INTRODUCTION

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Pesticide residues analyses plays an important role in food quality for evaluating food safety and possible risks to human health. Organophosphorus pesticides (OPPs) are widely used allover the world for agricultural practices because of their high effectual and relatively low price. Compared with organochlorine pesticides, (OPPs) demonstrate relatively low environmental persistence, but a high toxicity (**Community Directive, 1993**; **FAO, 1993** and **Zhao *et al.*, 2006**). Organophosphorus pesticides are frequently found in soil and other environmental matrices, constituting an animal and human health hazard. Therefore, it is necessary to monitor their residues regularly through analytical methods which combine short analysis time, sufficient selectivity and sensitivity (**Fuentes *et al.*, 2007**).

Although organophosphorus (OP) pesticides are relatively less stable and persistent, there is a number of ways in which they can reach food. Among them, are the followings (i) through foodstuff containing high levels of OP pesticide residues from post-harvest treatment or contamination; (ii) through foodstuff manufactured from plant material that has been treated during the growing season with insecticides; (iii) use of insecticides directly on animals against disease vectors; (iv) use of insecticides in stables (e.g. treatment against flies); (v) hygienic treatments against insects in food processing factories (**Di Muccio *et al.*, 1996**).

Ethoprophos is an organophosphorus pesticide, that is extremely toxic to animals. It is a direct cholinesterase inhibitor, with excellent contact action. It has moderate residual activity and is not phytotoxic. The annual consumption of this pesticide during 1995 in California was about 28.250 kg used mostly on potatoes (97.2%). It entered the risk assessment process due to its high acute toxicity, possible oncogenicity, and adverse effects on liver upon chronic exposure (**Cochran *et al.*, 1995**).

Fluazifop-P-butyl is a selective, post-emergence herbicide registered for the control of perennial and annual grass weeds. It is typically applied as a broadcast, banded, directed or spot treatment with groundboom sprayers and aerial equipment to asparagus, carrot, coffee, cotton, endive (escarole), garlic, macadamia nut, onion, pecan, pepper, rhubarb, soybeans, stone fruits, potato, and yam, its application would result in its release to the environment (**Humburg, 1989** and **EPA, 2004**). Fluazifop-butyl used as post-emergence against grass weeds (**EPPO Standards, 2008**).

Ethoprophos is used for treatment of the soil against soil-borne pests (especially potato cyst nematodes), and is considered one of the most important nematicides used on potato as a general control strategy to control volunteer potatoes in other crops (**EPPO Standards, 2008**).

Potato (*Ipomoea batatas*) is a perennial herbaceous dicotyledonous species of the family Convolvulaceae. It is grown as an annual in Egypt. It is an important source of food in the Egyptian markets. It also improves the fertility of the soil via providing a substantial input of N fixation. The reduction of potato yield is mainly due to weed infestation which could reach 30 to 44% **(Hassan, 1987)**. Thus, weed control is one of the essential cultural practices for raising potato yield and improving its quality. Hoeing is recommended for effective weed control in Potato **(Hassan, 1987; Jat and Gaur, 2000; Jat *et al.*, 2002)**.

The protection of potato plant from the attacking of pests is considered a key factor for the obtaining high yield particularly and some of the key pests affecting the production of potato crops are the parasitic nematods **(Davis and Heald, 1983)**.

However the investigations and experiences indicate that nematodes on potatoes may be a problem in any area where potatoes can be grown successfully. The most serious nematode damage is root damage which is difficult to diagnose by foliar symptoms. Nematodes spend most of their lives in roots or soil. Plant-pathogenic nematodes will become even more important to world agriculture in the future because of their spread by man, and because of more intensive agriculture on better soils to satisfy the food and

fiber needs of increasing world populations (**Argauer and Feldmeser, 1978**).

Residues of pesticides extracted from various matrices have been recorded from soil (**Camel *et al.*, 1995** and **Izquierdo *et al.*, 1996**), and vegetables (**Lehotay, and Ibrahim, 1995** and **Kim *et al.*, 1998**).

In the United States any pesticide must be registered with the Environmental Protection Agency (EPA) and laws require manufacturers of pesticides to test them for potential and side effects on animals before a pesticide can be sold (**Pesticide Education Center, 2002**).

The objectives of this study aimed to investigate the following aspects:

1- The fate of ethoprophos nematicide and fluazifop-P-butyl herbicide in clay loam soil under normal field conditions.

2- The fate of ethoprophos nematocide and fluazifop-P-butyl herbicide in potato tubers.

3- Relationship between the fate of pesticides in soil and in the potato crop.

4- Effect of ethoprophos nematocide and fluazifop-P-butyl herbicide on experimental laboratory animals, regarding biological functions and their residues in different organs.