



**EXPERIMENTAL STUDIES ON THE IMPACT
OF A FUNGICIDE ON THE HISTOLOGICAL,
HISTOCHEMICAL AND ULTRASTRUCTURAL
CHARACTERISTICS OF MAMMALIAN TESTIS**

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**First And Foremost,
Great Thankful To ALLAH
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ABSTRACT

Key words: albino mice, diniconazole, histochemistry, histology, mammals, testis, ultrastructure

The fungicide **Sumi-8** has an active ingredient of **diniconazole** that is a synthetic derivative of triazole compounds. It belongs to promising groups of fungicides that act by inhibiting the biosynthesis of ergosterol, an essential component of fungal cell membrane, via inhibition of cytochrome P450 dependent enzyme lanosterol 14 α -demethylase. So, the Sumi-8 is used to prevent and cure mycoses on many plants such as peanuts, cereals, fruit, vegetables, roses and other ornamentals in Egypt. In addition, this fungicide acts as potential hazards and harmful for health on man and his domestic animals after the utilization of it.

Hence, the present investigation aimed to follow the possible pathogenic impacts of the Sumi-8 on the histological, histochemical and ultrastructural aspects of testicular tissue and sperm morphology of adult albino mice. Therefore, ninety adult male albino mice weighing ~ 25 g were used and were divided into two main groups; Group "A" contained forty mice, was used to determine the LD₅₀, whereas Group "B" contained fifty mice and was divided equally into five subgroups; "1", "2", "3", "4" and "5". The sub-group "1" considered as control that was orally received distilled water, while "2" & "3" subgroups were orally received daily dose of **23.5 mg/kg b.wt. (1/10)** of the LD₅₀ for two and four weeks respectively and subgroups "4" & "5" were treated in the same manner but with a dose of **47 mg/kg b.wt. (1/5)** of the LD₅₀. The mice were scarified and the results obtained from such treatments illustrating the following:

Administration of the fungicide Sumi-8 revealed conspicuous decrease in the **mean body weight** gained in all treated groups. The maximal decrease in body weight was recorded after four weeks of treatment of both doses.

Histologically, testes of treated mice exhibited many changes that increasingly progressed within the augmentation in dose and time of treatment. These marked changes were represented by disattachment and disorganization of the testicular tissue caused wide spaces between tubules, thickened tunica albuginea and deformed seminiferous tubules ensheathed by irregular basal

laminae. Necrosis and vacuolization of spermatogonia, primary spermatocytes, round spermatids and deformed elongated spermatids were also detected. In addition, deformed Sertoli cells as well as Leydig cells displayed vacuolation and their nuclei suffered from necrosis. Vasodilatations of the blood vessels engorged with blood congestion were also noted in interstitial tissue.

Histochemically, the fungicide caused moderate depletion of polysaccharides at the basal laminae and primary spermatocytes where severe depletion was taken place at spermatids and spermatozoa. Slight decrease in the total proteins, in addition, decreased levels of DNA and RNA in the cellular components of testicular tissue were also seen.

Ultrastructurally, examination of treated mice showed various alterations of the testicular tissue. The surrounding basal lamina appeared thickening with irregular wavy appearance and some spermatogonial nuclei showed clumps of highly condensed material. The cytoplasm of primary spermatocytes exhibited large numbers of lysosomes and degenerated mitochondria besides dilated rough-surfaced endoplasmic reticulum. The spermatids appeared having damaged acrosomal vesicles, the mitochondria swelled with obvious condensation of their matrices, and some of them lost their cristae. While some of Sertoli cells exhibited many lysosomes, dilated rough endoplasmic reticulum, damaged mitochondria as well as intracellular vacuoles, Leydig cells also displayed numbers of lysosomes, lipid droplets and their nuclei were darkly stained with an ill-defined internal structure representing signs of pyknosis.

Sperm morphology examination showed significant increase in sperm abnormalities after treatment with the Sumi-8. These deviations varied among heads and tails of treated mice sperms.

Therefore, such fungicide doses have serious effects on the body weight, histological, histochemical and ultrastructural aspects as well as sperm morphology of the treated mice testis. The severities of these lesions were time and dose-dependent.

Thus, the abuses of this fungicide may affect the human health and his domestic animals, but data on the potency of Sumi-8 are needed.

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