

International Conference on **Food Safety & Regulatory**
&
3rd International Conference on
Water Microbiology, Water Sustainability and Reuse Technologies
December 03-04, 2018 | Chicago, USA

Isolation and characterization of antibiotic resistant *Escherichia coli* found on superficial water from Honda River, Costa Rica

Paulette Ramirez

University of Texas at El Paso, USA

Inappropriate use of antibiotics leads to the emergence of drug-resistance strains that give rise to bacterial infections that may be difficult to treat. Although tetracycline and penicillin are among the most commonly used antibiotics in aquaculture and farming around the globe, there is scarce information on environmental consequences linked to these uses. The objective of this study was to test the antimicrobial susceptibility of the *Escherichia coli* isolates found along the Honda River to explore their natural resistance. Four consecutive weekly water samples taken from four different altitude points of the river were analyzed (sixteen total samples). Using membrane filtration with Colibblue24®, 41 dilutions from which we isolated 38 bacteria were characterized as *E. coli* and later confirmed by Indole test. The Kirby Bauer method was employed to determine the susceptibility of the isolated bacteria to nine antibiotics. Based on the results, amoxicillin and cephalothin had the highest frequency of resistance (95% and 87%); and 24% of the bacteria showed resistance to 3 or more antibiotics. Multi-resistant bacteria were identified at the highest and lowest altitude sampled points of the river showing resistance to amoxicillin, cephalothin, tetracycline, and chloramphenicol. Additionally, we performed a 16S-gene analysis where only 6 isolates corresponded to *E. coli*. Subsequently, the presence of *int1* and *int2* genes was analyzed and found in 66% of the isolates. Future work concerns molecular analyses of antibiotic-resistant genes present in these bacteria. These results suggest that Honda River might play a role as a reservoir of antibiotic-resistant bacteria. In this context, water from Honda River might not be appropriate for human consumption, and awareness should be brought up on the responsible use of antibiotics among the Costa Rican community.

pramirez13@miners.utep.edu