The Effects of Leaf Extract of Guava on the Liver Enzymes of Adult Wistar Rats.

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Abstract- Guava leaves have been used to treat cough and pulmonary diseases; they have also served as anti inflammatory and haemostatic agent in china. This work is therefore aimed at investigating the effects of guava leaf extract on the liver enzymes of adult wistar rats. Twenty apparently healthy wistar rats were used for this study. They were allocated into four groups (A, B, C & D) of five animals each. Group A served as the control and was orally administered with 0.5ml of distilled water; the experimental groups B, C, & D were orally administered 250mg/kg, 500mg/kg and 750mg/kg of guava leaf extract respectively for fourteen days. Twenty four hours after the last administration, the animals were dissected. Blood for serum preparation were collected through cardiac puncture. The activities of serum aspartate aminotransferase (AST), alanine aminotransferase (ALT) and alkaline phosphotase (ALP) were determined using randox kit method. There were no biochemical alterations in the activities of serum aspartate aminotransferase (AST), alanine aminotransferase (ALT) and alkaline phosphotase (ALP).

Index Terms- Liver enzymes, Wister rat, Body weight, Serum, Guava.

I. INTRODUCTION

Guavas are plants in the myrtle family (Myrtaceae) genus psidium, which contains about 100 species of tropical shrubs and small trees. They are native to Mexico, Central America and northern south America. Guavas are now cultivated and naturalized throughout the tropics and subtropics in Africa, south Asia, subtropical regions of North America, New Zealnd, Australia and Spain [1].

Guavas are rich in dietary fiber and vitamin C with moderate levels of folic acid. Having a generally broad, low calorie profile of essential nutrients, a single common guava fruit contains about four times the amount of vitamin C as orange [2].

However guavas contains both carotenoids and polyphones like (+)- gallocatechine, leucocyanidin and amritoside. The major classes of antioxidant pigment giving them relatively high potential antioxidant value among plant food. As these pigments produce the fruit skin and flesh color, guavas that are red orange have more pigment content as polyphenols, carotenoid and pro-vitamin A, retinoid sources than yellow – green ones [3, 4, 5]

Since the 1950s, guavas- particularly the leaves have been the subject for livers research on their constituents, pharmacological properties and history in folk medicine [6]

From preliminary medical research in laboratory model, extracts from guava leaves are implicated in therapeutic mechanisms against cancer, bacterial infections, inflammation and pain [7, 8, 9]

This work is therefore aimed at investigating the effect of leaf extract of guava on the liver enzymes of adult wistar rat.

II. MATERIALS AND METHODS

2.1 Experimental Animals

Twenty apparently healthy wistar rats were used in the study. They were purchased from animal house, department of pharmacy, Nnamdi Azikiwe University Agulu Campus and were allowed to acclimatize in the animal house of department of Anatomy, Nnewi Campus for one week. They were maintained under standard housing condition and fed with standard rat chow and with water ad libitum.

2.2 Preparation of the Extract

Guava leaves were plugged from Okofia, Nnewi, Anambra State. They were authenticated in herbarium unit of botany department, Nnamdi Azikiwe University. The leaves were air-dried for two weeks. It was then put in an oven to make them crimsy. The leafs were grinded to fine powder for extraction. 250g of the extract was dissolved in 200ml of distilled water and administered to the animals.

2.3 Experimental Protocols

The animals were divided into four groups of five animals each. Group A served as the control and received 0.5ml of distilled water. The experimental groups B, C & D received 250mg, 500mg and 750mg of the extract orally administered respectively for a period of fourteen days. Twenty four hours after the last administration, the animals were sacrificed using chloroform inhalation method. Liver tissues were removed and weighed. Blood samples were collected through cardiac puncture using sterile syringes and needles. Blood for serum preparation was collected into sterile plain tubes for analysis. The activities of serum aspartate aminotransferase (AST), alanine aminotransferase (ALT) and alkaline phosphates (ALP) were determined using randox kit method.

2.4 Statistical Analysis

The result obtained from this study was analyzed by one – way analysis of variance using SPSS version 16. The significance of the difference between the mean value of the measured parameters in the control and experimental group was evaluated by t-test. A significant change is to be considered acceptable is at $P<0.05$.

III. RESULTS

3.1: Morphometric Analysis of Body Weights

Table1: comparison of mean initials and final body weight in all the groups (A, B, C & D) (Mean ± SEM given for each measurement)

	Group	Group A	Group B	Group C	Group D
	Initial body weight (g)	180. 40 ± 2.40	200.00 ± 4.60	220.40± 2.60	240±-10± 4.20
	Final body weight (g)	191.10 ± 3.60	215.80±2.80	225.20±4.10	249 - 20± 7.10

