

TITLE: Antimicrobial resistance and metal tolerance profile in *Pseudomonas* sp. isolated from environmental samples in Brazil

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Antimicrobial resistance is a public health problem and the environment is an important reservoir of multidrug-resistant (MDR) bacteria and genes related to antimicrobial resistance. *Pseudomonas* species are opportunistic pathogens exhibiting increased multidrug resistance and metal tolerance, and *Pseudomonas aeruginosa* is the pathogen that poses a serious threat to human health. In this study we investigated the antimicrobial resistance and metal tolerance profiles in isolates of *Pseudomonas* sp. recovered from soils and aquatic environments. The samples were inoculated in selective and differential medium for the selection of *Pseudomonas* sp. The obtained isolates were identified through conventional PCR using specific primers to the genus *Pseudomonas* and species of *P. aeruginosa* and *Pseudomonas fluorescens*. The minimal inhibitory concentration (MIC) for antimicrobials and metals was determined using the agar dilution method. Subsequently, according to the obtained profiles, genes associated with resistance to different classes of antimicrobials and metal tolerance was searched. A total of 39 isolates of *Pseudomonas* sp. were obtained. Among the isolates, 23% were identified as *P. aeruginosa* and another 23% as *P. fluorescens*. The other isolates (54%) have not yet been identified as species. Regarding the antimicrobial resistance profile, 61% were classified as MDR, highlighting the resistance to tetracycline, aztreonam and meropenem, with MIC ranging from 16 to 256 mg/L. High levels of metal tolerance were observed, spotlighting high MIC values for cadmium, cobalt, copper, and zinc. Several antimicrobial resistant genes were found including *bla_{CTX-M-G9}*, *bla_{CTX-M-G8}*, *bla_{VIM}*, *bla_{VEB}*, *bla_{NDM}*, *bla_{CTX-M-G9}*, *bla_{OXA-48}*, *bla_{SHV}*, *ant(2'')-Ila*, *qnrA*, *tet(A)*, *tet(B)*, *tet(C)*, *tet(D)*, *tet(E)*, *tet(L)*, *tet(M)*, *tet(O)*, *tet(S)*, *tet(P)* e *tet(Q)*. Besides that, it was also detected different metal tolerance genes such as *rcnA*, *chrA*, *arsB* and *silA*. Therefore, these results call attention to the spread of MDR *Pseudomonas* sp. in different environmental samples harboring antimicrobial resistance and metal tolerance genes.

Keywords: *Pseudomonas*, antimicrobial resistance, metals tolerance, soil, water.

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