The occurrence of pandrug resistant gram-negative bacteria at Joana river, Rio de Janeiro metropolitan area, Brazil

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Bacterial resistance and/or outbreaks of multiresistant microorganisms are usually associated with hospital and clinical practice; however, studies have shown the aquatic environment functioning as a reservoir of resistance genes. According to WHO, multidrug-resistance is one of the greatest concerns of public health all over the world. Over the years, gram-negative bacteria (GNB) have been increasingly recognized as pandrug resistant due to resistance to all antimicrobials tested *in vitro*. This present work approaches the detection of GNB pandrug resistant in Joana river, located at Rio de Janeiro metropolitan area, near a University Hospital. Suspect strains were previously selected in BHI broth with imipenem and identified by MALDI-TOF mass spectrometry. Antimicrobial susceptibility testing (AST), ESBL-production by the double disk diffusion test, polymerase chain reaction (PCR) assays and semi-quantitative analysis of biofilm formation using polystyrene microplates were also performed. Four bacterial isolates identified as *Acinetobacter baumannii* (n=2), *Enterobacter aerogenes* (n=1) and *Enterobacter agglomerans* (n=1) were characterized as pandrug resistant. All these strains expressed ESBL and carbapenemase activity phenotypes in addition to Plasmid Mediated Quinolone Resistance while three strains, except *Acinetobacter baumannii*, showed positive results for the aacC2 gene coding aminoglycoside modifying enzyme but not for the aacC3 gene. Pandrug resistant isolates exhibited the ability of biofilm formation classified as strongly adherent. In conclusion, a better understanding of the ecological role and resistance to antimicrobials in nature was currently observed in Joana river , near a hospital unit located at Rio de Janeiro metropolitan area. Additional analysis remaing necessary in order to prevent the emergence of resistance and understanding the evolution of these mechanisms specially for *Acinetobacter baumannii*, *Enterobacter aerogenes* and *Enterobacter agglomerans*.

Key words: pandrud resistanti, aquatic environment, biofilm formation, gram-negative bactéria.