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# Antifertility Activity Of An Indigenous Plant Preparation (ROC-101)—III : Effect On Ultrastructure Of The Rat Uterine Luminal Epithelium

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An indigenous plant preparation, ROC-101, was administered orally to spayed virgin rats, alone or in combination with progesterone or estrogen. Judged from the gross and ultrastructure of the uterine luminal epithelium, the plant preparation did not show any progestational or estrogenic activity. Further, it failed to interfere with the action of exogenous progesterone or estradiol on the luminal epithelium. It is therefore suggested that the plant preparation does not exert its antifertility action by interfering with the activity of ovarian hormones on the uterus.

## Introduction

ROC-101, an indigenous plant preparation composed of a mixture of three plants, has been reported to prevent pregnancy in women when administered twice a day during the first three days of the menstrual cycle (Personal communication). Female mice and rats administered a diet containing the plant preparation failed to become pregnant, but instead showed an abnormal number of pseudopregnancies when mated with normal males (Munshi and Rao 1972). Further, there was no evidence of impaired ovulation as revealed by the presence of both newly formed corpora lutea and follicles in the ovaries of treated mice. Apparently the plant preparation does not interfere with normal mating or ovulation (Munshi and Rao 1972).

In order to elucidate further the mode of action of the plant preparation in inhibiting fertility, its effect on the ultrastructure of the uterine luminal epithelium of the spayed virgin rat was studied. This tissue was selected since it undergoes characteristic gross and ultrastructural changes when treated with progesterone (Ljungkvist 1971b) or estrogen (Ljungkvist 1971c).

## Material and Methods

Twenty-one female rats of the Sprague-Dawley strain were used in this study. Seventeen of these rats were ovariectomized at 3 months of age and used after a two

weeks rest. A suspension of the plant preparation was made in melted butter and administered to the rats by a stomach tube. Each animal received 2 ml of the suspension containing 0·7 g of the plant preparation daily. The spayed rats were divided into four Groups. Group I which comprised 3 rats received butter only for 14 days while group II comprising 8 rats received the plant preparation for the same period. The 3 rats in Group III received the plant preparation for 14 days together with 5·0 mg progesterone for the last two days. In Group IV the 3 rats received the plant preparation for 14 days along with 0·1 μg of estradiol for the last two days. To confirm the antifertility activity of the plant preparation at the dose used, 4 normal cyclic rats were administered the plant preparation for 14 days, mated with normal males and observed for pregnancy.

Twenty-four hour after the administration of the last dose of the plant preparation, the spayed rats were perfused through the abdominal aorta with 2·5 per cent glutaraldehyde in phosphate buffer, pH 7·2, and the uterine horns dissected out. After dehydration and embedding in plastic, sections were cut both for light and electron microscopy as described previously (Ljungkvist 1971**a**).

In the earlier studies (Munshi and Rao 1972, Munshi **et al** 1972), the plant preparation had been incorporated into the diet of the animals and its effect studied. A second experiment was therefore carried out in Wistar strain normal as well spayed rats, in which the plant preparation was administered in the diet at the 10 per cent dose level for 21 days. The details of the experiment were essentially the same as that reported above.

## Results and Discussion

The results of both experiments show that the plant preparation has no progesterone or estrogen-like activity, since the uterine luminal epithelium showed no gross or ultrastructural change in spayed rats treated with butter or the plant preparation. Further, it failed to block the action of exogenous progesterone and estrogen respectively on the epithelium. Nevertheless, it did prevent pregnancy among those rats treated with the plant preparation and then mated.

Theoretically, the plant preparation may cause infertility by interfering with development, fertilization, tubal transport, and/or implantation of the ovum. Fertilization, tubal transport and implantation are all influenced by estrogen and progesterone. Interference with them seems, however less likely in view of the absence of any estrogen or progesterone-like activity of the plant preparation. Administered post-coitally the plant preparation had no effect on implantation and pregnancy (Munshi and Rao 1972). It thus appears that the plant preparation may be affecting the development of the ovum. This action seems feasible in view of the results obtained in male mice (Munshi **et al** 1972) where the plant preparation caused an arrest of spermatogenesis at the primary spermatocyte stage. Studies are therefore in progress to evaluate the effect of the plant preparation on ovum development.

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