

TITLE: *STENOTROPHOMONAS* SPP.: NEGLECTED RESERVOIRS OF *bla*_{KPC} IN RECREATIONAL COASTAL WATERS

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KPC is an important determinant of carbapenem resistance that has been documented in both clinical and environmental settings. Although environmental bacteria may act as stable reservoirs and potential vectors in aquatic matrices, *Stenotrophomonas*' importance in KPC environmental dissemination is neglected due to their low pathogenic potential and intrinsic resistance phenotype. The aim of this study was to describe the frequency and diversity of *Stenotrophomonas* species carrying the *bla*_{KPC} gene, including its characterization, in isolates recovered from coastal waters with distinct pollution degrees located in Rio de Janeiro, Brazil. Superficial water samples from five beaches were collected in five different days across one year (Sep2013 to Sep2014). Isolates recovered under imipenem selective pressure were identified by MALDI-TOF and presence of *bla*_{KPC} was assessed by PCR. Positive isolates had their antimicrobial susceptibility profile assessed by disk diffusion and were genotyped by PFGE. Each pulsotype were identified at the species level by *gyrB* sequencing. *bla*_{KPC} alleles was determined by PCR and amplicon sequencing, and its genetic environment was assessed by PCR mapping. Plasmid profile was determined and conjugative transfer was attempted by mating-out assays using *E. coli* J53 as the recipient. A total of 220 out of 319 *Stenotrophomonas* spp. carried *bla*_{KPC} (68.9%). Frequency of *bla*_{KPC}-positive isolates did not correlate with fecal indicator bacteria counts in water samples. All *bla*_{KPC}-positive *Stenotrophomonas* spp. were susceptible to all antimicrobials tested. We observed 62 PFGE pulsotypes. It was possible to observe clones and isolates genetically related recovered at different beaches within up to nine months. *S. maltophilia* complex such as *S. pavanii* (6) and *Pseudomonas hibiscicola* (3) were the most frequent taxons identified among isolates carrying *bla*_{KPC}, followed by *S. acidaminiphila* (5). All genotype carried *bla*_{KPC-2}, allele most widespread around the world. It was harbored on Tn4401 isoforms similar to a (3), b (15), c (2), and d (2). Seven plasmid profiles were observed among the collection studied, including plasmids of ca. 3,8 kb, 4 kb, 6 kb, 12 kb, 13 kb, 17 kb and 220 kb. Repetitive attempts to transfer *bla*_{KPC} to conjugation. This is first description of strictly environmental samples of *Stenotrophomonas* non-*maltophilia* carrying the *bla*_{KPC} gene. Our findings highlight that *Stenotrophomonas* spp., especially those belonging to the *S. maltophilia* complex, are important reservoirs of *bla*_{KPC} in coastal waters regardless of its suitability for primary contact and should be considered relevant in studies aiming at assessing the environmental dimension of antimicrobial resistance spread.

Keywords: *Stenotrophomonas* spp; *Klebsiella pneumoniae* carbapenemase (KPC); environmental dissemination of antimicrobial resistance

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