

## Fertility Control of Female Through Sesbania Sesban Seeds

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*Abstract : The effect of Sesbania sesban seed powder on genital organs and fertility of female albino rats was studied at doses of 100, 250 and 400 mg/kg/day for 30 days. The higher doses caused histopathological 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 the place of 'Pill'.

*Sesbania sesban* (L.) Merr. Syn.-*S. aegyptiaca* Pers. (Hindi-Jaint, Jayanti; English-common sesban, Aegyptian Rattle pod) belonging to family-leguminosae, is a soft wooded, fast growing, short lived shrub, 1.8-6 m. high found cultivated throughout the plains of India up to an altitude of 1200 m. and has been reported by Saha[17] *et al.*, 1961; Chaudhury[5], 1966 and Malhi & Trivedi[11], 1972. Bhaduri[2] *et al.* (1968) noted the antifertility activity of flowers and leaves in albino rats and mice. Pakrashi[16] *et al.* (1975) reported the abortifacient activity of flowers in mice. Dhawan[7] *et al.*, 1980 observed anti-implantation effect in albino rats. Since, no report is available regarding the seeds; the experimental work was done in female albino rats to assess its effects on genital organs and fertility.

### Materials and Methods

The fresh, air-dried, powdered seeds, filtered through muslin cloth were used at 100, 250 and 400 mg/kg doses. Each dose alongwith 0.5% gum acacia powder was suspended in distilled water. The volume was adjusted in such a way that 1 ml. of suspension correspond to each dose.

Adult, cyclic female albino rats (80- 100g.) were divided into 8 groups each with 5 animals. They were maintained under uniform laboratory conditions with free-

access of food (Hindustan Lever ) and tap water. The seed powder as aqueous solution was administered orally by an intregastric catheter. The I and I I groups served as control in which 1 ml. of gum acacia ( 0.5%. ) was administered. In III, IV and V groups, 100, 250 and 400 mg/kg dose administered to each rat respectively for 30 days. Similarly VI, VII and VIII groups received the same doses respectively for 30 days. Before the start of experiment, the body weight of each rat was recorded. On day 31st, the rats of groups I, III, IV and V were weighed and sacrificed.

The ovaries and uteri were dissected out, freed from surrounding tissues, blotted on filter paper and weighed quickly on a semi-microbalance. For histopathological studies, the ovaries and uteri were fixed in Bouin's fluid and dehydrated. The paraffin sections of tissues were cut at 6 m m and stained with Ehrlich's haemotoxylin and eosin

The female rats of groups II, VI, VII and VIII 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 first day of pregnancy. On day 10th of pregnancy, the rats were laparotomized to know the presence of implantation sites in the horns of uteri.

## Results

### Effect on body and genital organ weight

Table 1 displays the changes in body and genital organ weight. The rats of control group did not show any change in body weight and genital organ weight. It was maintained throughout the experimental period. No effect on body weight was observed at any dose of *S. sesban* seed administered to albino rats. However, the genital organ weight was reduced significantly ( $P < 0.05$ ) after the treatment at 250 and 400 mg/kg doses for 30 days.

**Table 1:** Effects of *S.sesban* seed powder on body weight and genital organ weight of female albino rats treated for 30 days at different doses (mg/kg/day). 5 rats were included in each group. Values are mean  $\pm$  S.E.

Treatment	Dose	Body Weight (g)		Genital Organ wt. (mg)		
		Mg/Kg	Initial	Final	Ovaries	Uterii
Control	Vehicle		159.00	183.80	39.40 $\pm$	107.00

		± 0.71	± 0.45	0.92	± 1.12
S.Sesban	100	157.00 ± 0.84	170.20 ± 2.24	35.90± 0.80	102.50 ± 0.20
S.sesban	250	160.60 ± 2.15	165± 2.71	27.50± 0.40*	84.10± 0.70*
S.sesban	400	157.10 ± 0.89	163.40 ± 2.16	26.00± 0.30*	61.20± 0.20*

### Effect on Histology of Genital Organs

**Ovaries** - The cellular organization of the ovaries of control rats presented normal features as evidenced by presence of all types of follicles, few atretic follicles with normal vascularity in compact stroma. The germinal epithelium was intact ( Fig. 1 ). The dose 100 mg/kg for 30 days of administration caused no deleterious effect on ovarian tissues whereas 250 mg/kg dose within 30 days severally affected the ovarian structure. Large number of developing as well as mature follicles underwent atresia. Some developing follicles showed lysis of ova. Th stroma was compact with poor vascularity ( Fig. 2)

The dose 400 mg/kg appeared highly effective to cause degenerative changes in the ovary. The administration of this dose for 30 days caused severe damage to cellular organization. Even the large antresia follicles underwent atresia and nuclear degeneration. The stroma became fibrotic with poor vascularity. The germinal epithelium was atrophied and devoid of primordial oocytes (Fig 3.).

