

**TITLE:** FIRST REPORT OF *SALMONELLA* spp. HARBORING THE *mcr-1* GENE IN BRAZIL

**AUTHORS:** Rau, R. B.<sup>1</sup>, Lima-Morales, D.<sup>2</sup>, Dalmolin, T. V.<sup>2</sup>, Wink, P. L.<sup>2</sup>, Ribeiro, A. R.<sup>1</sup>, Perin, T. F.<sup>1</sup>, Schuller, L.K.<sup>1</sup>, Martins, A. F.<sup>3</sup>, Barreto, F.<sup>1</sup>, Barth, A. L.<sup>2</sup>

**INSTITUTION:**

1 LANAGRO-RS – Laboratório Nacional Agropecuário no Rio Grande do Sul, Ministério da Agricultura, Pecuária e Abastecimento, Estrada da Ponta Grossa, 3036, Porto Alegre, RS, Brazil.

2 LABRESIS – Lab. de Pesquisa em Resistência Bacteriana, HCPA - Hosp. de Clínicas de Porto Alegre, Ramiro Barcelos, 2350, Porto Alegre, RS, Brazil.

3 ICBS – Inst. de Ciências Básicas da Saúde, UFRGS - Univ. Federal do Rio Grande do Sul, Sarmiento Leite 500, Porto Alegre, RS, Brazil.

**ABSTRACT:**

Resistance to polymyxins is of great concern to public health as polymyxins are considered the last resource for treatment of infections caused by carbapenemase producing Enterobacteriaceae. Polymyxin resistance was restricted to chromosomal mutations until 2015, when the plasmid transferable polymyxin resistance, mediated by *mcr-1* gene, was described. The gene *mcr-1* was detected worldwide mainly in *Escherichia coli* and less often in *Enterobacter cloacae* and *Enterobacter aerogenes*, *Klebsiella pneumoniae*, *Shigella sonnei* and *Salmonella enterica*. Among them, *Salmonella enterica* has call the attention since it is a leading cause of food-borne disease in humans and animals all over the world. In Brazil, so far, the gene *mcr-1* was described in *E. coli*, isolated from animals and inpatients. In view of the concerning spread of antibiotic resistance among food-producing animals we screened 40 *Salmonella* isolates, collected from several origins (retail meat, poultry, dehydrated egg white, oyster and feedstuffs), in Brazil, between 2011 and 2017. Initially the isolates were screened for carbapenemase production (HRM RT-PCR) and all of them were negative for the following genes: *bla*<sub>NDM-1</sub>, *bla*<sub>KPC</sub>, *bla*<sub>OXA-370</sub>, *bla*<sub>GES</sub> e *bla*<sub>IMP</sub>. The gene *mcr* was screened by PCR using the primers CLR5-F (5'-CGGTCAGTCCGTTTGTTC-3') and CLR5-R (5'-CTTGTCGGTCTGTAGGG-3') and one isolate was positive. The isolate was termed *Salmonella* SLRe1 and was collected from a frozen pork, in 2016, from a commercial establishment in the south of Brazil. The PCR amplified fragment was sequenced and the sequence confirmed to be the *mcr-1* gene. The minimum inhibitory concentration (MIC) of polymyxin for *Salmonella* SLRe1, performed by broth microdilution, was 8mg/L. The Rapid Polymyxin NP test was performed and the result was visually positive in 2 hours of incubation. Further studies are being carried out in order to identify the serovar of *Salmonella* SLRe1 and to evaluate the plasmid transferability, by transformation and conjugation experiments. In addition, the complete genome will be sequenced. To the best of our knowledge, this is the first report of *mcr-1* in *Salmonella* spp. in Brazil and, probably in Latin America, highlighting the worldwide spread of this novel resistance determinant.

**Keywords:** polymyxin resistance, *Salmonella*, *mcr-1*, retail food

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