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AN OVERVIEW OF THE LEVEL OF ORGANOCHLORINE COMPOUNDS IN THE COASTAL ZONE OF ALEXANDRIA

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Organochlorines were determined in the three compartments of the aquatic ecosystem around Alexandria(Fish, sediment & water). The highest PCB (Colphen 60) in fish were found off the industrial of Mex, comparable to those of the N-Adriatic [1], but lower than in the Aegean [2] Their level decrease with distance from the city.DDT and its major degradation products are more widespread in fish from the area and comparable in level to those of Ligurian & Aegean Seas. γ-HCH was lower in the level than its α isomer. DDE in fish from the hydrodrome (an artificial fish water lake) was higher than in the open sea fish. The levels were correlated to the fat content. The major compounds detected in sediment were DDT (DDD & DDE) α and γ-HCH and PCB. The distribution downstream from the effluent appears to be dependent on the organic content. The levels of PCB & DDT was highest in Abu-Kir Bay, wherethe sediment organic content was highest near El-Tabia pump station. It exceeds the levels reported by a number of Mediterranean authors [3,4,5 and 6] The α & γ-HCH, DDT derivatives were the major compounds detected in water. Although DDT occurred in sediments, it was undetectable in water. Again the γ HCH was lower than its α-isomer. As observed for sediments, Abu-Kir and Edku lake outlet yielded the highest levels of organochlorines in water. HCH and DDE in our area are higher than the levels reported by Fossato [5] and Villeneuve and Burns [6] but lower than those reported by Raybaud. [7]

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Table 1.

Selected examples (single fish specimens)

Sampling site	Fish weight (g)	Tissue	PCB	DDE	DDD	DDT	HCH	HCH	Dieldrin
Mex	Mugil sp. 247	Muscle	79	8.5	11.9	10.3	0.4	0.3	0.7
		Liver	945	109,4	388	49	0.5	n.d.	5.5
	Pomatomus 600	Muscle	96	113.4	54.7	40	1.5	1	3.7
	saltator	Liver	253	166	193	115	6.2	3.5	9.5
Abu - Kir	Mugil 280	Muscle	10.6	0.8	0.9	0.4	n.d.	n.d.	n.d.
		Liver	183.4	18	26.9	7.8	1.6	1.6.	2.8
	Boops 221	Muscle	n.d.	9.8	n.d.	n.d.	n.d.	n.d.	n.d.
		Liver	n.d.	3.0	11.6	11.8	n.d.	n.d.	1.5

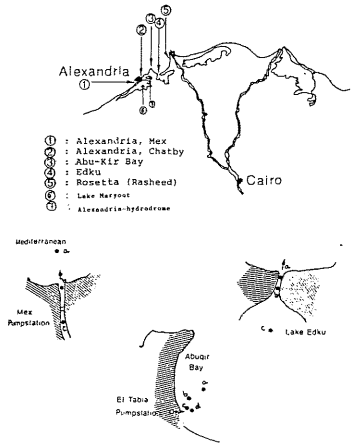

Fig. (1): Area of study

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FURTHER EVIDENCES ON CD-ZN INTERACTION WITHIN EMBRYO-LARVAL DEVELOPMENT OF MYTILUS GALLOPROVINCIALIS IN RELATION TO BIOACCUMULATION AND FORMATION OF METAL-BINDING PROTEINS

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Developing embryo-larval phases of different bivalve molluscs have been considered as very convenient organisms for testing of variety potentialy toxic substances including trace metals. Results obtained previously on embryo-larval development of M. galloprovincialis proved that Cd-Zn combined toxicity was antagonistic or less than additive reducin intensity of morphological and physiological responses measured more than in organisms exposed to single Cd or Zn intoxication (PAVICIC, 1980). The existance of metal-binding proteins (MBP) similar in some properties to mammalian metallothionein in eggs and veliger larvae of blue mussels has been found recently (PAVICIC et al., 1984). The main intention of the present study was to elucidate some functional aspect of heavy metal tolerance and bioaccumulation, particulary as the conséquence of Cd-Zn interaction. The methods applied, dealing with culturing of embryo-larval stages, metal exposure conditions as well as with fractionation of 27000xg supernatant of homogenized larvae, were already reported in above mentioned publications. Carrier free radioisotopes ^{109}Cd and ^{65}Zn (NEN, W. Germany) were used to study bioaccumulation of metals via sea water. A activity of samples prepared from larvae and sea water medium was measured by gammaspectrometry technique.

The results obtained following 48 hours of postfertilization during exposure to elevated concentrations of Zn (0.09 µg/ml) and Cd (2.75 µg/ml) single and in combination, show markedly altered Cd distributions as the consequence of exposure to Cd alone or in combination with Zn. When Zn+Cd were applied simultaneously the considerably larger portion of Cd was associated with MBP indicating inducible potency of Zn itself and possibly subsequent exchange of Zn with more strongly bound Cd. Results obtained on bioaccumulation show that concentration factor of ^{65}Zn (390) was markedly higher than of ^{109}Cd (164) although both radiotracers applied together into sea water did not have produced significant difference compared to single metals as presented on Table 1.

TABLE 1

Bioaccumulation of ^{109}Cd and ^{65}Zn radiotracers, added into sea water, in a straight-hinge veliger stage of M. galloprovincialis within 48 hours of embryo-larval development . The results of single- and combined-metal accumulation are expressed as concentration factors and relative activity corrected according internal standards.

LARVAL CULTURE N°	RELATIVE ACTIVITY s.w. (imp/ml) ^{65}Zn	^{109}Cd	larvae (imp/g) ^{65}Zn		^{109}Cd	CONCENTRATION FACTOR ^{65}Zn	^{109}Cd
1	-	957	-	156	587	-	164
2	560	-	218	156	-	390	-
3	428	1422	163	580	222 616	382	156
4*	551	-	233	720	-	424	-

* eggs being pretreated by stable Cd (via parents).

References

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