

-39-SUMMARY OF

**ENVIRONMENTAL TOXICITY OF SOME PEST CONTROL
AGENTS**

A THESIS

**PRESENTED TO THE GRADUATE SCHOOL
FACULTY OF AGRICULTURE, DAMANHOUR UNIVERSITY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF**

MASTER OF SCIENCE

IN

PESTICIDE CHEMISTRY AND TOXICOLOGY

BY

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SUMMARY

Cucumber plant (*Cucumis sativus* L.) was planted in El-Mahmodia region at El-Behera Governorate, A. R. E. In June 2009 under the normal field conditions and sprayed with imidacloprid (Admire) and tetraconazole (Domark) pesticides using the recommended rates of 125 cm³/ 100 liters water and 50 cm³/ 100 liters water, respectively. Residues of these pesticides on and in cucumber fruits were determined. The effects on various haematological and biochemical parameters of these residues and sublethal doses of these pesticides on treated rats were determined.

Results of this study can be summarized as follows:-

Pesticide Residue Analysis:

1. Average recovery percentages were 117.50 % for imidacloprid and 91.62% for tetraconazole. The data of residues analysis were corrected according to these obtained recovery percentages.
2. The initial deposits of imidacloprid on and in cucumber fruits were 0.943mg/kg after one hour from application, and the residues decreased to 0.365mg/kg, 0.271, 0.226, 0.086, 0.049, 0.028 and 0.013mg/kg after 1, 3, 5, 8, 11, 15 and 21days from application, respectively.
3. The initial deposit of tetraconazole on and in cucumber fruits was 0.174mg/kg, then residues decreased to 0.104, 0.037, 0.009, 0.005 and 0.002mg/kg after 1, 3, 5, 8 and 11 days from application, respectively.
4. Under normal field conditions, tetraconazole was more persistent on cucumber fruits ($t_{1/2}$ was 1.4 day) than imidacloprid ($t_{1/2}$ was 2.2 days). Thus, tetraconazole was degraded more rapidly than imidacloprid.
5. The results also revealed that the detected residues in and on cucumber fruits were less than that suggested by codex (2007, 2009).

Toxicological studies:

1. A 30 days oral toxicity study of imidacloprid and tetraconazole was conducted in male rats with doses of 0.365, 0.943, 45, 56.25mg/kg from imidacloprid and 0.104, 0.174, 124.8, 156 mg/kg from tetraconazole.
2. No mortality or any signs of toxicity occurred during the two treatments.
3. Significant increase in WBC's and significant decrease in % PCV occurred at the two high doses of each pesticide. On the other hand, the two high doses of tetraconazole gave no significant increase of RBC's counts, and decreased (Hb) concentration while imidacloprid in its highest doses caused the same effects, but the high dose at 56.25mg/kg caused significant increase of RBC's counts.
4. In clinical chemistry parameters the two high doses of tetraconazole caused significant elevation of AST, ALT, GGT, ALP, LDH, creatinine, uric acid,

total protein, and decreased significantly of AChE and the concentrations of albumin and glucose.

5. The two high doses of imidacloprid increased significantly the activities of AST, ALT, and LDH, the concentration of creatinine, uric acid and decreased glucose concentration. However, the highest doses caused significant increase of GGT, ALP, total protein, and decreased AChE and the concentrations of albumin.
6. The two high doses of each pesticides caused significant reduction of T₃, T₄, Testosterone, and TSH concentrations.
7. The two low doses which equal to the pesticide residues on and in cucumber at zero time and one day after application with the recommended doses did not show any changes in the haematological and biochemical targets in treated rats.