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Antifertility Effects of Aqueous Suspension of *Allium sativum* on Seminal Profile of Swiss Albino Male Mice

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Abstract: ***The current study intended to investigate the antifertility effects of aqueous suspension of Allium sativum on male mice. 60 adult male mice were taken and divided into two groups, each group further subdivided into five subgroups. The first five subgroups were given daily dose of 0.5 ml distilled water orally as a control, while rest subgroups were fed same amount of Allium sativum aqueous suspension orally as a treated group upto 50 days. Animals were sacrificed at the stage of 10, 20, 30, 40 & 50 days of exposure of Allium sativum. Result revealed significant decrease (P<0.001) in sperm count, seminal pH and motility of spermatozoa, while significant increase (P<0.001) in mortality of spermatozoa as compared to control. These observation suggest that the Allium sativum possesses antifertility effects on male mice.***

Keywords: *Allium sativum* , Antifertility, Sperm count, Male contraception

1. Introduction

The growing population has become major problem throughout the world especially in developing country. It impairs the growth and development of the country. The population of india is also multiplying at the alarming rate. If it is not controlled or checked it will lead severe problems and also a deleterious effects on the life supporting system on earth. The solution of this predicament is population control. The population can be controlled by contraceptive means. There are various synthetic contraceptive agents are available and most of them are female oriented with less assurance. Hence, there is need to derive such contraceptive agents which has no side effect, easily available and of plant origin.

In recent years, plants are persued over synthetic contraceptive agents because it is economical, easily available, reversible and has no side effects. Among these plants, *Allium sativum* is such plants which is used for medicinal purpose.

Allium sativum is a biennial bulbous plant and commonly known as garlic. It is used as spices and widely cultivated. *Allium sativum* shows various activity like antifungal (Anderson B., 2006), antioxidant (Borek C (2006)), antibacterial (M N Palaksha et al.), anticancer (M kakimoto et al. 1998). Besides these medicinal property Allium sativum also shows spermicidal (chakrabarty et al. 2003), abortifacient (Kemper k J 2000), antiandrogenic (Hammami et al. 2008), antispermatogenic (Omotoso et al. 2010) activity in mice. Parvez et al. (2015) also reported that methanolic extract of *Allium sativum* exhibits antifertility effects on Swiss albino mice.

The present experiment has been designed to investigate the effect of *Allium sativum* aqueous suspension on seminal profile of Swiss albino male mice.

2. Material and Method

Collection and Preparation:- Fresh mature *Allium sativum* bulb were purchased from the nearest market. The collected bulb of *Allium sativum* were washed in distilled water and dried for an hour at room temperature (27^0 c) before peeling with a clean knife. 1000 mg Allium sativum bulb was measured by using weighing balance and then sliced into small pieces. The small pieces of bulb grind in a clean mortar pestle and added 20 ml of distilled water. The dose of male mice was provided at the rate of 1000 mg/kg/bw/day (parvez et al. 2015).

The study was carried out on adult swiss albino male mice weighing 25-30 gm. The mice were collected from Animal house of University department of zoology T.M Bhagalpur University. Animals were maintained under normal husbandry condition (12 hr light &12 hr dark cycle) along with 25 ± 2^0 temperature. All the animals were fed normal diet along with tap water ad libitum and milk.

All the mice were divided into two group and further each group divided into five subgroups. Control group of mice were fed 0.5 ml of distilled water orally by gastric catheter, while treated group of mice were fed same amount of allium sativum suspension. Six male mice from each group were sacrificed after the treatment of Allium sativum at 10, 20, 30, 40 &50 days exposure. Mice was killed by cervical dislocation. Cauda epididymis were exposed and kept in sterilized watch glass. 2 ml normal saline were added and then cauda epididymis were crushed. The suspension were sieved through metallic net to avoid debris from other tissue. Sperm counts were done after the methods of Eliasson (1975), while motility of spermatozoa were observed after the method of Tijee and Oentoeng (1968). Seminal pH was measured with the help of pH paper.

