4	201.20	1.404	250
	B1	64.80	6.048	250
	B2	129.60	0.216	275
B	B3	198.00	5.724	300
	B4	122.40	3.240	250
	C1	165.60	0.216	200
	C2	151.20	0.108	200
C	C3	223.20	2.808	200
	C4	61.20	4.108	200
	D1	53.60	9.072	200
	D2	251.20	2.700	200
D	D3	223.20	1.080	150
	D4	291.20	9.720	200

The results of the analysis of the blood samples collected from the rats after they have been orally administered *G. latifolia* leaf extract for three weeks showed that there was a significant decrease ($p > 0.05$) in AST and bilirubin secretions. This means that the extract may have healing properties on the liver. The decrease in the bilirubin secretion may also have resulted from the erythropoietic activities of *G. latifolia* extract since *G. latifolia* leaves can stimulate red blood cell production (Satih, 2007). There was an increase in the weights of the rats after the administration of *G. latifolia* leaf extracts; this could be as a result of its use for nutritional purposes as described by Dalziel (1931). The increase in the weights of the rats could also be as a result of the ability of *G. latifolia* extract to increase red blood cell production. In zero analysis, group A, B and C showed little secretion of AST but after the administration of the extract for three weeks, there was a decrease in the level of AST (table 2).However, the level of AST in group D which served as the control did not increase. After the administration of the extract for three weeks, there was little or no bilirubin secretion except in the control which was administered only tragacant solution (Table 2). Thus, *G. latifolia* plant could represent a led source of natural medicinal product of properly utilized (Eze etal, 2010). From this research, it could be deduced that *G. latifolia* leaf extract is also a good source of nutrient which can help in the erythropoietic process. This can be seen from the significant increase in the weights within 21 days of the administration of the extract. Onyeka and Joy, (2001) suggested that these qualities of *G. latifolia* could be used in drug production. Overall, the effects of 250 mg/kg and 500 mg/kg of the extract gave the best result on the liver function.

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