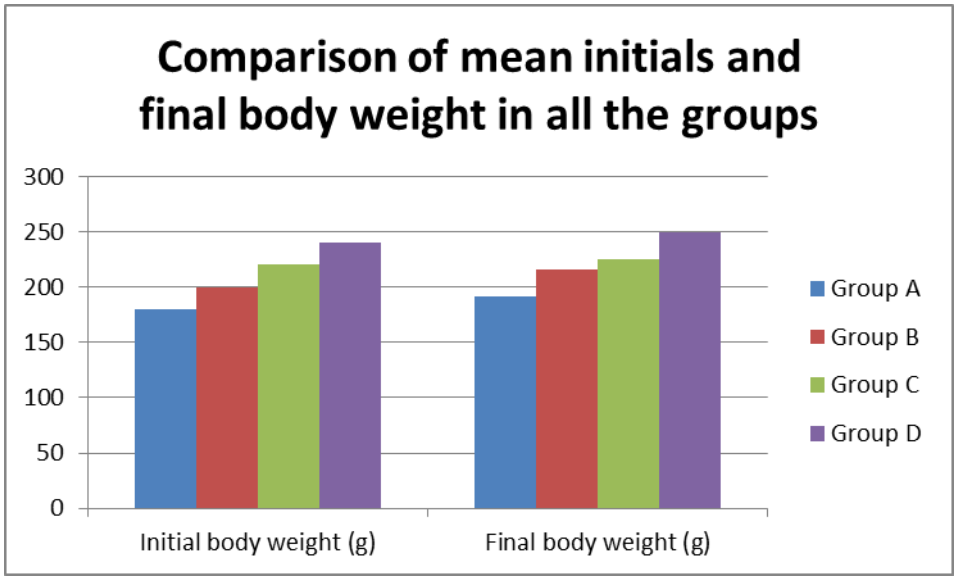

Figure 1: Bar chart showing the mean initial and final body weight

3.2: Morphometric Analyses of Liver Weight

Table 2: Comparison of mean relative liver weight of the entire groups (A, B, C, & D) (Mean ± SEM given for each Measurement)

	Group A	Group B	Group C	Group D
Liver weight	5.20 ± 0. 140	5.35 ± 0310	5.41± 0.380	5.49 ± 0.280

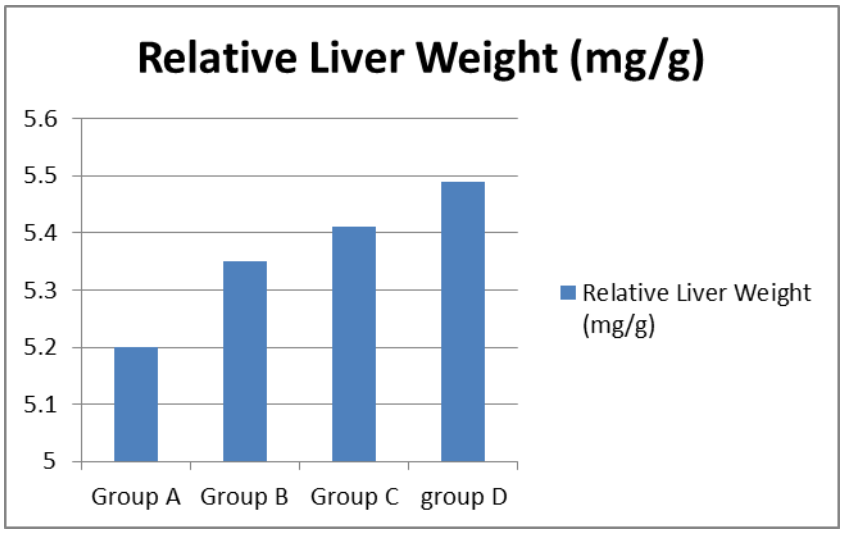

Figure 2: Bar chart showing the relative liver weights of all the groups

3.3: Activities of serum levels of aspartate aminotransferase (AST), alanine aminotransferase (ALT) and alkaline phosphates (ALP)

Table 3: comparison of activities of serum levels of aspartate aminotransferase (AST), alanine aminotransferase (ALT) and alkaline phosphates (ALP)

Liver markers	Group A	Group B	Group C	Group D	F – ratio	Sig of Prob
ALP	137.94 ± 11.76	326.70 ± 124.79	376.20 ± 75.50	352.63 ± 75.50	12.30	P< 0.05
AST	28.42 ± 7.879	27.63 ± 7.484	28.00 ± 3.404	27.77 ± 3.816	45.04	P< 0.05
ALT	79.96 ± 54.012	78.54 ± 69.081	77.44 ± 70.340	77.14 ± 40.162	7.58	P< 0.05

IV. DISCUSSION

Knowledge of the health attributes of plants dates back thousands of years. Today scientific research has identified essential minerals and compounds in plants that are not only required for proper nutrition, but are responsible for health maintenance and disease prevention. These health promoting compounds are referred to as phytonutrients.

Physiochemical analyses of guava leaf reveal alkaloids, anthocyanins, carotenoids, essential oils, fatty acids, and flavonoids especially lectins, phenols, saponins, tannins, triterpenes and vitamin C [10, 11, 12, 13, 14, 15].

In the present study, the mean initial and final body weight for the experimental groups (B, C & D) treated with different doses of extract of guava leaves increased significantly with the control guava leaf extract in this instance functions primarily as a dietary supplement enhancing growth.

The comparison of the mean relative organ (liver) weight of the experimental groups indicated no significant increase or decrease (P<0.05). This could be as a result of physiochemical medicinal constituents of guava leaves and its antioxidant properties.

The activity levels of aspartate phosphates aminotransferase (AST), alanine aminotransferase (ALT), and alkaline phosphotase (ALP) were statistically similar with the control. This could be as a result of its radical-scavenging activity.

V. CONCLUSION

Guava leaf extract administered to animal in low and high doses did not induce adverse alterations in biochemical parameters of serum asparatate aminotransferase (AST), alanine aminotransferase (ALT), and alkaline phosphate (ALP).

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