Journal

J. Biol. Chem. Environ. Sci., 2008, Vol. 3(1): 583-597
www.acepsag.org

MONITORING OF SOME PESTICIDE RESIDUES IN WATER AND FISH TISSUE SAMPLES COLLECTED FROM THREE LOCATIONS AT SHARKIA GOVERNORATE, EGYPT

OLFAT A. RADWAN

Pesticides Analysis Department, Central Agricultural Pesticides Laboratory, Giza, Egypt.

ABSTRACT

Pesticide residues in fish water pond, water resource (inlet) and drainage water (outlet) samples were collected from three different locations Diarb-Negm, Abo-Hamad and Hehya at Sharkia governorate during July, August, September and October 2007, and compared its residues with Acceptable Daily Intake (ADI) values.

In the drainage water samples, the dominance of organophosphorus such as monocrotofos, chlorpyrifos-methyl and profenfos was noticed in Hehya, Diarb-Negm and Abo-Hamad respectively. While the high level of abamectin was detected in the drainage water (outlet) samples collected from Hehya, Diarb-Negm and Abo-Hamad.But the high level of pesticides was detected in the fish gills. On the contrary the fentrothion, carbofuran and acetampride were not detected in fish tissues while, acetampride, dicofol, fentroyhion and carbofuran were not detected in water samples collected from Hehya but acetampride, fentrothion and carbofuran were not detected in water samples collected fromAbo-Hamad, while, carbofuran was not detected in different water samples (outlet, inlet and fish water pond). Water samples collected from Diarb-Negm at Sharkia governorate.

INTRODUCTION

The pollution of soils and water resources by pesticides, detergents, solvents and variety of industrial organics is a pressing world wide problem. The indiscriminate use of pesticides in

agriculture can cause environmental problems especially to aquatic system by altering the quality of water and so affecting the physiology and biochemistry of non target organism such as fish, (Shakoori, et al 1996). Several publications revealed the existence of pesticide residues mainly organochlorine compounds in various aquatic ecosystems components, (Badawy 1998); El-Kabbany et al., 2000; Gupta et al (2002)., Radwan & Atalla (2005); and Tarek (2007).

The objectives of the present work were to study and evaluate some of the pesticide residues in fish water pond, water resource (inlet) and drainage water (outlet) sample collected from three different locations Diarb-Negm , Abo-Hamad and Hehya at Sharkia governorate were monitored during July, August, September and October 2007 , the pesticide residues were evaluated in muscles, gills and brain of Tilapia (*Oreochromis niloticus*) grown in drainage water were collected from three different locations at Sharkia governorate in Egypt during 2007.

MATERIALS AND METHODS

Fish samples:

Twenty five Tilapia (*Oreochromis niloticus*) growing in drainage water were collected from each location (Diarb-Negm, Abo-Hamad and Hehya) at Sharkia governorate .

Water samples:

Drainage water, water resources and fish water pond samples of two liters were collected from Diarb-Negm, Abo- Hamad and Hehya locations during July, August, September and October 2007.

Apparatus and reagents;

Liquid- chromatography water model Agilent series 1100 solvent delivery system, quartenary pump, shromatograph with UV spectrophotometer detector and C18 stanless column (4.6×250 mm). Solvent- liquid chromatography grade: (Merk company).Clean up cartridge : Purge C18 cartridge with 5ml acetonitryl / methanol 1:1 and with 4 ml acetonitryl followed by 5 ml methylene chloride.

Extraction and cleanup of water samples:

50 ml water sample were mixed with 50 ml methylene chloride-methanol (1:1). Resulting mixture was drawn through C18 cartridge. Stream of air (aerator) and reconstitute residues were eluted with 1 ml mobile phase (methanol) and then determined using HPLC analysis according to Mann (1981).

Extraction and cleanup of fish samples:

Fish samples (1g) of brain with 10 ml of acetone and 100 ml of acetone to (50 g) fish muscle flesh and gills were added and blended in warring blended a high speed centrifuge for 2 min and partition with dichloromethane. The resulting extracts of fish tissues were cleaned by activated florisil using elution solvent system of 50% dichloromethane, 48.5% n- hexane and 1.5 % acetonitril (Mills *et al.*, 1972). The pesticide extracts were evaporated at 30 °C to dryness. After clean up the pesticides extract dissolved in 1 ml methanol to HPLC analysis with UV detector and C18 stainless column 25 mm.

