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ABSTRACT

This work is an attempt to obtain basic information concerning ecology of some insect species associated with cowpea plants, biology and control of major insect pests at Sharkia Governorate. Nine species belonging to 9 families were determined in the total collected samples. These species identified and classified according to their feeding habitats to two major groups i.e. harmful insects and predacious insects. Absolute and relative frequencies of occurrence for insect pests recorded on cowpea plants at the three localities, Belbees, Fakous and Zagazig, Sharkia Governorate were calculated.It was found that the most frequently species were *Aphis craccivora* Koch and *Spodoptera littoralis* (Boisd.). The percentage of their absolute frequency occurrence recorded 76.06 and 43.58%, respectively while their relative frequency occurrence was 38.86 and 22.26 %. Population dynamics of the major pests were studied during season 2015 and 2016 on cowpea crop at Zagazig district. Aphids and cotton leafworm showed two peaks of abundance during 2015 and three peaks during season 2016.

Six insecticides were used in this study, namely, indoxacarb, lufenuron and methomyl against *S. littoralis* and thiamethoxam, pymetrozine and chlorpyrifos-methyl against *Aphis craccivora* under field and laboratory conditions. Laboratory studies were conducted to study susceptibility of both laboratory and field strains of 4^{th} instar larvae of the cotton leaf worm *S. littoralis* (Boisd.) to Match, Betavaunt and Methomate .The high differences in LC_{50} values were observed between the laboratory and the field strains as demonstrated by resistance ratio of 12.58, 13.47 and 23.09-fold for Betavaunt, Methomate and Match respectively.

In regarding to the effect of tested insecticides on biological aspects of *S. littoralis*, the results cleared that all insecticides caused prolongation in larval duration, reduction in pupation and adult emergence percent with significant differences between laboratory and field strains.

In addition, the effect of tested insecticides on the activities of carbohydrate hydrolyzing enzymes (amylase, trehalase and invertase), phosphatases (acid and alkaline phosphatase), acetyl cholinesterase and chitinase were evaluated in the field strain of *S. littoralis* (Boisd.), compared with the laboratory strain.

As for aphids ,toxicity of the tested insecticides was studied and the results showed that, Chess was the most effective insecticide followed by Actara and Reldan. LC_{50} for the tested insecticides can be arranged in the following descending order: Chess, Actara and Reldan since LC_{50} values were 2.39, 20.35 and 34.08 ppm, respectively.

In regarding to biological aspects, results showed that there were significant differences between longevity and fecundity of *A. craccivora* compared with control for using the concentration LC_{50} of insecticides. Going to field studies, results showed that, Match was the most effective insecticide against *S. littoralis* and exhibited the highest residual values which were 92.44% in the first season 2015 and 87.71% in 2016. Data indicated significant and high reduction percentages were recorded after 3 days of treatment against *A. craccivora*. Actara was the most effective insecticide which caused mean reduction percent 88.13% followed by Chess 79.37% while Reldan was the lowest one.