Effect Of Aqueous And Alcohol Extract Of Glyphaea Brevis (speng) Moraches On The Reproductive Parameters Of Adult Male Sprague Dawley Rats.

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Abstract

Human male infertility is found to be on the increase and various factors have been attributed to this including exogenous factors affecting the male reproductive system. Recently, the treatment has changed from using Pharmaceutical products and Orthodox care to Natural care (i.e. use of Herbal preparation). Plants have been used in the treatment of various ailments. However, scanty information is available on the use of this leaf extract. This present study is to assess the effect of this leaf extract on the Testicular functions of adult male Sprague Dawley Rats.

The mean sperm count and motility were found to be reduced in the treated groups i,ii,iii,iv when compared with the control (group v).

However, it was observed that the extract affected the histology of the testis. The evidence indicates that the extract is injurious to testicular functions that could impair male fertility.

Keywords: Glyphaea Brevis leaf extract, Infertility, Sperm count, Motility.

introduction.

Human male infertility is on the increase and several factors have been adduced to this. Whorton et al.,1977;Petrelli and Mantorani, 2002 claimed it is due to exogenous factors affecting the male reproductive system. Mcdonald R.M. et al., 2007 said it is due to increase incidence of sperm showing chromosomal or DNA damage. Studies conducted on farm animals as well as humans by Smith, 1971; Evenson et al., 1980 and Evenson et al., 2000 showed that elevated testicular temperature increases the incidence of sperm with DNA damage.

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Several herbs have been used in Clinical Medicine for treatment of many ailments. Only recently researchers were able to employ scientific methods to prove efficacy and give better understanding of mechanisms of action (Graf, 2000). Many Indian plant species were claimed to possess medicinal properties (Grover et al., 2002).

However, the increase incidence of male infertility among low income earners and the aphrodisiac property of the leaf extract (Vasilea 1969) stimulated us to see its effect on the male reproductive parameters.

Glyphaea Brevis Moraches which is of TILIACEAE family referred to by the local name Aloanyasi (Igbo), Dorina (Hausa) and Atori (Yoruba) (Ogbonnia et al., 2003). It is a small tree when fully grown and found commonly in the Tropical areas (British Pharmacopoeia, 1993).

The reduction in the sperm count and motility especially in low dose aqueous extract indicated the need for further studies on how this happens.

Materials and methods

Twenty-five adult male Sprague Dawley rats were procured from a breeding stock maintained in the animal house of Physiology Department, Ladoke Akintola University of Technology, Ogbomosho Nigeria. They were fed with rat chow (Pfizer) and water ad-libitum.

Experimental Design

The twenty-five (25) sexually matured adults (8-12 weeks old) male Sprague Dawley rats weighing between 100-140gm were randomly divided into five designated groups and were treated for eight weeks.

Group 1 Rats were administered 200 mg/kg aqueous extract of G. brevis moraches orally.

Group 2 rats were administered 400 mg/kg aqueous extract of G. brevis moraches orally.

Group 3 rats were administered 200 mg/kg alcohol extract of G. brevis moraches orally.

Group 4 rats were administered 400 mg/kg alcohol extract of G. brevis moraches orally.

Group 5 control (Rats administered 200 mg/kg Physiological saline orally).

The five groups were subjected to the same feeding regimen and weighed weekly.

After 8 weeks of the experiment, the rats were sacrificed by cervical dislocation and blood collected by

cardiac puncture for testosterone analysis.

The testes were excised quickly and transferred into 10% formol-saline for fixation. Testes were prepared for histological analysis.

Statistics

Data were subjected to analysis of variance and students T-test was used to determine significance. The criterion for significance was set at $p<0.05$.

Results

Data in table 1 showed that administration of 400 mg/kg of aqueous extract did not show marked difference in sperm count from the control but there's a marked difference in motility of the two groups.

However, there is significant reduction in the count and motility of 200 and 400 mg/kg Alcohol extract when compared with the control.

