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EFFECT OF *Vitex negundo* ON THE GROWTH AND DIFFERENTIATION OF THE OVARY OF *Corcyra celphalonica* (LEPIDOPTERA: PYRALIDAE)

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Abstract- The leaf extract of *Vitex negundo*, an important medicinal plant found throughout India inhibited growth and differentiation of the ovary of *Corcyra celphalonica*, a serious pest on rice and pulses. The treated early last instar larvae of *Corcyra cephalonica* resulted in various development aberrations in the ovary. Treatment of one and three day old pupae produces serve alternations in the ovarian anatomy with many aberrations. The production of only a few fully-grown oocytes by a female obtained after pupal treatment illustrates the partial sterility of the insects. These defects are possibly caused by the *Vitex negundo* since it inhibits synthetic activity in the fat body and germinal part of the growing ovariole.
Keywords- Oocyte, ovariole, aberrations

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Introduction

According to FAO study, world-wide loss in store approximates 10% of all stored grain, i.e., 13 million tons of grain lost due to insects or 100 million tons to failure to store properly [9]. The rice-moth, *Corcyra cephalonica* is a notorious pest of stored cereals and cereal commodities in India as well as in other tropical and subtropical regions of the world. Its larval stages cause serious damage to rice, gram, sorghum, maize, groundnut, raisins, nutmeg, chocolates, milled products etc. [1,2]. The continuous use of chemical pesticides for control of stored grain pests has resulted serious problems such as hazards to the environment including human health and non- target organisms [8]. Hence there is urgent need for safe but effective, biodegradable pesticides with toxic effect on non-target organisms. Botanical insecticides are broad-spectrum in pest control, and many are safe to apply. In the present study, *Vitex negundo* has been selected as one of the safer substitutes to control the stored cereal pest rice-moth, *Corcyra cephalonica*. *Vitex negundo* induces growth disruption and feeding inhibition in several insect species [3]. In this study, the effect of *Vitex negundo* on the growth and differentiation of the Ovary of *Corcyra celphalonica* was assessed.

Materials and methods

A rich standard culture of this insect was maintained in the laboratory on normal dietary medium composed of coarsely ground jowar (*Sorghum vulgar*) inside a glass container at 26±10°C temperature and 65±5% relative humidity.

Preparation of crude leaf extract of VN

Fresh leaves of *Vitex Segundo* were collected, shade dried for a week and pulverized. The material was cold extracted in different solvents of petroleum ether, methanol, diethyl ether and acetone separately at room temperature for 24hrs and the extract was evaporated to dryness under reduced pressure. The extract was weighed, re-dissolved in a known volume of acetone for making different concentrations of the extract. Preliminary studies showed that the methanol extract to be most effective among all the three solvents. Hence the follow up study were conducted using methanol extracts.

Freshly moulted IV and V instar larvae were treated on the abdominal region with 1µg/larva of VN dissolved in 2µl of acetone with the help of Hamilton micro syringe. 50 larvae were treated each time and the experiments were replicated 5 times. Controls

(Fig. 1) were treated with 2µl of acetone. After treatments a suitable time gap of 5 minutes was given and they were transferred into diet. The treated larvae were observed daily to note the changes.

Fig. 1-

Results

The treated early last instar larvae of *Corcyra cephalonica* resulted in various development aberrations in the ovary (Fig. 2 and 3). Treatment of one and three day old pupae produces serve alternations in the ovarian anatomy with many aberrations. The production of only a few fully-grown oocytes by a female obtained after pupal treatment illustrates the partial sterility of the insects. In certain cases the ovarioles formed loops, while in some oocytes were displaced from their normal position.

Fig. 2-

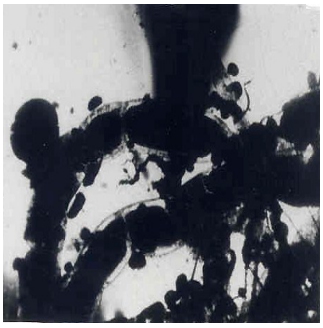

Fig. 3-

Discussion

The IV and V instar larvae of *Corcyra cephalonica* treated with *Vitex negundo* resulted in adults, which had ovaries with varied deformities. Hormones are internal secretions that regulate a wide variety of physiological processes especially those concerned with growth development and egg maturation [4]. *Vitex negundo* induced significant aberrations in the growth and differentiation of the ovary of *Corcyra cephalonica.* There was disturbance in the linear arrangement, and number of ovarioles. These results are supported by the findings of Jeybalan and Murgan (1997) who stated that significant decrease in the rate of reproductive maturation caused after treatment appears to be direct consequence of poor nutrition and also associated with feeding and physiology which might have influenced oogenesis [5,7]. Our study indicates that, sustainable protection of *Vitex negundo* against the stored product insect *Corcyra cephalonica* may be feasible using the botanical product in controlling the insect.

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