

## DETECTION OF RESISTANCE GENES AND WATER QUALITY OF THE ZOO LAKES, BRAZIL

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The investigation of the presence of antibiotic resistance genes in aquatic environment is important to identify possible reservoirs of resistant microorganisms that could be a threat to human and animal health. The aims of this study were analyze the presence of resistance genes to antimicrobial and quality of Zoo water. Water samples from nine different points of the zoo were collected. The samples were filtered and the DNA was extracted from these. The detection of 16 resistance genes was performed using PCR. Microbiological and physicochemical analyses were employed in seven point where there is the presence of animals. Results showed a pattern of multiple resistance genes which was expected due to the presence of contaminants discharged into zoo lakes. The most frequent genes were *sul I* and *sul II* (sulphonamides), which are present in all lakes and  $\beta$ -lactamases as *blapse I* (77.8%) and *ampC* (66.7%). The *tet(K)*, *tet(M)* and *ermC* genes were not detected. Though sulfonamides are widely used in veterinary medicine, they are even more widely used in human medicine. Because the genes encoding resistance to sulfonamides are present in all lakes, it is probable that contamination occurred from human contamination. Studies have also demonstrated the presence of the  $\beta$ -lactamases is related with the presence of *Aeromonas* spp., that is natural producer of  $\beta$ -lactamases that conferring resistance to  $\beta$ -lactam antibiotics. The *tet(K)* and *tet(M)* genes that encode tetracycline resistance were not expected in aquatic environments because the occurrence of precipitation of tetracyclines. There was an association between the presence of coliforms and detection of resistance genes. In conclusion the sources of contamination of all lakes are probably urban neighbor sewage or wastewater that increases total coliforms frequency and resistance genes. The importance of wastewater control is not only important to public health but to animal conservation life.

**Key Words:** multidrug resistance, zoo pollution, aquatic environment, coliforms

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