**Uteri** - The uterine histology of the control rats presented normal structure. The endometrium was provided with large epithelial cells having basal and middle nuclei. The uterine glands were numerous, irregular and tortuous. The uterine lumen was highly distended and loose stroma with normal vascularity (Fig. 4). The dose 100 mg/kg for 30 days did not alter the endometrial height and uterine lumen. The uterine glands were irregular and tortuous. The stroma, and vascularity appeared normal. The dose 250 mg/kg reduced endometrial height. No effect was noticed on musculature, stroma and vascularity. The uterine glands were affected, as they became very small. The uterine lumen was reduced (Fig. 5).

The administration of 400 mg/kg for 30 days caused great reduction in endometrial height. The uterine glands were shrunken. In the compact stroma, the vascularity was poor. The musculature was also affected.

## Effect on Fertility

Table 2 shows the effects of *S. sesban* seeds on fertility of treated female rats of the control group of rats, all became pregnant and showed good number of Implants. Treated with 100 mg/kg dose, only 20% of rats showed pregnancy and reduction of implants. The doses 250 and 400 mg/kg showed 100% anti-fertility activity and no implants were recorded in the horns, of uteri of these rats on 10th day of pregnancy.

**Table 2:** Antifertility Activity of *S. sesban* seed powder in female albino rats.

Treatment/Group	Dose Mg/kg	Number of Rats		% Antifertility Activity	Number of Implants M ± S.E.
		Mated	Pregnant on day 10th		
Control (II)	Vehicle	5	5	0	9.30 ± 0.47
<i>S. sesban</i> (VI)	100	5	4	20	4.33 ± 0.66
<i>S. sesban</i> (VII)	250	5	0	100	NIL
<i>S. sesban</i> (VIII)	400	5	0	100	Nil

## Discussion

In the present study, no reduction in the weight was observed after 30 days of administration of *S. sesban* seeds. A significant reduction in genital organ weight was noticed at 250 and 400 mg/kg doses. [Prakash and Mathur\[15\]](#) (1977) obtained similar results with the administration of *Artobotrys odoratissimus* L. leaf extract. The results noticed in the present study on histopathology of genital organs are comparable to the studies made by [Chakraborti\[6\]](#) *et al.* (1968) when the female rats were fed with green leaves of *A. odoratissimus* Linn. [Dixit\[8\]](#) (1977) reported the follicular degeneration and uterine dysfunction by daily administration (25) days of *Malva viscus conzattii* flower extract. Follicular atresia and other changes were reported by [Kholkute and Udupa\[9\]](#) (1974) and [Kholkute\[10\]](#) *et al.* (1976) following the treatment of extract of *Hibiscus rosa sinensis* Linn. flower.

Both ponderal and histological changes in the uteri were reported by [Prakash\[13\]](#) (1979a) and [Prakash\[14\]](#) (1979b) respectively by administering, the extracts of

*Embelia ribes* Burm. seeds in albino female rats. The present observations are in agreement with Munshi[12] (1972) who had reported the effects on endometrial glands, musculature and uterine lumen in female rats after the application of an indigenous plant preparation.

Bhardwaj and Mathur[3] (1979) and Bhardwaj[4] *et al.* (1980) presented the results of anti-fertility studies in *Cassia fistula* Linn. fruit extracts on oestrus cycle, uterus and implantation. The higher dose showed encouraging activity which can be corroborated with the present study, Agrawal[1] *et al.* (1980) found similar activity in fruits of *Juniperus communis* which results in 100% anti-implantation at a dose of 500 mg/kg in female albino rats.

It is concluded that *S. sesban seed* powder inhibits the ovarian function, changes the uterine structure and prevents implantation, thus, controls the fertility of female albino rats.

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