

Fertility Control Of Female Rat Through *Abutilon Indicum* Seeds

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Abstract: The effect of *Abutilon indicum* seed powder on genital organs and fertility of female albino rats was studied at dose of 25, 50 and 75 mg/kg/day for 15 and 30 days respectively. The higher dose caused histo-pathological changes in the ovary and uterus leading to 100% control of fertility as no implants recorded in treated rats on the day 10th of pregnancy.

Introduction: Global search on anti-fertility agents is going on to tackle the problem of population explosion many hormonal drugs are available for the purpose but they are not free from side effects. Hence the search for a suitable product from indigenous medicinal plants is proposed which could be effectively used in place of "pill". The *Abutilon indicum* under the family malvaceae includes 75 genera and 1000 species mostly confined to the tropical and sub-tropical regions of the world. In India the family is represented by 22 genera and about 110 species occurring mostly in the warmer part. The well known example of the family is species of *Hibiscus* (rose mallow), *Gossypium* (cotton), *malva* (mallow) and *abutilon* (flowering maple).

Material and Methods: The fresh, air dried, powdered seeds, filtered through muslin clothes were use at 25, 50 and 75 mg/kg/day/rat doses. Each dose along with 10% gum acacia powder was suspended in the distilled water. The volume was adjusted in such a way that 1 ml of suspension corresponds to each dose. Adult, cyclic female albino rats (100-150 gm) were divided into four groups each with five animals. They were maintained under uniform laboratory conditions with free access of food (Hindustan Liver Ltd.) and tap water. The seed powder as aqueous solution was administered orally by an intregastric catheter. The first group served as control in which 1ml of gum acacia (10%) was administered. In II, III and IV groups 25, 50 and 75 mg/kg dose administered to each rat respectively

for 30 days. Before the start of experiments, the body weight of each rat was recorded. On day 31st the rats of groups I, III, IV and V groups were weighed and killed under chloroform anaesthesia. The rats were dissected and genital organs were taken out the weight of ovaries and uterus was also noted. The female rats of groups II, III and IV were mated with normal male rats (1:2) during night hours next morning, the vaginal smear of each female rat was examined for presence of spermatozoa. The day on which the spermatozoa were found in the smear was considered as the 1st day of pregnancy. On the 10th day of pregnancy the rats were laparotomized to know the presence of implantation in the horns of uteri.

Results – Effects on body and genital organ weight

Table -1 & 2: Display the changes in body weight and genital organs weight. The rat of control group did not show any changes in body weight and genital organs weight. It was maintained throughout the experimental period for 15 and 30 days.

Crude Powder: On administration of crude powder of *Abutilon indicum* for 15 days an increase in body weight was observed at all dose level i.e. 25, 50 and 75 mg/kg (table -1) . Similar results were noticed after 30 days.

Table 1: Effects of *Abutilon indicum* seed powder on body and reproductive organs weight of female albino rats at different doses for 15 days (mg/kg/day) 05 rats were included in each group.

Values are mean \pm S.E

Name of treatment	Dose	Body weight (gm)		Organs weight (gm)		
		Initial	Final	Ovary	Uterus	
Control	Vehicle	105 \pm 2.9	108 \pm 2.7	0.070 \pm 0.004	0.312 \pm 0.021	
	Crude Powder	25	105 \pm 3.7	110\pm3.9	0.057 \pm 0.006	0.279 \pm 0.072
		50	100 \pm 3.0	105 \pm 3.1	0.051 \pm 0.004	0.210 \pm 0.086
Hot Water Extract	75	105 \pm 4.1	108 \pm 3.6	0.049 \pm 0.008	0.259 \pm 0.073	
	25	105 \pm 1.7	106 \pm 1.6	0.060 \pm 0.006	0.278 \pm 0.090	
	50	105 \pm 2.0	109 \pm 3.1	0.058 \pm 0.020	0.248 \pm 0.020	
Alcoholic Extract	75	110 \pm 4.3	115 \pm 3.7	0.051 \pm 0.041	0.238 \pm 0.060	
	25	107 \pm 2.1	110 \pm 1.1	0.069 \pm 0.005	0.0309 \pm 0.040	
	50	110 \pm 3.1	115 \pm 2.0	0.068 \pm 0.002	0.297 \pm 0.010	
	75	109 \pm 2.5	114 \pm 1.7	0.048 \pm 0.009*	0.280 \pm 0.080	

