



## CONTRACEPTIVE EFFECT OF *MOMORDICA CHARANTIA* SEEDS ON SEMINAL PROFILE OF MICE

### Zoology

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### ABSTRACT

The objective of this research is to study the impact of aqueous extract of *Momordica charantia* seeds on seminal profile of male mice. The effect of *Momordica charantia* seeds causes significant decline in sperm count, motility of spermatozoa and pH of semen while there is an increase in mortality of sperms of Swiss Albino male mice. The aqueous extract of *Momordica charantia* seeds was orally administered 0.5 ml (250 mg/kg/bw/day) to male mice for 10, 20, 30, 40, 50 days along with control group of mice. The research investigation was carried out on seminal quality of mice on above parameters. The extract of *Momordica charantia* seeds causes significantly decline during 10 days ( $P<0.1$ ), 20 days ( $P<0.01$ ), 30 days ( $P<0.01$ ), 40 days ( $P<0.001$ ) and 50 days ( $P<0.001$ ) treatment in sperm count, sperm motility and seminal pH with the respect to control group of mice while there is an significantly increase in mortality of spermatozoa during 10 days ( $P<0.1$ ), 20 days ( $P<0.01$ ), 30 days ( $P<0.01$ ), 40 days ( $P<0.001$ ) and 50 days exposure than control ( $P<0.001$ ). The alteration occurred in seminal quality of male mice signifies that aqueous extract of *Momordica charantia* seeds alters the seminal parameters and thus causes contraceptive effect in treated group of mice than control.

### KEYWORDS

*Momordica charantia*, sperm count, sperm motility, contraceptive.

**INTRODUCTION:** One of the important concerns of today is problem of over population. If it is not controlled or checked, it will lead to several consequences. Various methods of contraception has been opted for fertility control. There are a variety of methods available and in use for female contraception. Herbal recipes have been used since time immemorial to hinder reproduction, with most preparations targeted at plummeting female fertility. In male only barrier method and vasectomy are in practice. There are no other methods available for male contraception (Vivek et al. 2009)<sup>20</sup>. The risk occurred by use of drugs has triggered the need to develop a new antifertility agent of plant origin.

*Momordica charantia* (karela) is a herbal climber grown in tropical and sub-tropical regions, belonging to the family *Cucurbitaceae* (Rekha et al.; 2011)<sup>17</sup>. *Momordica charantia* have provided many remedies for various disease from ancient days to now a days (Grover et al.; 2004)<sup>7</sup>. *Momordica charantia* posses various pharmacological and biological properties ie; anti-microbial<sup>8</sup>, anti-diabetic<sup>3</sup>, anti-oxidant<sup>6</sup>, immunodulatory<sup>12</sup> and anti-cancerous<sup>3</sup>. *Momordica charantia* also shows antifertility effects in female mice (Papaiya B et al.; 2011)<sup>14</sup>, anti-implantation activities (Koneri R. et al.; 2007)<sup>16</sup>, abortifacient properties (Chan WY et al.; 1984)<sup>7</sup> in female mice and androgenic properties (Sharanbasppa et al.; 2011)<sup>11</sup> in male mice.

The present investigation has been made to understand the effects of *Momordica charantia* seeds extract on seminal quality of male mice for fertility control during different exposures.

### MATERIALS AND METHOD:

**Plant Extract:** The mature *Momordica charantia* seeds were taken. These seeds were shade dried and minced to powder (Ampa et al. 2015)<sup>1</sup> and filter with fine cotton cloth.

**Preparation of Aqueous Extract:** 100mg powdered seeds were taken and mixed with 10 ml of distill water and the mixture was left overnight at room temperature and filtered.

**Experimental Animal:** Adult Swiss Albino mice of 25-30 gm body weight were selected for investigation<sup>10</sup>. They were divided into 6 groups ie; control group of mice were fed with 0.5 ml of distilled water and the other groups will be fed with 0.5 ml (250 mg/kg/BW/day)<sup>21</sup> of seed extract for 10 days, 20 days, 30 days, 40 days and 50 days. All the experimental and control group of mice maintained at uniform animal husbandary conditions of food, light, temperature and water throughout the period of experiment.

**Methodology:** The treated and control group of mice were sacrificed

by cervical dislocation. For assessment of various parameters both cauda epididymis were exposed and taken into watch glass with 2 ml of normal saline. The cauda epididymis were teased and sieved by metallic filtered to avoid the debris in seminal content.