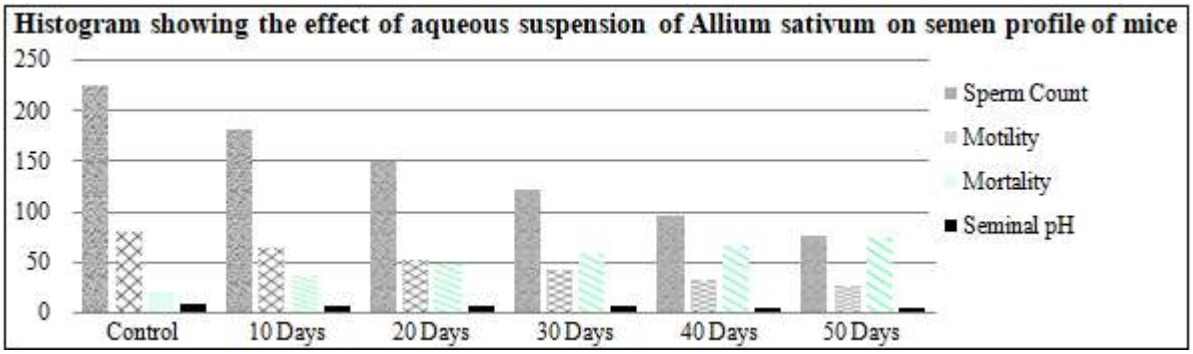
Stastistical Analysis:- Data were analyzed by using student' t-test.

3. Result

The oral feeding of 0.5 ml of *Allium sativum* suspension to male mice cause significant decrease in sperm counts (P<0.001), sperm motility (P<0.001) and seminal pH (P<0.001) in comparison to control, while mortality of spermatozoa increase significantly (P<0.001) as shown in table 1.

Table 1

Groups	Sperm Count (x10^4 Sperms/ml)	Motility (In %)	Mortality (In %)	Seminal pH
Control (6)	226±2.33	79.5±1.06	20.5±0.89	7.25±0.04
10 Days Treated (6)	182±2.25*	64.16±0.88*	35.83±0.87*	6.61±0.05*
20 Days Treated (6)	149.5±1.56**	52±1.13**	48±1.13**	6.13±0.04**
30 Days Treated (6)	122.5±1.28**	41.5±0.99**	58.5±0.99**	5.45±0.04**
40 Days Treated (6)	95.16±1.32***	33.16±1.08***	66.6±1.11***	4.81±0.06***
50 Days Treated (6)	75.66±1.17***	26.5±1.06***	73.6±0.76***	4.12±0.05***



Data presented as Mean±SEM; *,**,*** shows significance at 0.1, 0.01 and 0.001 level with the value in control. Number within parenthesis denote number of samples

4. Discussion

The current study clearly demonstrate that a significant decrease (P<0.001) in sperm counts after 50 days treatment of aqueous suspension of *Allium sativum* as shown in table 1. Sperm counts decrease due to interruption of normal spermatogenesis which is under influence of androgen. Hence it indicates that *Allium sativum* possesses antiandrogenic activity (Hammami et al.,2008) The significant decrease in sperm couts leads to infertility in male mice.

Motility of spermatozoa significantly decrease (P<0.001) after 50 days treatment of *Allium sativum*. Significant decrease in sperm motility is caused by *Allium sativum*, which affect sperm motility (Chakrabarty k et al. 2003).

Seminal pH also significantly decrease (P<0.001) after50 days treatment of *Allium sativum* suspension. Decrease in seminal pH affect on the viability of spermatozoa (R.L. Ingermann et al.2002) Mortality of spermatozoa significantly increase(P<0.001) after the treatment of aqueous suspension of *Allium sativum*. The increasing number of mortality of spermatozoa cause the less chance of fertilization, which leads to infertility.

This study cleared that aqueous suspension of *Allium sativum* significantly decrease seminal pH, sperm count and sperm motility, while mortality of spermatozoa significantly increase in treated group of male mice than control. Such changes in seminal profile in treated male mice lead to infertility among treated group. Thus the study shows that *Allium sativum* possesses antifertility activity in mice.

5. Conclusion

The current study indicates that the aqueous suspension of Allium sativum exhibits antifertility effects on male mice. This study may be helpful in developing contraceptives for male of plant origin.

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