Table 1

Parameters.	Mean Values + SE on S perm characteristics of Rat following Aqueous and alcohol administration. Groups + SE				
	Group 1 (200 Aqueous)	Group II (400 Aqueous)	Group III (200 Alcohol)	Group IV (400 Alcohol)	Group V (200 Control)
Sperm count × 10^6/ml	$32.36^{ab} \pm 9.09$	$40.60^{ab} \pm 8.31$	$34.84^{ab} \pm 5.41$	$23.44^{b} \pm 1.97$	$45.98^{a} \pm 3.53$
Sperm motility (ml)	$28.64^{b} \pm 0.41$	$29.42^{b} \pm 1.00$	$25.20^{ab} \pm 7.31$	$14.24^{c} \pm 2.46$	$41.20^{a} \pm 2.81$
Sperm motility %	$88.50^{b} \pm 0.41$	$72.46^{b} \pm 1.00$	72.30 ± 7.31	$60.75^{c} \pm 2.46$	$89.60^{a} \pm 2.81$

a, b, c means along the same row with different superscript differ significantly ($p< 0.05$).

Table 2

	Mean Values + SE on Testicular Weight of Rats following Aqueous and Alcohol Administration				
Groups	Group 1 (200 Aqueous)	Group II (400 Aqueous)	Group III (200 Alcohol)	Group IV (400 Alcohol)	Group V (200 Control)
	0.80 ± 0.05	0.90 ± 0.04	0.84 ± 0.07	0.80 ± 0.07	0.92 ± 0.03

No groups are significantly different ($p>0.05$).

Table 3

	Mean Values ± SE on Testosterone Level in Rats following Aqueous Alcohol Administration (M ean Value ± SE).				
Testosterone Level (ng/ml)	Group 1 (200 Aqueous)	Group II (400 Aqueous)	Group III (200 Alcohol)	Group IV (400 Alcohol)	Group V (200 Control)
	$2.20^{ab} \pm 0.06$	$2.50^{ab} \pm 0.16$	$2.00^{b} \pm 0.16$	$1.80^{b} \pm 0.31$	$3.00^{a} \pm 0.57$

Data obtained from Tables 2 and 3 showed that both extracts have effect on the testicular weight and testosterone level of the rats.
Data in Table 1. showed reduction in sperm count and motility at all dose levels of aqueous and alcohol leaf extract of Glyphaea Brevis Moraches, though much more reduced in alcohol extract than aqueous extract.
Data in Table 2 did not show significant reduction in the testicular weight.
Data in Table 3 showed some reduction when compared with the control.

Histological Findings
Testicular sections from the control rats showed normal histology. The seminiferous tubules were oval and normal, the intestitium were consistently normal [fig V]. The seminiferous epithelium was more degenerated in fig IV than in any of fig I-III. The size of the interstitial space varies from fig I-III whereas it is obliterated in fig IV.

