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**STUDY OF THE TOXICITY AND HISTOLOGICAL
EFFECTS OF SOME INDUSTRIAL
SYNTHETIC MATERIAL ON
CERTAIN MAMMALS**

A thesis

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SUMMARY AND CONCLUSION

Rodents are the most destructive vertebrate pests on earth and they are also considered to be the principle foes of farmers since time immemorial. The rodents bring about substantial economic losses by an intensive damage to crop plants and households.

Anticoagulant rodenticides are major branch of pesticides and the most commonly used to control harmful rodents. But are quite toxic according to increase singly number of reports from international authorities concerned with wild contamination and occupational toxicosis.

The purpose of this work is an attempt to get some information about possible damage of exposure to rodenticide **brodifacoum** by studying its side effect on chromosome, sperm and histological effect induced by it (hepatotoxicity and testicular), also the protective role of ginger extract against **brodifacoum** effect was study.

130 adult male mice weighting approximately 20 – 25gm were used in this study. The study included groups A and B. (A group) was 65 Male mice for the genetic study and (B group) 65 male mice for histological examination, each was divided into 13 sub-groups. Each sub group was 5 male mice.

Group (1): 5 male mice as the control group.

Sub Group (2): 5 male mice were administrated orally with a single dose of 1.5% ginger aqueous extract.

Sub Group (3): 5 male mice were administrated orally with single dose of 3% ginger aqueous extract.

Sub Group (4): 5 male mice were administrated orally with a single dose (0.04mg/Kg) equal (1/10 LD₅₀) of brodifacoum

Sub Group (5): 5 male mice were administrated orally with two doses (0.02mg/ kg) equal (1/120 LD₅₀) of brodifacoum.

Sub Group (6): 5 male mice were administrated orally with a single dose (0.04mg/Kg) equal (1/10 LD₅₀) of brodifacoum and then orally administrating ginger extract 1.5% (one doses) then sacrificed after 48 hours

Sub Group (7): 5 male mice were administrated orally with a single dose (0.02mg/Kg) equal (1/20 LD₅₀) of brodifacoum and then orally administrating ginger extract 1.5% (one doses) then sacrificed after 48 hours

Sub Group (8): 5 male mice were administrated orally with a single dose (0.04mg/Kg) equal (1/10 LD₅₀) of brodifacoum and then orally administrating ginger extract 3% (one doses) then sacrificed after 48 hours

Sub Group (9): 5 male mice were administrated orally with a single dose (0.02mg/Kg) equal (1/10 LD₅₀) of brodifacoum and then orally administrating ginger extract 3% (one doses) then sacrificed after 48 hours

Sub Group (10): 5 male mice were orally administrating ginger extract 1.5% (one doses) and then administrated orally with a single dose (0.04mg/Kg) equal (1/10 LD₅₀) of brodifacoum then sacrificed after 48 hours

Sub Group (11): 5 male mice were orally administrating ginger extract 1.5% (one doses) and then administrated orally with a single dose (0.02mg/Kg) equal (1/20 LD₅₀) of brodifacoum then sacrificed after 48 hours

Sub Group (12): 5 male mice were orally administrating ginger extract 3% (one doses) and then administrated orally with a single dose (0.04mg/Kg) equal (1/10 LD₅₀) of brodifacoum then sacrificed after 48 hours.

Sub Group (13): 5 male mice were orally administrating ginger extract 3% (one doses) and then administrated orally with a single dose (0.02mg/Kg) equal (1/20 LD₅₀) of brodifacoum then sacrificed after 48 hours

Each 5 male mice were injected orally with **brodifacoum** and ginger extract (one dose).

- Beside chromosomal studies, both epididymis from each mice were dissected out for sperm morphology testing.

I- Chromosomal aberration: -

Both structural and numerical types of aberration and chromosomal stickiness are elucidated in male mice. Also the mitotic index was noticed in this study.

- Structural aberrations:

In cells of male mice that treated with different doses of **brodifacoum** rodenticide. The highest percentage of chromosomal abnormalities were found in the form of deletion, gaps, and, and centromeric attenuation and lowest value in end to end and chromatid fragment.

- Numerical aberrations:

The numerical aberration was represented by monosomic cells. The value of mitotic index decreased in all treated groups than that of the control. Ginger extract reduces the value of chromosomal aberration and increase the value of mitotic index induced by **brodifacoum**.

- The treatment of **brodifacoum** caused increase in the sperm head abnormalities compared to control such as amorphous, banana like, lack of hook hammer shape. Amorphous and banana like were the highest recorded of aberrations while hummer shape has the lowest.
- Ginger extract reduces the value of sperm head abnormalities induced by **brodifacoum** anticoagulant rodenticide.

II-Histological examination: -

The male mice treated with **brodifacoum** anticoagulant rodenticides showed pronounced histological effect in the liver, and testis.

- The microscopic histological changes in **the liver** are manifested by necrosis, hydropic, fatty degeneration, fatty infiltration, and venous congestion.
- **The testis** showed degeneration and atrophy of surrounding tubules with irregular peripheral out line and lose of spermatogenesis and appearance of giant spermatogonial cell and, most of the seminiferous tubules showed diffusion of its constituents without differentiation between various types of spermatogenic cells, the nuclei of these cells are pyknotized. The treatment of these animals with ginger (*Zingiber officinalis*) extract, successfully prevented most of these histological alterations.
- The study indicated that **brodifacoum** which was used in this study has a mutagenic effect on chromosome, sperm and histological change in different organ (livers and testis) thus; ginger may be a potent protective against the toxicity of **brodifacoum** anticoagulant rodenticides.