

Effect of Noise Pollution on the Total Weight of the Fat Body of *Dysdercus koenigii*

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Abstract

The effect of noise pollution on the total weight of fat body of Red cotton bug or *Dysdercus koenigii*. Experiments were conducted to evaluate the morphology of fat bodies. The insect were exposed to sound 10db power. This is the initial dose as seen by the weight of insect. An insect were treated for 1 hr. daily and this was done for 3 days and then killed after 24 hr., 48 hr., 72 hr., and 96 hr. The fat body cells have the trophocytes which function as a depot for reserves of fat, glycogen and protein. Increase in size during development of the insect make them on the largest cells in the insect body. In normal Red cotton bug or *Dysdercus koenigii*, the total weight of the fat body in control insect of male was found to be 0.0415gm. And the in female was 0.0616gm. After 96 hrs. of post treatment it was shown decreasing in their weight respectively. The weight of fat body was in female 0.0152gm. And in male was 0.0059gm., in female 0.0113gm and in male was 0.0026gm, in female it was 0.0113gm and in male was 0.0026gm., after exposure of 48hrs, 72hrs and 96hrs of post treatment respectively.

Key words: red cotton bug, trophocyte cells, glycogen,.

Introduction

Cotton an important cash crop is extensively cultivated in several state of India but it suffers heavy losses due to various insect. Species of the genus *Dysdercus* are found in several other countries also and are known as cotton "stainer", Adult and nymphs both are infectious. Their mouth part are piercing and sucking type. The bugs are elongated slender body. The females are distinguishable by their large size abdomen. The insect suck cell sap from leaves and green balls of cotton. Heavily attached bolls open badly and the lint is of poorer quality. On the removal of the dorsal side of the experimental insect *Dysdercus koenigii* one of the conspicuous organ immediately apparent in the fat body, occupying large part of the body cavity principally in the abdomen, but extending also between the muscles of the thorax. The fat bodies are seen as compact lobes, which on more details inspection are found to be surrounded by a membrane of connective tissue. The fat body contain a number of different types of cells of which the most important are trophocytes, mycetocytes, oenocytes and the urate cells. The present study deal with to evaluate the effect of noise pollution on the total weight of the fat body.

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Material and Methods

Experimental insect *Dysdercus koenigii* was cultured in laboratory raised from a single pair of adult collected from cotton field of Tabiji and Dorai agriculture farm of Ajmer. The colony was maintained at a temperature of $28^{\circ} \pm 2^{\circ}\text{C}$ and a photoperiod of 14 to 16 hrs. Of day length. The insect were reared in bottles size 30x10x10cm. Air dried cotton seed soaked in water were provided as food. These bottles were covered with the muslin cloth by a rubber band.

The fat bodies from the normal and killed insect were taken out after 24hr, 48hr, 72hr, and 96 hr. of treatment. The fat bodies were collected in silver cup made up of aluminium foil and weighted in Metzer single pan balance. Averages of fat bodies of 10 insect were taken. Generally observation was done under Bausch and Lamb dissecting binocular microscope.

Result and Discussion

The fat body consist of two major types of cells. These are trophocyte and urate cells. The fat body trophocyte store up fatty materials within their cytoplasm in the form of oil drops. In the mature cells of fat globules become so large that they may occupy most of the perinuclear part of the cell and the nuclei are often distorted in shape by their pressure. The urate cells of the fat body are regarded as ductless excretory organs, which extracts waste products from the blood and retain in their cytoplasm.

A gradual decrease was found in the percentage of total weight after exposure to noise. This decrease in weight was further observed with increase in exposure of time. The total weight of the fat body in control insect male was found to be 0.0415gm. And in female was 0.0616gm. After 24hrs. Of exposure the weight of fat body in female was 0.0192gm. And in male was 0.0152gm after 48hrs. of exposure the weight of the fat body was decrease it was found in female was 0.0152gm and in male was 0.0059gm.

After 72hrs. of post treatment the total weight of the fat body in female was 0.0113gm. And in male was 0.0026gm. After 96hrs post treatment it was 0.0113gm in female and male was 0.0026gm. Result are tabulated in Table no.1

It seems that exposure increased the metabolism and utilization of the fat as reported by Skurichina(1961).

Thomas (1952) observed that the fat bodies of *Calliphora* female, whose activation hormone centre had been removed, had a higher glycogen contents though the quantity of fat was reduced. Bodenstein(1953b) investigated the urate cells of the fat body in *Periplaneta* after removal of the corpora cardiac and corpora allata as well as the corpora allata alone. The urate persists in the latter case, whereas in the former they disappear in two weeks but reappears with corpora cardiaca implantation.

Ghanshani, Bhargava and Tandon (1881) studied the effect of chemosterilants (apholate, hema, thiotepa) on the fat bodies of *Periplaneta americana* and reported that these chemicals reduce the weight of the fat bodies.

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Table No. 1

Changes in the Total weight of the Fat Bodies of adult insect *D.koenigii* after exposure of noise

S. No.	Time of Exposure (in Hrs)	Total weight of the Fat bodies in Male(gm)	Total weight of the Fat bodies in Female(gm)
1	Normal	0.0415	0.0616
2	24hrs.	0.0152.	0.0192
3	48hrs	0.0059	0.0152
4	72hrs	0.0026	0.0113
5	96hrs	0.0026	0.0113

*Mean of 10 insects

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