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Body and Organ Weight Changes Following Administration of Aqueous Extracts of *Ficus exasperata.* Vahl on White Albino Rats

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Abstract: Administration of aqueous extracts of *Ficus exasperata.* Vahl at doses 100, 200, 500 and 1000 mg kg^{-1} body weight to male albino rats resulted in a significant ($p \geq 0.05$) increase in body weight in all test group mean relative kidney and liver weights increased significantly in all test groups while spleen weight decreases from $8.4x10^{-3}\pm7.9x10^{-3}$ to $6.0x10^{-3}\pm5.5x10^{-4}$ in the group receiving the highest dose. Serum alanine and aspartate aminotransamisase as a well as serum alkaline Phosphatase activity increased in a dose dependent manner all the test groups.

Key words: Aqueous extract, *Ficus exasperata*, vahl, body weight, organ weight

INTRODUCTION

Ficus exasperata, Vahl can be classified as a tree or shrub. It's common name is sandpaper leaf Nimenibo-Uadia, 2003.

The plant leaves are used in wood polishing and for cleaning of pots and pans. (Personal Communication).

It is used in ethnomedicinal preparations for treating a number of diseases, the viscid clear non-milky sap of the tree is used for treating sores, abscesses, eye trouble and stomach pains in Ivory Coast as cited by[1]. The sap is used to arrest bleeding in Ghana[2] the bark is boiled and the extract given to cows to hasten expulsion of afterbirth.

In Ivory Coast the leaves are pulped up and used in treatment of leprous sores[3].

In Nigeria the rough leaves are used in the treatment of diarrhea. Extracts of the plant are used to poison arrows for hunting in Ghana. There are reports of toxicity of the plant to goats[2].

The present study is a preliminary one aimed at assessing the effect of a 2weeks (14 days) exposure of experimental rats to crude aqueous extracts of the leaves on vital body organs.

MATERIALS AND METHODS

Collection of plant material: Fresh stem cuttings of *Ficus exasperata*, Vahl, were collected from around the farms at Michael Okpara University of Agriculture, Umudike. The plant was identified by Dr. A.O.A. Meregini of the Department of Forestry of the same University and voucher specimen was kept.

Preparation of plant extract: About 1500g of the collected leaves was air dried to a constant weight and ground in a porcelain mortar and pestle to a coarse powder. A 300 g portion of the ground plant material was extracted in two liters of distilled water. This was done by mixing thoroughly to remove air bubbles and allowing to stand for 24 hrs with constant stirring. The extract was then filtered through a fine sieve and refiltered through Whatman No.1 filter paper. The filtrate was evaporated over a water bath. The residue was redisolved in water to obtain different concentration of the aqueous extract.

Experimental design and procedure: Young adult male albino rats of wistar strain weighing 60-120 g were purchased at the animal breeding unit of the College of Vertinary Medicine University of Nigeria Nsukka. They were kept in well ventilated plastic cages. Feed (grower feed supplied by Vital Feed Ltd) and water were given *Ad-libitum.* Animals were exposed to a 24 hrs light and dark cycle under humid tropical conditions. After a one-week equilibration period they were divided into five groups of four rats each. Group I, which served as control received an equivalent volume of distilled water while groups II, III, IV and V received 100, 200, 300, 400 and 500mg kg^{-1} body weight of aqueous extract of *Ficus exasperata*, respectively. The doses were administered orally.

At the end of the experiment the animals were sacrificed by dazing and blood was collected by cardiac puncture from a bleeding heart. Organs were promptly excised and dabbed with filter paper to remove blood and other liquid. They were then weighed using a satorium

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top-loading balance. The serum was allowed to separate and collected and analyzed for serum Akaline phosphatase, serum alanine amino transaminase activity and serum aspartate amino transaminase activity using kits supplied by Randox Co. UK.

Statistical analysis: This was carried out using analysis of variance (ANOVA) oct 0.05 95% confidence interval.

