

Effects of Aqueous Extracts of *Ficus Asperifolia* MiQ Leaves on Some Heamatological Parameters in Albino Wistar rats

Uwakwe, A.A. Chuku, L.C. Oluwa, V*. Opotu, R.O.
Department of Biochemistry Faculty of Science University of Port Harcourt

Abstract

This study investigated the effect of aqueous leaf extract of *Ficus asperifolia* leaves on some heamatological parameters in albino wistar rats. The wistar rats were grouped and were treated with different concentration of extract (control, 200mg/kg, 300mg/kg body weight) for four (4) weeks. The result showed an initial significant rise ($p < 0.05$) of packed cell volume (PCV) and Heamoglobin (Hb g/dl), with slight dose dependent increase by week four. However *F. asperifolia* has slight reductive effect on white blood cell (WBC $\times 10^9/l$) when compared to the control on the first week. Its boost is also evident on the red blood cells level as the result revealed a significant increase in RBC level from week one (1) to week four (4)(RBC $\times 10^{12}/l$). This however supports the use of the plant by locals as a blood booster in treating anemic patients.

Keywords: *Ficus asperifolia*; Heamatology, Wistar Rat, Medicinal plant

1.0 INTRODUCTION

Recently usage of herbal remedies in the management and cure of diseases is gaining fast grounds as several of herbs have been found to possess pharmacological properties thereby giving these herbs therapeutic potentials towards ameliorating disease conditions. Some of these herbs have been used directly to boost haematological parameters (Chatterjee, 2000).

The genus, *Ficus* with about 850 species of shrubs, hemiepiphytes, woody trees, vines and epiphytes is of the family of *Moraceae*. They are Collectively known as figs or fig trees, they may be found throughout the tropics with few species found in semi-warm zones. The leaves, stems, roots and fruits of fig trees have proven useful in ameliorating certain disease conditions. One of such is *Ficus asperifolia*, which is commonly found in the West-Central region of Africa, growing comfortably along streams. It's been proven to have antibacterial and reproductive effects (Annan and Houghton, 2008). Kafimiya *et al.*, 2010, revealed that *Ficus asperifolia* is rich in phytochemicals such as alkaloids, phytates, saponins, tannin and oxalate etc as well as the nine (9) essential amino acids, which however may account for its outstanding medicinal usage.

The leaves are normally brewed by the Ikwerres of the southern region of Nigeria and administered to anaemic patients as a blood booster.

Ojo and Akintayo, 2014, observed antioxidant potentials and phenolic content of the extract hence suggesting that an aqueous extract of *Ficus asperifolia* leaves is a potential source of natural antioxidants and may be responsible for its popular and wide traditional use. Oluwafemi *et al.*, 2016, also revealed that aqueous extracts of *Ficus asperifolia* exhibited detoxification potentials and curative effects against CCl₄ induced kidney injuries and oxidative damage in rats which could be attributed to its antioxidant constituents also confirming the work earlier reported by Ojo and Akintayo, 2014.

Materials and Methods

Collection and identification of Plant material

Fresh sample leaves of *Ficus asperifolia* were obtained from a farm at Alakahia Rivers state and identified at the Department of Plant Sciences and Biotechnology, University of Port Harcourt, Nigeria. The fresh leaves were air dried and finely powdered with an electric grinder.

PREPARATION OF CRUDE EXTRACTS OF *FICUS ASPERRIFOLIA* MIQ. LEAVES

Fresh leaves of *Ficus asperifolia miq* were washed under running water and air dried, the leaves were crushed using a mill and extracted with distilled water at a ratio of 1:4 leaf (g) to water (ml) after 25 hours at room temperature. It was then filtered using whatman number 1 filter paper and the filtrate was placed in a rotary evaporator using water bath at 46°C - 60°C in order to obtain the crude extract.

EXPERIMENTAL ANIMALS

Thirty six wistar albino rats weighing 175-250g bred in the animal house of the Department of Biochemistry, University of port Harcourt were used. They were randomly selected and kept in three (3) groups of twelve (12) rats.

Each group was kept in a separate cage, all the animals were fed with commercially produced feed and water given ad libitum. The feed was purchase from the livestock feed shops. Choba, a division of the livestock Feeds Nigeria Ltd, Lagos. Water was obtained from tap connected from the water treatment plant of the university. The

animals were subjected to 12 hours of light cycle in a properly ventilated room. The animals were allowed to acclimatize for a period of 7 days before the experiment commenced.

