

TITLE: OCCURRENCE OF ANTIBIOTIC RESISTANCE IN FECAL COLIFORMS ISOLATED FROM RIVERS AT CURITIBANOS, SC

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ABSTRACT:

The occurrence of antibiotic resistance is a worldwide problem, and one of the main ways of spreading resistant microorganisms in the environment is through water bodies, posing a risk to human health and the environment, if consumed without treatment or when used for irrigation of gardens and crops. The aim of this study was to evaluate the microbiological quality of river water in Curitiba, SC, and to observe antibiotic resistance profile in bacteria isolated from those locations. Samples were obtained at three seasons: Spring 2020, Summer 2021 and Fall 2021. Three 100 mL replicates were obtained from 5 collection sites, which comprised three locations at the Pessegueirinho River (spring, bed and mouth), and two at the Marombas River (at Companhia Catarinense de Águas e Saneamento intake point and after confluence with the Pessegueirinho River). Analysis of fecal coliforms was carried out using the multiple tube technique, and quantification performed using the most probable number (MPN). After isolation, four colonies per replicate were submitted to antimicrobial susceptibility testing by disk-diffusion. Four antimicrobial drugs, divided into groups A, B and C were tested, in order of preference that should be adopted in the treatment of infections caused by enterobacteria. Mean values of thermotolerant coliforms, at points 1, 2, 3, 4 and 5, in spring, was 11, 442, 39, 15, and 45 MPN 100 mL⁻¹, respectively. In summer, this average was 560, 787, 1,100, 590, and 1,100 MPN 100 mL⁻¹. In Fall, these values corresponded to 44, 233, 401, 174, and 617. Regarding antibiotic resistance profile in spring, 1.66% of isolates showed resistance to Ampicillin and Tetracycline. There were no isolates resistant to Ampicillin+Sulbactam and Ciprofloxacin. In summer, 21.66% of isolates were resistant to Ampicillin, 5% to Ampicillin+Sulbactam, 1.66% to Ciprofloxacin and 35% to Tetracycline. In Fall, there was 50% resistance to Ampicillin and 26.66% to Ampicillin+Sulbactam. No isolate showed resistance to Ciprofloxacin and Tetracycline. Results point to a high load of fecal contamination and alarming levels of antibiotic resistance, demonstrating the importance of raising awareness about the indiscriminate use of antibiotics and the contribution of animal or human fecal waste to rivers, aiming to slow down the environmental spread of resistant bacteria.

Keywords: bacteria, contamination, water.

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