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TOXICOLOGICAL PATHOLOGY OF VEGETABLE OIL IN MALE RATS AS DIETARY FOR SIX MONTHS

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ABSTRACT: *The study consist of two groups, untreated control of twenty male rats feed on normal diets while treated young and adult 40 male rats feed solely on vegetable oil for six months during treatment. Some animals diet especially young ones. Grossly, macroscopically and microscopically studies were done, treated male rats showed rough greasy hair macroscopically in larged pale yellow liver discoloration. Microscopically, varying degree of vacuolation in hepatocyte associated with renal pathological lesion. Also showed thinning of epiderms reduce hair follicals and atrophic sepaceous gland in the skin, and atrophy of skeletal muscle associated with interstatial odema, and showed vacuolation in stomach (glandular region), small intestine and testis. also showed congestion and thickening bronchiolar epithelium.*

KEYWORDS: vegetable oil, liver, testis, histopathology, rat.

INTRODUCTION

Nutritional and short term toxicological evaluation of Perilla seed oil by[1]. Effect of four different oils (red palm olein, palm olein, corn oil, coconut oil) on anti-oxidant enzymes activity of rat liver by [2]. Vegetable oil high in phytosterols make erythrocytes less deformable and shorten the life span of stroke-prone spontaneously hypertensive rats were studied by [3]. Behavioural and reproductive effects of chronic developmental exposure to brominated vegetable oil in rat by [4]. [5] studied the toxic effects of brominated vegetable oils in rats, males and females with different grades brominated corn, cottonseed, olive or sesame oil for 105 day. The toxicity of brominated sesame oil and brominated soybean oil in miniature swine by [6]. [7] reported toxicological effects induced by the chronic intake of brominated vegetable oils for 105 day which gave 0.5g per 100g of diet(olive and sunflower). [8] reported dietary high linoleate sa.ower oil is not hypocholesterimic in aged mice after a long term feeding-comparison with lard, Perilla oil and fish oil. [9] investigated fatty acids in health and disease. [10] studied the Linolenate-derived polyunsaturated fatty acid and prevention of atherosclerosis. The effects of corn oil on the amount of cholesterol and the excretion of sterols in the rat by [11]. [12] studied Fish oil consumption and decreased risk of cardiovascular disease : a comparison of findings from animal and human feeding trials. [13] reported effect of n-3 fatty acids on lipid metabolism. Dietary requirements and functions of a linoleic acid in

animals studied by [14]. [15] studied dietary a-linoleic acid in man. The goal of the present research was to find the target organs affected by the toxicological pathology induced with treatment of a model experimental to vegetable oils and the end was found that the male rat of sprague dawelly of the best model.

METHODOLOGY

Male laboratory rats were bought locally from veterinary medicine college of animal house. The study was than on 2 groups of saprague dawelly white male rats, untreated control of 20 male rats and 40 male rats of young and adult as treated group. Control rats feed only on normal diets while treated rats feed solely on vegetable oil and the experiment was than for six months. Five µm thick paraffin sections of 10% neutral buffered formalin as fixative, liver, kidney, stomach, small intestine, skeletal muscle, skin, testis and lung from each rat were fixed in formalin, then samples were cut and paraffin blocks were made, sections stained with Haematoxyline-Eosin (HE), selected histopathological changes were photographed from treatment related histopathological changes in comparison to untreated controls, according to the method of (16).

RESULTS/FINDINGS

Macroscopic changes, treated animals showed enlarged pale yellow discolored. Microscopic changes, microscopic examination of tissue stained by (H and E) showed varying degrees of vacuolation in the liver. Indicating fatty degeneration as fig.1,2 and 3. in addition renal lesion characterised us dilated proximal convoluted tubules as in fig.4,5 and 6, also changes hitopathological changes in the digestive tract characterised by hyperkeratosis in the nun glandular region as in fig.7and 8, furthermore glandular region showed increase in number of mucous gland and vacuolation of musculars externa of stomach as in fig. 9 and 10. vacuolation epithelial lyning of villi of small intestine as in fig. 11 and 12, thinning of epiderm and reduced hair follicles with atrophy of sepaceous gland as in fig. 13 and 14, atrophy of skeletal muscle of subcutaneous region associated with interstitial odema as in fig. 15 and 16, in lung evidence of increase number of bronchioles some with thickened epithelium and congestion as in fig. 17, 18 and 19. Finally, separation of spermatogenesis in the testis as in fig.20 and 21.

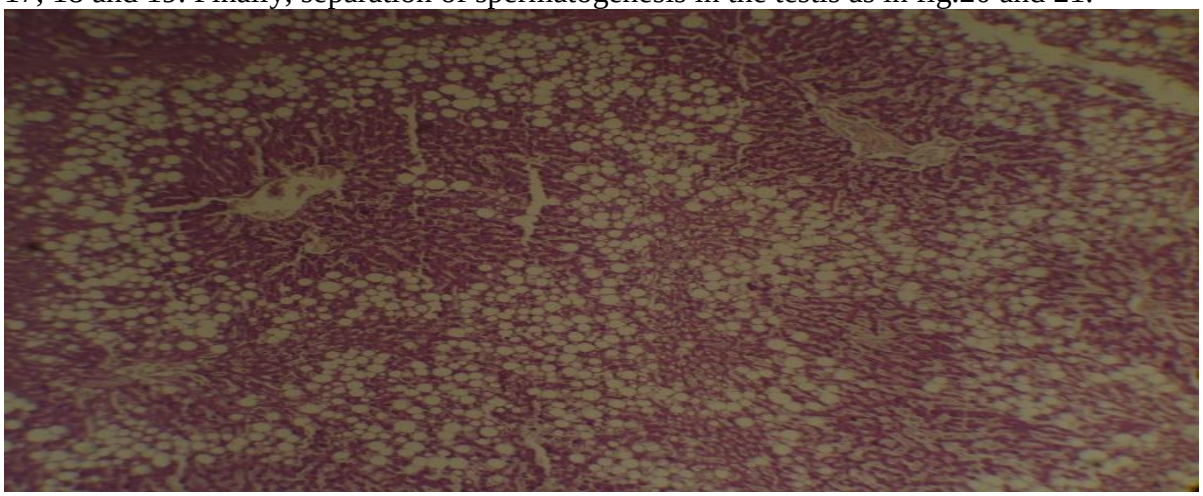

Fig.1: Liver with moderate vacuolation of hepatocyte in mid zone and centri lobular region (H&E. 4 X)