EXPERIMENTAL DESIGN

Group (1) served as positive control and received no treatment.

Group (2) and three (3) received aqueous extract of the plant at 200mg/kg and 300mg/kg respectively

Three animals from each group were randomly selected and sacrificed on the 7th, 14th, 21st and 28th days of the experiment. Blood samples were collected for analysis.

COLLECTION OF BLOOD AND LIVER SAMPLES FOR ANALYSIS

Each animal to be sacrificed was withdrawn from its cage 24 hours after administration of extract and anesthetized in chloroform saturated chamber.

The jugular vein was cut and fresh blood was collected into appropriately labeled EDTA sample bottles for hematology tests.

HEMATOLOGICAL DETERMINATIONS.

PACKED CELL VOLUME

Sample of well mixed uncoagulated blood, contained in parallel sided glass tubes were centrifuged, at approximately 12000 rpm for 10 mins in a specially designed centrifuge. The PCV was determined by measuring the height of the erythrocyte column and expressing this as a fraction of the height of the total blood column. A PCV reader was used for this purpose. $PCV = \text{height of packed cell column (n)} \div \text{Height of whole blood column (g/dl)}$

HAEMOGLOBIN (Hb) DETERMINATION

$Hb = PCV \div 3 \text{ (g/dl)}$

WHITE BLOOD CELL COUNT: This done using the method of Baker and Silverton, 1985

STATISTICAL ANALYSIS

Data collated were analyzed using analysis of variance (ANOVA). Test of significance was accepted at 95% confidence limit ($p < 0.05$).

RESULTS

Table 1.1 Effect of crude extract of *F. asperifolia* on haematological parameters of albino rats after 7 days.

TREATMENT	DOSE	PCV(l/l)	Hb(g/dl)	WBC X 10 ⁹ /l	RBC X 10 ¹² /l
CONTROL	-	40.00±0.00a	13.30±0.00	3.67±0.15	6.00±0.00
<i>F. asperifolia</i>	200mg/kg	44.00±1.00a,b	14.65±0.35a,b	4.00±0.50b	6.00±0.00d
	300mg/kg	46.00±1.00a,c	15.57±0.51	3.47±0.57b	6.57±0.05f

Result represents mean ± standard deviation

Table 1.2 Effect of crude extract of *F. asperifolia* on haematological parameters of albino rats after 14 days.

TREATMENT	DOSE	PCV(l/l)	Hb(g/dl)	WBC X 10 ⁹ /l	RBC X 10 ¹² /l
CONTROL	-	40.00±0.00	13.30±0.00	3.67±0.15	6.00±0.00
<i>F. asperifolia</i>	200mg/kg	42.67±0.58	14.17±0.15	4.27±0.25	5.90±0.10
	300mg/kg	45.67±2.51	15.10±0.85	3.37±0.15	6.27±0.25

Result represents mean ± standard deviation

Table 1.3 Effect of crude extract of *F. asperifolia* on haematological parameters of albino rats after 21 days.

TREATMENT	DOSE	PCV(l/l)	Hb(g/dl)	WBC X 10 ⁹ /l	RBC X 10 ¹² /l
CONTROL	-	40.00±0.00	13.30±0.00	3.67±0.15	6.00±0.00
<i>F. asperifolia</i>	200mg/kg	44.67±0.58	14.87±0.15	4.27±0.25	6.20±0.20
	300mg/kg	46.67±1.53	15.67±0.58	3.77±0.25	6.67±0.15

Result represents mean ± standard deviation

Table 1.4 Effect of crude extract of *F. asperifolia* on haematological parameters of albino rats after 28 days.

TREATMENT	DOSE	PCV(l/l)	Hb(g/dl)	WBC X 10 ⁹ /l	RBC X 10 ¹² /l
CONTROL	-	40.00±0.00	13.30±0.00	3.67±0.15	6.00±0.00
<i>F. asperifolia</i>	200mg/kg	45.67±0.57	15.17±0.15	4.40±0.17	6.00±0.2
	300mg/kg	46.67±1.15	15.63±0.35	3.37±0.05	6.60±0.2

Result represents mean ± standard deviation

DISCUSSION

Medicinal plants abound widely in the world. WHO has defined medicinal plants as plant which in one or more of its organs contains substances that has and can produce therapeutic effects or which are precursors for the production of useful drugs (Andrews, 1982). Such properties have been seen in *F. asperifolia*.

In this study white blood cell count, red blood cell count, haematocrit, haemoglobin levels were used to measure the effect of *Ficus asperifolia* on haematological parameters.

