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In-Vivo Evaluation of the Effects of *Physcia grisea* Extract on Alanine Aminotransferase (ALT) and Alkaline Phosphostase (ALP) Secretions in Albino Rats

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ABSTRACT

Blood samples from four (4) groups (A, B, C and D) of albino rats of four rats per group were analyzed for Alanine Aminotransferase (ALT) and Alkaline Phosphatase (ALP) secretions. The analysis was carried out in two phases; phase 1 and phase 2. In phase one, which was the zero analysis, the weights of the animals were taken and the blood samples were collected and analysed. From the analysis, it was observed that there were secretions of ALT and ALP in the albino rats before administration. In the second phase of the analysis, the groups A, B, and C were orally administered 500 mg/kg, 250 mg/kg and 125 mg/kg of *P. grisea* respectively while the control (group D) were administered tragacant solution which was the vehicle used. After three weeks of administration, the blood samples were collected for final analysis to check the effect of *P. greasia* on both ALT and ALP secretions. It was however observed that there was significant decrease (P>0.05) in ALT and ALP secretions except in group D that served as the control. This could therefore be deduced that *P. grisea* may have a hepato-protective ability if properly utilized.

Keywords: *Physcia grisea*, Alaninine Aminotransferase, Alkaline Phosphatase and Extract.

INTRODUCTION

Naturally occurring, plant-derived substances with minimal or no industrial processing have been used in the treatment of illness/ infections within our local and regional settings. *Physcia grisea* is one of the medicinal plants in which the uses of its extract against fungus and bacteria have been well documented. Thus, *P. grisea* possesses a wide broad spectrum of antimicrobial actions and could represent a novel source of drugs

belonging to a wide range of structural classes (Eze and Ogonnaya, 2010).

P. grisea are lichen found on walls, rocks, and trees attached by short threats which grow from the underside and are white with black tips. The plant is light grey and slightly brownish grey, and is almost always covered, at least near the tips of the lobes with a very fine white powder. The colour develops a greenish tinge when the plant is wetted (Nicholson, 1966).

The assessment of antimicrobial activity and interaction of *P. grisea* extracts as carried out by Eze and Onumah (2010) may provide opportunities for new drugs because of their matched less availabilities of chemical diversity. However, there is little or no work on the effects of *P. grisea* extract on renal and liver functions. This work is therefore aimed at determining the in-vivo effects of *P. grisea* on Alanine Aminotransferase (ALT) and Alkaline Phosphostase (ALP) secretions in albino rats.

MATERIALS AND METHODS

The reagents used for this research were all analytical grades and those that were commercially prepared by Randox Laboratory Ltd, United Kingdom.

Experimental Animals

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

Collection and Preparation of *P. grisea*

P. grisea was obtained from Ezimo in Udenu Local Government Area of Enugu State and was identified in the Department of Crop Science, University of Nigeria, Nsukka. The plant material (*P. grisea*) was air dried for about four weeks after which, they were pulverized into fine powders before they were weighed and dissolved in the tragacant solution. The solution was left to stand for 48 hours for thorough dissolution before administration.

Administration of *P. grisea* 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 extract. The rats were administered the solution of *P. grisea* extract orally for three weeks. Group A, B, C were administered 500 mg/kg, 250 mg/kg and 125 mg/kg of the extracts respectively using 10% tragacant as the vehicle and group D (control) was

administered 10 % tragacant solution only.

Determination of ALT and ALP

Alanine Aminotransferase (AST) and Alkaline Phosphatase (ALP) were determined in the animal blood before and after administration of the extract, using kits from Randox Laboratories Ltd, United Kingdom as described by Reitman and Frankel (1957).

RESULTS

The results of the analysis carried out on the blood samples collected from the adult albino rats for the determination of Alanine aminotransferase (ALT) and ALP secretions before and after the administration of *P. grisea* were shown in table 1 and 2 below.

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

Groups	Rats	Conc. of ALT (U/L)	Conc. of ALP (U/L)	Weights (g)
	A1	151.20	2588.88	200
A	A2	122.40	2340.20	200
	A3	256.20	6541.20	150
	A4	147.60	1920.40	150
	B1	180.00	1840.20	150
B	B2	79.20	2470.20	250
	B3	144.00	2423.28	150
	B4	165.60	2240.30	150
	C1	230.40	2680.30	300
C	C2	302.40	3698.40	150
	C3	302.40	2870.40	200
	C4	306.00	1480.50	150
	D1	115.20	1508.30	150
D	D2	201.60	1853.42	150
	D3	132.60	924.60	250
	D4	153.60	1848.32	150

Values are replicates from four trials

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

Groups	Rats	Conc. of ALT (U/L)	Conc. of ALP (U/L)	Weights (g)
	A1	133.20	1540.08	250
A	A2	100.80	1821.60	250
	A3	169.20	1153.68	200
	A4	129.60	1747.08	250
	B1	162.00	1738.80	200
B	B2	75.60	2346.00	275
	B3	79.20	1429.68	200
	B4	79.20	1807.80	200
	C1	122.40	2312.88	300
C	C2	36.00	979.80	175
	C3	97.20	1504.20	200
	C4	104.40	1181.28	200
	D1	115.80	1512.48	200
D	D2	201.60	1857.48	200
	D3	133.20	926.70	250
	D4	154.80	1863.00	200

Values are replicates from four trials

DISCUSSION

The results of the analysis of the blood samples collected from the rats after they have been orally administered *P. grisea* extract for three weeks showed a significant decrease ($p > 0.05$) in the levels of ALT and ALP secretions when compared to the control. Liver enzymes such as ALT, AST and ALP are marker enzymes for liver function and integrity (Jens and Hanne, 2002; Adaramoye *et al*., 2008; Ajayi *et al*., 2009). It has been severally reported that liver enzymes are liberated into the blood whenever liver cells are damaged and enzyme activity in the blood is increased (Edward *et al*., 1995; Effraim *et al*., 2000). Elevation of these liver enzymes is also associated with cell necrosis of many tissues especially the liver (Adedapo *et al*., 2004). The fact that the activities of these enzymes were reduced after treatment with *P. grisea* extracts indicated that the extract did not have necrotic effects on the liver. Thus, *P. grisea* extract may have healing properties on the liver (Ugwu and Eze, 2010).

There was an increase in the body weights of the rats in both treatment groups and the control after the administration of *P. grisea* extract; the increase could be as a result of the nutritional constituents of the feed used in feeding the animals. In zero analysis (table 1), group A, B and C showed little or no secretion of both ALT and ALP but, after the administration of the extracts for three weeks, there was a significant decrease (P>0.05) in the levels of ALT and ALP (table 2). However, there was no significant changes in the levels of these enzymes in the control group (group D) which was administered tragacant solution only (table 2). Thus, *P. grisea* extract could have hepato-protective ability if properly utilized. This is in line with Eze *et al*., (2010) that *P. grisea* could represent a led source of natural medicinal product.

Overall, the effects of 125 mg/kg of the extracts gave the best result on the liver function.

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