

**BIOLOGICAL AND BIOCHEMICAL STUDIES ON
THE GAMMA IRRADIATED COTTON LEAFWORM
Spodoptera littoralis (Boisd.)**

By

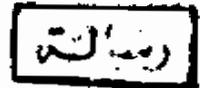
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A thesis submitted in partial fulfilment
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(Pesticides)



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**DEPARTMENT OF PLANT PROTECTION
FACULTY OF AGRICULTURE
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IRRADIATED COTTON LEAFWORM Spodoptera littoralis (Boisd)

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ABSTRACT

A set of experiments were carried out to evaluate the effect of irradiating both sexes of parental pupae Spodoptera littoralis (Boisd.) with 10, 20 and 30 Krad of gamma rays on some biological aspects at parental and first generation (F_1). The criteria taken into account were the reproductive potential, mating, sperm-transfer and adult longevity.

The effect of previous irradiation on some biochemical aspects at parental stage and F_1 generation was considered. Nucleic acids content (RNA, DNA), major and trace element concentrations, and the amino acids content were studied.

Obtained results could be summerized as follow:

Irradiated female parents were more sensitive to radiation than males. F_1 male progeny showed higher sterility than either their parents or F_1 females. Gamma rays increased the average number of spermatophore in both male parents and F_1 males, reduced the percentage of sperm-transfer in ($P_1 \text{ } \varnothing \text{ X } N \text{ } \sigma$) and ($F_1 \text{ } \sigma \text{ X } N \text{ } \varnothing$) crosses, increased the average of pupal and larval duration of F_1 progeny.

Irradiation reduced total body nucleic acids content, this was dose dependent; and was more pronounced in females than in males. DNA was more radiosensitive than RNA.

Analysis of F₁ progeny ash produced from irradiated male pupae resulted in identification of K,P,S,Ca,Mn,Fe,Cu and Zn. Gamma irradiation had an effect on investigated elements metabolism. No clear relationship could be detected between the applied doses and effects on the concentration level of any of the studied elements. No permanent correlation was obtained between the radiation effect and either sex or stage.

Irradiation had an effect on amino acids metabolism of entire body male moths, reproductive system of both sexes and F₁ egg progeny. Amino acids of male reproductive system was highly affected than female, where Cystein and Arginine were dropped in irradiated male to less than half of its control value, while Methionine increased by more than four times as control. Irradiation caused a severe reduction to Lysine in F₁ egg progeny.

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INTRODUCTION