International Scholars Journals

International Journal of Urology and Nephrology ISSN 2091-1254 Vol. 6 (10), pp. 001-003, October, 2018. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Short Communication

Acute effect of administration of ethanol extracts of *Ficus exasperata* vahl on kidney function in albino rats

Ijeh Ifeoma Irene and Ukweni Ajike Iheanacho

Department of Biochemistry, College of Biological and Physical Sciences and Department of Veterinary Physiology, Biochemistry and Pharmacology Michael Okpara University of Agriculture Umudike, P.M.B 7267 Umuahia Abia State Nigeria.

Accepted 13 March, 2017

Administration of ethanol extracts *Ficus exasperata*. Vahl at doses 50, 200, 500 mg/kg body weight resulted in body weight gain in all extract - administered groups over a 3-day period. Mean relative kidney weight increased from 7.5 x 10^{-3} ± 8.7 x 10^{-4} in the control group to 1.2 x 10^{-2} ± 5.3 x 10^{-5} in the highest dose group. Serum urea concentration also increased in a dose dependent manner (4.35 ± 0.045, 4.70 ± 0.00, 5.06 ± 0.53, 5.50 ± 0.58) in groups I, II, III and IV respectively. Serum sodium concentration also increased from 44.95 + 10.94 in the control group to 98.85 + 0.0, 123 ± 1.95 and 152.0 ± 35.70 in groups II, III, and IV respectively. These findings suggest that the administration of ethanol extracts of *Ficus exasperata.* Vahl at high doses could affect kidney function.

Key words: *Ficus exasperata*.Vahl, kidney function, ethanol extracts, serum, sodium, urea.

INTRODUCTION

Ficus exasperata (Vahl) is known by the local name sand paper tree/plant. It is a medicinal plant used for treating different diseases. The viscid non-milky sap is used for treating sores eye trouble and stomach pains in Ivory Coast (Burkill, 1997). The sap is used to arrest bleeding in Ghana (Abbiw, 1990). The liquid in which the bark is boiled is given to cows to hasten the expulsion of the after birth (Hallan, 1979). It is also used by traditional birth attendants (TBAS) in Congo to ease childbirth (Bouquet, 1969).

In Southern Africa scrapings of the bark is used in an embrocating of the body and also as a stimulant (Burkill, 1997). In Upper Ivory Coast it is applied to leprous sores (Bouquet 1969). In Zaire a leaf poultice is used in medication for ring worm (Burkill, 1997). Chest complications are treated in the Gambia by steam inhalation of the leaves boiled in water. The leaves are also used as a medication for a number of livestock diseases. Abbiw 1990 reported that *F. exasperata* leaves were toxic to goat and sheep and that Ghanaians use the extracts from the leaves in poisoning their arrows for hunting Nimenibo-Uadia (2003) reported that administration of aqueous extracts of *F. exasperata* resulted in decreased plasma triacyl - glycerol and -oh butyrate levels in allo-xan treated rats.

The present study is aimed at investigating the effect of three different dose levels of *F. exasperata extract* on kidney function in albino rats.

MATERIALS AND METHODS

Preparation of plant extract

Leaves of *F. exasperata.* Vahl were collected from a bush in Amawom village in Ikwuano local Government area of Abia State, Nigeria. They were botanically identified by Mr G C Osuagwu of the Department of Biological Science, Michael Okpara University of Agriculture Umudike, Nigeria. A voucher specimen code was placed in the Department of Biochemistry.

The leaves were air –dried to a constant weight. The dried leaves and stems were ground first using a coarse grinding engine and then reduced to a powdery form using a mill.

The powdery plant material (200 g) was soaked in 500 ml of (98%) ethanol for 24 h with constant stirring. The extract was filtered through a muslin cloth and concentrated using a rotary evaporator. The concentrated extract was allowed to dry under a fast moving ceiling fan at room temperature. The residue was weighed and used in the preparation of the stock extract for administration.

*Corresponding author. E-mail: ijehirene@yahoo.com.

Table 1. Phytochemical constituents of leaves and stems of *Ficus exasperata.* Vahl

Phytochemical	Leaves	Stems
Akaloids(%)	4.10±10	5.30±0.50
Flavonoids(%)	4.35±0.23	3.21±0.53
Tannins(%)	4.10±0.01	3.25±.01
Saponins (%)	0.13±0.01	0.17±0.01
Cyanogenic glycosides (mg %)	230.65±14.50	181,10±5.00

N.B: Results are means ± s.d of duplicate estimations.

Table 2. Mean Relative kidney weight of experimental animals administered ethanol extracts of *Ficus exasperata*.Vahl.

Group/treatment	Mean relative kidney weight
1(CONTROL)	$7.5X10^{-3}$±$8.7X10^{-3}$
11(50mg/kg body.wt)	$2.8X10^{-3}$±$2.8X10^{-4}$
III(200mg/kg body wt)	$8.5X10^{-3}$±$1.7X10^{-5}$
IV(500mg/kg body wt)	$1.2X10^{-2}$±$5.3X10^{-5}$

N.B Results are means of duplicate estimations of four animals per group

Table 3. Serum Urea and Sodium concentration of animals administered ethanol extracts of *Ficus exasperata* Vahl.

Group/treatment	Urea (mmol/l)	Sodium (meq/l)
1(CONTROL)	4.39±0.45	44.96±10.94
11(50mg/kg body.wt)	4.70±0.00	98±0.00
III(200mg/kg body wt)	5.06±0.53	123.15±1.95
IV(500mg/kg body wt)	5.50±0.58	152.25±35.70

Extract was stored in a refrigerator.