RESULTS AND DISCUSSION

Data in tables (1, 2, and3) indicate the presence of negligible residues of pesticides in fish water pond, water resources and drainage water samples from Diarb-Negm, Abo-Hamad and Hehya on July 2007 respectively. The average of the detected pesticide residues in these locations were as follows Diarb-Negm water samples contained methomyl (0.4591, 0.1521 and 0.6912 ppm) monocrotofos (0.2819, ND, and 0.3005 ppm), malathion (0.1643, 0.1521, and 0.6912 ppm) ,chlorpyrifos-methyl (0.6993, ND and 0.8341 ppm), profenfos (0.4051, ND, and 0.6133 ppm) ,scor (0.044, ND, and 0.1107 ppm) , thiobencarb (0.0677, ND, and 0.0803 ppm) ,acetamprid (0.4631 , 0.1521, and 0.8148 ppm) , abamectin (0.3261, 0.0195 and 0.6341 ppm) , glyphosate (0.1761, 0.0187 and 0.2576 ppm) , dicofol (0.3261, 0.0917 and 0.7231 pm), and fentrothion (0.3660, 0.1211, and 0.4312 ppm) in fish water pond, water resources and drainage water respectively on July 2007. While the detected pesticidez residues in Abo- Hamad, water samples contained methomyl (o.o400. ND. And 0.0482 ppm) monocrotofos were (0.0410, ND, and 0.0588 ppm). Malathion (0.0910. ND, and 0.1003 ppm), chlorpyrifos- ethyl (0.0173, ND, and 0.1303 ppm) chlorpyrifos- methyl (0.0195, ND, and 0.1050

ppm), profenfos (0.6141, ND,and 0.4146 ppm) ,scor (0.0305. ND and 0.0359 ppm), thiobencarb (0,0556 ND , and 0.4566 ppm), abamectin (0.0737, ND, and 0.5103 ppm), glyphosate (0.0141, ND, and 0.0167 ppm), and dicofol (0.0440, 0.0017 and 0.0465 ppm) in fish water pond, water resources and drainage water respectively on July 2007, and the detected pesticides residues in Hehya water samples contained methomyl (0.0651 ,ND ,and 0.0738 ppm) , monocrotofos (0.6665 , ND , and 0.7443 ppm) , malathion (n 0.0133 , ND , and 0.0301 ppm) , chlorpyrifos – ethyl (0.0016 , ND , and 0.4356 ppm) , chlorpyrifos – methyl (0.0363 , ND , and 0.5344 ppm) , profenfos (0.0183, ND, and 0.0803 ppm), scor (0.0104, ND, and 0.0139 ppm), thiobencarb (0.0871 , ND ,and 0.0916 ppm) , abamectin (0.3733 , ND ,and 0.6756 ppm) and glyphosate (0.3503, ND, and 0.5677 ppm), in fish water pond, water resources and drainage water respectively.

The detected pesticide residues on august 2007 in Diarb- Negm water samples contained methomyl (0.5426 , 0.1519 , and 0.6611 ppm) , monocrotofos (0.2171 , 0.0131 and 0.3602 ppm) , malathion (0.2686 , 0.0206 m and 0.2809 ppm) , chlorpyrifos- methyl (0.6512 , ND , and 1.1031 ppm) , profenfos (0.4161 , 0.0131 , and 0.7303 ppm) , scor (0.0456 , 0.0091 , and 0.0703 ppm) , thiobencarb (0.0841 , ND ,and 0.0886 ppm) , acetampride (1.0062 , 0.0936 , and 1.205 ppm) abamectin (0.6653 , 0.0193 and 0.6835 ppm) , glyphosate (0.2813 , 0.0791 ,and 0.3347 ppm) , dicofol (0.3969 , 0.1103 ,and 0.8811 ppm) and fentrothion (0.1190 , 0.5354 , and 0.5693 ppm) in fish water pond , water resources and drainage water respectively. While the detected pesticide residues in Abo- Hamad , water samples contained methomyl (0.0427 , ND ,and 0.0443 ppm) , monocrotofos (0.0313 , ND ,and 0.0756 ppm) , malathion (0.0991 , ND ,and 0.1383 ppm) , chlorpyrifos – ethyl (0.0104 ,ND , and 0.1706 ppm) , chlorpyrifos – methyl