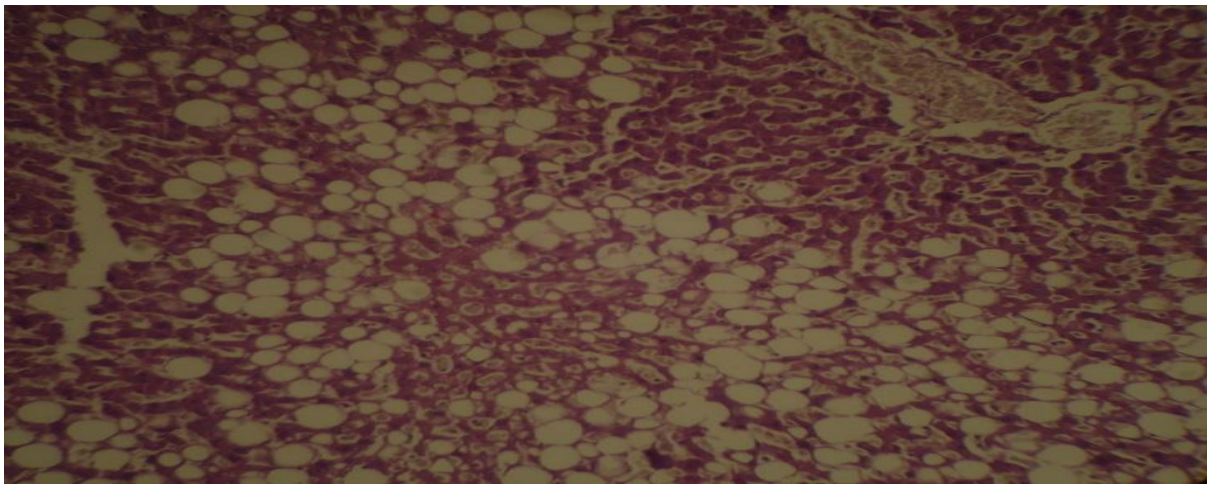

Fig.2: Liver with moderate vacuolation of hepatocyte in mid zone and centri lobular region (H&E. 10 X)

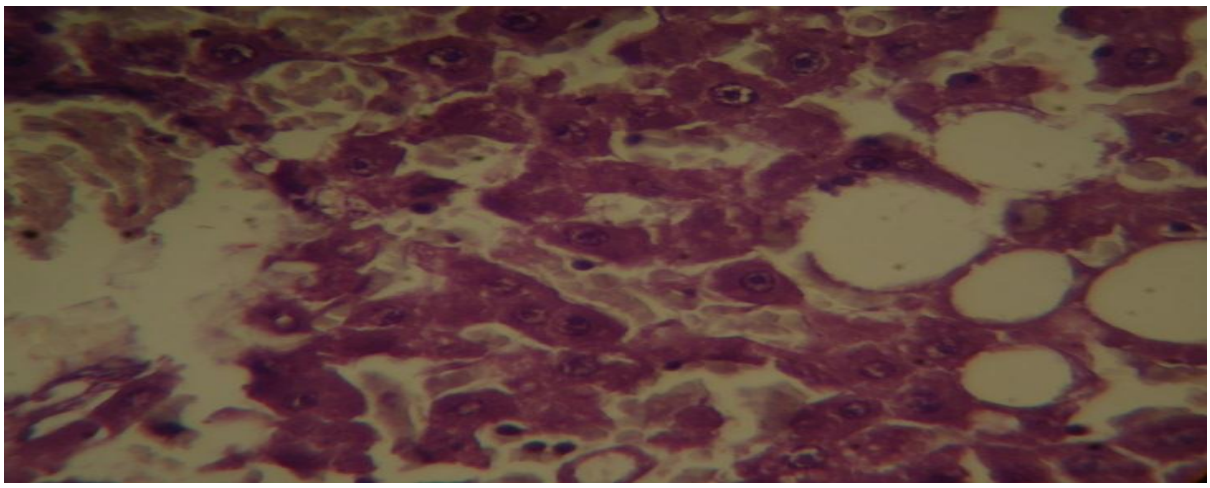

Fig.3: Liver with moderate vacuolation of hepatocyte in mid zone and centri lobular region (H&E. 40 X)

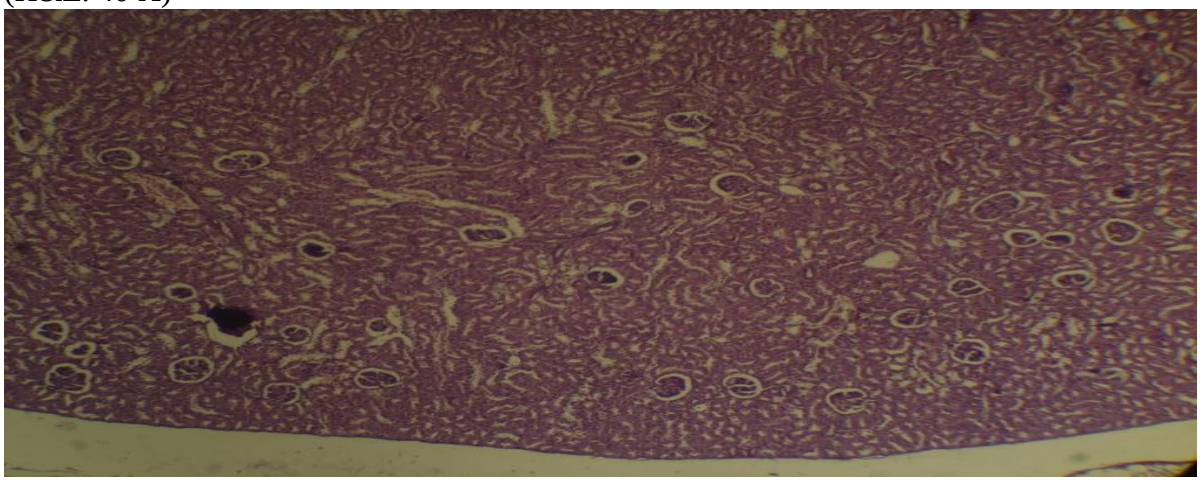

Fig.4: kidney with dilated cortical proximal convoluted tubules with vacuolate epithelium (H&E. 4 X)

