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## PRECOITAL ANTIFERTILITY ACTIVITY OF *Vinca rosea*

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Effect of petroleum ether extract of leaves of *Vinca rosea* was investigated in adult Swiss albino female mice precoitally. The uterine weights declined significantly. A total pregnancy interceptor efficacy of the extract Was observed at the dose of 5 mg/day/mice. The extract caused, a significant decline in the glycogen content and a significant increase in the cholesterol content of the uterus was observed.

### INTRODUCTION

Marvelous powers have been attributed to plants for the alleviation of different maladies in the indigenous medicine system of India. Millions of people in the third world use herbal medicines because they believe in them and regard them as their own system of medicine. (Chaudhary, R.R., 1992). Therefore, the present study examined the use of plant extracts as antifertility agents, as they are more effective and less deleterious

*Vinca rosea* (*Catharanthus roseus*) or periwinkle or sadabahar is a member of family Apocyanaceae. It is well known for its alkaloids vincristine and vinblastine which possess anti - cancer properties. Considerable antifertility activity of *Catharanthus roseus* has been reported in male rats and mice (Murugund *et al.* 1989; Murugund and Akbarsha, 1995; Chauhan and Mathur 1992). The present investigation, therefore attempts to evaluate the interceptor efficacy of the extract Was observed at the dose of 10 mg/day/rat.

### MATERIAL AND METHODS

**Plant extract and animals used:** Leaves of the experimental plant *Vinca rosea* were collected from agricultural farms near Jaipur, Rajasthan. They were then authenticated in the Herbarium, Department of Botany, University of Rajasthan, Jaipur, under the specimen voucher No. RUBL-20841. The leaves were shade dried, powdered, and extracted with

petroleum ether (BP-60-80" C) in a Soxhlet apparatus, to obtain a semi-solid viscous dark green mass i.e., the extract.

Colony-bred adult healthy male and female Wistar mice weighing 120-200 mg were used in the present investigation. The mice were housed in standard rat cages and maintained under standard conditions (12h light/dark cycle, room temperature) and provided standard laboratory chow (Ashirwad food Industries, Chandigarh, India) and water was provided ad libitum. The extract was administered intramuscularly. The study was approved by the Institutional ethical committee of the Department of Zoology, Vedic Kanya P.G. College Jaipur. The Indian National Science Academy (2000), New Delhi, guidelines were followed for maintenance of experimental animals.

### **Experimental design;**

#### **Female antifertility test:**

**CONTROL:** Parrous female mice were administered with 0.1 ml of olive oil vehicle only and were treated as control. Minimum of five animals were used in each experiment.

**EXPERIMENTAL:** 5 mg petroleum ether extract dissolved in 0.1 ml of olive oil vehicle was administered during precoital stages to adult, healthy parrous female mice for 3 consecutive days. These females were then cohabited with males of proven fertility. Mating was confirmed by the presence of a vaginal plug or spermatozoa in the vaginal smear. Day of mating was taken as day 0.

**Autopsy schedule:** The animals were weighed and an autopsy was performed on day 12 postcoitum (pc). The reproductive tract was quickly exposed and cleared of adherent tissue.

**Body and Organ weight:** Initial and final body weights of animals were recorded. The uterine horns were dissected out, cleared of adherent tissues and blood and weighed to the nearest milligrams.

**Fertility Test:** Number of Corpora lutea and implantation sites, if any, were counted and recorded.

**Tissue Biochemistry:** Uterine horns were frozen at -20C for biochemical estimations. The uterus was assayed for glycogen (Montgomery, 1957) and cholesterol (king, 1959).

**Statistical Analysis:** Data are expressed as meant SEM. Student's t test was used for statistical comparisons.

## RESULTS

**Body and organ weights:** The 5mg dose of the petroleum ether extract of *Vinca rosea* leaves did not cause a significant change in the mean body weights but a statistically significant decline in the wet uterine weights of the experimental mice as compared to the control mice was observed.(Table 1).

**Fertility Test**The 5 mg dose of the petroleum ether extract of the leaves of *Vinca rosea* proved to be sub effective as compared to the control animals. The percentage implantation i.e., the number of implantation site in relation to the number of corpora lutea dropped to 48.27% as compared to control animals.(Table 2).