(0.0197, ND, and 0.1079 ppm), profenfos (0.1191, ND, and 0.5465 ppm), scor (0.0529, ND, and 0.0467 ppm), thiobencarb (0.0308, 0.0116, and, 0.6630 ppm), abamectin

(0.0634 , ND ,and 0.4106 ppm) , glyphosate (0.0436 , ND, and 0.0527 ppm) , and dicofol (0.1022 , 0.0023 , and 0.0488 ppm) in fish water pond , water resources and drainage water respectively on august 2007 , but the detected pesticide residues in Hehya water

samplescontained methomyl (0.0703 , ND , and 0.0884 ppm) monocrotofos

(0.8317 , ND ,and 0.9838 ppm) , malathion (0.0113 , ND ,and 0.0674 ppm) , chlorpyrifos – ethyl (0.0336 , ND ,and 0.5536 ppm) , chlorpyrifos – methyl (0.0687 , ND , and 0.5913 ppm) , profenfos (0.0201 , ND ,and 0.0926 ppm) , scor (0.0116 , ND ,and 0.0176 ppm) ,thiobencarb (0.0731 , ND , and 0.1053 ppm) abamectin (0.5477 , ND , and 0.7936 ppm) , glyphosate (0.4110 , ND ,and 0.6377 ppm) in fish water pond , water resources and drainage water respectively on August 2007.

The detected pesticide residues in Diarb-Negm water samples on September 2007 contained methomyl (0.7022 , 0.1392 , and 0.7753 ppm) , monocrotofos (0.3940 , 0.0163 ppm) , malathion (0.1883 , 0.0103 , and 0.2377 ppm) , chlorpyrifos –ethyl

(0.1662 , 0.0053 and 0.3781 ppm) , chlorpyrifos – methyl (0.7614 , ND ,and 1.0913 ppm), profenfos (0.4136 , 0.0577 and 0.8055 ppm) , scor (0.0633 , 0.0073 and 0.8158 ppm) , thiobencarb (0.7889 , ND, and 0.9931 ppm) , acetampride (0.2859 , 0.0331 and 0.3479 ppm) , glyphosate (0.2362 ,0.1536 and 0.3961 ppm) , dicofol (0.4743 , 0.1193 , and 1.0197 ppm) , and fentrothion (0.5693 , 0.1362 and 0.6756 ppm) in fish water pond , water resources and drainage water respectively while the detected pesticide residues in Abo – Hamad water samples contained methomyl (0.0428 , ND , 0.0583 ppm) , monocrotofos (0.0351 ,ND, and 0.0870 ppm) , malathion (0.1281 ,ND, and 0.1604 ppm) , chlorpyrifos –ethyl (0.0108 , ND, and 0.2748 ppm) , chlorpyrifos -methyl(0.0188 , ND, and 0.1953 ppm) , profenfos (0.2710 , ND ,and 0.6563 ppm) , scor (0.0571 , ND, and 0.0472 ppm) , thiobemcarb (0.0336 , ND, and 0.6539 ppm) , abamectin (0.0657 , ND, and 0.5472 ppm) , glyphosate (ND ,ND, and 0.0405 ppm) , and dicofol (0.0477 , 0.0107 and 0.483 ppm) in fish water pond , water resources and drainage water respectively . But the detected pesticide residues in Hehya water samples contained methomyl (0.0786 , ND ,and 0.0896 ppm) , monocrotofos (0.6683 , ND ,and 0.9803 ppm) , malathion (0.0103 , ND ,and 0.0786 ppm) , chlorpyrifos -ethyl (0.0406 , ND , and 0.7667 ppm) , chlorpyrifos –methyl (0.0803 , ND ,and 0.6008 ppm), profenfos(0.0366 , ND ,and 0.1055 ppm) , scor (0.0152 , ND ,and 0.0197 ppm) , thiobencarb (0.0821 , ND ,and 0.2313 ppm) , abamectin (0.6773 , ND ,and 0.9010 ppm) , and glyphosate (0.5830 ,

ND, and 0.6706 ppm) in fish water pond , water resources and drainage water respectively.

