

Environmental study on the use of the electric device mosquito killer (model: MD-20WA) and histological study its effects on the livers and on weight

Sanna Abadi Habae¹ Nada Mahdi AL-Khafaji²

¹College of Science- University of Kufa/ Holly Al- Najef / Iraq

²College of dentistry-University of Babylon/ Babil / Iraq

Abstract

During this study evaluated the efficiency of insect killer device electric one as the deaths of four groups of adult *Culex pipiens* mosquitoes, *Culex pipiens* ratios during exposure periods of 1, 12, 24, 36 an hour and a study of its impact on those same conditions and periods of exposure of the device in the histological structure of liver of male laboratory mouse *Mus musculus* were divided into control group G1 and the group exposed to 1 hour G2 and 12 hours G3 and 24 hours G4 and 36-hour G5. Histological results showed that the group G2 and G3 liver tissue appeared normal milestones approach to animal control tissue either group G4 tissue animals showed a few pathological changes distress and Group G5 which got most of the pathological changes in the tissues studied.

Keywords: the electric device mosquito killer, histological study, liver, weight male mice.

INTRODUCTION

We have the latest human change in the ecological balance in many of exploiting areas and invest the territory and in order to assess a new balance and resist the animals and harmful plants focused to the use of certain chemical products which are increasing the quantity and seriousness of the day [1] and the right big health damage to non-target organisms such as pet birds and the bees and humans [2]. There are multiple types of pesticides vary according to the nature of their work, or take advantage of every type including a group or groups of chemical compounds similar or per differ them from the other and that was the origin of all of the synthetic either organically or metal or joint may share some plant sources in preparation [3] [4]. Spread in recent phenomenon of the use of electrically stunned plane insect devices which are of different types and sizes where attract insects by neon publisher UV at a wavelength of 365 Nanometer. The clamp was dumbfounded by insects and throw it designated for that purpose by the stairs [5]. We note that among the warnings and precautions set by the manufacturers of this type of device that is placed inside the places and rooms which closed the windows to prevent the attraction of insects abroad to the light emitted from the device, also indicated that the equipment generates UV and generates ozone gas [6] ozone gas Blue is the color is composed of three atoms of oxygen chemical formula O₃ and per slim atmosphere may not exceed, in some areas, one in a million and is one of the toxic gases [7]. On the contrary, the upper layers of the atmosphere, the presence of ozone in the atmosphere Lower cause major damage, Inhalation a fraction of the ozone with the air causes the headache and affects the lungs and weaken their resistance to the bacteria may cause Crash cells [8] The study aims was to investigate the efficiency of this device on weight the tissue and cellular composition of the liver of laboratory mice.

MATERIALS AND METHODS

Insect killer one as electrical device :-

Got the device from the local markets, carries the brand name kill pest (model: MD-20WA) factory by Kim Thuan Phat / China Company dimensions (40 × 25) cm contains Two contains neon bulb length of one 30 cm card consumption of 35 watts hedged its made internal network iron is connected to an electric current insects device ,external network is made of aluminum.

Laboratory animals:

Used in this study, male adult mice type of *Mus musculus* L. strain BALB / C weight (25-30) g, which have been bred in the animal house under controlled conditions of temperature (20-25) ° C and fed diet B integrated animal.

Experiment tests:

Electric shock device commented on the rise 3 meters above ground level in a closed room doors and windows and then samples of adult mosquitoes *C. pipiens* brought by 20 insect for each test period with operating control device for a period of 1 hour then calculated the percentage of the loss of adult mosquitoes. Repeated the same experiment in terms of the number of insect except for increasing the duration of exposure to electric shock device and by 12, 24, 36 hours and then calculated the percentage of loss in each experiment.

To study the possible side effect of the device electric shock to humans has been the use of laboratory mice as model his replacement, where it was put animals at all stages of the experiment under Living situation similar in terms of lighting, temperature, and provided the stuff and water are free divided rats into five groups each group of five mice, the first group G1 considered a control, the second group G2 and placed in front of electric shock device for 1 hour and the third group G3 for 12 hours and the group G4 for 24 hours and the group G5 for 36 hours, then explained the animals of each group after the end of the time of exposure of the device, liver eradication and preserved in formalin concentration of 10%, then the

samples sent to the laboratory histological preparations after the samples were examined with a microscope and photographed. Use the test less teams moral level of 0.05 to see significant differences between the results.