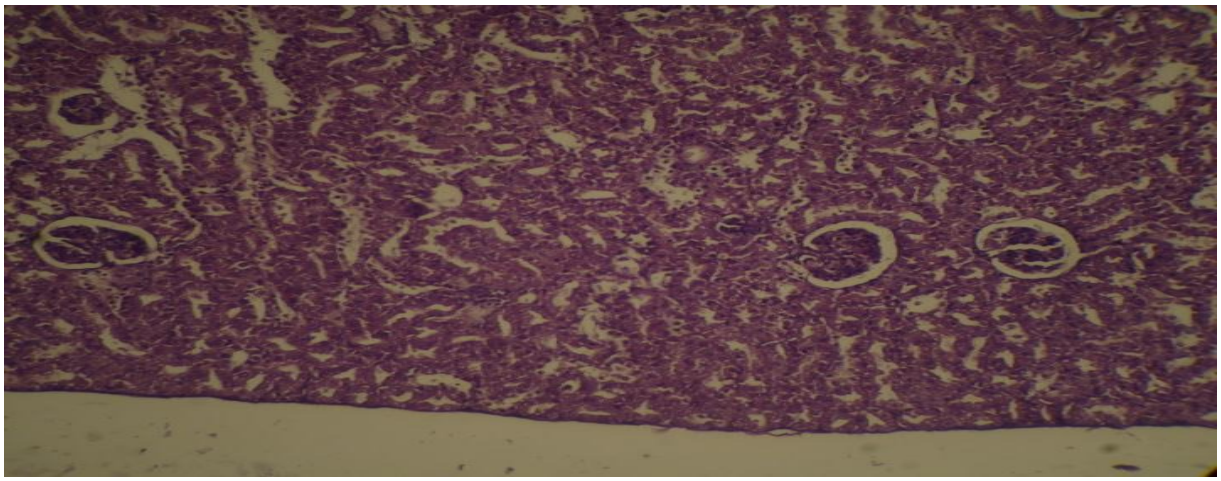

Fig.5: kidney with dilated cortical proximal convoluted tubules with vacuolate epithelium (H&E. 10 X)

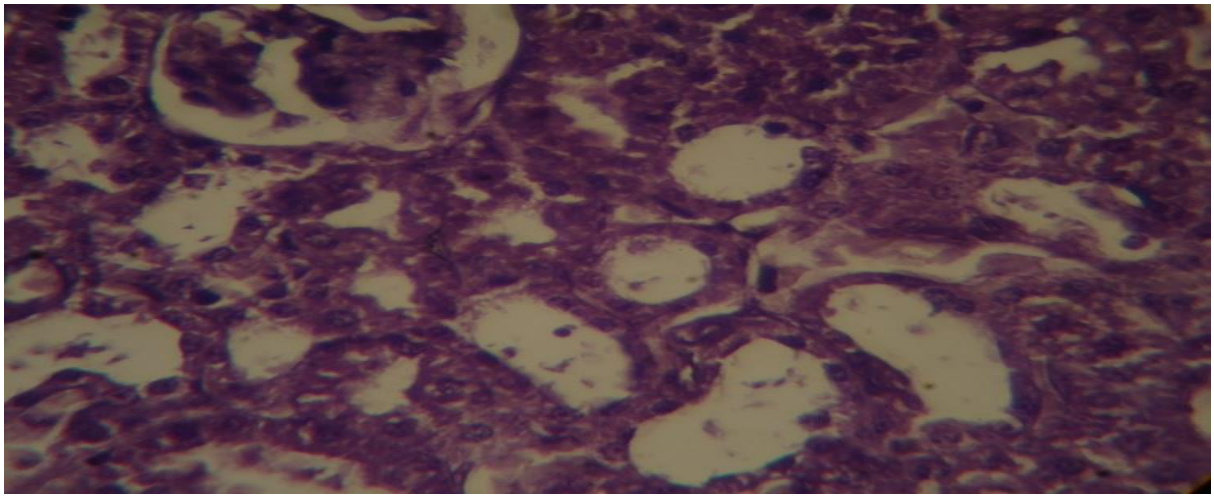

Fig.6: kidney with dilated cortical proximal convoluted tubules with vacuolate epithelium (H&E. 40 X)

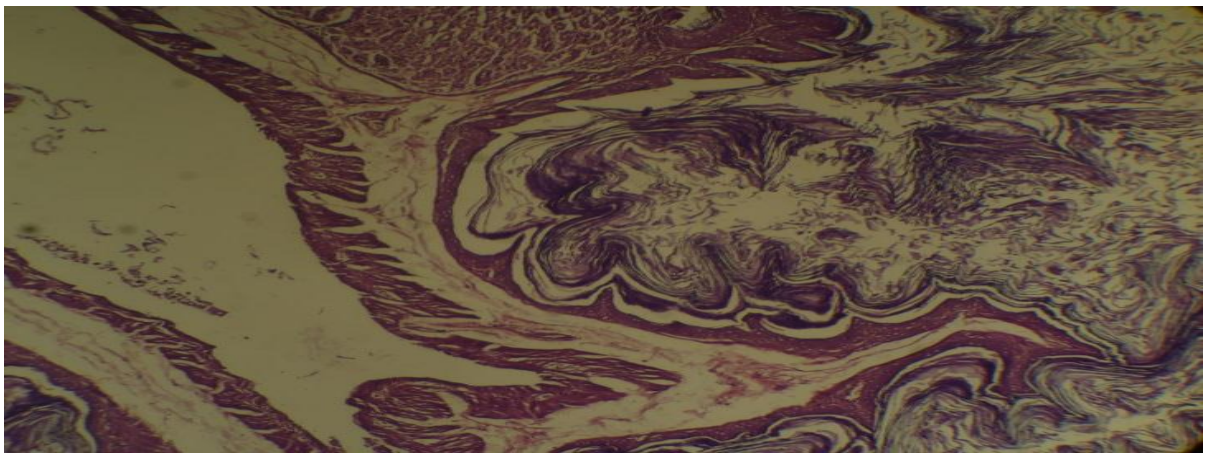

Fig.7: stomach (non-glandular region) with hyperkeratosis of the lyning epithelium (H&E. 10 X)

