TITLE: FIRST IDENTIFICATION OF mcr-1-POSITIVE *ESCHERICHIA COLI* ISOLATED FROM A COMPANION ANIMAL IN BRAZIL

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ABSTRACT

In human and veterinary medicine, the emergence of multidrug-resistant bacteria in clinical isolates has potentiated the use of colistin to treat infections by carbapenem-resistant pathogens. However, in 2016, researchers in China described the first plasmid-mediated colistin resistance gene, mcr-1, in bacteria from raw meet, food-producing animals, and inpatients with infection. Soon after, this gene was identified in enterobacteria in more than 30 countries. Recently, it was described the presence of the gene mcr-1 in *Escherichia coli* isolates from food-producing animals and human clinical samples in Brazil. Here we report the first *Escherichia coli* isolate carrying the gene mcr-1 from a companion animal in Brazil. In the present study, we have investigated the occurrence of the gene mcr-1 in colistin-resistant Gram-negative bacilli from companion animals in Joinville, Santa Catarina, Brazil. The 33 isolates, derived from various clinical materials, were identified in 2017 following routine microbiological investigation at laboratory Medivet Diagnostics: *Proteus* spp. (15), *Escherichia coli* (8), *Pseudomonas* spp. (6), *Enterobacter* spp. (2), and *Klebsiella* spp. (2). The bacterial DNA was assessed for the presence of mcr-1 by Polymerase Chain Reaction using the primers CLR5-F (CGGTCAGTCCGTTTGTTC) and CLR5-R (CTTGGTCGGTCTGTAGGG), which enabled the amplification of a specific 309 bp segment. Until now, we found one mcr-1-positive colistin-resistant *E. coli* isolated from the urine of a dog. Additional studies are being performed for better understanding on the dissemination and possible clinical significance of this clone. In Brazil, the emergence of mcr-1 has been reported in animals that were exposed or not to colistin in agrarian activities. Thus, the presence of mcr-1-positive *E. coli* in companion animals may represent a higher risk of dissemination to humans. We emphasize the importance of the restricted use of colistin in veterinary medicine and highlight that surveillance studies should be expanded.

Keywords: Companion animals, Antibiotic resistance, Colistin, mcr-1.

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