



## EVALUATION OF ANTIBIOTIC RESISTANCE IN KLEBSIELLA GENUS ISOLATED FROM SEWAGE SAMPLES COLLECTED IN THE URBAN AREA OF SANTARÉM - PARÁ.

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### RESUMO

The sewage produced by Brazilian cities is generally released directly into waterways, thus contributing to the spread of pathogenic microorganisms. The bacteria *Klebsiella* spp stands out for being a ubiquitous pathogen, present in different habitats, residing temporarily or permanently in the gastrointestinal tract of animals and humans. The multidrug resistance presented by this bacterial genus is a worrying reality in the public health context. The objective of this study was to analyze the multidrug resistance of *Klebsiella* spp. isolated from sewage samples from the urban area of Santarém - Pará, to first-choice antimicrobials in the therapeutic clinic. Sewage samples were taken in seven different neighborhoods of Santarém - Pará, with the aim of monitoring some hot spots such as targeted collections near UBS and hospitals. The samples were processed at the Bacteriology Laboratory (LABAC) at the Federal University of Western Pará - UFOPA. Isolation was carried out on Macconkey Agar (KASVI®), cultured at 30° ± 2°C/24 hours, followed by Gram staining to verify purity, and biochemical tests were carried out: EPM, Mili and Citrate (Probac do Brasil ®). The resistance phenotype was performed by the disk diffusion method, using the following antibiotics: Amikacin (30µ), Amoxicillin + Clavulanic Acid (20/10µ), Chloramphenicol (30µ) and Gentamicin (10µ). Eight colonies grown on plates with Macconkey Agar medium were isolated and identified as *Enterobacter cloacae*, *Escherichia coli*, *Klebsiella oxytoca*, *Shigella sonnei*, *Serratia* spp., *Klebsiella pneumoniae*, *Enterobacter* spp. (2 strains). *Klebsiella pneumoniae* (ATCC BAA 1705) was used as a positive control and the *Escherichia coli* strain (ATCC 25993) as a negative control. The bacteria identified as *Klebsiella pneumoniae* and *Klebsiella oxytoca* showed 100% sensitivity to all antibiotics tested. Although these findings indicate the absence of resistance of this bacteria to the drugs tested, it is necessary to monitor the presence of these bacteria in domestic sewage as these strains are susceptible to acquiring resistance through horizontal gene transfer, and are known to be potential opportunistic pathogens, capable of to cause moderate to severe infections. There is an urgent need to establish measures for open sewage treatment, which is still a reality in many municipalities in northern Brazil. This situation is even worse when considering estimates that multidrug-resistant bacteria will kill more people than cancer itself by 2050. Bacterial conjugation tests are still being carried out to verify the susceptibility of these strains to acquiring multidrug resistance through this route. **Funding source:** process 2022/1437972 FAPESPA/CNPq and Ufopa

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