In assessing this, a dose dependent increases in the levels of these parameters at P<0.05 were observed when being treated with extracts of *F. asperifolia*. This suggests its rich nutritional value as proximate analysis by Nkafamiya, *et al*, 2010 shows that the plant is rich in minerals such as magnesium and iron and is also a rich source of protein, containing all nine amino acids. This most likely supports the use of the plant by locals as a blood booster in treating anemic patients. The presence of all 20 amino acids as indicated by Nkafamiya, *et al*, 2010 also supports the fibroblast growth stimulation of the leaf extracts as indicated by Annan and Houghton, (2008).

The study revealed a significant rise at p<0.05 in white blood cell of 3.67± 0.15(In normal rats), to a three week mean average of 13.36 ± 0.67 at p<0.05. However, packed cell volume (PCV) and hemoglobin levels were significantly reduced from 40 ± 0.00 and 13±0.00, respectively in normal rats to a three week mean average of 31.87 ± 0.00, 10.59 ± 0.58 respectively at p<0.05. Treatment of rats in test groups with 50mg/kg, 100mg/kg, 200mg/kg and 300mg/kg aqueous leaf extract of the plant showed significant reversal of the afore mentioned parameters when compared with the negative control groups at p<0.05. The rats with CCl₄ induced liver damage showed dose dependent improved liver conditions while being treated with aqueous leaf extract of *f. asperifolia*, with the group which was treated with 300mg/kg extract showing the best results. It may thereof be concluded that *F. asperifolia*, may be biochemically significant in reversing haemotoxicity caused by CCl₄ and may thus be useful in the treatment and management of anemic conditions.

REFERENCES

- Andrews, T. (1982). A Bibliography on Herbs, Herbal Medicine, Natural Foods, and Unconventional Medical treatment. Littleton, Colorado Libraries Unlimited, Inc
- Annan, K. and Houghton, P.J. (2008). Antibacterial, antioxidant and fibroblast growth stimulation of aqueous extracts of *ficus asperifolia* Miq. And *Gossypium rboreum* l. would-healing plants of Ghana". Journal of Ethnopharmacology.119 (1):141-44.
- Baker, J. F., And Silvertown, R. S. (1985) introduction to medical laboratory technology.6th edition. Butherworths London.
- Chatterjee, T, K. (2000). Medicinal plants with hepatoprotective properties, in herbal opinions, third ed, books & allied (p) ltd., Calcutta.
- Nkafamiya, I. II., Osemeahon, S. A., Modibdo, U. U., And Aminu, A (2010). Nutritional status of non-conventional leaf vegetables, *ficus asperifolia* and *ficus somorus*, *afrian journal of food science*. 4(3): 104-108
- Ojo, O.A, and Akintayo, C.O (2014). Assessment of antioxidant activity of *Ficus asperifolia* Miq aqueous extract - In vitro studies . *The Journal of Phytopharmacology* ; 3(1): 16-21
- Oluwafemi, A. O., Busola, A., Fadaka, O.A. and Ajiboye, B.O. (2016). Antioxidant and Drug detoxification potentials of *Ficus asperifolia* Miq. Extract in CCl₄-Induced Kidney Injuries and Oxidative Damage in Wistar Rats. . Adv. Biores. Vol 7 [5] September 2016: 162-168. DOI: 10.15515/abr.0976-4585.7.5.162168

APPENDIX

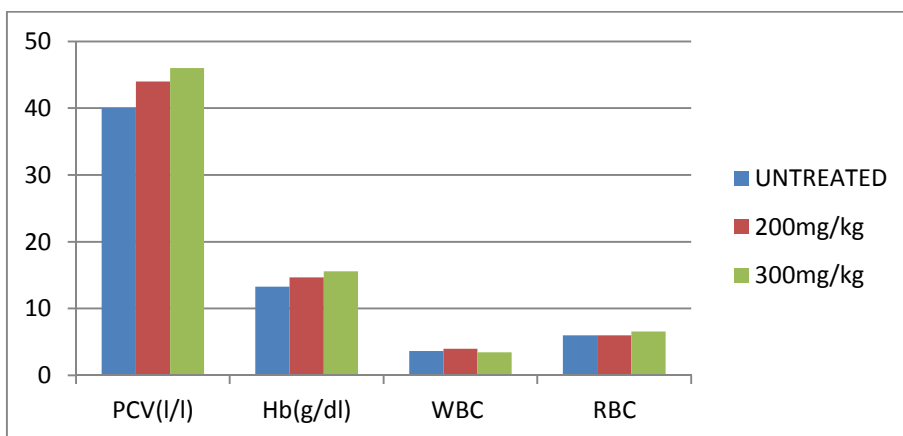


Fig. 1 Effect of crude extract of *F. asperifolia* on haematological parameters of Wistar albino rats after 7 days.