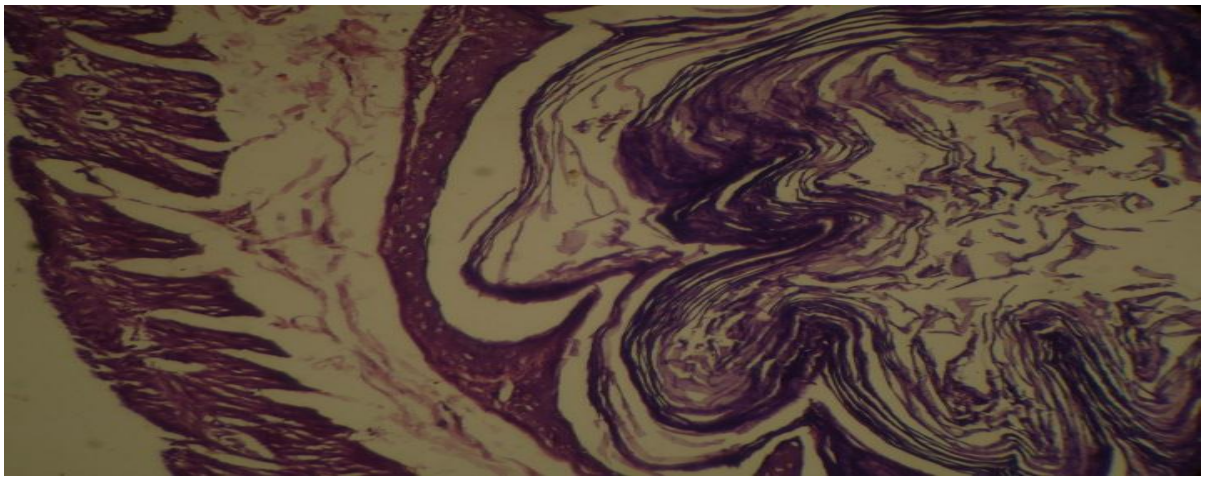

Fig.8: stomach (non-glandular region) with hyperkeratosis of the lyning epithelium (H&E. 40 X)

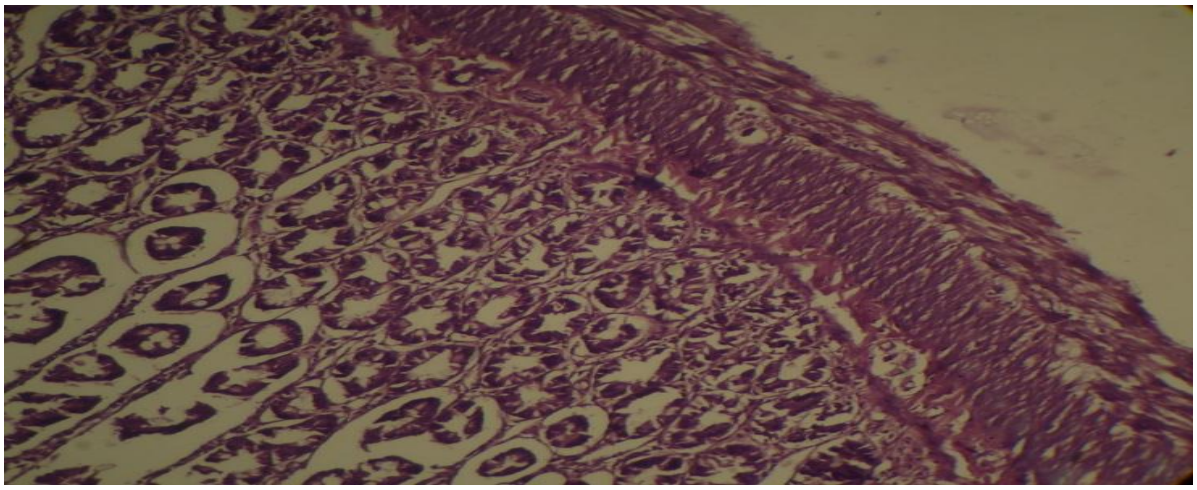

Fig.9: stomach (glandular region) with high number of mucous gland at the base of lamina propria and vacuolation of muscularis externa (H&E. 4 X)

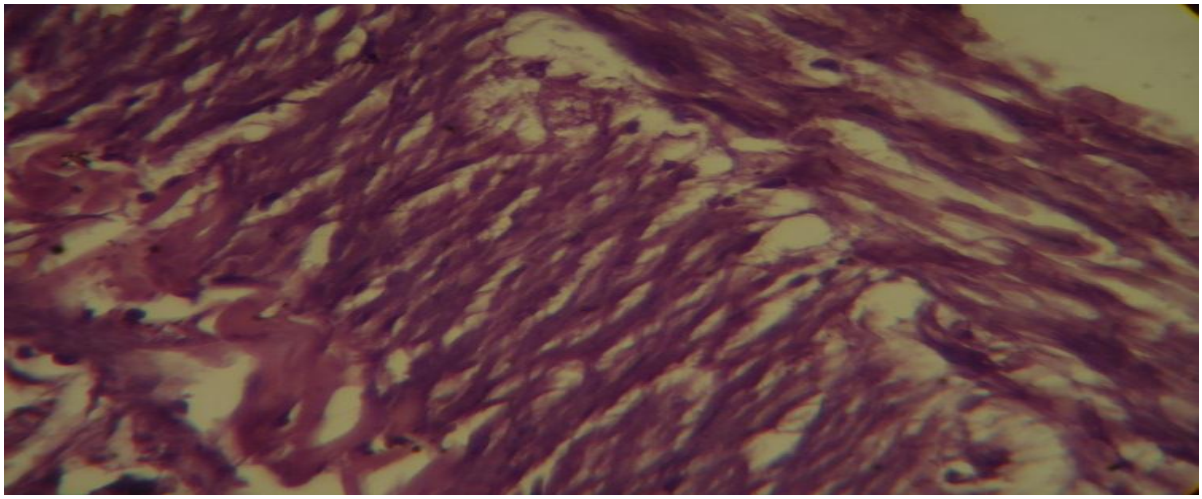

Fig.10: stomach (glandular region) with high number of mucous gland at the base of lamina propria and vacuolation of muscularis externa (H&E. 10 X)

