

Metal contaminants in Largemouth bass (*Micropterus salmoides*) collected in large dams from Tejo River basin and small irrigation dams

Pinto-de-Andrade L (1)(2)(3), Antunes P (3), Paulo L(3), Pereira ME (4) and Rodrigues AM (1)(2)

(1) School of Agriculture - Polytechnic Institute of Castelo Branco, Qt.^a Sr.^a Mércules, 6001-909, Castelo Branco, Portugal. (2) CERNAS - supported by FCT under the project PEst-OE/AGR/UI0681/2011. (3)

CATAA Zona Industrial de Castelo Branco, Rua A, 6000-459 Castelo Branco, Portugal. (4) Departamento de Química - Universidade de Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal.

luispa@ipcb.pt

Largemouth bass (*Micropterus salmoides*) is a very important fresh water fish in the Portuguese regional cuisine mainly in the countryside (Central region and north Alentejo). Because there's no aquaculture industry, all eaten largemouth bass in Portugal are collected in large dams (Basins of Tejo and Guadiana rivers) and small irrigation dams. For decades, the Tejo River received environmental pollutants from non-point and point sources that included intensive agriculture, industrial entities, municipalities and nuclear power plant. The aim of this work was to evaluate some metals (Cd, Cr, Cu, Fe, Hg, Mn, Pb, Zn) present on largemouth bass muscle tissue collected in the section of Tejo River that makes border between Portugal and Spain (TR) (N=9) and collected in three irrigation reservoirs (IR) located near Castelo Branco, Portugal (N=11). Individual were weighted and measured. Age was determined by examining fish scales, and sex determined by gonads observation. Samples for liver, dorsolateral muscle and tail muscle were collected from the right side of the fish. TR average weight 435.14g (± 109.15), average length 278.33mm (± 23.28), average K condition factor 1.98 (± 0.09) and average age 3.11 years (± 0.78) were similar ($P > 0.05$) to IR average weight 410.84g (± 137.71), average length 278.36mm (± 31.13), average K condition factor 1.86 (± 0.17) and average age 3.18 years (± 0.60). Total mercury was determined in freeze-dried samples by atomic absorption spectrometry with thermal decomposition and gold amalgamation. For the other metal analysis, freeze-dried powders were mineralized with a mixture of HNO₃ and H₂O₂, followed by ICP-OES quantification. Cd and Pb presented concentrations below LOQ (0.025 and 0.15mg.kg⁻¹wet.weight, respectively) for all muscle samples. These values are below legal limits in EU (0.05 and 0.3mg.kg⁻¹wet.weight, respectively). Average Hg levels are below legal limits (0.5mg.kg⁻¹wet.weight) and muscle presented higher levels than liver. These contaminant levels indicate that are no contamination sources in the sampling sites. Cu, Cr, Fe, Mn and Zn are essential micronutrients. Their concentrations were not significantly different between dorsal and tail muscle and were higher in liver ($P > 0.05$), with mean concentrations on muscle being, respectively: TR 0.16 (± 0.07), <LOQ(0.03), 1.45 (± 0.42), 0.04 (± 0.04) and 3.76 (± 0.39) mg.kg⁻¹wet.weight; IR 0.16 (± 0.02), <LOQ(0.03), 1.80 (± 0.52), 0.05 (± 0.05) and 4.17 (± 0.56) mg.kg⁻¹wet.weight. We concluded that metallic concentrations of largemouth bass muscle tissues were below the maximum permissible for a safety utilization of these fishes in human nutrition.