The detected pesticide residues in these locations were as follows Diarb-Negm water samples on October 2007 contained methomyl (0.6941 , 0.1694 and 0.8773 ppm) , monocrotofos (0.6153 , 0.0093 and 0.5111 ppm) , malathion (0.1588 , 0.0115 , and 0.3652 ppm) , chlorpyrifos –ethyl (0.2115 , 0.0069 and 0.4356 ppm) , chlorpyrifos –methyl (0.7761 , ND , and 1.2120 ppm) , profenfos (0.3571 , 0.0107 and 1.0221 ppm) , scor (0.0916 , 0.0116 , and 1.0133 ppm) , thiobencarb (0.7791 , ND ,and 0.9365 ppm) , acetampride (0.3361 , 0.0461 and 0.5280 ppm) , abamectin (0.7833 , 0.0959 and 0.9686 ppm) , glyphosate (0.4099 , 0.1163 and 0.4571 ppm) , dicofol (0.6963 , 0.1216 and 1.2313 ppm) , and fentrothion (0.7020 , 0.1341 and 0.7719 ppm) in fish water pond, water , water resources and drainage water respectively . The detected pesticide residues in Abo-Hamad water samples contained methomyl (0.0636 ,ND, and 0.0771 ppm) , monocrotofos (0.0414 , ND , and 0.0971 ppm) , malathion (0.1368 ,ND, and 0.1935 ppm) , chlorpyrifos –ethyl (0.0166 ,ND , and 0.2400 ppm) , chlorpyrifos -methyl(0.0241 , ND ,and 0.3103 ppm) , profenfos (0.3119 ND , and 0.6133 ppm) , scor (0.0418 , ND , and 0.0632 ppm) , thiobencarb (0.0619 , ND, and 0.7484 ppm) , abamectin (0.1316 , ND , and 0. 6933 ppm) , glyphosate (ND , ND , and 0.0332 ppm) , and dicofol (0.0696 , 0.0139 and 0.1141 ppm) in fish water pond , water resources and drainage water respectively. While the detected pesticide residues in Hehya water samples contained methomyl (o.o854 ,ND , and 0.1435 ppm) , monocrotofos (0.8436 ,ND , and 1.1198 ppm) , malathion (0.0336 ,ND , and 0.8376 ppm) , chlorpyrifos –ethyl (0.2493 , ND and ,0.8863 ppm) , chlorpyrifos –methyl (0.1356 ,ND , and 0.6131 ppm) , profenfos (0.0435 , ND and 0.1163 ppm) , scor (0.0124 ,ND , and 0.1006 ppm) , thiobencarb (0.0878 , ND , and 0.3373 ppm) , abamectin (0.7810 ,ND , and 0.9681 ppm) , and glyphosate (0.4996 , ND , and 0.7900 ppm) in fish water pond , water resources and drainage water respectively on October 2007 .

Table (1): Monitoring of some pesticide residues (ppm) in fish pond, inlet water and outlet (drainage) water samples collected from DiarbNegm at Sharkia governorate.

Source of samples	July			August			September			October		
Name of tissues	Pond	Inlet	Outlet	Pond	Inlet	Outlet	Pond	Inlet	Outlet	Pond	Inlet	Outlet
Methomyl	0.459	0.152	0.691	0.543	0.152	0.661	0.702	0.139	0.775	0.694	0.169	0.877
Monocrotofos	0.282	ND	0.301	0.217	0.013	0.36	0.394	0.016	0.435	0.615	0.009	0.511
Malathion	0.164	0.011	0.446	0.269	0.021	0.281	0.188	0.01	0.238	0.159	0.012	0.365
Chlorpyrifos-ethyl	ND	ND	ND	ND	ND	ND	0.166	0.005	0.387	0.212	0.007	0.436
Chlorpyrifos methyl	0.699	ND	0.834	0.651	ND	1.103	0.761	ND	1.091	0.776	ND	1.212
Profenfos	0.405	ND	0.613	0.416	0.013	0.73	0.414	0.058	0.806	0.357	0.011	1.022
Scor	0.044	ND	0.111	0.046	0.009	0.07	0.063	0.007	0.816	0.092	0.012	1.013
Thiobencarb	0.068	ND	0.08	0.084	ND	0.089	0.7129	ND	0.993	0.779	ND	0.937
Acetampride	0.463	0.152	0.815	1.006	0.094	1.205	0.286	0.033	0.348	0.336	0.046	0.528
Abamectin	0.326	0.02	0.634	0.665	0.019	0.084	0.337	0.012	0.629	0.783	0.096	0.969
Glyphosate	0.176	0.019	0.258	0.281	0.079	0.335	0.236	0.154	0.396	0.41	0.116	0.457
Dicofol	0.367	0.092	0.723	0.397	0.11	0.881	0.474	0.12	1.02	0.696	0.122	1.231
Fentrothion	0.366	0.121	0.431	0.471	0.119	0.535	0.569	0.136	0.676	0.702	0.134	0.772
Carbofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table (2) Monitoring of some pesticide residues (ppm) in fish pond, inlet water and outlet (drainage) water samples collected from Abo-Hamad at Sharkia governorate