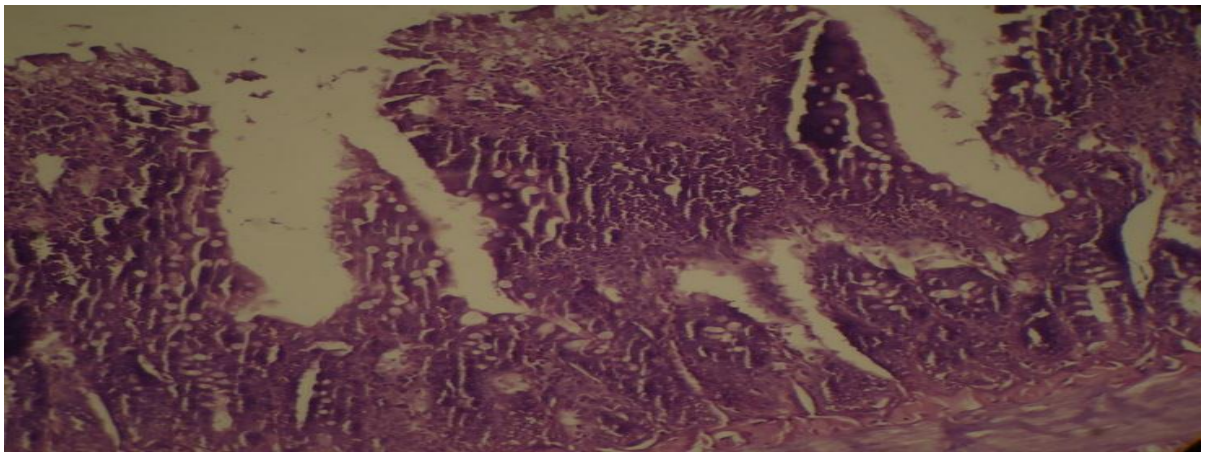

Fig.11: small intestine with vacuolation of villar epithelial lyning (H&E. 4 X)

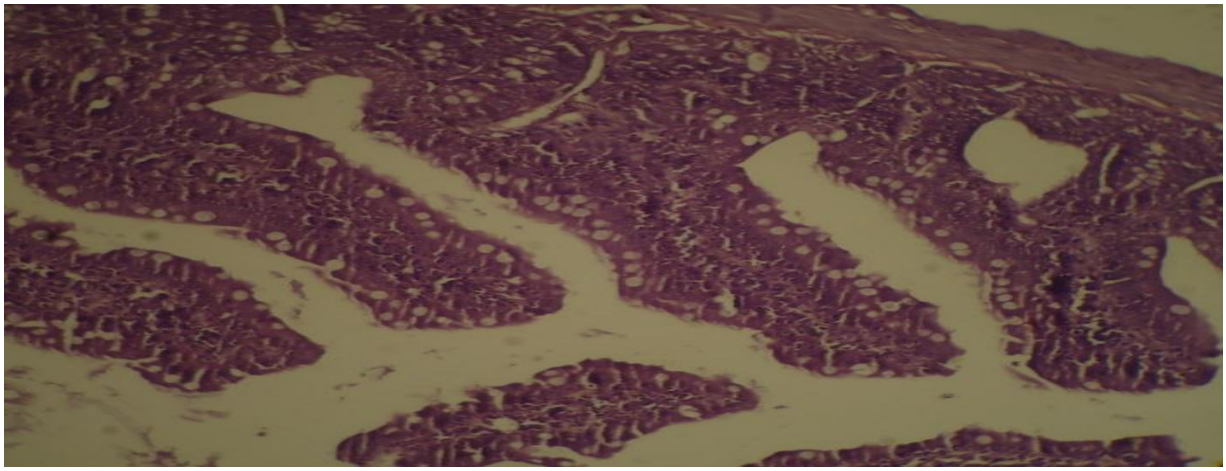

Fig.12: small intestine with vacuolation of villar epithelial lyning (H&E. 10 X)

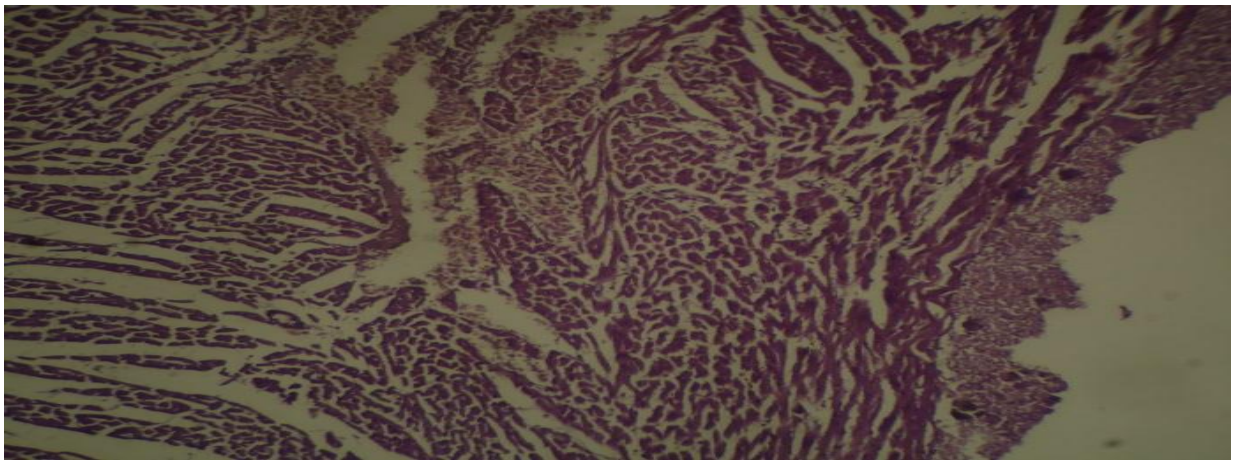

Fig.13: skin with thinning of epiderms reduce hair follicals and atrophic sepaceous gland (H&E. 4 X)