**Tissue Biochemistry:** The glycogen content of the uterus of experimental mice showed a statistically significant decline as compared to the control animals. On the other hand, a highly significant increase in the cholesterol content of the uterus was observed on day 12 pc. (Table 3). **DISCUSSION**

A number of plant extracts have been reported to act as effective antifertility agents (Badami et al, 2003, Vasudev and Sharma, 2006). Since, a long-time leaf of *Vinca rosea* are known for its medicinal properties. Significant antifertility activity of the leaves of *Vinca* have been reported in male rats and mice.(Murugand et al., 1989, Murugand and Akbarsha,1991., Chauhan and Mathur,1992,Stanley and Akbarsha,1992). In the present investigation, it was observed that petroleum ether extract of leaves of *Vinca rosea* caused a decline in the percentage of implantation in relation to corpora lutea. Similar results were reported by many other researchers (Kanjanoopathi et al, 1981, Gupta and Mathur 2009). The uterotrophic bioassay of petroleum ether extract of leaves of *Vinca rosea* using immature female mice established the anti-estrogenic nature of plant. These results tally with those of Kabir et al ,1985and Pakrashi and Chakraborty ,1978.

In the present study, the petroleum ether extract of leaves of *Vinca rosea* does not significantly alter the body weights of experimental animals. In gross terms, this possibly indicates that the extracts do not have any apparent toxic or adverse effect on the general physiology of the experimental animals. The uterine weights showed a dose-dependent decline. An active antiestrogen has been reported to decrease the wet uterine weight(Drill,1966,Edgren and Calhoun , 1957,1961.)The control uterus is heavy on day 12 pc when fetal sites are well marked and well-developed fetuses are present in the uterus. In the absence of pregnancy, in experimental animals' uterine weights decrease considerably and its

appearance is like that of a normal uterus. These results are in confirmation with those reported by Gopal Krishnan et al. (1979), Sharma (1989)., Gupta (1994).

Glycogen is the principal source of energy stored in the uterine tissue and its content is influenced by hormonal secretion. (Walaas 1952 and Christie 1966). In the present study, a decline in the glycogen content of the uterus of experimental animals leads to a depletion in stored energy required for gestation. (Mutreja et al., 2009, Gutpa and Joshi. 2005.) The antiestrogenic nature of Vinca leads to the competitive inhibition of the uterine receptor sites.

Cholesterol is a precursor molecule for the synthesis of steroid hormones (Eik Nes and Hall, 1962). In the present study, a decline in the cholesterol content of the uterus of experimental animals was observed which can be attributed to the antiestrogenic nature of the compound. The exact role of cholesterol in the mammalian uterus is not clearly understood. It could be presumed, that estrogens first increase the synthesis of cholesterol from its acetate precursor and secondly block the conversion of cholesterol to esterified compounds required for the maintenance of pregnancy (Lal, 1976), thus possibly contributing to the interference of pregnancy.

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#### **Table 1**

Effect of administration of 5 mg of petroleum ether extract of the leaves of *Vinca rosea* on the Body weight and uterine weight of the female mice. (Number of mice in each group 5)

GROUP	EXTRACT	TREATMENT mg/dose/day/mic e	AUTOPSY ON DAY 12 PC		
			INITIAL BODY WEIGHT (mg)Mea n ± SEM	FINAL BODY WEIGHT (mg)Mea n ± SEM	UTERINE WEIGHT (mg)Mean ± SEM
CONTROL	VEHICLE	-	33.5±0.8	35.7 ±1.03	372±31.9 4
EXPERIMENTA L	PETROLEU M ETHER EXTRACT	5MG	27.5 ± 1.4	28.3 ±1.4	129±39.6 1

**Table 2**

Effect of administration of petroleum ether extract of the leaves of Vinca rosea on the fertility of female mice (Number of mice in each group= 5)

GROUP	EXTRACT	TREATMENT mg/dose/day/ mice	AUTOPSY ON DAY 12 PC		
			CORPORA LUTEA	IMPLANTATION SITES	PERCENTAGE IMPLANTATION
CONTROL	VEHICLE	-	61	52	85.24
EXPERIMENTAL	PETROLEUM ETHER EXTRACT	5MG	58	28	48.27

### Table-3

Effect of administration of petroleum ether extract of the leaves of Vinca rosea on the Biochemical Parameters of the uterus of female mice (Number of rat in each group= 5)

GROUP	EXTRACT	TREATMENT mg/dose/day/mice	BIOCHEMICAL PARAMETERS		
			GLYCOGE N	CHOLESTEROL	
CONTROL	VEHICLE	-	8.3± 0.6	11.08± 0.7	
EXPERIMENTA L	PETROLEUM ETHER EXTRACT	5MG	5.4± 1.04	6.4± 0.7	

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