Sample source / Pesticide	July			August			September			October		
	Pond	Inlet	Outlet	Pond	Inlet	Outlet	Pond	Inlet	Outlet	Pond	Inlet	Outlet
Methomyl	0,04	ND	0,048	0,043	ND	0,044	0,043	ND	0,058	0,064	ND	0,077
Monocrotofos	0,041	ND	0,059	0,031	ND	0,076	0,035	ND	0,087	0,041	ND	0,097
Malathion	0,091	ND	0,1	0,099	ND	0,138	0,128	ND	0,16	0,137	ND	0,194
Chlorpyrfos-ethyl	0,017	ND	0,13	0,01	ND	0,171	0,011	ND	0,275	0,017	ND	0,24
Chlorpyrfos-methy	0,02	ND	0,105	0,02	ND	0,108	0,019	ND	0,195	0,024	ND	0,31
Profenfos	0,614	ND	0,415	0,119	ND	0,547	0,271	ND	0,656	0,312	ND	0,613
Scor	0,031	ND	0,036	0,053	ND	0,047	0,057	ND	0,047	0,042	ND	0,063
Thiobencarb	0,056	ND	0,457	0,031	0,012	0,663	0,034	ND	0,654	0,062	ND	0,748
Acetampride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Abamectin	0,074	ND	0,51	0,063	ND	0,411	0,066	ND	0,547	0,132	ND	0,693
Glyphosate	0,014	0,016	0,017	0,044	ND	0,053	ND	ND	0,041	ND	ND	0,033
Dicofol	0,044	0,002	0,047	0,102	0,002	0,049	0,048	0,011	0,048	0,07	0,014	0,114
Fentrothion	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table (3) Monitoring of some pesticide residues (ppm) in fish pond, inlet water and outlet (drainage) water samples collected from Hehya at Sharkia governorate

Sample source / Pesticide	July			August			September			October		
	Pond	Inlet	Outlet	Pond	Inlet	Outlet	Pond	Inlet	Outlet	Pond	Inlet	Outlet
Methomyl	0,0651	ND	0,0738	0,0703	ND	0,0884	0,0786	ND	0,0896	0,0854	ND	0,1435
Monocrotofos	0,6665	ND	0,7443	0,8317	ND	0,9838	0,6683	ND	0,9803	0,8436	ND	1,1198
Malathion	0,0133	ND	0,0301	0,0193	ND	0,0674	0,0103	ND	0,0786	0,0336	ND	0,8376
Chlorpyrifos-ethyl	0,0116	ND	0,4356	0,0336	ND	0,5536	0,0406	ND	0,7667	0,2493	ND	0,8863
Chlorpyrifos-methy	0,0363	ND	0,5344	0,0687	ND	0,5913	0,0803	ND	0,6008	0,1356	ND	0,6131
Profenfos	0,0183	ND	0,0803	0,0201	ND	0,0926	0,0366	ND	0,1055	0,0435	ND	0,1163
Scor	0,0104	ND	0,0139	0,0119	ND	0,0176	0,0152	ND	0,0197	0,0124	ND	0,1006
Thiobencarb	0,0871	ND	0,0916	0,0731	ND	0,1053	0,0821	ND	0,2313	0,0878	ND	0,3373
Acetampride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Abamectin	0,3733	ND	0,6756	0,5477	ND	0,7936	0,6773	ND	0,901	0,781	ND	0,9681
Glyphosate	0,3503	ND	0,5677	0,411	ND	0,6377	0,583	ND	0,6706	0,4996	ND	0,79
Dicofol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fentrothion	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Pesticide residues in fish tissues:

