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Occurrence and spread of beta-lactamases-producing *Enterobacteriaceae* isolated from river receiving treated effluent of wastewater treatment plant

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ABSTRACT

Rivers receiving effluents from urban wastewater treatment plants are suspected to be among the main sources for the development and dissemination of multidrug-resistant bacteria into the environment. In the present study, we analyzed 15 river samples in order to assess the spread of extended-spectrum β-lactamase (ESBL)-producing *Enterobacteriaceae*. One hundred eighty-eight *Enterobacteriaceae* were identified and classified as members of the genera *Pantoea*, *Klebsiella*, *Escherichia*, *Enterobacter*, *Serratia*, *Yersinia*, *Providencia*, and *Shigella*. Based on susceptibility results, the most part of isolates were highly resistant to the tested β-lactams (AMX, TIC AMC, and ATM), first-generation cephalosporins (CL), and second generation (FOX). ESBL production was determined by different methods, concluding its presence in 31.38% of the isolates by the disc approximation method, 25% by double-disk synergy test, and 28.72% by double-disk test. Given this situation, there is an urgent need to make more attention to the contamination of urban river by ESBL-producing bacteria, which constitute the main source of community infection.

Keywords: Antibiotic resistance; ESBL-producing *Enterobacteriaceae*; Wastewater treatment plants; Influent; Effluent; River

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