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# Effect of Permethrin on Reproductive Organ of Male Mus musculus

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#### Abstract

Most of the pesticides such as permethrin, profenos, and alderine effect on male reproductive function, including sperm head morphology and spermatogenesis. Several studies have reported that pesticides caused testicular oxidative stress, which has been linked to infertility and show significant teratogenic, mutagenic, and clastogenic. The aim of the present research is to investigate the effect of permethrin on protein index on reproductive organ in male Swiss albino mice (Mus musculus). After the treatment, experimental animals were sacrificed and analysis the protein index by lowry method. The result of permethrin group shows significant declined the protein level at (p < 0.05) as compared to the control groups. The protein index in testis was  $0.009 \pm 0.2$ , caput epididymis 0.013±0.1 cauda epididymis0.014±0.1,Vas deference-0.017 ±0.3 and Seminal vesicles-0.015  $\pm$  0.1in control groups. The protein index in testis was 0.008  $\pm$ 0.2, caput edidymis-0.012±0.4cauda epididymis-0.013±0.1, Vas deference-0.015  $\pm 0.1$  and seminal vesicles-0.014  $\pm 0.2$  in PM-1 groups and the protein index in testis was  $0.004\pm0.3$ , caput epididymis- $0.011\pm0.2$  cauda epididymis- $0.012\pm0.1$ , Vas deference0.015±0.3,Seminal vesicles0.013±0.2in PM-2 groups, In the present research work, permethrin administration shows a significant decrease of protein index in reproductive organ.

Keywords: Permethrin, Mus musculus, Testis, Vas deference, Protein index.

## Introduction

The environment is increasingly being influenced by the presence of waste and subproducts of natural and anthropogenic origin. Anthropogenic pollution is evidenced in a large number of chemicals, such as drugs, food additivesor pesticides, which would be largely responsible for damage and alterations at morphological and genetic levels in several species (ATSDR, 2000; Bustos-Obregon & Hartley, 2008). Permethrin is most widely used organophosphate insecticide throughout the world. It is used to control the pests of agriculture crops, ornamentals, green houses, live stocks, stored grains, forests, buildings and gardens. Contributing to its popularity is malathion's low acute mammalian toxicity. Several studies have described the adverse effects of pyrethroids on the liver, gastrointestinal, respiratory, neurological, and immunological systems, as well as other organ systems. Pyrethroids are metabolized in the liver and their

mechanism of action is by acting on voltage-sensitive sodium channels to prolong the closure time, with consequent reduction in action potential threshold and repetitive firing (Kakko et al., 2003). Studies in rats showed that permethrin affects male reproductive functions by directly reducing the motility of mature sperm cells (Yuan et al., 2010). The aim of this study was to determine the effects of the organophosphorus insecticide permethrinon protein index in reproductive organ.

# Materials and Method

**Maintenance of experimental model animals** -For the research experiment, 15 adult Male Swiss albino mice of same age and average weight of 28 -35 gm body weight were kept in a polypropylene cage under hygienic conditions in a well-ventilated room and were divided into equal number of experimental animals into different groups for the experiment research work.

## Methodology

**Estimation of Protein** - Experimental mice was sacrificed after completion of treatment and exposed the testis and all other accessory reproductive tissue and protein will be estimated by Lowrey method (Lowrey et al., 1951).

## **Statistical Analysis**

Data were analyzed using excel 2019 software. In each experimental variant obtained data from the control and treated groups are expressed as Mean  $\pm$  SE and for the comparison of data between the control and treated groups unpaired t-test was used to determine at significant level p <0.05.

Exp. Variant Group	Testis	Caput Epididymis	Cauda Epididymis	Vas Deferens	Seminal Vesicle
<b>F</b>	Mean ± SE	Mean ± SE	Mean ± SE	Mean ± SE	Mean ± SE
Control	$0.009 \pm 0.2$	0.013±0.1	0.014±0.1	0.017 ±0.3	$0.015 \pm 0.1$
<b>PM-1</b>	0.008 ±0.2*	0.012±0.4*	0.013±0.1*	0.015 ±0.1*	0.014 ±0.2*
<b>PM-2</b>	0.004±0.3**	0.011±0.2*	0.012±0.1*	0.015±0.3*	0.013±0.2*

Table:1	Effect	of	Permethrin	at	different	concentration	on	Protein	index	of		
Reproductive organ in Male Mus musculus.												

Values of the result expressed as Mean  $\pm$  SE and statistical analysis of p value (p<0.05) were analysed using Unpaired 't' Test for multiple comparison.



Graph-A. Showing Effect of Permethrin at different concentration on Protein index in Tesits



Graph-B. Showing Effect of Permethrin at different concentration on Protein index in Caput epididymis



Graph-C. Showing Effect of Permethrin at different concentration on Protein index in Cauda epididymis



Graph-D. Showing Effect of Permethrin at different concentration on Protein index in Vas deference



Graph-E. Showing Effect of Permethrin at different concentration on Protein index in Seminal vesicles.

# **Result and Discussion:**

Experimental animals treated (Group PM-1&PM-2) with Permethrin show decrease the protein index in reproductive organ and there was a statistically significant difference between these Permethrin and Control Group. These results are summarized in Tables: 1 and Figure A, B, C, D& E. The protein index in testes, caput epididymis cauda epididymis, Seminal vesicles and Vas deference's are the indicators of a possible alteration in androgen status (Das et al., 2023). Furthermore, according to Maina (2008) Protein index are considered valuable in toxicity studies because the changes in the reproductive organ reflect changes in seminiferous tubules. Protein index also reveal their sensitivity to toxicity due to dividing cells, physiology perturbations in rapidly and hormones (Huggett., 2018.). Decreased of protein index in reproductive organ in experimental animals Male Mus musculus were also observed in the present study. From the result it is clear that Permethrin has the potency to induced the gonadoxicityin different reproductive organ such as testis, Epididymis, Vas deference and Seminal vesicles in male Mus musculus.

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