



Review Article

EFFECT OF MIMOSA PUDICA ROOT EXTRACT ON VAGINAL ESTROUS CYCLE AND SERUM HORMONES FOR SCREENING ANTIFERTILITY ACTIVITY: A REVIEW

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ABSTRACT

The plant kingdom is a rich source of biologically active agent, revealing various types of Pharmacological actives. India has a rich heritage, use of medicinal plants for contraceptive actives in female as well as male. The present study on antifertility activity using ethanolic extract of Mimosa Pudica Linn (Fabaceae) is shows antibacterial, antivenom, anticonvulsant, antidepressant and various other Pharmacological activity. Mimosa Pudica is known as “Do not Touch me”, live & die, shame, sleeping grass and humble plant. This review is based on evaluates existing preclinical studies focusing on effect of Mimosa pudica root extract on the vaginal estrous cycle and serum reproductive hormones in experimental animal models. The modulation of estrous phases, alterations in estrogen and progesterone levels, and possible mechanisms underlying antifertility activity are discussed. The findings suggest that Mimosa pudica root extract may serve as a promising herbal antifertility agent, warranting further pharmacological and toxicological investigations.

INTRODUCTION

All around the world, medicinal plants have been traditionally to cure a variety of ailments. The present work was carried out to evaluate the claimed out pharmacological studies with the root of extract of the plant. Population control remains major global challenge and despite the availability of various contraceptive methods, their associated side effect such as hormonal imbalance, thromboembolic disorders, and carcinogenic risks has encouraged the exploration of safer alternatives. The *Mimosa Pudica* Linn (Fabaceae India), is locally known as an agent for birth control among rural people. Among different plant, the **root** has been particularly associated with reproductive effect. The root of this plant in combination with other medicinal are traditionally used in the treatment of disease-like diarrhea, amebic and blood pressure. *Mimosa pudica* root extract was given orally daily to Albino mice at a dose of 300 mg/kg body weight, and it was discovered that this decreased the number of litters by lengthening the estrous cycle and greatly lengthening the diestrus phase. The release of gonadotropins and the secretion of estradiol were discovered to be altered by the extract, which changed how the estrous cycle is regulated. Given intragastric ally at a dose of 150 mg/kg body weight, *Mimosa pudica* root powder disrupted the pattern of the estrous cycle in female *Rattus norvegicus*, and a significant decrease in the number of eggs was also noted.



Fig 1: *Mimosa Pudica*

Other Pharmacological Uses



Figure 2: *Leaf*

- Leaf's pasts treat boils, abscesses and skin infection when applied topical.
- Leaf's Juice helps wounds, piles and fistulas.
- Leaf deco cation helps with asthma and act as an expectorant.
- Used traditionally medicine ton treats diarrhea and stomach.



Figure 3– *Seeds*

- Used to treat Urinary infection.
- Utilized for treating female reproductive disorders.



Figure 4 – *Roots*

- Used traditionally to treat snakes' bites.
- Effective against Jaundice, leprosy, dysentery and fever.

BOTANICAL DESCRIPTION AND PHYTOCHEMICAL OF *MIMOSA PUDICA*

Mimosa pudica belongs to the family Fabaceae and is characterized by its sensitive leaves that fold upon touch. The plant contains several bioactive constituents, including:

- Alkaloids - L-mimosine, 5-MeO-DMT, and piperidine derivatives.
- Flavonoids - Orientin, isoorientin, vitexin, isovitexin, and gallic acid
- Tannins - Hydrolysable tannins

The presence of phytoestrogenic compounds is believed to play a crucial role in its antifertility activity by interfering with the hypothalamic–pituitary–gonadal axis.

ESTROUS CYCLE AND ITS IMPORTANCE IN ANTIFERTILITY SCREENING

The cycle is divided into four stages, characterized by changes in vaginal cytology (the types of cells present in a vaginal smear)

Table No: 1 Key Cytological Feature

Phase	Duration	Key Cytological Feature	Hormonal & Reproductive Status
Proestrus	12 Hrs	Nucleated epithelial cells	Follicles developing; High Estrogen; FSH rising.
Estrus	12 – 24 Hrs	Cornified cells (no nucleus)	"Heat" (receptive); Ovulation; Estrogen peaks, then falls.
Metestrus	21 Hrs	Leukocytes + Cornified cells	Corpus luteum forms; Progesterone rises.
Diestrus	57 Hrs	Many Leukocytes (white blood cells)	Longest phase; High Progesterone; Quiescent.