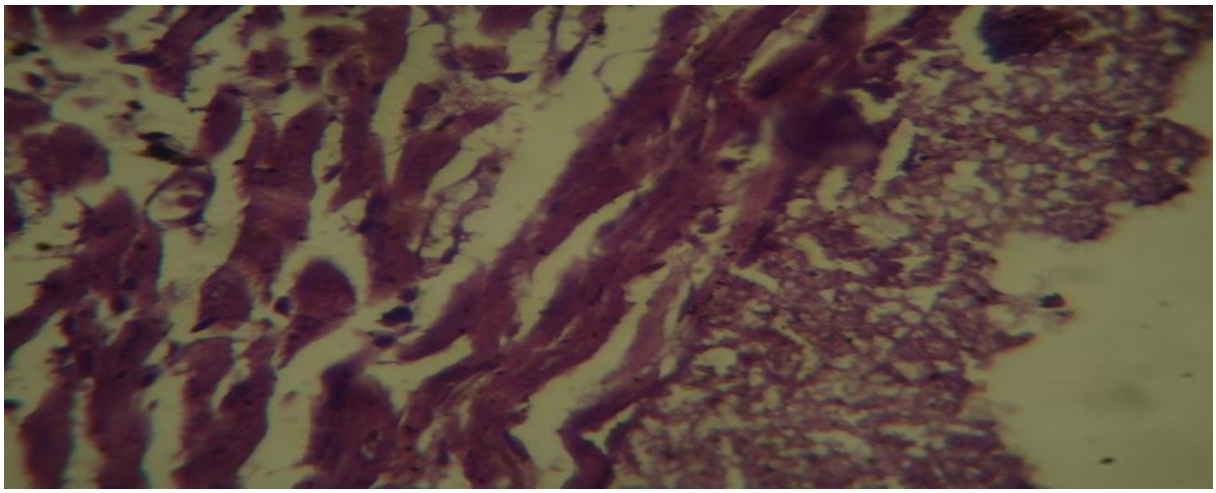

Fig.14: skin with thinning of epiderms reduce hair follicals and atrophic sepaceous gland (H&E. 10 X)

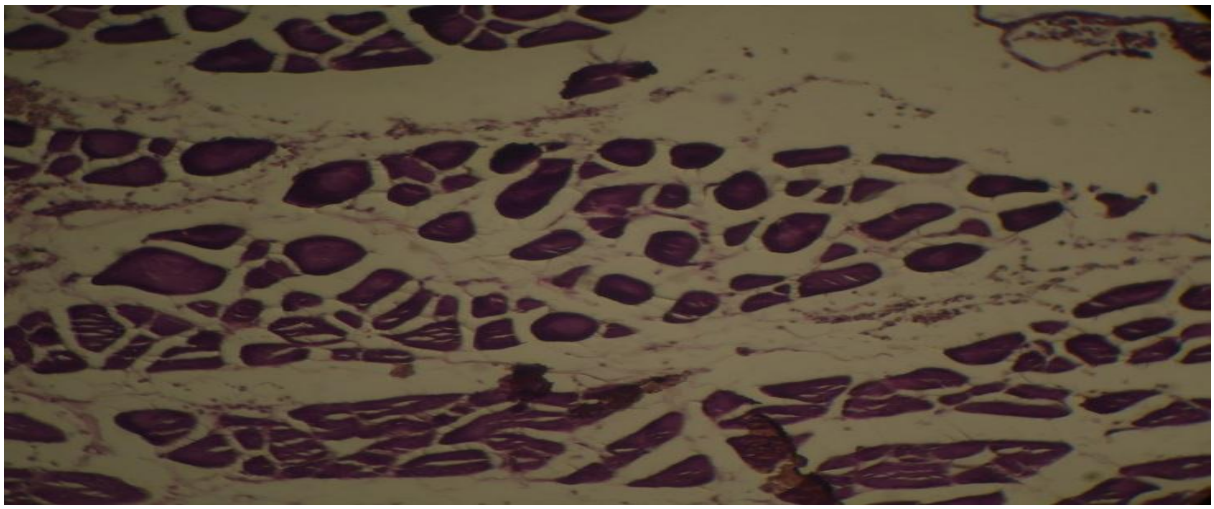

Fig.15: skeletal muscle with atrophy associated with interstatial odema (H&E. 4 X)

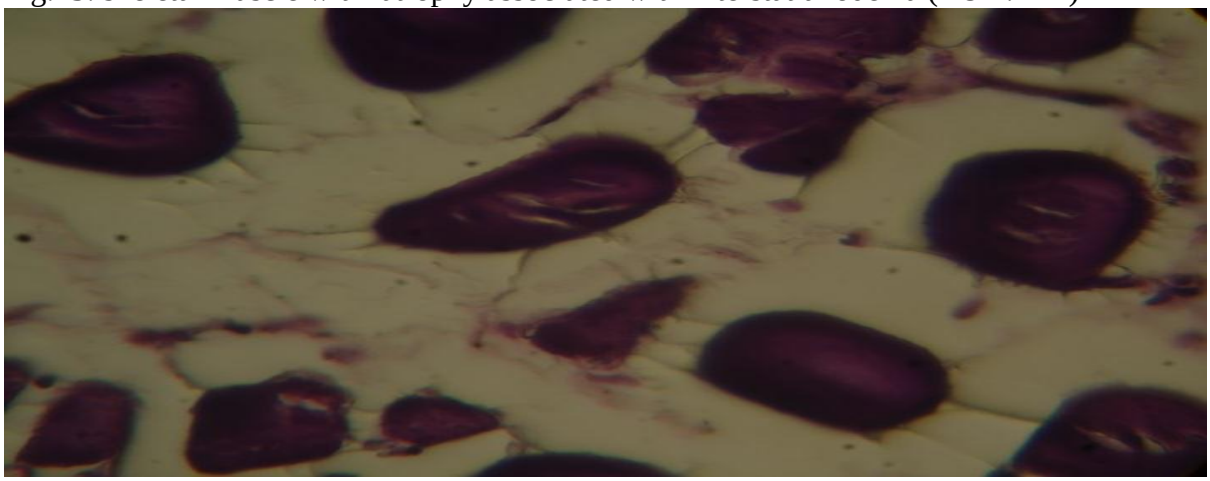

Fig.16: skeletal muscle with atrophy associated with interstatial odema (H&E. 10 X)

