بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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MONA MAGHRABY

THE COMBINED EFFECT OF PESTICIDE MIXTURES AGAINST COTTON LEAF WORM, *Spodoptera littoralis* (BOISD.)

By

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B.Sc. Agric. Sci. (Pesticides), Fac. Agric., Cairo Univ., 2007
M.Sc. Agric. Sci. (Pesticides), Fac. Agric., Cairo Univ., 2015

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SUPERVISION SHEET

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ABSTRACT

The isobologram equation combination index (CI), was used to evaluate the efficacy of Indoxacarb (I) and Pyridalyl (Py) in binary mixtures with recommended insecticides i.e. the insect development inhibitors (IDI's); lufenuron (L) and methoxyfenozide(M) and the conventional insecticides; chlorpyrifos (Ch), profenofos (Pr) and lambda- cyhalothrin (Cy) which against the 2nd instar larvae of *Spodoptera littoralis* (Boisd.). The latent effects of these binary mixtures were also studied to evaluate their impact on the larval and pupal durations, pupation, fecundity also, the percentage of emergence, hatchability% and sterility % of *S. littoralis* were calculated. Based on LC_{50} values of each individual insecticide, indoxacarb was the superior compound, while lambda- cyhalothrin was the inferior one against 2nd instar larvae of *S. littoralis.*

All tested binary mixtures were obviously had significant impact on all tested biological parameters. The detoxification enzymes; α- esterases, Glutathione-S-Transferase, Acetylcholine esterase, Acid Phosphatase and Alkaline Phosphatase were determined to explore their role on the mixture effects. The role of the oxidative stress in raising or reducing the effectiveness of pesticide mixtures; represented in total antioxidant capacity, Hydrogen peroxide and Lactate Dehydrogenase were also assessed. The mixtures that showed potentiation were investigated against a resistant strain of *S. littoralis.*

According to CI values, the toxicity of indoxacarb (I) decreased when mixed at LC_{25} value with lufenuron, methoxyfenozide, profenofos and lambda- cyhalothrin after 72h of observation time. The CI values were on the descending order of 16.2, 4.25, 1.99 and 1.84, respectively. On the contrary, the toxicity of indoxacarb increased when mixed with chlorpyrifos after 72h. After 72 hours of the treatment of indoxacarb mixtures, α – esterases total units increased significantly compared to control.

Referring to the CI values, the mixtures of pyridalyl (Py)/ M, Py/Pr and Py/L showed potentiation effect after 72 hrs, the CIs values were 0.36, 0.46 and 0.57, respect. However, the Py/Ch mixture showed antagonism effect after 72 hrs as the CI value was 3.14 Py/ Cy showed nearly an additive effect as the CI was 0.98 after 72 h. The treatment of pyridalyl binary mixtures, after 72 hours, increased significantly α – esterases total units to 44.01 µ moles/ ml/ min by the treatment of Py/ Ch mixture, but it increased insignificantly to 23.47 in Py/ Cy mixture. Contrariwise, α – esterases decreased to 0.22 and 1.71 µ moles/ ml/ min in Py/M, and Py/L mixtures, respectively.

The resistance strain indicated that mixtures of I/Ch, M/Ch, Py/M, L/Ch and Py/L could be effectively used as a component of integrated pest management programs (IPM) of *S. littoralis.* Depending on the CI values and the delayed toxic effects of the tested binary mixtures against *S. littoralis*, this study suggesting the using of the successful binary mixtures as a tool in IPM programs to overcome the possibility of resistance development in *S. littoralis* because of the intensive and repeated use of these compounds in Egypt.

Key words: Combination index, Indoxacarb, pyridalyl, binary mixtures, *Spodoptera littoralis* (Boisd.), Total Antioxidant Capacity.

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