Statistical analysis

The result were expressed as mean \pm SD and analyzed statistically by Spss system ver.20. The association between the body weight pre- and after exposure to device were analyzed by using student t-test and ANOVA at levels of ($p < 0.05$).

RESULTS & DISCUSSION:

On body weight (g)

Results indicate described in Figure (3-1) to the weight changes after exposure for of device mosquito killer the groups experience.G1,G2,G3,G4,G5. The results showed no significant differences ($0.05 \leq p$) in the weights of the bodies of the male rate rats sets of G2 and G3 & G4 , compared with the control group(G1) , while animals of G5suffered from the loss of weight was elevated to the level of significance ($p < 0.05$).

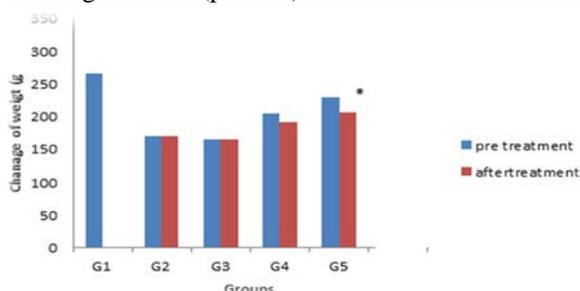


Fig. (3-1): Effect of exposure of device mosquito killer on weight changes for mature male mouse of study groups
*Means a significant change when ($p < 0.05$)

The significant correlation of oxidative stress indicated in fig. (3-1). The data are in good agreement with previous studies suggesting that oxidative stress correlated with body weight, [16] points the decrease of GSH levels as the BMI values were raised due to excessive utilization in various protective mechanisms, GSH is used as a cofactor by (1) multiple peroxidase enzymes, to detoxify peroxides generated from oxygen radical attack on biological molecules; (2) transhydrogenases, to reduce oxidized centers on DNA, proteins, and other biomolecules; and (3) Glutathione Stransferases (GST) to conjugate GSH and exogenous electrophiles (e.g., arene oxides, unsaturated carbonyls, organic halides), and diverse xenobiotic.

[5] indicate that the equipment generates UV and generates ozone gas O_3 , the effect of O_3 exposure play a role as oxidative agent that effect on decomposition of lipid in adipose tissue to glyceride and cholesterol, then decrease the body weight.

[17], found the oxidative damage associated with decreased body weight points to a key role of stress hormones in initiating stress-induced oxidative damage. Reflecting the current study showed pathological changes in the textile in the study, which included Members of the liver. It may

cause exposure to radiation for a long time ranging from one hour to 36 hours, to the emergence of pathological changes in most tissues studied varied severity of the fabric to another and from one area to another in the same fabric. While it is resulting in radiation exposure for 12 hours to the appearance of normal tissue milestones approach to the tissues of animals control. The group suffered a 24-hour radiation ,the tissues of animals showed low-intensity pathological changes in comparison with the group exposed for 36 hours radiation ,which demonstrates the arrival of the intensity of radiation exposure to toxic class which has produced all damaged monuments textile liver .

The picture shows (-1-) passage histologically for liver a rat control, which appears as a component of almost circular shape lobules, and shows the central vein average per lobule, as it extends its hepatocytes radially in the form of ropes called chords liver and permeates the liver cells make way or hepatic Sinusoids. Not noticed any change in the textile and textile clear sections of the livers of rats G2. The tissues sections rats G4,G5, has seen congestion of blood vessels and bleeding bloody, image (3a, 3b, 3c), as well as the emergence and bleeding bloody between sinusoids liver and the emergence intensify Kromtin some nuclei liver and called Pyknosis a form of necrosis of hepatocytes with the presence of hemorrhage in the vein pyloric Portal veins (4). The severity of the bloody eased congestion in histological sections of the livers of animals in the third set

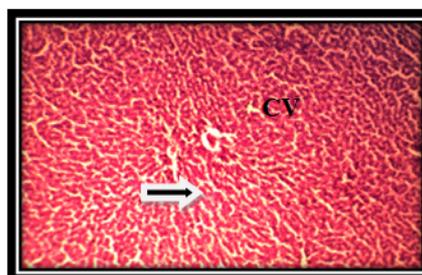


Image 1: A section in the liver of mouse in the control group G1, represented by the existence of a natural senesoides(\rightarrow) & central vein (CV)(200x hematoxylin & Aiosin)