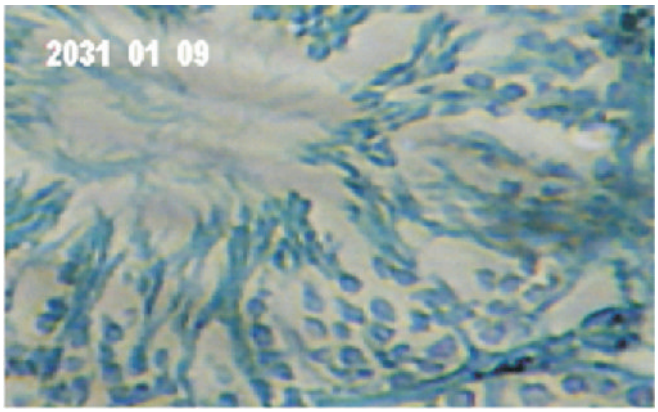

fig I

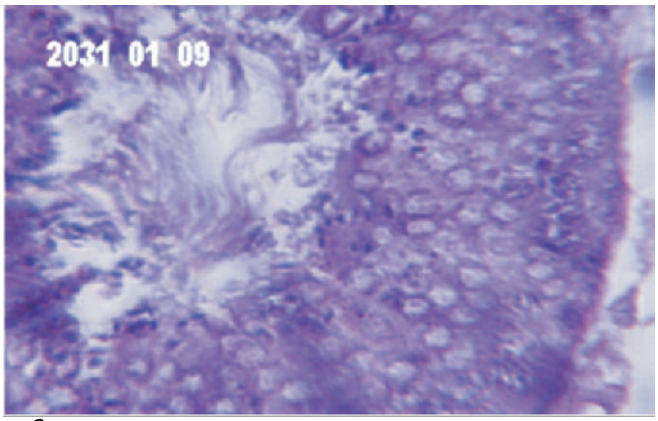

fig ii

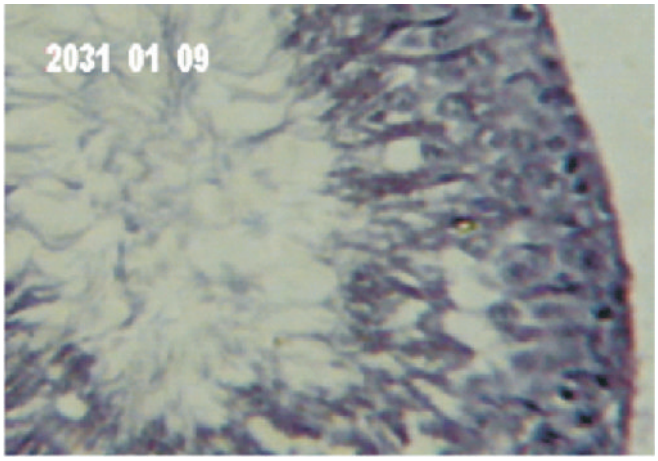

fig iii

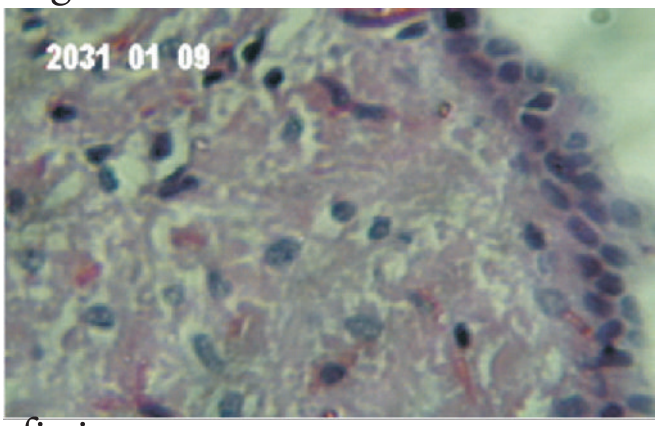

fig iv

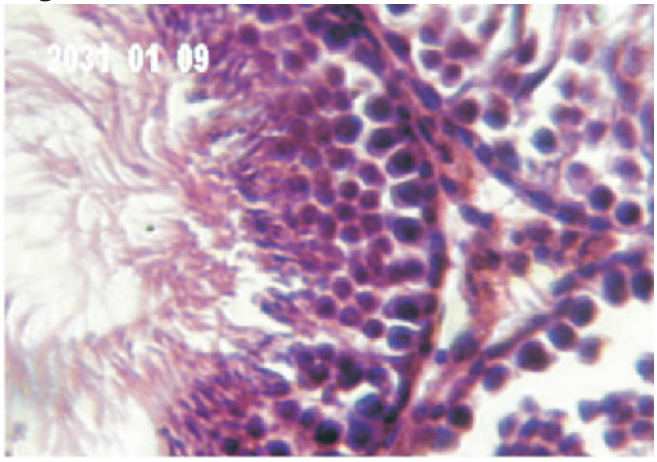

fig v

Discussion

In the study, alteration in the interstitial cells of leydig was found after treatment with aqueous and alcohol extract though much more pronounced in the higher dose of alcohol extract which further confirmed that apart from the Glyphaea brevis extract, alcohol itself also has effect on the Leydig cells and seminiferous epithelium. Leydig cells in the interstitium secrete "testosterone", a gonadal hormone required for spermatogenesis. The observed alteration in interstitium is an indication that the cells may be affected thus ultimately affecting spermatogenesis.

Spermatozoa in epididymis of fig I, II and III are reduced though much more in figure IV when compared with fig V which is the control.

So the use of Glyphaea Brevis (speng) Moraches will not be a good drug in the management of male fertility.

Further studies can be carried out on how this leaf extract affects the spermatogenesis.

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