

Fertility Index and Percentage Fertility of *Momordica charantia* Treated Male Wistar Rats

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Abstract

The effect of *Momordica charantia* leaf extract was evaluated on male wistar rats. The animals were randomly assigned into three (3) groups of six (6) rats each. Group one (1) served as control and received distilled water. Group two (2) and group three (3) received 200mg/kg and 400mg/kg of the hydromethanol (20%:80%) extract respectively. In the final 10 days of study, the males were co-habited with female rats [1 male:2 females]. Results obtained showed that the extract significantly ($P < 0.05$) reduced Fertility index and percentage fertility of male rats. Decreased sperm quality previously observed with the extract of *M. charantia* with associated reductions in serum Testosterone level may be responsible for this observation.

Keywords: *Momordica charantia*, hydromethanol, Fertility Index, wistar rats.

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INTRODUCTION

There have been some studies on effects of the extract of *Momordica charantia* (*M. charantia*) on some reproductive parameters in wistar rats. In a study [1], the effects of the extracts on the pituitary-testicular axis and sperm production in male rats were assessed and the findings indicated an inhibition of serum Testosterone (T), Luteinizing Hormone (LH) and Follicle Stimulating Hormone (FSH) production. In addition, there was a significant ($p < 0.01$) reduction in sperm number and sperm motility in treated rats. A similar study [2] revealed that *M. Charantia* extract caused marked alterations in the sperm physiology leading to significant reduction in sperm viability and motility. Furthermore, a significant reduction in serum T was reported in a study [3], following administration of extract of *M.charantia* without affecting the LH and FSH levels. There were significant reduction in sperm viability, morphology, motility and count. However, most of these findings suggest a relative reduction in these reproductive parameters in normal rats when test groups were compared to control. The changes that occur most times do not lead to hormonal concentrations and sperm measures below the normal ranges. It is therefore necessary to investigate if these reductions would translate to an inability of the male to produce conception in the female. The objective of this study is to determine the effects of leaf extract of *M.*

charantia on fertility index and percentage fertility of male wistar rats.

MATERIALS AND METHODS

Preparation of Plant extract

Fresh leaves of *M. charantia* were obtained from Choba community in Obio Akpor Local Government Area of Rivers State, Nigeria. The leaves were washed and dried at room temperature, then blended to fine powder. Soxhlet extraction was done using hydromethanol as solvent.

Animals

Eighteen adult male Wistar rats bred in the Department of Human Physiology, University of Port Harcourt, Nigeria were used for the experiments. The rats initially weighing between 155- 165g were randomly divided into 3 groups of 6 rats each. Group A served as control and were given distilled water. Group B and group C were given 200mg/kg bw and 400mg/kg bw of the hydromethanol leaf extract respectively. The extracts were administered as single oral doses for 30 days. The animals were allowed free access to their feeds and water.

Fertility Test

At the end of the 20th day after commencement of extract administration, the experimental animals

were mated with females (1 male: 2 females) to see whether pregnancy would occur. The males were separated after 10 days cohabitation period in accordance with documented methods [4, 5]. The

number of pregnant females and viable fetuses were recorded while the weights of fetuses were taken. The fertility index and percentage fertility were calculated using the formulae:

- i. Fertility index = $\frac{\text{Number of pregnant females in a group}}{\text{Number of mated females in the group}} \times 100$
- ii. Percentage fertility = $\frac{\text{Number of litters in a group}}{\text{Number of litters in control group}} \times 100$

STATISTICAL ANALYSIS

Results were expressed as mean±standard error of mean. Analysis was carried out on SPSS version 21 using analysis of variance (ANOVA). The level of significance was considered at P<0.05.

RESULT

The result of this study is presented in tables 1 and 2.

Table-1: Fertility index of male rats treated with *M. charantia* extract.

Group/ Extracts (mg/kg)	Parameters		
	Copulation index (%)	Pregnant females (n)	Fertility index
Control	100	6	100
200	100	5	83*
400	100	3	50*

Values presented as Mean±SEM. n=6. Significant at [*(P<0.05)] when compared with control.

Table-2: Percentage fertility of male rats treated with *M. charantia* extract.

Group/ Extracts (mg/kg)	Parameters		
	No. of live litters	%Change	% Fertility
Control	7.52±0.56	0	100
200	5.83±1.22*	-21.60	77.53*
400	3.50±1.58*	-51.60	46.54*

Values presented as Mean±SEM. n=6. Significant at [*(P<0.05)] when compared with control.

DISCUSSION

The effects on the number of mated males/females signifying the copulation index and the number of females which got pregnant as well as the fertility index after 30 days of extract administration are highlighted in this study. The males in all groups mated with at least one of the cohabiting females. In the control, all female rats that mated with their male became pregnant giving rise to a fertility index of 100%. For the 200mg/kg group, all male rats mated with at least one female but all female except one became pregnant. Although, all males mated with the females in the 400mg/kg group, only three became pregnant with a fertility index of 50%. In the number of live births, the control group had higher live births than test groups. The statistically significant (P<0.05) reductions in fertility index and percentage fertility in test groups when compared to control indicates a declining fertility following the administration of *M. charantia*. Several activities taking place in testis also contribute significantly to fertility. However, decreased numbers of spermatozoa, reduced motility and/or morphologically distorted spermatozoa are predominant causative factors in infertility or disturbed fertility in animals [6].

The sperm count is a very useful test of spermatogenesis having direct association with fertility [7] and is quantitatively maintained by Testosterone and Follicle Stimulating Hormone [8]. Also, motile spermatozoa in adequate concentrations devoid of abnormalities are highly correlated with fertility [9]. In a previous study [3] *M. charantia* reportedly caused a significant reduction of various sperm parameters. The reductions encountered in normal animals may be responsible for the decreased Fertility index and percentage fertility observed in this study.

CONCLUSION

It was observed that a significant reduction occurred in Fertility index and percentage fertility of male wistar rats treated with leaf extracts of *M. charantia*.

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