* P<0.05

Table2: Effect of various extracts of *Abutilon indicum* on body and reproductive organs weight of female albino rats at different doses for 30 days. 5 rats were used for each dose of treatment.Values are mean \pm S.E

Name of treatment	Dose	Body weight (gm)		Organs weight (gm)		
		Initial	Final	Ovary	Uterus	
Control	Vehicle	129 \pm 4.3	134 \pm 4.3	0.071 \pm 0.010	0.384 \pm 0.020	
	Crude Powder	25	123 \pm 5.8	127 \pm 6.40	0.057 \pm 0.008	0.324 \pm 0.077
		50	131 \pm 8.2	138 \pm 9.02	0.050 \pm 0.009	0.292 \pm 0.026
Hot Water Extract	75	127 \pm 3.9	133 \pm 4.06	0.048 \pm 0.006	0.235 \pm 0.020	
	25	122 \pm 5.14	127 \pm 5.14	0.064 \pm 0.005	0.289 \pm 0.033	
	50	121 \pm 2.91	138 \pm 4.63*	0.044 \pm 0.004	0.229 \pm 0.042*	
Alcoholic Extract	75	130 \pm 4.63	145 \pm 4.30*	0.036 \pm 0.005	0.220 \pm 0.001*	
	25	128 \pm 3.39	133 \pm 4.63	0.063 \pm 0.011	0.311 \pm 0.008	
	50	122 \pm 6.70	125 \pm 3.70	0.040 \pm 0.008*	0.237 \pm 0.096	
	75	124 \pm 1.34	127 \pm 4.18	0.045 \pm 0.006*	0.210 \pm 0.040	

30 days of administration, compared to the control group of rats. The weight reduction of genital organs was noticed after 15 days of administration of crude powder at all dose level, i.e. 25, 50 and 75 mg/kg (table-1). Reduction was also recorded after 30 days of administration of crude powder of *Abutilon indicum* at all dose level (Table-2)

Hot water extract:

Increased in all the body weight was noticed at each dose level for 15 days of dose administration (Table-1). When treatment was continued for 30 days an increase in the body weight was also noticed. Significant increase in the body weight was noticed at higher doses 50 and 75 mg/kg (Table-2) Administration of *Abutilon indicum* as hot water extract for 15 days caused reduction in the genital organs weight at dose level of 25, 50 and 75 mg/kg /day. Maximum reduction was noticed in the higher doses i.e. 50 and 75 mg/kg (Table -1). When the treatment was continued for 30 days, significant weight reduction was noticed in the ovary at the dose level of 50 and 75 mg/kg. At the dose level of 25 mg/kg there was no significant reduction in the weight of ovary at dose level, lower to higher dose. (Table-2)

Alcoholic extract:

Alcoholic extract of *Abutilon indicum* when administered for 15 days it increased body weight of treated animals. Body weight was increased in same proportion for all the dose level i.e. 25, 50 and 75 mg/kg body weight and this proportion was similar to that of controlled group (Table-1). When this extract was administered for 30 days, it caused an increase in the body weight, which is similar to the 15 days of administration. (Table-2). Reduction in the genital organs was noticed after 15 days of administration with alcoholic extract of *Abutilon indicum* at all the dose level i.e. 25, 50 and 75 mg/kg, significant reduction was noticed (Table-1). When this extract was administered for 30 days, it caused reduction in the weight of genital organs which was significant at the dose level of 75 mg/kg. Uterine weight was also reduced significantly in comparison to ovary at dose of 50 mg/kg and 75 mg/kg (Table-2)