RESULTS

Administration of extracts to experimental animals resulted in a significant ($p \geq 0.05$) in body weight of animals relative to control. Group V receiving the highest dose of the extract gained less weight than all the other groups. (Table 1) Mean relative kidney weight (Table 2) increased a dose dependent manner in all the experimented groups. The same pattern is seen in mean relative liver weight (Table 2). However means relative spleen weight decreased in a dose dependent manner. Table 3 shows that activity of serum alkaline phosphatase increased in a dose dependent manner doubling control values in groups IV and V receiving 500 mg kg^{-1} and 1000 mg kg^{-1} body weights, respectively. Also serum alanine aminotansaminase activity increased in a dose dependent manner becoming approximately four and five times the control value at dose 500 and 1000mg kg^{-1} body weight. About the same pattern is seen in the activity of as partate aminotransaminase activity. These increases were all found to be statistically significant ($p \leq 0.05$).

Table 1: Percentage body weight gained by animal

Group/Treatment	Mean weight gained
Group I Distilled Water	36.56±7.56
Group II 100 mg kg^{-1}	38.43±8.32
Group III 200 mg kg^{-1}	39.55±9.62
Group IV 500 mg kg^{-1}	43.80±11.97
Group V 1000 mg kg^{-1}	36.75±14.84

Results are means of four animals for group II, III, IV, V and means of 3 animals for control I

Table 2: Results of mean relative organ weight

Group/ Treatment	Kidney	Liver	Spleen
Group I	$5.6x10^{-3}$±$1.4x10^{-3}$	0.033±$7.0x10^{-3}$	$8.4x10^{-3}$±$7.9x10^{-3}$
Group II	$6.8x10^{-3}$±$2.7x10^{-3}$	0.040±$1.5x10^{-2}$	$7.9x10^{-3}$±$7.8x10^{-4}$
Group III	$8.5x10^{-3}$±$1.1x10^{-3}$	0.042±$9.8x10^{-3}$	$7.3x10^{-3}$6.$1x10^{-4}$
Group IV	$9.1x10^{-3}$±$4.0x10^{-3}$	0.047±$9.6x10^{-3}$	$6.7x10^{-3}$±$1.4x10^{-3}$
Group V	$1.2x10^{-2}$±$1.8x10^{-3}$	0.049±$4.9x10^{-3}$	$6.0x10^{-3}$±$5.5x10^{-4}$

Results are means of four animals for group II, III, IV, V and means of 3 animals for control I

Table 3: Enzyme activities

Group/Treatment	ALP (U/L)	ALT (U/L)	AST (U/L)
Group I Distilled Water	40.48±3.2	8.75±1.06	13.38±1.6
Group II 100 mg kg^{-1}	44.90±0.96	12.38±0.53	17.13±0.53
Group III 200 mg kg^{-1}	47.55±1.06	15.25±1.77	19.0±0.71
Group IV 500 mg kg^{-1}	84.89±3.55	33.5±3.54	35.3±1.7
Group V 1000 mg kg^{-1}	96.14±2.6	54.0±2.83	42.25±0.35

Results are means of four animals for group II, III, IV, V and means of 3 animals for control I

DISCUSSIONS

Our findings indicate that the administration of extracts of *Ficus exasperata* supported weight gain at the doses under study. The weight increases could have arisen from increases in organ weight as is seen on Table 2. The increase in relative organ weight could be attributable to induction of Xenobiotic enzymes leading to increased protein synthesis. This finding agrees with the findings of[3] who have earlier observed increases in the weight of some vital body organs following the dietary inclusion of *Vernonia amygdahina.* del. Both organs (Liver and Kidney) are involved in the metabolism of Xenobiotics and express inducible Xenobiotic biotransformation of enzymes. The induction of these enzymes frequently results in an increase in mean relative organ weight following an exposure to Xenobiotics[4].

Our finding of reduction in spleen weight (Table 2) is quite interesting as if appears to support the use of the plant in the treatment of hypersplenism[5] in sheep and goats.

Increase in serum alkaline phosphatase activity as observed in this study could be indicative of liver damage and also an obstruction of biliary duet. This agrees with the findings of Kerharo[6] who had earlier observed increased serum alkaline phosphatase activity in animals fed leaves of *Ficus exaspearata* Vahl.

Increases is serum alanine and asparatate amino transaminase activity observed in this study suggest a mild damage to liver mitochondrial or cytoplasmic membranes which the enzymes especially serum amino transaminase serve as abiochemical marker[7].

CONCLUSION

This study suggests the need to use aqueous extracts of *Ficus exasperata* at low concentrations in medicinal preparations to avoid possible change to vital body organs.

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