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DIVERSITY AND ANTIMICROBIAL RESISTANCE OF BACTERIA IN AQUATIC ENVIRONMENTS IN AN URBAN AREA IN THE BRAZILIAN AMAZON

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RESUMO

Water is essential for human health and development, but its quality is threatened by anthropogenic pressure on aquatic ecosystems. This is evident in urban basins or microbasins, where population growth and lack of basic sanitation result in water pollution. Bacterial contamination is a growing concern, due to antibiotic resistance being a public health problem. This research aims to evaluate bacterial diversity and resistance in aquatic environments in urban areas of Santarém, Pará and correlate environmental health data in these urban basins used by the population. Collections were carried out at 5 points in urban and peri-urban areas of Santarém. The samples were diluted (1:9), inoculated in Plate Count Agar (PCA) culture medium and phenotypically identified through biochemical assays. Subsequently, the isolates were cultivated in Tryptone Soya Agar (TSA) medium, from which a microbial suspension corresponding to the McFarland scale of 0.5 was prepared. It was then inoculated into Mueller Hinton Agar medium (MH - KASVI®) using the disk diffusion technique, antimicrobials were added according to the bacterial morphotype profile. Eleven antimicrobials were used for Gram positives and negatives: ciprofloxacin (CIP); imipenem (IMP); nitrofurantoin (NIT); penicillin (PEN G); oxacillin (OXA); ampicillin (AMP); amoxicillin/clavulanic acid (AMO+CLA); erythromycin (ERI), gentamicin (GEN), amikacin (AMI) and chloramphenicol (CLO). There was a predominance of *Corynebacterium* sp., followed by *Clostridium* sp., *Lactobacillus* sp. and *Staphylococcus* spp., respectively among the 129 strains isolated. There was resistance to at least one antimicrobial in 78.2% of the strains, where *Corynebacterium* sp. was the genus that showed the most resistance. The genera *Shigella* sp., *Yersinia* sp. and *Serratia* sp., however these strains did not show resistance to the antimicrobials tested. There was a high rate of resistance to penicillins in Gram positive strains, with more than 60% isolated, while they were highly sensitive to ciprofloxacin and imipenem. Gram-negative strains were sensitive to all antimicrobials tested. Considering all isolates, 55.03% presented a multidrug resistance index, that is, they were resistant to more than one antimicrobial tested and only 21.7% were sensitive to all antimicrobials tested. Antibiotic resistance, especially among strains of *Corynebacterium* sp., suggests a risk to public health, high resistance to penicillins and the occurrence of multidrug resistance highlight the urgency of measures to preserve water quality and avoid negative health consequences.

PALAVRAS-CHAVE: Water, Anthropogenic pressure, Microbial resistance, Basic sanitation

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