

## Occurrence of antibiotic-resistant Indicators in paradise coastal water of Grenada, West Indies

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Indicators such as coliforms and fecal enterococci are used to monitor coastal water quality to verify health risks. High frequency of horizontal gene transfer was observed among microorganisms in marine environments (McDaniel et al., 2010). Antibiotic resistance of indicators correlated with their survival in subtropical seawater (Qureshi and Qureshi, 1992). We used long term MPN assessment of coastal water quality (2004-2010) and antibiotic-resistance of indicator organisms with the Kirby-Bauer disk diffusion method (2008-2010) to determine how often coastal waters were contaminated with antibiotic-resistant organisms. On 255 coastal water samples, the percentages of polluted samples were 10-35% in Grand Anse beach, 8-48% Prickly bay, 20-55% in True Blue bay, and 18-49% in Black Sand beach. We identified coliforms using Enterotube II and *Enterococcus* using 0.01% tetrazolium in KF agar, pyruvate, and arabinose. *Escherichia coli* (19-28%), *Klebsiella pneumonia* (11-22%), and *Enterococcus faecalis* (6-10%) dominated indicators while *Klebsiella ozaenae* (0-3%), *Klebsiella oxytoca* (0-5%), *Citrobacter diversus* (0-2%), *Enterobacter cloacae* (0-6%), and *Serratia liquifaciens* (0-1%) were in minority. Pure cultures of *E. faecalis* (21) and *E. coli* (57) were tested against 6 and 12 antibiotics representing major classes, respectively. Some strains of *E. faecalis* were resistant to nitrofurantoin-300 (24%), penicillin-10 (14%), and tetracycline-30 (9%); while none to ampicillin-10, chloramphenicol-30, or vancomycin-30. Some indicator strains identified as *E. coli* were resistant to amoxicillin/clavulanate-30 (2%), ampicillin-10 (11%), cefoxitin-30 (4%), cephalothin-30 (4%), chloramphenicol-30 (4%), ciprofloxacin-5 (4%), gentamicin-10 (2%), and tetracycline-30 (14%); but none to cefepime-30, cefotaxime-30, ertapenem-10, or meropenem-10. There is risk of exposure to antibiotic-resistant organisms with contact to the coastal waters.

### References

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