

TITLE: MAGELLANIC PENGUINS (*Spheniscus magellanicus*) AS A RESERVOIR OF ANTIMICROBIAL RESISTANT *Escherichia coli*.

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ABSTRACT:

Animal models that live in environments with low direct human influence, has been monitored to investigate the impact of eutropized ecosystems on the spread of antimicrobial-resistant bacteria. Magellanic penguins (*Spheniscus magellanicus*) make seasonal migrations, from isolated environments in the south pole, to coastal regions with high human influence, and can serve as a reservoir of antimicrobial resistance between anthropized regions and the Antarctic pole. Therefore, the present study characterized phenotypically, through biochemical methods and antimicrobial susceptibility tests, and genotypically, by PCR of resistance genes, resistant *Escherichia coli* isolates obtained from samples of blood cultures, pericardial fluid, coelomic cavity, air sacs, tracheas and lungs of 46 penguins, collected between 2016 and 2020. Among the 55 *E. coli* isolates obtained, 67.2% were classified as MDR (multidrug-resistant). The resistance profile for the tested antimicrobials was: Ampicillin (83.6%); Ciprofloxacin (78.2%); Tetracycline (76.3%); Norfloxacin (74.5%); Amoxicillin-Clavulanic Acid (72.7%); Tobramycin (67.3%); Nalidixic Acid (65.4%); Cefotaxime (58.2%); Ceftriaxone (58.2%); Cefuroxime (58.2%); Levofloxacin (58.2%); Ampicillin-Sulbactam (56.4%); Ceftazidime (56.4%); Cefoxitin (45.5%); Piperacillin-Tazobactam (45.5%); Cefepime (40%); Gentamicin (36.4%); Ertapenem (30.9%); Aztreonam (21.8%); Imipenem (12.7%); Meropenem (7.3%); Nitrofurantoin (5.5%); Amikacin (3.6%); Tigecycline (1.8%) and Phosfomycin (1.8%). The proportion of isolates with ESBL phenotype was 20%, from which were detected the genes *bla*_{TEM}, *bla*_{SHV}, *bla*_{CTXM-1}, *bla*_{NDM} and, in an unprecedented occurrence in penguins, the *bla*_{KPC} gene. In addition, the present study, in a temporal analysis, highlights an increase in the presence of resistance genes in penguin samples, over the years of samples collected. Observing the results obtained, we conclude that the antimicrobial resistance found in *E. coli* of penguins is high, and is probably associated with human activities, being a problem in the context of One Health, since penguins live in open seas and antimicrobial resistance has an conducive environment to spread more easily.

Keywords: One Health, MDR, ESBL, Beta-lactamases.

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