

PRESENCE OF POLYCHLOROBIPHENYL CONGENERS IN THE TISSUES OF GOLDEN GREY MULLET FROM THE MEDITERRANEAN SEA

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Abstract

Concentrations of polychlorinated biphenyls were determined in the muscle tissues of mullets (*Liza aurata*) caught from two coastal marine areas in Tunis bay: Raoued and Radès. Residue levels of total PCBs ranged from 45 to 194 ng/g wet wt in the mullet from Radès and between 43 and 65 ng/g wet wt in specimens from Raoued. Hexachlorobiphenyls were predominant in fishes caught from both Raoued and Radès.

Keywords : *Bio-accumulation, Pcb, Pollution.*

Tunis Bay, located on the Mediterranean sea of northern Tunisia, is submitted to the impact of many chemical and physical stressors related to the human activities. Wastes resulting from these activities are dumped into the sea via two channels: Meliane wadi flowing to Radès beach and Khelij channel flowing into Raoued. Coastal fishing activity has been very developed in these areas. Among the exploited fishes, the golden grey mullet (*Liza aurata*), euryhaline fish inhabiting especially rivers mouths and lagoons, is known to concentrate pollutants [1]. To our knowledge, no data have been already mentioned about the contamination of marine organisms by organochlorine compounds from Tunis bay. For this fact, our purpose in the present work is to assess the chemical quality of the golden grey mullet from Raoued and Radès by revealing the possible presence of PCBs residues in the fish flesh.

Tab. 1. Minimum, Maximum and Mean concentration (ng/g w wt) of individual PCB congeners in the mullet muscle from Raoued and Radès. (*: Coplanar congeners)

Congeners	Raoued	Radès
PCB 77*	(4.1-5.4) 4.5	(0.9-1.1) 1
PCB 99	(0.1-1.1) 0.5	(0.2-0.4) 0.3
PCB 100	(0.6-2.1) 1.2	(1.8-7.1) 3.8
PCB 101	(0.5-1) 0.8	(0.9-6.8) 3.2
PCB 110	(0.4-1.8) 1.3	(ND-2.1) 1
PCB 118*	(2.3-2.5) 2.4	(2.1-4.9) 3.2
PCB 138	(3.9-4.3) 4.1	(2.7-14.6) 6.8
PCB 141	(ND-0.4) 0.2	(0.1-1.7) 0.6
PCB 149	(5.7-6.9) 6.2	(5-26.2) 12.4
PCB 153	(ND-20.4) 11.6	(8.1-36.2) 18.8
PCB 156*	(0.1-0.7) 0.4	(ND-0.4) 0.2
PCB 169*	(0.1-0.5) 0.3	(0.2-0.3) 0.2
PCB 170	(1.1-3.1) 2.1	(0.6-9.9) 3.9
PCB 176	(ND-4.9) 2.7	(ND-3.6) 2.4
PCB 187	(2.6-3.1) 2.8	(2.1-10.9) 6
PCB 194	(ND-4.9) 2.7	(0.1-0.6) 0.4
PCB 198	(0.2-0.6) 0.4	(ND-0.5) 0.2
PCB 200	(ND-11.7) 7.7	(6.8-64.3) 26.4
PCB 203	(0.9-2.9) 1.9	(1.6-7.8) 3.8
PCB 206	(0.1-2.3) 1	(1.4-2.5) 1.9
Σ PCBs	(43-65) 52	(45-194) 96

Specimens of the golden grey mullet (length: 6.4 ± 0.7 cm; weight: 3.7 ± 1.2 g) were sampled using a net in Raoued and Radès, during March 2004. Fishes are immediately sacrificed and kept frozen until analyses. The PCBs analysis was conducted in composite samples of fish muscles according to a standard procedure [2].

Twenty PCB congeners are omnipresent in all fish samples of both sites. Residue levels of total PCBs were ranged from 45 to 194 ng/g wet wt with a median of 96 ng/g wet wt in the mullet from Radès. The concen-

trations of PCB residues in fishes from Raoued site were between 43 and 65 ng/g wet wt with a median of 52 ng/g wet wt (Table 1). Polychlorinated congeners profiles according to the chlorination degree revealed that hexachlorobiphenyl were predominant in fishes caught from both Raoued and Radès areas accounting for 43 and 40 % respectively. This kind of distribution of PCB congeners was also registered in other studies in fishes from the Mediterranean sea [3,4]. We are also interested in the coplanar PCBs also called dioxin-like PCBs which are considered as the most toxic of all 209 congeners. In fishes from Raoued, coplanar PCBs represent a fraction of 14 % of the total PCBs, while in mullet from Radès, these congeners made up a lower fraction of the total PCBs (5 %). In Raoued samples, PCB 77 accounted for the most of PCB coplanar content with a percentage of 60.3 %, followed by PCB 118 (31.6%), PCB156 (4.8%) and PCB 169 (3.3%). In Radès fishes, PCB 118 contributed with the higher percentage (68.9%) followed by PCB 77 (22.2 %), PCB 156 (4.5 %) and PCB 169 (4.3%).

In conclusion, we dispose here the first data about polychlorinated biphenyl contamination of the grey golden mullet from Tunis bay. PCB profiles showed a similarity between the two investigated sites. On the other hand, it's important to set limits for PCBs in fishes in order to estimate better the risk to human health.

References

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