HIDROGEOCHEMICAL CONSIDERATIONS AND RELATIONSHIP WITH THE ENVIRONMENTAL HEALTH IN THE UPPER PARANÁ RIVER, PORTO RICO REGION, BRAZIL

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In the present work, it was studied several aspects of the hydrogeochemical of the Mutum Islands and Porto Rico, as well as its surroundings in the upper Paraná River, Brazil. The downstream of the dams of Porto Primavera and Rosana were also studied, because these tanks have had influenced the water quality and river dynamics. Samples of the Paraná river channel were collected, as well as ponds internal Mutum Islands and Porto Rico. The samples were collected in low water period, the month of August and during the flood, March. Si, Mg, Mn, Ca, Sr, Ni, Fe, Zn, Pb, Cd, P, Cr, Al, Ba, Co and Cu were analyzed by Emission Spectrometry with Power Inductive Coupled Plasma (ICP-AES). The concentrations of the elements in the low water period were: Fe=11.27 mg L^{-1}, Mg=2.72 mg L^{-1}, Ca=6.42 mg L^{-1}, Mn=1.28 mg L^{-1}, Cd=0.005 mg L^{-1}, Cu=0.007 mg L^{-1}, Ba=0.17 mg L^{-1}, Co=0.011 mg L^{-1}, Zn=0.43 mg L^{-1}, Pb=0.14 mg L^{-1} and Al=7.22 mg L^{-1}. The concentrations of Al, Pb, Zn and Cd are higher than stipulated by CONAMA Resolution 357 (maximum of 0.1 mg L^{-1}, 0.01 mg L^{-1}, 0.18 mg L^{-1} and 0.001 mg L^{-1}, respectively). These results are indicating a contamination related to human activities, possibly because the use of chemicals or the release of wastewater in the region. In the period of flooding the metal concentrations were below the low water period. Ni (0.038 mg L^{-1}) concentration was also higher than CONAMA Resolution 357 (max. 0.025 mg L^{1}), which could also be related to pesticides. The lowest pH values found are located in isolated ponds. However, high rates hydro-geochemical could be responsible for some infectious diseases, intestinal and respiratory in the Porto Rico region (Brazil). Since some chemicals including metals such as Al, Zn, Cr and Pb cause diseases of the respiratory system (chronic lower airway, chronic obstructive pulmonary disease and pneumonia) and others such as Mn, Pb, Co and Hg cause gastrointestinal problems (gastroenteritis). Data of the System of Health (DATASUS) indicate that the Porto Rico region (PRR) showed higher levels of diseases than those of the State of the Paraná in Brazil (PB). The diseases of the digestive system (PB=8% and PRR=15% of the local people), respiratory system (PB=18% and PRR=27% of the local people) and genitourinary system (PB=6% and PRR=25% of the local people) presents different patterns.

Keywords: Paraná River (Brazil), hydro-geochemical, environmental health