TITLE: DETECTION OF ENTEROBACTERIA STRAINS PRODUCING RESISTANCE GENES *mcr*-1 ISOLATED FROM ANIMAL AND ENVIRONMENTAL SOURCES

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ABSTRACT:
Enterobacteria represent a serious public health problem because of the enormous capacity to acquire resistance genes for different classes of antimicrobial agents such as carbapenems, aminoglycosides and fluoroquinolones. Those characteristics are intra and interspecies, transferable via mobile resistance elements, and conduce in low therapeutic options leading the use of other classes such as polymyxins. A plasmid mediating resistance to colistin has been described in strains of *Escherichia coli* and other Enterobacteria of human and animal origin through the *mcr*-1 gene. We investigate the presence of this gene in 268 strains of Enterobacteria which 232 isolated from sewage treatment plant and sewage pumping and 36 from animal sources analyzed or received between May and December / 2016. The strains were inoculated into MacConkey agar containing 2 µg / ml colistin and positive growths were evaluated for the presence of the *mcr-1* gene by PCR. Their resistance profiles were determined according to CLSI using 12 representative antimicrobial drugs of seven classes. The multiple resistance profile was observed in 36 strains (62.1%), including association of 3rd generation beta-lactams, aminoglycosides and fluoroquinolones. Overall, 56 strains of *E. coli*, one strain of *Klebsiella pneumoniae* and one strain of *Enterobacter gergoviae* showed amplification products for the *mcr-1* gene. Among the strains of *E. coli*, 64.3% were isolated from environmental sources and 50% had a multidrug resistant profile. This study showed the highest occurrence of *mcr-1* in three sewage treatment stations and two sewage pumping in Rio de Janeiro city between July and September 2016. The results showed the importance of monitoring the introduction of emergent or exotic microorganisms containing important characteristics to public health, as well as the more conscious use of antimicrobial agents in humans, husbandry and veterinary activities, which can contribute to control the dissemination of these microorganisms in different sources and regions of the world.

KEYWORDS: Enterobacteria, *Escherichia coli,* multidrug-resistance, colistin resistance, *mcr*-1 gene.