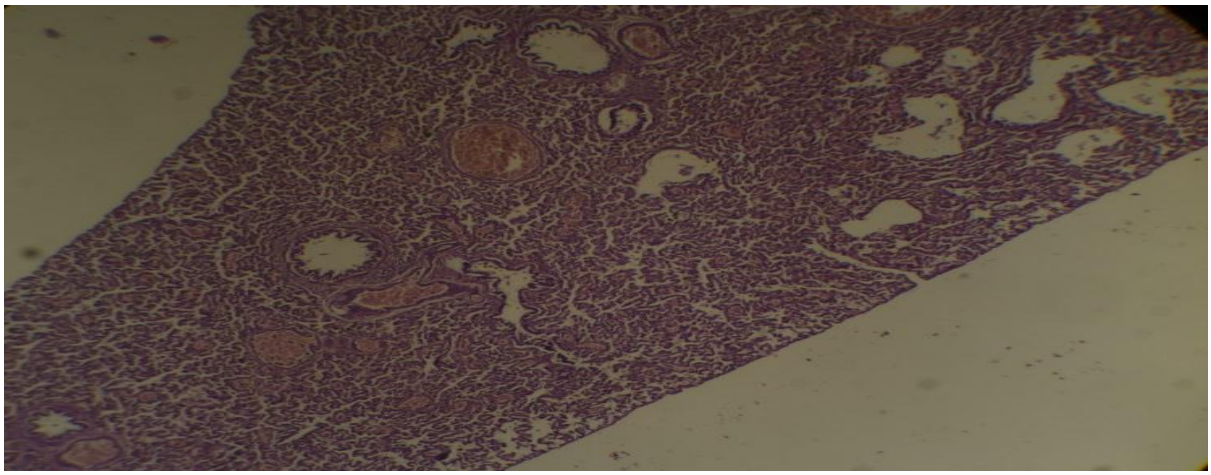

Fig.17: lung with dilated bronchi (H&E. 4 X)

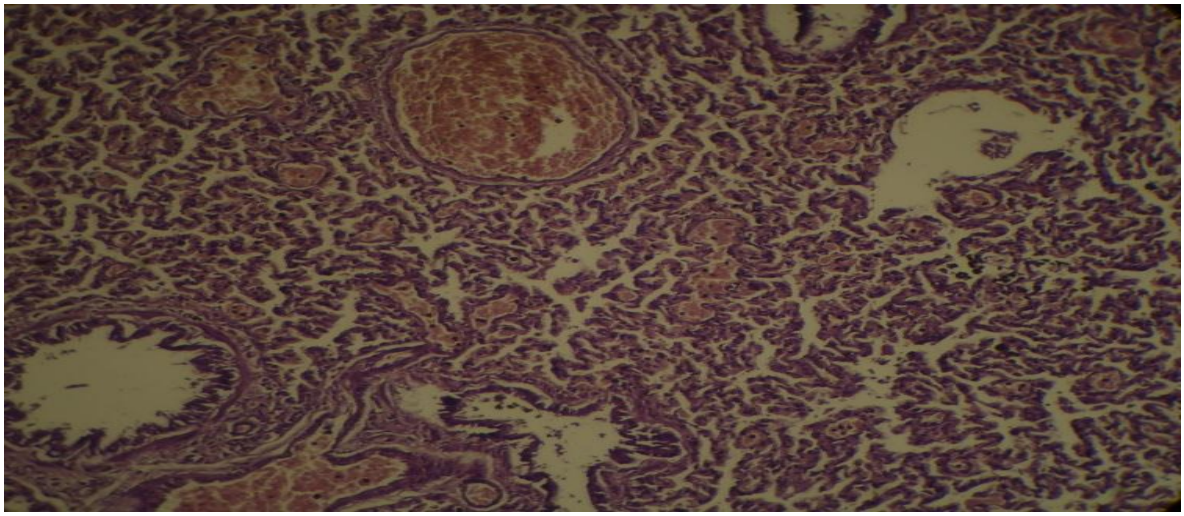

Fig.18: lung with dilated bronchi and congestion(H&E. 10 X)

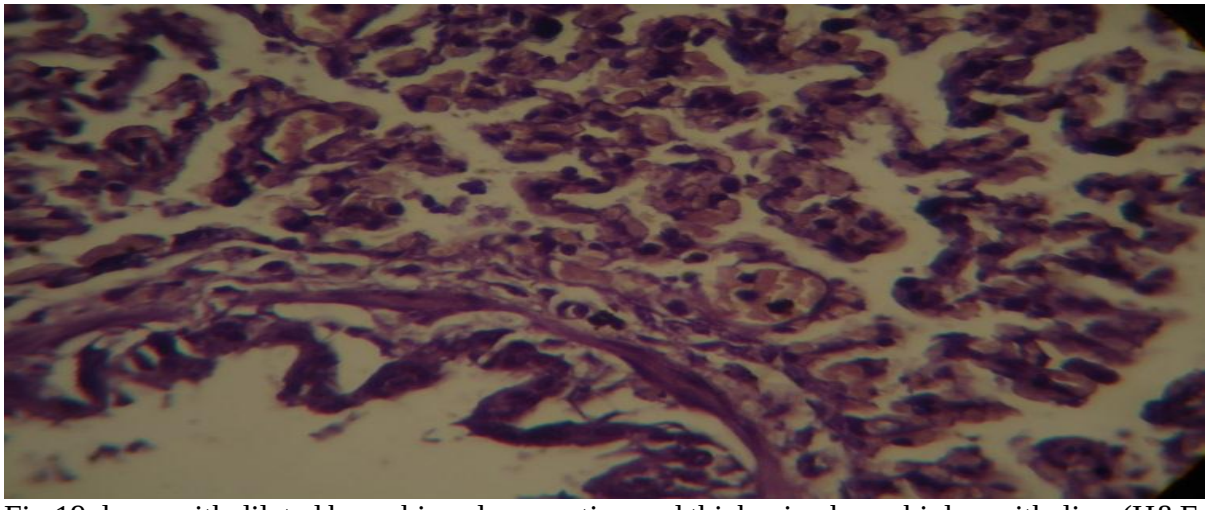

Fig.19: lung with dilated bronchi and congestion and thickening bronchiolar epithelium(H&E. 40 X)