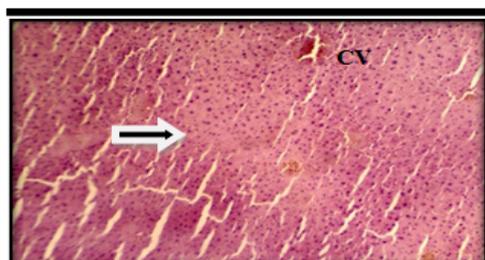


Image 2: A section in the liver of mouse in the G2 , Natural landmarks tried to control. Are ropes around the central vein (CV) and interspersed senesoides (\rightarrow) (200x hematoxylin & Aiosin)

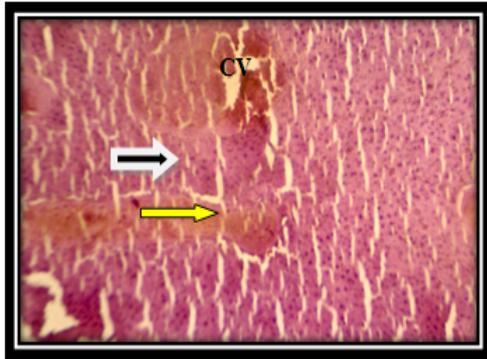


Image (3a): section in the liver of mouse (G4) in which sinusoids (→) and arranged in a sling around the central vein (CV) dilated and contain hemorrhage (→) (Allosan – hematoxylin 200 x)

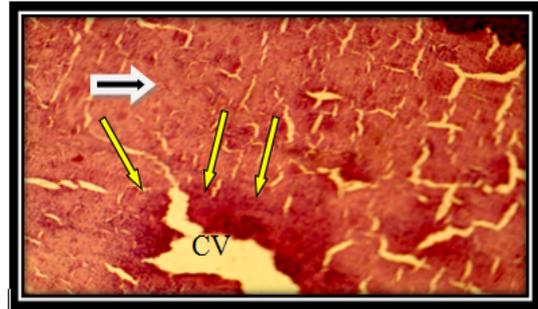


image (3d) section in the liver of a rat G3 in which liver cells (sinusoid) swollen & necrosis show (→) and arranged in a sling around the central vein (CV) very dilated and contain hemorrhage (→) (Allosan – hematoxylin 200 x)

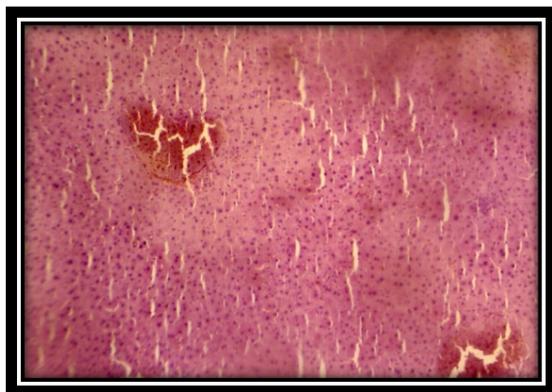


Image 3c (Allosan – hematoxylin 200 x)

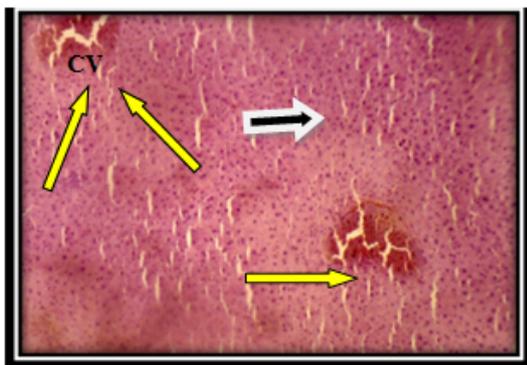


Image (3b) section the liver of a rat (G3) in which liver cells swollen show (→) and arranged in a sling around (→) the central vein (CV) dilated and contain hemorrhage (→) (Allosan – hematoxylin 200 x)

The study structural changes in the lymph Members of the reticular endothelial system , a result of exposure to chemical and radiological an important indicator to assess the toxic effects - immune resulting from these materials [14], and the attic was this side take an important place in the present study was to assess the size of the deviations mice immune to males. histological sections of the liver showed the existence of the state of tension and blood vessels which is due to the relaxation of Arteries.

