

Extended-Spectrum Beta (β) Lactamase-producing *Enterobacteriaceae* Isolates from Flat Creek Water Samples

Antibiotics have played a major role in containing bacterial infections. Extended spectrum beta (β) lactamases, better known as ESBLs, are enzymes produced by the bacterial family *Enterobacteriaceae* that inhibit the activity of many common antibiotics used today such as penicillin. The genes that encode for ESBLs are *bla* genes and are plasmid encoded. Thus, they can be easily transferred to different species of bacteria via horizontal transmission. In this study, freshwater samples were collected upstream and downstream of a water treatment plant and were tested for ESBL-producing bacteria. A total of 12 colonies were isolated and DNA extraction was performed. Future testing includes antibiotic susceptibility assay, gel electrophoresis and 16S sequencing for proper bacterial identification. A correlation between antibiotic resistance as well as the presence and amount of *bla* genes is to be analyzed and compared to results from samples collected and performed previously. As ESBLs are easily conferred to other bacterial species, the results are significant in identifying how the environment affect ESBL-producing *Enterobacteriaceae* and whether this contributes toward the uprising issue of increasing antibiotic resistance. Ultimately, the significance of this research applies toward public health as *Enterobacteriaceae* are found naturally within humans and are the causes of many infections and diseases.

Keywords: ESBL, antibiotic resistance, transmission, health, *bla* genes