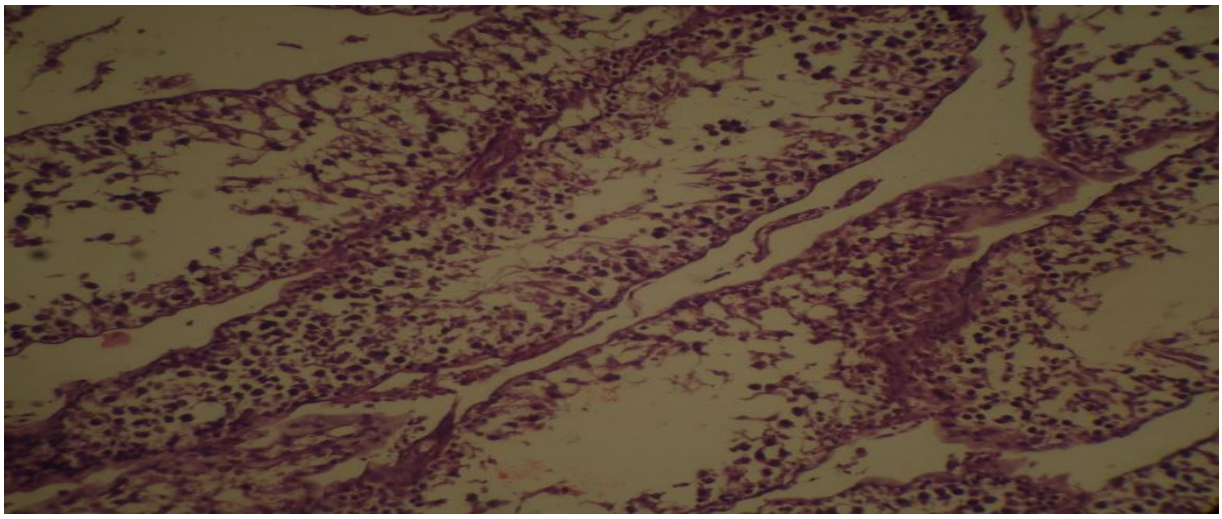

Fig.20: testis with moderate seperation spermatogenesis of vacuolation (H&E. 10 X)

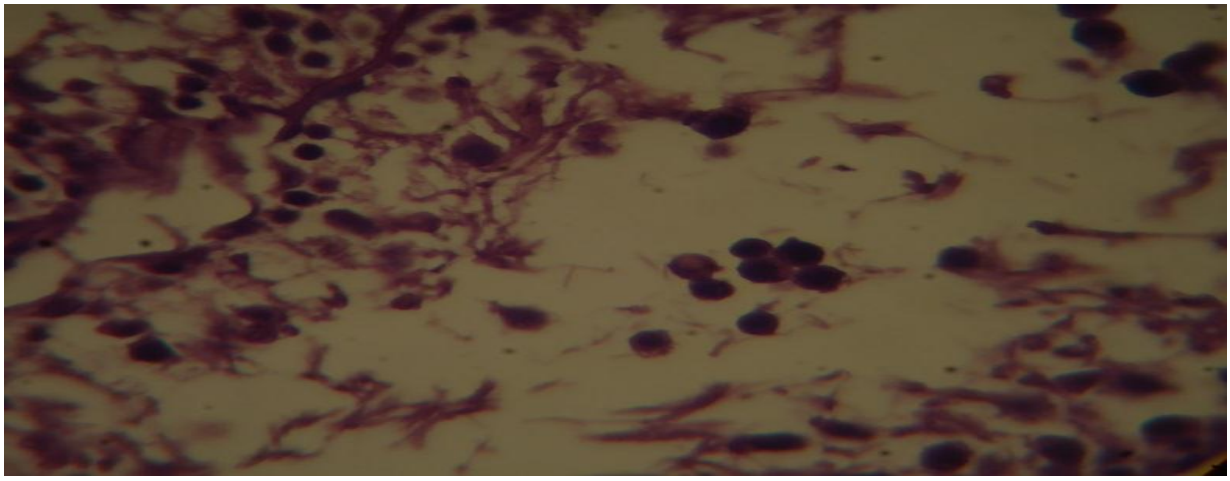

Fig.21: testis with moderate seperation spermatogenesis of vacuolation (H&E. 40 X)

DISCUSSION

Hardly any clear histopathological studies on toxicological pathology of vegetable oils therefore we felt the need to find a good model to study the histopathological changes related to overdose and/or toxicity of vegetable oils. From the study in appeared that male rats was very good model for toxicologic pathology of vegetable oil as it gave clear evidence of histopathological lesions in the lung, liver, kidney,s kin, testis and digestive tract. [1] feed 10% perilla seed oil in diet of waster rats for 18 weeks but did not report toxicological effect for the histopathological point view in any of internal organs examined including: heart, liver, kidney, gastrointestinal tract while in the present paper male sprague dawelly rats feed solely for six month showed remarkable histopathological changes mainly in liver than kidney. [2] studied the effect of 4 different the vegetable oil only on antioxident enzyme activity of rat liver but did not do any histopathological changes and the study was only (1-2 months) with 15% concentration, the present study was for six month the same species of male rat of sprague dawelly solely feed vegetable oil as dietary (probably cotton seed oil) gave very clear histopathological changes in liver and kidney in some animals died during the experiment. [3]

studied the effect of vegetable oils which shorten the life span of stroke- prone spontaneously hypertensive rats, while the present study which feed vegetable oil with six months to male rats also showed evidence of emaciation and histopathological changes which cause death of male rats. [4] studied only the effect of vegetable oil on behavioural and reproductive effect while the present study was done on histopathology an internal organs affected by complete feeding of vegetable oil for six month in male rats. [5] in a low dose uptp 0.5% evidence of myocardial lesions characterised by myocytolysis and fatty changes, also fatty changes in the liver, the present study of male rat feed totally for six months on vegetable oil showed varying degrees of fatty change in the liver with additional changes in the kidney. [6] feeding of brominated sesame oil at different dietary levels at 0, 5, 25, 50 or 500 mg/kg of body weight for 17 weeks or brominated soybean oil the same concentration as above for 28 weeks showed liver histopathological change

with increased transaminase enzymes mostly the histopathological lesion were confined to animals with the highest dose level with mark fatty degeneration of liver cells and renal tubular epithelial cells also necrosis of individual or small groups of cardiac muscle fibres and marked testicular atrophy were also observed. In comparison with the above the present study of total feeding of vegetable oil to male rats for six months showed varying degrees of fatty degeneration in liver also pathological lesions in kidney. [7] reported increased cholesterol content in both heart and liver after feeding vegetable oils of 0.5g/100g of diet but further histopathological studies while the present study of vegetable oils for six months gave severe histopathological lesion in liver and kidney even some death.

IMPLICATION TO RESEARCH AND PRACTICE

The present topic was intended to find if there will be any toxic effect by feeding on vegetable oil.

CONCLUSION

In conclusion the study showed that male rats are mainly susceptible to the toxic effect of the vegetable oil. Even some animals diet during treatment.

FUTURE RESEARCH

The finding of this topic recommended using male rats in order to find if there will be any possible toxic effect induced by the vegetable oil.

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