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ANTIFERTILITY ACTIVITY OF ETHANOLIC EXTRACT OF *CORDIA OBLIQUA* LEAVES ON FEMALE WISTAR RATS

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ABSTRACT

Objective: The present study was to evaluate the antifertility activity of ethanolic extract of *Cordia oblique* leaves on female wistar rats.

Materials and Methods: Three groups of rats were administered orally (EECOL) ethanolic extract of Cordia obliqua leaves at doses of 200 and 400 mg/kg body weight daily for 10 days. The control group received Tween 80. On day 10 of gestation, preserve for histopathology evaluation of each rat uterus was examined to determine the number of implantation. and body weights is compared to the respective initial body weights, and the blood collected for biochemical evaluation of estrogen.

Results: Oral administration of the extract from days 1 to 10 of gestation showed reduction ($p<0.05$) in the number of live fetuses. Anti-implantation activity of the treatment groups were 61% and 100% for groups II to III respectively, whereas antifertility activity of the groups was found to be 61% and 100% in the same order.

Conclusion: The results suggest that ethanolic extract of *Cordia oblique* leaves could induce positive effects on antifertility activity of female wistar rats.

Key words: Antifertility, Cordia obliqua, Anti-implantation

INTRODUCTION

Anti-fertility agents are those which are capable of stopping ovulation or fertilization and able to result in termination of being pregnant **[1]**. The growth in population is alarming the growing world in the want for effective beginning control measures **[2]**. One of the serious issues in the growing nations like India is over population **[3]**. The Boraginaceae family consists of about

2,700 species, which are distributed in tropical, sub-tropical and warmer regions around the world. It is composed of about 130 genera and six sub families, in which Cordioideae is one. It contains the genus Cordia, which is comprised of evergreen trees and shrubs. About 300 species of genus Cordia have been identified worldwide. There are 13 species of this genus found in India **[4]**. One of them is *Cordia obliqua* Willd. It is a medium-sized deciduous tree, found scattered throughout the midHimalyas up to elevations of 1,470 meters. It shows a tall growth. There are two-forms of *Cordia obliqua* Willd, which are found in Himachal Pradesh and the major difference in between these two-forms is the size of their fruits, once have smaller fruit than other. The plant having small fruits is commonly found.[5] Its fruit is sweet and possess diuretic, anthelmintic, purgative, expectorant, maturant, useful in dry cough, in the diseases of chest and urethra, in biliousness and chronic fever and pains in the joints. As per Yunani system, it is good in diseases of spleen. According to ayurveda, it is valuable in all diseases of lungs and used as a substitute for *Cordia wallichii* **[6]**. The plant is reported to have an Anti-inflammatory activity **[7]**, Hypotensive and respiratory stimulation activity **[8]**, Antimicrobial activity **[9]**, Diuretic activity **[10]**, Hepatoprotective activity **[11]**, Analgesic, Antipyretic and Anti-Inflammatory activity **[12]**, Antioxidant activity **[13]**, Wound Healing activity **[14]**. The current investigation was focused on the antifertility activity of ethanolic extract of *Cordia obliqua*LEAVES on female Wistar rats.

MATERIALS AND METHODS

Plant material

*C. obliqua*leaves was collected from Rambakkam village, villupuram district, Tamil Nadu, India. Taxonomic identification was made from **Dr. N. Srinivasan,** M. Pharm., Ph.D., Assistant Professor, Department of Pharmacy (pharmacognosy), Annamalai University.

Preparation of crude extract

The *Cordia obliqua* leaves was dry under shade, segregated, pulverized by a mechanical grinder and passed through a 40 mesh sieve. The powdered materials will successively extract with ethanol by hot continuous percolation method in Soxhlet apparatus for 24 hrs. The extract was concentrated by using a rotary evaporator and subjected to freeze drying in a lyophilizeruntill dry powder was obtained.

Animals

The rats maintained under standard conditions of environment and feed with standard pellet diet. Before starting of experiment, the animals were given time of

seven days to get acclimatized with laboratory environment conditions. The animals fasted for 18hrs before the experiment. After sufficient period of acclimatization, they were used to evaluate antifertility activity. The experimental protocol was subjected to the scrutinization of IAEC of Central Animal House, Rajah Muthiah Medical College,Faculty of Medicine, Annamalai University, Annamalai Nagar and was duly approved under the IAEC Proposal No. AU/IAEC/1263/11/19 and care of animals were carried out according to the guidelines of CPCSEA, New Delhi, Reg. No:160/PO/ReBi/S/1999/CPCSEA Date.25/11/1999.