Data in table (4) showed the pesticide residues in muscles, gills and brain of fish grown in drainage water collected from Diarb-Negm ,Abo- Hamad and Hehya at Sharkia governorate in Egypt during year 2007. Data concerning the existence of detected pesticides in Diarb- Negm fish muscle samples were (0.0204, 0.0117, 0.0293, 0.0287, 0.0444, 0.0383, 0.0316 and 0.0111 µg/100 g muscle of fish) of methomyl , monocrotofos , malathion , chlorpyrifos – ethyl , chlorpyrifos – methyl , profenfos ,thiobencarb , and abamectin respectively. While the pesticide residues in sample fish muscles were collected from Abo – Hamad were (0.0295, 0.0227 , 0.0552 , 0.0568 , 0.0882 , 0.0758 , 0.0039 , 0.0518 , 0.0051 and 0.0537 µg/100 g muscle of fish of methomyl , monocrotofos , malathion , chlorpyrifos – ethyl , chlorpyrifos – methyl , profenfos , scor ,thiobencarb , abamectin , and dicofol respectively, and the residues of pesticide in fish muscles samples collected from Hehya were (0.0303 , 0.0252 , 0.0362 , 0.0506 , 0.0536 ,0.0563 ,0.0135 , 0.0423 , 0.0077 and 0.0085 µg/100 g muscle of fish) of methomyl , monocrotofos , malathion , chlorpyrifos – ethyl , chlorpyrifos – methyl , profenfos ,scor , abamectin and glyphosate respectively.

The pesticide residues analysis of samples fish gills collected from Diarb –Negm were (0.0384 , 0.0221 , 0.0552 , 0.0882 , 0.0156 , 0.0284 , 0.0107 , 0.0175 and 0.0320 µg/100 g gills of fish) of methomyl , monocrotofos , malathion , chlorpyrifos – methyl , profenfos , scor , thiobencarb , abamectin , and dicofol respectively, and the pesticide residues analysis in gills of fish samples collected from Abo – Hamad were (0.0220 , 0.0126 , 0.0316 , 0.0282 , 0.0505 , 0.0376 , 0.0051 , 0.02576 , 0.0083 and 0.0529 µg/100 g gills of fish) of methomyl , monocrotofos , malathion , chlorpyrifos – ethyl , chlorpyrifos – methyl , profenfos ,scor , thiobencarb , abamectin and glyphosate respectively.

The pesticide residues analysis of fish brain samples collected from Diarb –Negm were (0.0354, 0.0203, 0.0508, 0.0289, 0.0811, 0.0386, 0.0088, and 0.0264, µg/100 g brain of fish) of methomyl , monocrotofos , malathion , chlorpyrifos – ethyl , chlorpyrifos – methyl , profenfos ,scor , and thiobencarb respectively. But the residues of pesticides in brain of fish Smples collected from Abo – Hamad were (0.0408 , 0.0234 , 0.0585 , 0.0314 , 0.0935 , 0.0419 ,

0.0029 , 0.0286 and 0.0252 μg/100 g brain of fish) of methomyl , monocrotofos , malathion , chlorpyrifos – ethyl , chlorpyrifos – methyl , profenfos ,scor , thiobebcarb , and dicofol respectively.While the pesticide residues analysis in brain of fish samples collected from Hehya were (0.0396 , 0.0274 , 0.0061 , 0.0225 , 0.0546 , 0.0273 , 0.0016 , 0.0215 , 0.0008 and 0.0003 μg/100 g brain of fish) of methomyl , monocrotofos , malathion , chlorpyrifos – ethyl , chlorpyrifos – methyl , profenfos ,scor , thiobencarb , abamectin and glyphosate respectively.The residue concentration of malathion , chlorpyrifos – ethyl , chlorpyrifos – methyl , profenfos , thiobencarb , and abamectin in fish muscles collected from Diarb – Negm , Abo – Hamad and Hehya were higher than the Acceptable Daily Intake (ADI) . In contrast the residue concentration of methomyl and glyphosate in fish muscles collected from the same locations were lower than its ADI values, while the ADI values of scor and monocrotofos were not reported. Effects from the combination of all these pesticides are unknown, but are likely to be greater than individual effects.

