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Mangroves as a biogeochemistry barrier to metals and its accumulation pattern in abiotic/biotic compartments in State of São Paulo, Brazil

M.A.A. Pinheiro^{*1}, L.F.A. Duarte¹, M.R. Souza²

¹Universidade Estadual Paulista (UNESP) - Campus Experimental do Litoral Paulista, Brazil, ²Instituto de Pesca (IP), Brazil

Mangroves are important biogeochemistry barriers to metals, but few studies evaluated the accumulation of metals in their different abiotics/biotics compartments. This study determines accumulation of six metals (Cu, Cd, Pb, Cr, Mn and Hg) in four different mangrove compartments (W, water; S, sediment; and GL and SL, green and senescent leaves of *Rhizophora mangle*, respectively) in 18 Southern areas in Brazil. Concentration of metals was established by atomic absorption spectrophotometer and data submitted to ANOVA (one way), revealing differences between averages of each metal by compartment ($p < 0.05$), but not between leaf stages ($p > 0.05$). We obtained the following average concentration (\pm standard error) for each metal, in ascending order: copper ($\mu\text{g/g}$) = W, 0.004 ± 0.001 ; SL, 0.74 ± 0.08 ; GL, 1.23 ± 0.08 ; and S, 4.41 ± 0.34 ; cadmium ($\mu\text{g/g}$) = W, < detection limit (nd); SL, 0.05 ± 0.01 ; GL, 0.05 ± 0.01 ; and S, 0.27 ± 0.05 ; lead ($\mu\text{g/g}$) = W, 0.05 ± 0.01 ; SL, 0.62 ± 0.12 ; GL, 0.64 ± 0.12 ; and S, 2.64 ± 0.54 ; chromium ($\mu\text{g/g}$) = W (nd); GL, 0.61 ± 0.18 ; SL, 0.62 ± 0.20 ; and S, 12.87 ± 0.87 ; and manganese ($\mu\text{g/g}$) = W, 0.0004 ± 0.0001 ; S, 56.35 ± 10.19 ; GL, 125.71 ± 16.27 ; and SL, 131.88 ± 16.26 . Four metals (Cu, Cd, Cr and Pb) showed higher accumulation in the sediment [$S > (GL=SL) > W$], differing from Mn which was more accumulated in leaves [$(GL=SL) > S > W$], and Hg only in sediment (169.46 ± 14.01 ng/g). The chemistry of mangrove sediment promotes high adsorption and immobilization of metals, although some of them (p. ex., Mn) have greater mobility between compartments due to low oxygen / pH in mangroves and absence of translocation from leaves to perennial tissues in *R. mangle*.

Keywords: Metal, Pollution, Mangrove, *Rhizophora mangle*