Experimental design

Both sexually Wistar rats (150−200g) of proven fertility and regular estrus cycles were selected and caged with males of proven fertility in the ratio of 3:1 in the evening of estrus phase were examined the following day for the evidence of copulation. Those rats showing thick clumps of spermatozoa in their vaginal smears and presence of HCG (human chorionic gonadotrophin) in their urine samples (detected by using urine pregnancy kits) was separated, and that day marked to designed as day 1 of pregnancy. Those rats were divided into three groups. Group I received vehicle (tween 80) at served as the control. Groups II and III received (EECOL) ethanolic extract of *cordia oblique* leaves at a dose of 200 and 400 mg/kg body weight respectively. Doses are administered from day 1 to 10 of pregnancy by oral feeding needle. After the last dose, the animals were sacrificed under excess ketamine anesthesia using sterile conditions, and the uterus was examined to determine the number of implantation sites. However, a body weights is compared to the respective initial body weights, and the blood collected for biochemical evaluation and uterus isolated and preserve for histopathology evaluation.

Dose & route of administration

The group 1 received normal saline (Tween 80) at served as control, group II received EECOL at 200mg/kg b.w/day and group III received EECOL at 400mg/kg b.w/day. and The antifertility activity of ethanolic extraction of Cordia obliqua leaves extract was administered by oral gavage.

Statistical analysis

All the values were expressed as mean ± SEM. The data were analyzed using one-way analysis of variance (ANOVA). The levels of significance were taken at **$p < 0.05$ in relation to control and standard.

RESULTS

Table 1: Body weight (gm)

Group	Treatment	Dose (mg/kg)	Initial Body weight (gm) in day 1	Final Body weight (gm) in day 10	Body weight gain (gm)
1	Control	Tween 80	151.8 ± 1.0	179.6 ± 3.8	27.8 ± 2.4
II	EECOL	200mg/kg/ b.w/day	150.66 ± 0.4	164.66 ± 2.2	14 ± 1.3
III	EECOL	400mg/kg/ b.w/day	151.5 ± 0.25	155.5 ± 0.5	4 ± 0.37

n= 5, 3, 2, The levels of significance were taken at **p < 0.05 in relation to control and standard

Table 2: Antifertility and Antiimplantation activities of *Cordia obliqua*LEAVES extract

Group	Treatment	Dose (mg/kg)	No. of pregnant / No. of tested	No. of dead rats	No. of implantation (mean ± SEM)	% Inhibition of Anti-implantation	% of Anti-fertility activity
1	Control	Tween 80	5/5	0	5.4 ± 2.6	0%	0%
II	EECOL	200mg/kg/ b.w/day	3/5	0	2.64± 1.1	61%	61%
III	EECOL	400mg/kg/ b.w/day	2/5	0	0 ± 0	100%	100%

n= 5, 3, 2, The levels of significance were taken at **p < 0.05 in relation to control and standard

Table 3: Biochemical test for estrogen EECOLin female rats

Group	Treatment	Dose (mg/kg)	Estrogen
1	Control	Tween 80	163.45 ± 2.03 pg/ml
II	EECOL	200mg/kg/ b.w/day	358.67 ± 1.01 pg/ml
III	EECOL	400mg/kg/ b.w/day	554.14 ± 3.21 pg/ml

n= 5, 3, 2, The levels of significance were taken at **p < 0.05 in relation to control and standard

DISCUSSIONS

Administration of EECOL at the test doses from days 1 to 10 of pregnancy resulted in strong antiimplantation and antifertility activities **(Table 2)**. Although there were neither deaths nor clinically observable, treatment-related inhibitory effects of *Cordia obliqua* on the pregnant rats, changes in body weights **(Table 1)** provide a good index of the integrity of maternal homeostasis **[15]**. In the present study, significant decreases (**p< 0.05) in body weights were observed when EECOL was given to the rats. The low body weight gain in pregnant rats given the extract might suggest nil or few number of implantations In anti-implantation study, a dose dependant anti-implantation effect was observed **(Table 2)**. With increase in the dose of the EECOL, the percentage of implantation inhibition decreased and was significant (**p < 0.05) at higher dose, i.e. 400 mg/kg. In this study, the extract showed 61% and 100% anti-implantation effect at the doses of 200 and 400mg/kg body weight, respectively. The extract showed maximum inhibition of implants at higher dose, i.e. 400 mg/kg. The EECOL

when administered at control group to immature female wistar rats, enhanced the estrogen level in the serum whereas increased the estrogen level at 200 and 400 mg/kg dose. The extract along with estradiol at dose level of 400 mg/kg significantly (**$p < 0.05$) increased the level of estrogen, in comparison to control group rats indicating the antiestrogenic nature of the extract.

CONCLUSION

The results suggest that ethanolic extract of *Cordia oblique* leaves could induce positive effects on antifertility activity of female wistar rats.

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