The results are in agreement with those obtained by Hassan et al.(1996) , Radwan and Atalla (2005), who monitored the pesticide residues in drainage water samples collected from different governprate (Sharkia , Menofya , Giza , and Kalyobia) during 2003 in Egypt all the samples contain appreciable amounts of organochlorine residues and Osfor *et al.*(1998) who detected and determined of pesticide residues in 136 samples of water sediment and fish. Highly significant differences were found in levels of organochlorin and carbamate pesticides in River Nile water when compared with that of Manzala Lake.Levels of organochlorin and organophosphorus pesticides were significantly higher in soil sediment of Manzala Lake, while the boury fish of Manzala

Lake contained higher levels of heptachlor, aldrin, p,p – DDE and malathion. But the boury fish of River Nile contained a higher level of zectran only.The same trend was found by several investigators Tarek (2007) and Iwata *et al.* (1995) who considere the maximum residues level of pesticide in water. It could be mentioned that such levels are available only for drinking water (WHO, 1984), while there is no available data for drainage water.

Table (4): Pesticide residues (ppm) detected in fish *Oreochromis niloticus* muscle, gills and brain samples collected from Diarb-Negm , Abo- Hamad and Hehya at Sharkia governorate .

Source of samples	Diarb- Negm			Abo- Hamad			Hehya		
Name of tissues / Pesticides	Brain	Gills	Muscles	Brain	Gills	Muscles	Brain	Gills	Muscles
Methomyl	0.0354	0.0380	0.0204	0.0408	0.0220	0.0290	0.0396	0.0250	0.0303
Monocrotofos	0.0203	0.0220	0.0117	0.0234	0.0130	0.0227	0.0274	0.0100	0.0253
Malathion	0.0508	0.0550	0.0293	0.0585	0.0320	0.0552	0.0061	0.0420	0.0362
Chlorpyrifos-ethyl	0.0289	ND	0.0287	0.0314	0.0280	0.0568	0.0225	0.0190	0.0506
Chlorpyrifos methyl	0.0811	0.0880	0.0444	0.0935	0.0510	0.0882	0.0546	0.0500	0.0536
Profenfos	0.0386	0.0160	0.0383	0.0419	0.0380	0.0758	0.0273	0.0190	0.0563
Scor	0.0088	0.0280	ND	0.0029	0.0050	0.0399	0.0016	0.0030	0.0135
Thiobencarb	0.0264	0.0110	0.0316	0.0286	0.0260	0.0518	0.0215	0.0170	0.0423
Acetampride	ND	ND	ND	ND	ND	0.0051	ND	ND	ND
Abamectin	ND	0.0180	ND	ND	0.0080	ND	0.0008	0.0130	0.0077
Glyphosate	ND	ND	0.0111	ND	ND	0.0537	0.0030	0.0030	0.0085
Dicofol	ND	0.0320	ND	0.0252	0.0530	ND	ND	ND	ND
Fentrothion	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND

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تتبع متبقيات بعض المبيدات فى المياه وأنسجة الأسماك من ثلاث مناطق بمحافظة الشرقية- مصر

ألفت عبد اللطيف سيد رضوان

المعمل المركزى للمبيدات-الجيزة –مصر

- تم تجميع عينات مياه كلا من الأحواض السمكية والترع والصرف الزراعى من ثلاث مناطق مختلفة هى ديرب نجم و أبو حماد وهيهيا (محافظة الشرقية) خلال شهر يوليو وأغسطس وسبتمبر وأكتوبر عام 2007 ومقارنة القيم المتبقية من المبيدات والقيم التى يسمح بتناولها يوميا منها ·

- لوحظ فى مياه الصرف الزراعى ثبات المبيدات الفوسفورية مثل مونوكروتوفوس وكلوربيرفوس ميثيل وبروفينفوس فى كلا من هيهيا وديارب نجم وأبو حماد ·

- كذلك لوحظت التركيزات العالية من الابامكتين فى مياه عينات الصرف المجمعة من هيهيا وديارب نجم وأبو حماد

- لكن التركيزات العالية من المبيدات تم الكشف عنها فى خياشيم الأسماك على العكس لم تظهر كلا من الفنتروثيون و الكربوفيوران والأسيتامبراید فى أنسجة الأسماك ·

- أما الأسيتامبراید والديكوفول والفنتروثيون و الكاربوفيوران لم تظهر فى عينات المياه المجمعة من هيهيا والأسيتامبراید و الفنتروثيون و الكربوفيوران لم تظهر فى عينات المياه المجمعة من أبو حماد ·

- ومبيد الكربوفيوران فلم يظهر فى عينات المياه المجمعة من الأحواض السمكية والصرف الزراعى ·