Phytochemical and toxicological analysis of leaves and stems of *Ficus exasperata*

Quantitative determination of alkaloids was carried out using a modification of the alkaline precipitation methods as described by Harbone (1978).

Flavonoid contents were determined by gravimetric method as described by Harbone (1978). Tannins were determined by Folin Denis Spectrometric method as described by Pearson (1976).
Cyanogenic glycoside contents were as determined as described by AOAC (1984).

Animal -housing and extract administration

Weaned male albino rats of the Wistar strains weighing 30 – 160 g were purchased at the animal breeding unit of the college of Veterinary Medicine, University of Nigeria Nsukka and kept in well ventilated plastic cages. They were exposed to 24 h light and dark cycles and allowed free access to growers feed and water. The animals were allowed a 7 day period of acclimatization. They were then weighed and divided into four groups of four animals per cage such that the mean weight differences between the cages did not exceed ± 5.0 g

The control group received distilled water while groups II. III and IV received 50,100 and 500 mg /kg body weight of extract respectively. Extract administration was *per os* by intubation. Animals were sacrificed after the third day of extract administration by daz-ing and blood was collected by cardiac puncture of a beating heart. Organs were promptly excised and weighed after dabbing with filter paper.

Determination of serum urea concentration

This was carried out using the urease (Baker and Silverton, 1985) method as described by the kit manufacturers (Randox Co. UK). Urea in serum is hydrolyzed to ammonia in the presence of urease. The ammonia is then measured photometrically by Ber-thelot's reaction.

Determination of serum sodium concentration

This method used was based on the precipitation of sodium as triple salt described by the kit manufacturers Hi –Tech Diagnosis Nigeria Limited. In the reaction the excess uranium after precipitation of the triple salt (Sodium magnesium uranyl acetate) was reacted with ferrocyanide producing a chromophore whose absorbance varies inversely as the concentration of sodium in the test specimen.

Statistical analysis

Statistical analysis was carried out using analysis of variance (ANOVA) at 0.05(95%) confidence level.

RESULTS

The results (Table 1) show that the plant *F. exasperata.* Vahl is rich in alkaloids flavonoids and tannins. The stems had higher concentration of alkaloids and tannins, while the leaves had higher concentrations of flavonoids, saponins and cyanogenic glycosides.

The relative kidney weight decreased in the low dose group and increased in the medium and high dose groups (Table 2).

Our findings show that the serum urea nitrogen increased significantly ($P< 0.05$) in all extract administered groups. (Table 3)

There was also a significant elevation of serum sodium concentration in all extract administered groups.

DISCUSSION

Ethanolic fractions of plant materials usually extract tannins, polyphenols, flavanolols, terpenes, alkaloids, sterols and propolis, if they are present; the fraction used in this study seem to be rich in alkaloid flavonoids and tannins, but not saponins. These suggest that the medicinal properties attributed to *F. exasperata* could be based on the antioxidant and antimicrobial effect of these phyto-

chemicals (Cowman, 1999). Our findings also suggest that the stem of *F. exasperata* is safer medicinally than the leaves because of the lower content of cyanogenic glycosides. The toxicity of *Ficus exaspe- rata* leaves to goat and sheep may be attributable to the high cyanogenic glycoside content of the leaves and not the alkaloidal contents as suggested by Abbiw (1990).

The elevation of serum urea and sodium in this study strongly indicate that the concentration of extract used in this study ethanol extract of *Ficus exasperata.* Vahl could interfere with the filtration function of the kidney.

Several studies (Bwititi et al., 2000; Ijeh et al., 2006) have indicated the possibility that the use of plant extract in high doses could lead to toxic injury to the kidneys which interfere with renal tubular functions and induce acute renal failure. Our findings indicate a need to further investtigate safe concentration of ethnomedicinal preparations in view of the increasing reports of acute renal failure.

REFERENCES

Abbiw T (1990). Study of Tropical shrubs and plant.. J. Biogeorge. 23: 591-602

AOAC (1984/1975). Official Methods of Analysis .11th Edition Association of official Analytical Chemists. Washington D.C. pp.236-248.

Baker FJ, Silverton RE (1985). Introduction to Medical Laboratory Technology Butterworth.

Bouquet AJ (1969). Natural products as an alternative remedy. *2* .4th Ed. Royal Botanic Gardens. Kew pp; 166-179.

Burkill HM (1997). The useful plants of tropical West Africa. *4* 3rd Ed . Royal Botanic Gardens Kew. pp 166-179

Bwititi P, Musabayane CT, Nhachi CF (2000) Effects of *Opuntia megacantha* on blood glucose and Kidney function in streptozotocin diabetic rats. J. Ethnopharmacol. 69(3): 247-252.

Cowman MM(1999). Plant products as antimicrobial agents. Clin. Microbiol. Rev.12 :561-582

Hallan P (1979). Population dynamics of Fig wasps from *Ficus exasperata* Vah,. Proc. Kon, Ned. Akad –We Ser. C. 87:365-375.

Harbone JB (1973/79) Phytochemical Methods. A guide to modern techniques of plant analysis. Chapman Hall, New York. Pp.185

Ijeh II and Agbo CA (2006). Body organ weight changes following the administration of Aqueous extracts of *Ficus exasperata* .Vahl. J. Animal and Vet. Adv. *5*: 277-279

Nimenibo-Uadia R (2003) *Ficus exasperata* : Effects on diabetes mellitus in an experimental rat model. Global J.Pure and Applied Sci.*9*:529-532.