

TITLE: DETECTION *mcr-1* GENE ASSOCIATED WITH PLASMID INCOMPATIBILITY GROUPS IN STRAINS OF *Escherichia coli* FROM BROILER AND POULTRY FARMS IN THE STATE OF RIO DE JANEIRO

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ABSTRACT

Brazil is the second largest producer of poultry and the biggest exporter in the world. The performance of the country is related to the low cost of production besides factors such as; nutrition, health and genetic improvement of broilers. To improved feed conversion ratio, the antimicrobial colistin was widely used until 2016 in small doses in feed. In the literature, the *mcr-1* gene encodes resistance to colistin, and its occurrence is described initially in the chromosome, but in 2015, there were reports of the detection of the gene in the plasmid type *IncI2*, *IncHI2* and *IncX4*, thus worrying the academic community. The objective of the study was to detect the *mcr-1* gene associated with plasmid incompatibility groups in strains of *Escherichia coli* from commercial broilers and poultry farms in the state of Rio de Janeiro. Samples were collected in two commercial broilers farms and one commercial poultry farm, where 75 cloacal swabs and 75 tracheal swabs were obtained in total. Methyl Eosin Agar (EMB) was used for primary isolation and identified was performed the MALDI-TOF MS technique. Phenotypic detection of colistin resistance was performed according to PIRS et al., (2017). The bacterial DNA was extracted for detection of the *mcr-1* resistance gene, seventeen plasmid incompatibility genes and genes encoding the integrase and transposase production *int1* and *ISEc12*. 107 strains of *E. coli* were obtained, 95% (102/107) presented phenotypic resistance to colistin, but the *mcr-1* gene was detected in only 61% (62/102) of this strains. Among the seventeen groups of plasticity incompatibility evaluated, the three most prevalent were *incI2*, *B/O* and *FIB* with 32% (34/107), 28% (30/107) and 36% (39/107), respectively. The *int1* gene was detected in 10% (11/107) of the *E. coli* strains and in 13% (8/62) of the *mcr-1* positive, while the *isec12* gene in 13% (14/107) strains of *E. coli* and 10% (6/62) of the *mcr-1* positive. In one strain the *mcr-1*, *int1*, *isec12* and plasmid *incI2*, *FIB* genes were detected concomitantly. These results shows the necessary studies in future regarding the genetic variability of the *mcr-1* gene. The associate occurrence of the *mcr-1* gene, plasmid incompatibility group and integrase and transposase production gene in the same individual is considered a risk factor, because the plasmid can carry the resistance gene from animals production for human population.

Keywords: resistance, *Escherichia coli*, *mcr-1*

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