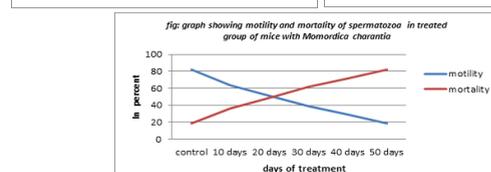
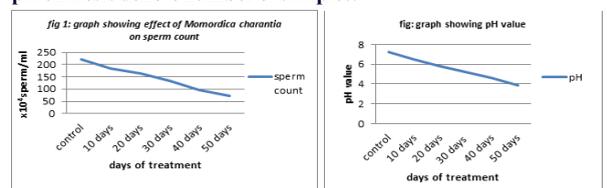
Sperm count was done after the method of Eliasson (1975)<sup>4</sup>; motility of spermatozoa was done after the method of Tijee and Oentoeng (1968)<sup>19</sup>, while the seminal pH was measured with the help of pH paper indicator.

**RESULTS AND DISCUSSION:** Sperm count ( $P<0.001$ ), motility of spermatozoa ( $P<0.001$ ) and seminal pH ( $P<0.001$ ) decline significantly while mortality of sperm increases significantly ( $P<0.001$ ) in male mice after the treatment of aqueous extract of *Momordica charantia* seeds as shown in table 1 after treatment from 10 to 50 days, than the control group of mice as shown in Table 1.

**TABLE 1: Effect of Aqueous Extract of *Momordica charantia* seeds on seminal profile of mice.**

Groups	Sperm Counts	Motility(%)	Mortality(%)	Seminal pH
Control (6)	223.00 ± 1.88	81.66 ± 1.15	18.33 ± 1.14	7.2 ± 0.07
10 days (6)	185.16* ± 1.66	63.66* ± 1.28	36.33* ± 1.28	6.5* ± 0.07
20 days (6)	163.33** ± 1.88	51.33** ± 1.05	48.66** ± 1.05	5.8** ± 0.05
30 days (6)	133.50** ± 2.21	39.00** ± 1.46	62.00** ± 1.88	5.2** ± 0.07
40 days (6)	94.50*** ± 2.04	28.83*** ± 0.94	71.16*** ± 0.94	4.6*** ± 0.07
50 days (6)	72.16*** ± 2.36	19.00*** ± 1.81	81.66*** ± 0.88	3.9*** ± 0.06

Data presented as Mean ± SEM \* \*\*, \*\*\* shows significance at 0.1, 0.01, 0.001 levels with value in control. Numbers within parenthesis denote number of samples.



As indicated in (Table 1) there is a significant decline in various parameters of seminal quality of mice after the treatment of aqueous extract of *Momordica charantia* seeds than the control.

Reduction in sperm counts of treated mice may be due altered to androgen synthesis which interfere with spermatogenic process and sperm count and sperm motility<sup>11</sup>. *Momordica charantia* seeds extract also lowers the level of testosterone which may impair sperm parameter<sup>13</sup>. Lower concentration of androgen may result in depletion of fertility rate. The decrease in testicular volume and luminal fluid; an essential prerequisite for spermatogenesis. The significant decline ( $P<0.001$ ) in sperm count from 10, 20, 30, 40, 50 days exposure in treated group of mice than control is recorded due to effect of aqueous extract of *Momordica charantia* seeds. The natural phenomenon of spermatogenesis were blocked.

Motility of sperm is inhibited by *Momordica charantia* extract is reported by Luangpirom et. al.(2015). Decrease in sperm motility might be due to increase of reactive oxygen substances by lipid oxidation. It alter the integrity and the fluidity of cellular membrane structures, an essential parameter for sperm motility. It revealed that sperm count, sperm motility and sperm viability were decreased<sup>11</sup> and thus mortality gets increased. Sperm motility significantly ( $P<0.001$ ) decline after the treatment of *Momordica charantia* seeds while mortality of spermatozoa gets significantly increased ( $P<0.001$ ) in treated group mice than control.

The seminal pH also decline significantly ( $P<0.001$ ) and became more acidic in treated group of mice than control after the treatment. The decrease in seminal pH towards acidic medium induces capacitation and decrease the motility spermatozoa<sup>9</sup>.

After the assessment of various parameters of seminal quality of male mice; it is concluded that significant decrease in sperm count, sperm motility, high acidic pH of semen and increase in mortality rate of spermatozoa adversely affect the fertility. The changes in seminal profile of mice in treated group impairs fertility among male mice than control. Hence, *Momordica charantia* shows anti-fertility effects in mice by modulating seminal quality among them.

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