Effects on Histology of genital organs:

The ovarian histology of the controlled group of rats with 1ml/day gum acacia powder suspension for 15 and 30 days it exhibits normal growth of the follicles with all stages of development such as organized germinal epithelium, all types of follicles, interstitial cells, normal vascularity and loose stroma (Fig-1)

Crude Powder:

Administration of lower dose i.e. 25 mg/kg of *Abutilon indicum* as crude powder for 15 days, it caused mild degenerative changes in the ovary. Atretic follicles were also encountered (Fig..2) When the same dose i.e. 25 mg/kg was administered for 30 days there were similar degenerative changes in the ovarian follicles as seen in 15 days. At the dose of 50 mg/kg the ovarian tissue showed mild degeneration after 15 day of administration. When the treatment of the same dose i.e. 50 mg/kg was extended for 30 the population of primary and developing follicles were depleted. The stroma was loose with normal vascularity. (Fig..3) At the dose of 75 mg/kg dose for 15 and 30 days caused considerable reduction of primary follicles and other follicles showed nuclear pyknosis. The interstitium and vascularity suffered mild regression. (Fig-4)

Hot water extract:

At a dose level of 25 mg/kg form 15 days caused mild effect in histoarchitecture of ovary. Antric follicles showed degeneration. When, same dose given to the rats for 30 days, it caused changes in the histoarchitecture of the ovary. Reduction in the developing follicles was notices. They were with de-generated nucleus. At the dose level 50 mg/kg for 15 days showed reduction in the developing follicles and degeneration in the antric follicles, when same dose given for 30 days (Fig-7). At 75 mg/kg showed changes in the cellular elements of ovary within 15 days and stroma appeared to be compact when dose extended till 30 days (Fig-8)

Alcoholic Extracts:

Dose administered with alcoholic extract at 25 mg/kg for 15 days caused degeneration in the antric follicles. (Fig-9) The cellular architecture was destroyed within 30 days of the treatment. Nuclear degeneration was observed in few developing and antric follicles as in 15 days of the treatment. (Fig-10) At the dose 50 mg/kg for 15 days nuclear degeneration among the oocytes of antric follicles has seen. At the dose level 30 days it causes severe degeneration in the ovary. At 75 mg/kg administration for 15 days caused follicle degeneration. The stroma was compact with poor vascularity at 30 dose of dose administration (Fig-14) Effect on Fertility: Shows the effects of *Abutilon indicum* seeds on fertility of treated rats of the control group of rats, all became pregnant and horns of uterus were observed and counted. Treated with 25,50 and 75 mg/kg dose only 20% of rats showed pregnant and reduction of implants. The dose 75 mg/kg showed 60% infertile mating was observed.

Discussion:

In the present study, significant increase in the weight was observed after 15 and 30 days of administration of *Abutilon indicum*. A significant reduction in genital organs weight was noticed within 30 days. Pincus et. al. (1956), the reduction of ovarian weight was due to suppression of the endogenous oestrogen or its progestogenic action as on progesterone administration in rats. Varshney, et.al (1982) reported the effects of *Emblca ribes* extract on the ovarian structure of female albino rats. Cranston (1945) and Radhakrishan and Alam (1975), gave the conclusion that the reduction of the female genital organ weight was due to anti-oestrogenic property of the administration of *Lithospermum ruderales* and reserpine from *Rauwolfia serpentina* and *Randia dumetorum* linn respectively. Srivastva and Jain (1993) reported anti-fertility activity in plants for male and anti-ovulatory and anti-implantation activity for female. Vohora; et.al. (1969) reported that aqueous extract of *Ocimum sanctum* linn. Leaves showed post-implantation effect at 75 mg/kg dose. It is concluded that *Abutilon indicum* seed powder inhibits the ovarian function, change the uterine structure and prevent the implantation thus control the fertility of female albino rats.

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