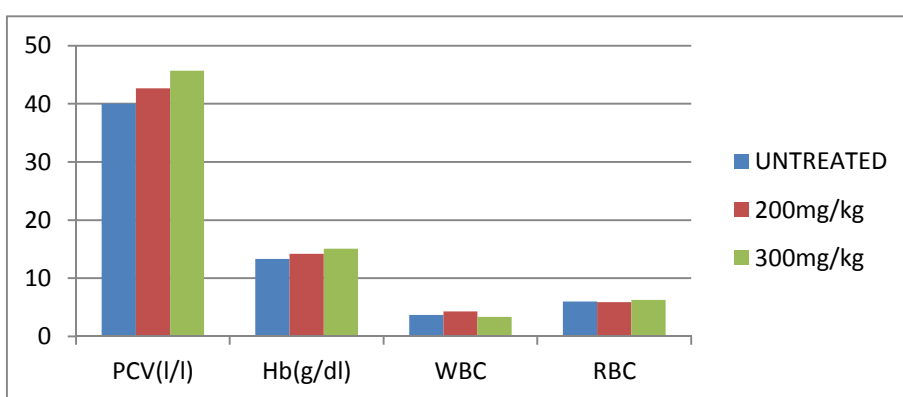


Fig. 2 Effect of crude extract of *F. asperifolia* on haematological parameters of Wistar albino rats after 14 days.

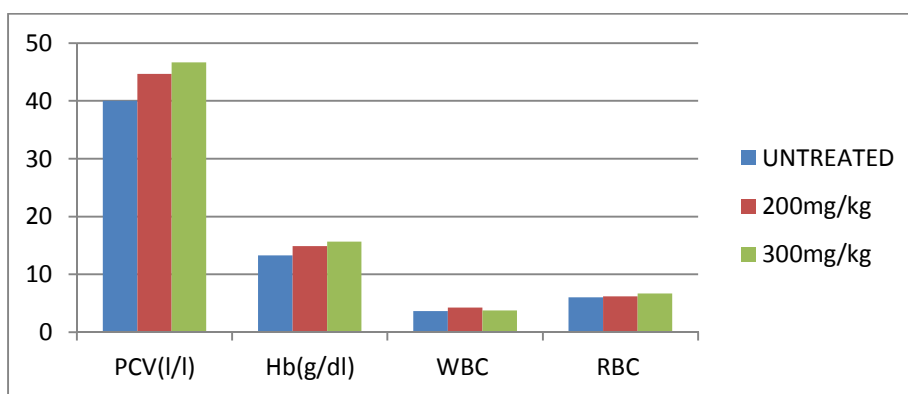


Fig. 3 Effect of crude extract of *F. asperifolia* on haematological parameters of Wistar albino rats after 21 days.

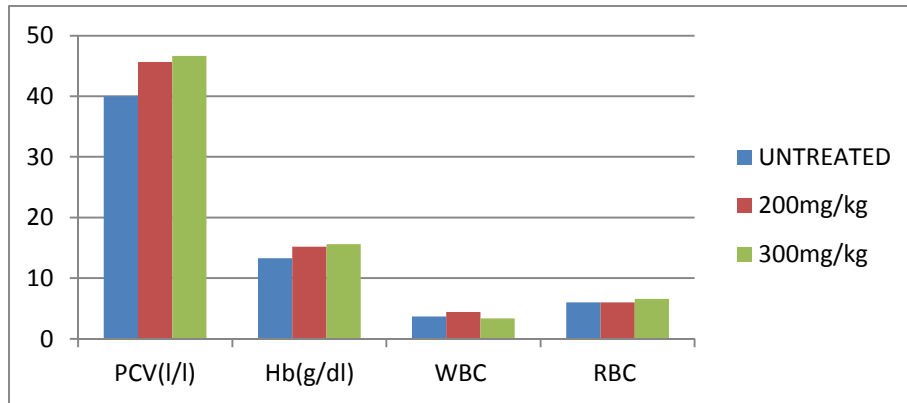


Fig. 4 Effect of crude extract of *F. asperifolia* on haematological parameters of Wistar albino rats after 28days.