

# OCCURRENCE AND GENETIC DIVERSITY OF *Stenotrophomonas* spp. CARRYING *bla*<sub>KPC</sub> IN RECREATIONAL COASTAL WATERS SHOWING DISTINCT DEGREES OF POLLUTION

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KPC is an important carbapenemase found in both clinical and environmental settings. *Aeromonas* spp. and *Enterobacteraceae* producing KPC have been described in Rio de Janeiro's coastal waters, in a study in which *Stenotrophomonas* spp. comprised 42% of all gram-negative bacilli recovered. As *bla*<sub>KPC</sub> has been described in this genus from shrimp and sewage, we hypothesized that *Stenotrophomonas* spp. could act as reservoir of *bla*<sub>KPC</sub> in coastal waters. To test this hypothesis, we analyzed 319 *Stenotrophomonas* spp. recovered from water samples collected at five beaches over the course of one year. Counts of fecal indicator bacteria were used to qualify samples as suitable or not for bathing. Bacterial identification at the genus level, initially assessed using MALDI-TOF, was confirmed by PCR. The *bla*<sub>KPC</sub> gene was surveyed by PCR and genotypes of 101 isolates were assessed by PFGE after *Xba*I digestion of genomic DNA. Overall, 220 isolates (69%) carried *bla*<sub>KPC</sub>. Curiously, KPC producers were recovered from water considered both suitable (38%) and unsuitable (62%) for primary contact. Counts of KPC-producing *Stenotrophomonas* ranged from 0.2 to 320000 CFU/100mL, where as waters considered suitable for primary contact showed up to 5.2 CFU/100mL. Among 49 PFGE genotypes observed, 20 harbored more than one isolate and 29 were unique. For 13 genotypes, including the two predominant ones, clonal samples were obtained from water collected at the same sampling site and date. However, it was also possible to observe clonally-related strains that were recovered from different beaches and at different moments, within an interval of up to nine months. Our preliminary findings suggest that *Stenotrophomonas* spp. is important reservoirs of *bla*<sub>KPC</sub> in coastal waters. Even though higher prevalence was observed in more polluted samples, these microorganisms could also be recovered from waters considered suitable for primary contact. Being well adapted to the marine environment, it is reasonable to consider *Stenotrophomonas* spp. stable reservoirs of *bla*<sub>KPC</sub> in coastal waters, thus with potential to accelerate the evolution of antimicrobial resistance in the community. However, studies addressing the fate of *bla*<sub>KPC</sub> in these isolates are needed to confirm this assumption. Although a diversity of genotypes was enrolled in *bla*<sub>KPC</sub> dissemination, some persistent lineages appear to perpetuate *bla*<sub>KPC</sub> in coastal waters more successfully. Future studies will also be conducted to address this issue.

**Keywords:** *Stenotrophomonas* spp.; *Klebsiella pneumoniae* carbapenemase (KPC); Environment; Resistance dissemination