

**TITLE:** Occurrence of colistin-resistant and hypermucoviscous *Klebsiella* sp. in aquatic environments from Brazil

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## ABSTRACTS

*Klebsiella* sp. are important pathogens associated with hospital-acquired infections due to their virulence and drug-resistance profile. *Klebsiella* species have also been reported in aquatic environments, which can act as reservoir of multidrug-resistant (MDR) bacteria and antimicrobial resistance genes. In addition, the emergence of colistin-resistant bacteria has become a global concern since colistin is the last resort treatment for several infections caused by MDR bacteria. Therefore, this study aimed to characterize colistin-resistant *Klebsiella* isolates recovered from different aquatic environments (i.e., rivers, streams and lakes) in Brazil. For bacterial selection, the water samples were filtered using sterile membrane filters, which were placed on MacConkey agar supplemented with 4 mg/mL of colistin. The resistance profile was determined using eighteen antimicrobials by disk diffusion method and colistin resistance was evaluated by minimum inhibitory concentration. The *mcr*-type genes (*mcr-1* to *mcr-9*) were investigated by conventional PCR. The hypermucoviscous phenotype was tested using the string test. A total of 26 *Klebsiella* sp. isolates were obtained, which exhibited resistance to norfloxacin, ofloxacin, tetracycline, nalidixic acid, streptomycin, gentamicin, amikacin and ceftriaxone. Colistin resistance ranged from 4 to >64 mg/L and three isolates presented *mcr-1* gene. Colistin resistance in isolates without *mcr*-type genes is usually correlated with chromosomal mutations in different genes, including *prmAB*, *PhoPQ* and *mgBr*. The hypermucoviscosity phenotype was observed in five isolates. The presence of hypermucoviscous isolates resistant to colistin and others antimicrobials in aquatic environment calls attention to the dissemination of these bacteria and their ARGs in the environment.

**Keywords:** *Klebsiella*; colistin-resistance; hypermucoviscosity; water

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