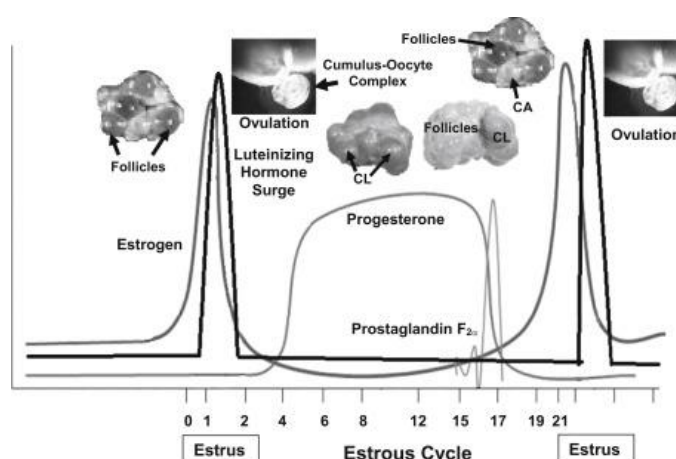


Figure 5: Estrous Cycle

Monitoring vaginal cytology is a well-established method to assess reproductive toxicity and antifertility effects. Disruption or prolongation of specific phases particularly estrus or diestrus indicates interference with ovulation and hormonal regulation.

EFFECT OF MIMOSA PUDICA ROOT EXTRACT ON VAGINAL ESTROUS CYCLE

Several animal studies have demonstrated that administration of *Mimosa pudica* root extract leads to:

- **Prolongation of the Cycle:** The extract significantly prolongs the overall length of the estrous cycle, disrupting the normal rhythm.
- **Prolongation of Diestrus:** There is a significant increase in the duration of the diestrus phase, indicating that the ovaries are not transitioning to the next cycle, thus blocking ovulation.
- **Hormonal Alteration:** The root extract acts by suppressing FSH (Follicle-Stimulating Hormone) during the proestrus/estrus stages, which prevents follicle maturation and ovulation.
- **Anti-implantation:** *M. pudica* extracts (leaf and root) have been found to cause significant anti-implantation and early abortifacient activity, likely through disrupting the progesterone-estrogen balance, causing a decrease in the number of healthy ova and reducing the number of litters.
- **Reversibility:** Studies showed that after withdrawing the *M. pudica* root extract, the estrous cycle resumed normality, indicating that its effects are reversible.

Effect on Serum Reproductive Hormones

Table No: 2 Hormones and Effect

Hormones	Effects	Rationale
FSH (Follicle Stimulating Hormone)	Decreased	Suppression linked to cycle irregularity and ovulation disturbance in mice; rat oestrous abnormalities imply similar down-regulation.
LH (Luteinizing hormone)	Altered / suppressed	Altered gonadotropin release reported in mice; disrupted cyclicity in rats suggests pituitary hormone dysregulation.
Estradiol (Estrogen)	Disturbed levels	Studies in mice show oestradiol perturbations during oestrus; rat ovarian dysfunction implies hormone imbalance.
Prolactin	Variable changes	Mouse data show changes consistent with cycle disruption.
Progesterone	Likely altered indirectly	Though not consistently measured, changes in cycle phase durations imply effects on progesterone dynamics.



Proposed Mechanisms of Antifertility Action

The antifertility activity of *Mimosa pudica* root extract may involve multiple mechanisms:

- Interference with estrogen receptor signaling
- Suppression of gonadotropin release from the pituitary
- Inhibition of ovarian steroidogenesis
- Alteration of uterine receptivity and endometrial development

The combined effect ultimately results in an unfavorable hormonal and physiological environment for conception.

Safety and Toxicological Considerations

Acute and sub-acute toxicity studies reported in the literature indicate that *Mimosa pudica* root extract is relatively safe at therapeutic doses. However, chronic toxicity, reproductive reversibility, and teratogenic potential require detailed evaluation before clinical application.

Research Gaps and Future Perspectives

Despite promising preclinical evidence, several gaps remain:

- Lack of standardized extract formulations
- Limited mechanistic studies at the molecular level
- Absence of long-term fertility reversibility data
- No clinical trials in humans

Future research should focus on isolating active constituents, evaluating receptor-level interactions, and establishing safety through well-designed clinical studies.

CONCLUSION

The available evidence indicates that *Mimosa pudica* root extract significantly affects the vaginal estrous cycle and serum reproductive hormones, demonstrating potential antifertility activity. Its ability to modulate hormonal balance and disrupt ovulatory processes highlights its promise as a natural contraceptive agent. However, extensive pharmacological validation and safety assessment are essential before its therapeutic application.



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