He noted [11] that exposure periods UV that come with the sun or artificial light therapy lamps are the two things very worry for human health ,the effect radiation on the skin, including dermatitis and weaken the immune system. According to [12] that the ultraviolet radiation term UVA and medium UVB and short UVC can destroy the protein collagen and thus accelerates aging skin .the interactions electric discharge converts some oxygen into ozone O₃, which strongly dissociates of something organic compounds or for some metals or their oxides [9], [10].

[13], [14] reviled that the ozone Once effect on the organism that enters the body decomposes into oxygen, O₂ and free electron unstable attacks the membranes of living cells reasoned case of lipid peroxidation performer to rupture of membranes and flow the hemoglobin through them and this proved the picture of 5 for the case of hemorrhage and necrosis of the cells.

Acknowledgement

The researcher wish to grant this work for my friends that supported and contributed to completion this work. Special thanks to S.S Inam Ali Tsear Environment Department \ College of Science University of Kufa for the great supporting during the study

REFERENCES

1. WHO. The impact of pesticides on health: preventing intentional and unintentional deaths from pesticide poisoning. 2004: PesticidesHealth2.pdf .
2. Sanborn M. D.; Cole D.; Abelsohn, A.; Wei,r E. (2002) .Identifying and managing adverse environmental health effects: 4. Pesticides CMAJ • MAY 28.; 166 (11) p: 1431-36.
3. WHO. (2006). Pesticides and their application: For the control of vectors and pests of public health importance. Sixth edition .

4. Helfrich, L.A.; Weigriann, D.L.; Hipkins, P. and Stinson, E.R. (1996). Pesticides and aquatic animals: A guide to reducing impacts on aquatic systems. Virginia cooperative extension, Publication, Virginia.
5. B270-Superwhite Glass Transmission Curve".
6. Grant, W. B.(2002)."An estimate of premature cancer mortality in the U.S. due to inadequate doses of solar ultraviolet-B radiation". Cancer Volume 94, Issue 6, pp. 1867-1875
7. J.U.S. Environmental Protection Agency. Air Quality Criteria for Ozone and Related Photochemical Oxidants. 2006. EPA 600/R-05/004aF Available at <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=149923>.
8. Bell ML, Dominici F, and Samet JM. A Meta-Analysis of Time-Series Studies of Ozone and Mortality with Comparison to the National Morbidity, Mortality, and Air Pollution Study. *Epidemiology* 2005; 16:436-445.
9. Levy JI, Chermerynski SM, Sarnat JA. Ozone Exposure and Mortality: an empiric Bayes metaregression analysis. *Epidemiology* 2005; 16:458-468.
10. Ito K, De Leon SF, Lippmann M. Associations Between Ozone and Daily Mortality: analysis and meta-analysis. *Epidemiology* 2005; 16:446-429.
11. Hockberger P. E. (2002) "A history of ultraviolet photobiology for humans, animals and microorganisms". *Photochem. Photobiol.* **76**: 561-579.
12. Vahlquist A (1988) "UV irradiation and topical vitamin A modulate retinol esterification in hairless mouse epidermis". *Acta Derm. Venereol.* **68** (4): 291-299
13. Ananthaswamy H. N. (2004) "Toxic effects of ultraviolet radiation on the skin". *Toxicology and Applied Pharmacology* **195** (3): 298-308 doi:10.1016/j.taap.2003.08.019
14. Kinney PL, Lippmann M. Respiratory Effects of Seasonal Exposures to Ozone and Particles. *Arch Environ Health* 2000;210-216 ; 55
15. Delfino RJ, Murphy-Moulton AM, Becklake MR. Emergency Room Visits for Respiratory Illnesses among the Elderly in Montreal: Association with Low Level Ozone Exposure. *Environ Res* 1998; 76 (Section A): 67-77
16. Olusi S.O. (2002): Obesity is an Independent Risk Factor for plasma lipid Humans. *Int. J. Obes. Relat. Metab. Disord*; 26:1159-1164.
17. Zafir, A and Banu, N (2009) :Induction of Oxidative Stress by Restraint Stress and Corticosterone Treatment in Rats. *Indian jour.of Biochem.& Biophys.* Vol.46.P:53-58.