TOXICOLOGICAL ASPECTS OF CERTAIN PESTICIDES AFFECTING LABORATORY ANIMALS

By

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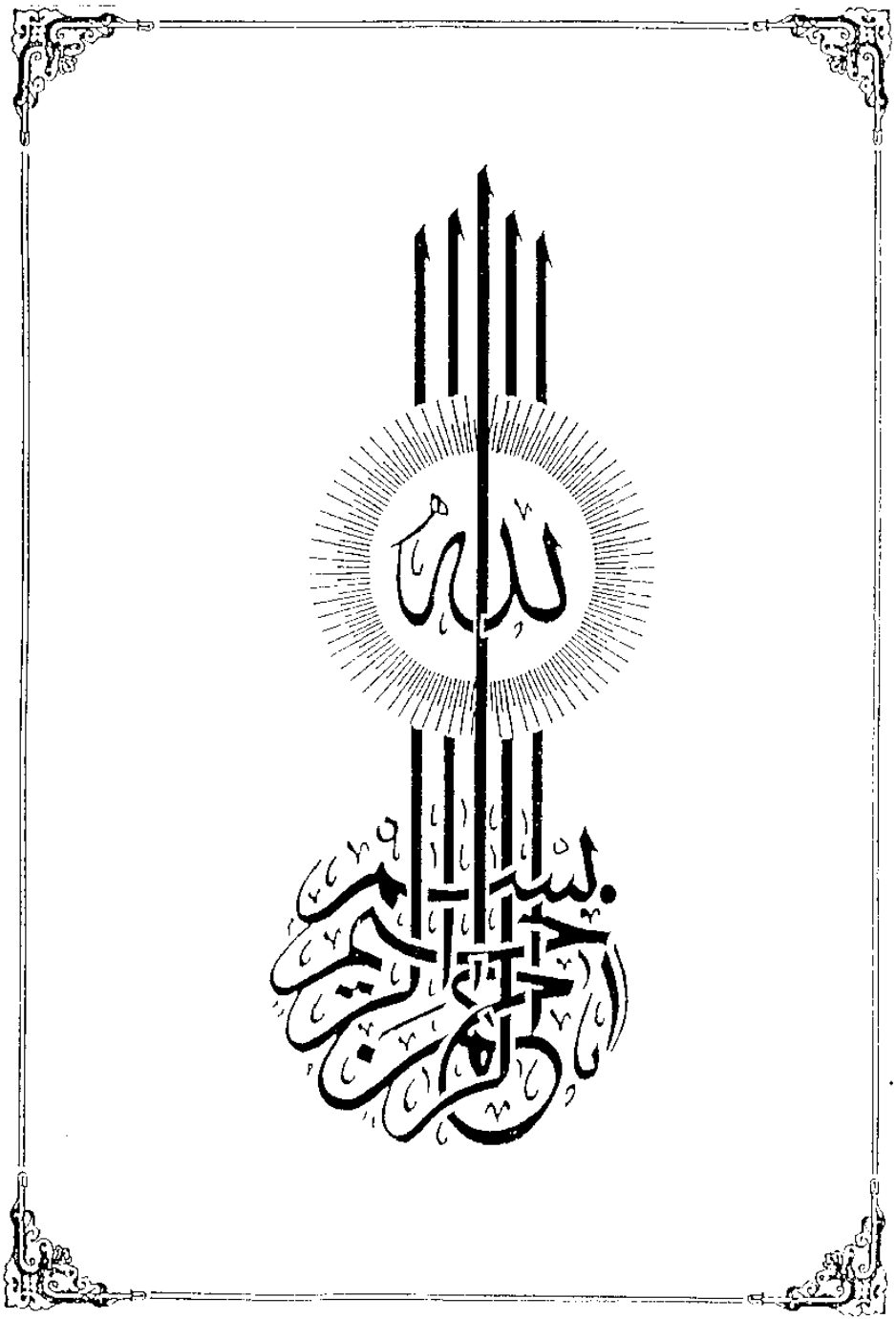

APPROVAL SHEET

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ABSTRACT

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The work was mainly conducted to investigate and asses the magnitude of hazards which may be encountered with the intraperitoneal injection of Acephate, Cyanophos and Esfenvalerate in mice.

In order to gain an insight into the toxilogical action of these pesticides, female and male mice were similarly treated with LD_{50} or 1/2 LD_{50} . The mice were sacrificed and frequent measurments were made 2, 4, 12, 24 and 168 hours after the pesticides administration to determine cholesterol, glucose, haemoglobin and protein components. Moreover, the transaminases (GOT & GPT), Glutathione-S-transferases (GST) and mixed-function oxidases (MFO) activities were all assayed. The electrophysiological changes in nerve-muscle preparations were recorded.

Acephate caused increased heart beat, strong tremors, convulsions and flattened posterior region of the animals. Cyanophos initiated variable pathological symptoms, but, it showed less marked effects compared to that of Acephate or Esfenvalerate.

A significant increase over that of the check in serum cholestrol was noted in male and female mice treated with either LD_{50} or 1/2 LD_{50} of Acephate and Cyanophos, while opposite results have been recorded with Esfenvalerate.

It is evident that times-response relationship after the intraperitoneal injection of 1/2 LD_{50}, Acephate and Esfenvalerate caused hyperglycemia in both sexes, while, Cyanophos caused hypoglycemia.

Acephate and Esfenvalerate increased haemoglobin concentration in both sexes while, Cyanophos decreased in the parameter at 2 and 4 hour post-dosing in both sexes, followed by gradual increase.

Acephate and Cyanophos, at LD_{50} , showed a depression in total

protein concentration in both sexes few hours after administration, where, it increased after one day of administrations. Esfenvalerate increased the total protein concentration 2 hours posttreatment.

Acephate decreased A/G ratio, while, Cyanophos increased it compared with that of check in both sexes. Esfenvalerate decreased A/G ratio after few hours of treatment and increased it after one day posttreatment.

Acephate, Cyanoohos and Esfenvalerate showed fluctuated depressions of GST activity in male and female mice. Smaller depressions were observed following treatment with Esfenvalerate.

Acephate and Cyanophos increased MFO activity in both sexes at the two doses, while, Esfenvalerate-decreased it till the end of the experimental time.

The tested pesticides increased the activities of GPT and GOT in both sexes at all times posttreatment.

The results showed that the percent concentration of GOT activity denoting highest efficacy of Esfenvalerate followed by Cyanophos whereas Acephate came last, since it effect gradually decreased by time. Although Cyanophos showed low activity at the end of the period tested, yet the other two compounds exhibited twice as much activity as that of Cyanophos.

The contraction amplitude of mice muscle as being affected with 0.05 mM Acephate, Cyanophos and Esfenvalerate gradually increased to reach 50, 40, and 46 %, respectively as compared with the amplitude of check muscle. Such compounds also increased the contraction duration and recovery of contraction was observed.

KEY WORDS

Toxicoligical aspects-Acephate- Cyanophos- Esfenvalerate - Mice-Toxicoligic syndroms-Determination-Glucose-Cholestrol-Haemoglobin-Protein components-Activity-GST-MFO-Transaminases-(GOT-GPT)-Electrophysiological studies

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