

## EFFECT OF FOENICULUM VULGARE SEED EXTRACT ON MAMMARY GLANDS AND OVIDUCTS OF OVARIECTOMISED RATS

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**Received: March 06, 1985**

**Accepted: June 30, 1985**

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**ABSTRACT:** *The effect of acetone extracts of *Foeniculum vulgare* Mill., seeds at different dose levels (50/ug, 150/ug and 250/ug/100gm body wt.) on mammary glands and oviducts of castrated rats was investigated. The extract was found to increase nucleic acids and protein concentration as well as the organ weights in both the tissues. The medium and high doses were very effective. The results confirm the estrogenic nature of the seed extract.*

### INTRODUCTION

*Foeniculum vulgare* Mill. (Fennel) is an aromatic herb belonging to the family Umbelliferae. The seeds are used in the indigenous system of medicine as an emmenagogue and galactagogue<sup>1</sup>. The compound anol or anethole, which is the major active compound of fennel oil, is considered to be an active estrogenic agent<sup>2</sup> due to its structural resemblance to diethylstilbestrol, a synthetic estrogen<sup>3</sup>. Our preliminary studies have shown the acetone extract of the fennel seeds to induce vaginal cornification in adult ovariectomised female rats and also to exhibit anti – androgenic effect in adult male rats<sup>4</sup>. Further, anol has also been reported to cause growth of lobule – alveolar system in the mammary glands of female immature rabbits<sup>5</sup>. In the absence of specific information on the effect of fennel seed extracts on the female genital tissues and on the mammary glands, the present investigation was undertaken in the oviduct and mammary glands of ovariectomised

female rats administered with acetone extracts of fennel seeds at different doses, so as to understand the biochemical changes induced in these tissues.

### MATERIALS AND METHODS

*Foeniculum vulgare* (*F. vulgare*) seeds were procured locally, dried in shade and powdered. The powdered material was extracted with acetone by soxhlation. Acetone was allowed to evaporate and residue thus obtained was dissolved in known volume of 1% ethanol for oral administration.

Adult female albino rats of Wistar strain (3 – 4 months old; 120 – 160 gms) were maintained in a well ventilated animal house with a constant 14 hrs light and 10 hrs darkness schedule. They had free access to tap water and standard rat pellet diet (Hindustan Lever Ltd; India). Females

histologically showing regular 4 – 5 days cycle were selected for experimentation.

A batch of animals were bilaterally ovariectomised under light either anesthesia. 15 days after ovariectomy, the animals were divided into 4 groups of 5 animal each.

Group 1 : Control – intact animals showing estrus phase.

Group 2 : Ovariectomised controls – receiving 1% ethanolic solution.

Group 3 : Ovariectomised + 50 µg / 100 g. body wt. / day of *F. vulgare* seed extract / 10 days.

Group 4 : Ovariectomised + 150 µg / 100 g. body wt. / day of *F. vulgare* seed extract / 10 days.

Group 5 : Ovariectomised + 250 µg / 100 g. body wt. / day of *F. vulgare* seed extract / 10 days.

The intact controls were sacrificed on the day they exhibited estrus phase. The ovariectomised controls as well as the experimental were sacrificed by cervical dislocation 24 hrs after the last dose administration. The oviducts and mammary glands were dissected out, cleaned out, cleaned, blotted on a filter and paper quickly weighed. The wet weights of organs were expressed as mg/10g. body weight. The tissues were stored at -20°C until further determination of protein and nucleic acids.

Total protein was estimated by the method of Lowry *et. al*<sup>6</sup>. The nucleic acids are extracted by the method of Schneider<sup>7</sup> and DNA was estimated according to Burton<sup>8</sup> and RNA was determined by the orcinol reaction of Ceriotti<sup>9</sup>. Protein and nucleic acid wet tissue. The data were analysed statistically using Students ‘t’ test.

## RESULTS

Table. 1 shows the effect of *F. vulgare* seed extract on organ weights and protein and nucleic acid concentrations in mammary glands of castrated rats. Results indicate the dose dependent increase in DNA, protein and mammary glands weight by the drug treatment. The RNA concentration were markedly elevated by medium ( $p < 0.05$ ) and high doses ( $p < 0.01$ ) only. While the protein / DNA ratio showed a linear increase with increasing doses of the extract, the RNA / DNA ratio exhibited significant decrease with the low and high doses. The levels of all the biochemical parameters studied in the experimental were comparable to the values in the estrus animals (Group – 1).

Results presented in Table.2. also indicate the dose dependent increase of DNA, RNA and Protein concentrations as well as the oviducted weights, after the drug administration at medium and high doses. Low dose administration caused an increase in protein levels only. The trend in Protein / DNA and RNA / DNA ratios were similar to that observed in the mammary glands.