

Detection of carbapenemase-producing genes *bla*_{KPC-2}, *bla*_{NDM-1}, and *bla*_{OXA-48} in water samples from Nanaimo B.C. by PCR analysis.

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Antibiotic-resistant bacteria presents an ongoing concern for the continued success of antibiotic treatment for bacterial infections. While many antibiotic resistant bacteria can be treated by alternative types of antibiotics, such as carbapenems, a growing number of multiple antibiotic resistant bacteria have developed resistance to carbapenems due to the production of carbapenemase enzymes. This problem is compounded by the ability of bacteria to acquired new genes through the process of horizontal gene transfer. The presence of antibiotic-resistant bacteria in the environment at large presents an opportunity for the wider dissemination of antibiotic resistance genes. Regional monitoring of wastewater for the presence of antibiotic resistance genes is the first step in mitigating the release of these genes into the environment. The sampling of publicly accessible recreational water sources for carbapenemase producing genes provides information into the persistence of such bacteria in the environment at large. This study was designed to determine the presence of three clinically significant carbapenemase-producing genes: *bla*_{KPC-2}, *bla*_{NDM-1}, and *bla*_{OXA-48} via PCR analysis, from both wastewater and recreational water samples collected from the greater Nanaimo area. Analysis of the water samples resulted in the consistent detection of *bla*_{KPC-2}, and *bla*_{OXA-48} in wastewater samples collected from the Greater Nanaimo Pollution Control Center (GNPCC) and the intermittent presence of *bla*_{OXA-48} in wastewater samples collected from the Duke Point Pollution Control Center (DPPCC). In contrast, recreational water samples examined in this study indicated no positive detection of any *bla* genes.