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ANTIFERTILITY SCREENING OF *ERVATAMIA CORONARIA* LEAF EXTRACT IN FEMALE WISTAR RATS

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ABSTRACT

Ervatamia coronaria belong to the family Apocynaceae, is traditionally used in Indian health care system, for various therapeutic applications. Few of its biological activity have been explored. Current study was designed, in order to investigate the birth control effect of *Ervatamia coronaria* in female rats. The objective of the study is to screen the antifertility activity of aqueous leaf extract of *Ervatamia coronaria* in female rats. The proestrus female rats were kept with male rats of proven fertility in the ratio of 2:1. Animals in the groups I received 0.5% CMC given vehicle only and serve as control. Aqueous leaf extract of *Ervatamia coronaria* 200 mg/kg and 400 mg/kg were administered to group II and group III respectively from day 1 to 7 of pregnancy. The number of implantation sites on both horns of uteri was observed. The results showed that, *Ervatamia coronaria* leaf extract exhibited dose dependent antifertility activity in female rats.

Keywords: *Ervatamia coronaria*, Antifertility, Apocynaceae.

INTRODUCTION

Population explosion is one of the major threats in the developing countries, facing new challenges, with its expected outcome on all aspects of development [1]. So it is essential to control the population explosion, and to mark better health for one and all. Measures have been taken to control this serious problem by developing anti-fertility agents called contraceptive; those chemical substances that influence either the sperm production or motility in males or to prevent ovulation and alters the endometrial environment, making it unsusceptible to a fertile ovum in females[2]. Even though synthetic contraceptives are available, but continuous usage may leads to health related

effects, like increase in blood transaminase and cholesterol levels, dyspepsia, headache, depression, tiredness, weight gain, hyper menorrhea and inter-menorrheal hemorrhage and also disturb the metabolism of lipid, protein, carbohydrate, enzymes and vitamins [3]. Therefore, a need of novel herbal alternatives as antifertility agent, with lesser side effects as compare to synthetic one.

Ervatamia coronaria Stapf Local name: Adukkunandiyavattai (In Tamil Language) (Synonym: *Tabernaemontana divaricata*) belongs to the family Apocynaceae, is a glabrous, evergreen tree indigenous to India and is cultivated in gardens for its ornamental and fragrant flowers. This species has been extensively investigated and a number of chemical constituents such as alkaloids [4], triterpenoids, steroids [5], flavonoids [6] and phenolic acids [7] were isolated from leaves, roots and stems of the plant.

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In Indian traditional system of medicine the plant material is widely used as a purgative, antifertility, tonic to the brain, spleen, and the liver and also used in the treatment of cancer, wounds and inflammations[8]. The plant extract was also found to possess analgesic, antipyretic, vasodilator and CNS depressant effects [9], antispasmodic, hypotensive [10], anti-inflammatory [7], uterine stimulant effect [11], cytotoxic [12] and anti-oxidant activity [13], anti-cataract activity [14]. Current study is aim to screen the antifertility activity of aqueous leaf extract of *Ervatamia coronaria* in female rats.

MATERIALS AND METHODS

Plant Material

Leaves of *Ervatamia coronaria* were collected from outskirts of Erode, Tamilnadu. Authentication has been done by Prof. V. S. Kumar, Scientists (F) and Head of the Office, Tamilnadu Agriculture University, Coimbatore (Tamilnadu). The voucher specimen (No.: BSI/SRC/5/ 23/ 12-13/ Tech. 816) has been deposited in the herbarium for future references.

Preparation of Extract

The collected leaves were washed to remove the adhering foreign matters, shade dried for 7 days and ground to course powder using a blender. The powdered leaves of *Ervatamia coronaria* were soaked in sufficient quantity of purified water for maceration, after maceration the meristrium was collected, filtered and then evaporated to obtain dry extract and it was used for the study.

Animals

Healthy male and female Wistar albino rats weighing between 150–220 g were used for the study. The animals were obtained from animal house of Sri Lakshminarayanan Institute of Medical Sciences, Pondicherry. On arrival the animals were placed at random and allocated to treatment groups in polypropylene cages with paddy husk as bedding. Animals were housed at a temperature of 24 ± 2°C and relative humidity of 30–70 %. A 12:12 light: dark cycle was followed. All animals were allowed free access to water and fed with standard

commercial pelleted rat chaw (Hindustan Lever Ltd, Mumbai). All the experimental procedures and protocols used in this study were reviewed by the Institutional Animal Ethics Committee (932/a/06/CPCSEA) and were in accordance with the guidelines of the CPCSEA.

Antifertility Activity

18 Female rats of proestrus phase and 9 male rats with proven fertility were used for the study. The proestrus female rats were kept with male rats of proven fertility in the ratio of 2:1. The female rats were examined in the following morning for evidence of copulation. The animal which showed thick clumps of spermatozoa in vaginal smear were separated from the male partner and divided into 3 groups (n=6). Animals in the groups I received 0.5% CMC given vehicle only and serve as control. Aqueous leaf extract of *Ervatamia coronaria* 200 mg/kg and 400 mg/kg were administered to group II and group III respectively from day 1 to 7 of pregnancy. The day when spermatozoa detected in vaginal smear was considered as day 1 of pregnancy. All the animals were sacrificed under light ether anaesthesia and laprotomy was performed to determine the number of implantation sites on the both horn of uteri. [15]

Statistical Analysis

Results were expressed as mean ± SEM. The data were analyzed by using one way analysis of variance (ANOVA) followed by Dunnet’s t test using GraphPad version 3. P values < 0.05 were considered as significant.

RESULTS

The antifertility activity of aqueous leaf extract of *Ervatamia coronaria* was studied in female rats and the numbers of implantations were observed. Group I control animals treated with vehicle showed 8.37 ± 0.14 implantations sites. The groups treated with 200 & 400 mg/kg of aqueous leaf extract of *Ervatamia coronaria* showed 4.66 ± 0.07 and 1.24 ± 0.01 implantations respectively. Both the doses of *Ervatamia coronaria* leaf extract showed significant (P < 0.001) decrease in the implantation compared to control groups.

Table 1. Shows the anti-fertility activity of aqueous leaf extract of *Ervatamia coronaria* in female rats

Groups	Drug Treatment	Number of Implantations sites
Group I	Control (0.5% CMC)	8.37 ± 0.14
Group II	<i>Ervatamia coronaria</i> (200mg/kg)	4.66 ± 0.07***
Group III	<i>Ervatamia coronaria</i> (400mg/kg)	1.24 ± 0.01***

Values are in Mean ± SEM; (n = 6)

*P < 0.05, **P < 0.01, *** P < 0.001 Vs Control

CONCLUSION

From the above it was concluded that, aqueous leaf extract of *Ervatamia coronaria* exhibits anti-fertility activity in female rats.

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