

RISK ASSESSMENT OF CHLORPYRIFOS-METHYL USING 21-DAY SUBACUTE DIETARY STUDY IN THE JAPANESE QUAIL (*Coturnix coturnix japonica*)

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ABSTRACT:

The risk assessment of the organophosphate pesticide, chlorpyrifos-methyl (CPM), was conducted to determine the probability of adverse effects occurring from exposure to CPM in the Japanese quail (*Coturnix japonica*). The quail were exposed to sublethal levels, 1/10, 1/100 and 1/1000 LC50 of CPM, for 21-day dietary toxicity test, based on OECD workshop report. At 1/10 LC50, quail body weight was significantly decreased by 22.7% than that of the control. However, absolute weight of liver from quail exposed to 1/10 and 1/100 LC50 showed significant increases than that of the control. Kidney weight was also increased at the lower dose, 1/1000 LC50, while showed a significant decrease at the higher dose, 1/10 LC50. Data on hepatic function showed increased levels of ALT and ALP at concentrations of 1/10 and 1/100 LC50. Total protein levels were also increased at these doses. In kidney function parameters, data showed an obvious increase in concentrations of uric acid, at 1/10 and 1/100 LC50 without significant change in creatinine level due to pesticide exposure. The data obtained verified the toxic hazard of chlorpyrifos methyl, at concentration used, on Japanese quail that could be an excellent bird model for monitoring the toxicological risks of pesticides in Egypt.

Key words: Dietary toxicity test; Japanese quail; Chlorpyrifos-methyl

JOINT ACTION OF BIOINSECTICIDES AND IGRS IN BINARY MIXTURES WITH SEVERAL INSECTICIDES AND THEIR ROLE IN DEVELOPMENT OF RESISTANCE IN SPODOPTERA LITTORALIS (BOISD.)

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ABSTRACT:

The efficacy of 8 binary mixtures representing two naturally derived insecticides, spinosad and abamectin when combined with each of deltamethrin, furathiocarb, methomyl and profenfos at mixing ratios of 9:1, 4:1, 1:1, 1:4 and 1:9 was studied, by feeding 4th instar larvae of *S. littoralis* (Boisd.) on treated castor bean leaves for 24 hr. Also, the joint action of deltamethrin, chlorpyrifos and methomyl when combined with each of four IGRs, methoxyfenozide, chlorfluazuron, hexaflumuron and pyriproxyfen in binary mixtures at the same mixing ratio was studied. Therefore, the acute toxicity (LC50) of each insecticides separately and those of binary mixtures was assessed. Based on LC50 value of each insecticide separately or the mixtures and mixing ratios, the co-toxicity coefficient (CTC) of mixture was determined. At 24h post treatment neither naturally derived compounds in their mixtures showed synergism to the conventional insecticides except for methomyl at limited mixing ratios. However, chlorpyrifos in its mixtures with tested IGRs showed remarkable synergistic activity regardless mixing ratios, whereas deltamethrin in mixture with only methoxyfenozide and hexaflumuron exhibited synergistic activity at limited mixing ratios. In contrast methomyl recorded clear antagonistic action in all mixtures with IGRs, except with chlorfluazuron at 9:1 mixing ratio. When the most promising mixtures (showing the highest CTC) was used in selection at level LC30 for 5 generations, the data obtained indicate remarkable delay in development of resistance in case of spinosad+methomyl (1:4) and chlorpyrifos+hexaflumuron (9:1), compared with relatively higher rate of resistance development for selection with each component alone. Using synergism from these promising insecticide mixtures should prove to be an additional tool in the overall resistance management strategy.

Key words: Joint action, resistance, insecticides, IGRs and cotton leafworm