TITLE: MULTIDRUG EFFLUX SYSTEMS IN *Escherichia coli* ISOLATED FROM THE THREE SECTORS OF ONE HEALTH

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ABSTRACT:

Multidrug efflux systems are energy-dependent membrane transporters that have the physiological role of extruding toxic contents from cells. In bacteria, these pumps are also capable of expelling several classes of antimicrobials decreasing them intracellular concentration, allowing the bacteria become resistant to a wide range of antimicrobials all the same time. The aim was to detect the presence of genes related to multidrug efflux systems of different families in *Escherichia coli* that was known multiresistant isolated from the three spheres of the One Health: environment, animal and human. A total of 33 bacterial isolates were selected, of which 17 were of human origin, two of environmental origin and 14 of animal origin (goats and pigs). After DNA extraction from the bacterial isolates by boiling, four genes were investigated: *acrB* and *acrF* (Resistance-Nodulation-Division Family - RND), *emrB* (Major Facilitator Superfamily - MFS) and *tehA* (Small Multidrug Resistance Family - SMR) by Polymerase Chain Reaction technique, using primers reported in the literature after annealing temperature optimization. The *acrB* gene was detected in 100% of the isolates, the *acrF* gene in 87.9% (29/33), the *emrB* gene in 84.8% (28/33) and, finally, the *tehA* gene was present in 90.9% (30/33). Divinding by sector, among the human isolates, 94.1% (16/17) presented the four genes that were investigated, among the environmental isolates, one was positive for three genes, while the other was positive for only two genes. For those from animals, 50% (7/14) were positive for four genes and the other 50% (7/14) were positive for three genes. The presence of efflux system genes from different families in the same isolate is an alarming situation and may explain the resistance to different classes of antimicrobials causing therapeutic failures. Since *Escherichia coli* is a ubiquitous bacterium with different genetic information exchange strategies, it can be concluded that multiresistance transits between the different niches of the One Health, which raises the importance of the study and shows the need to deepen knowledge in this topic.

Keywords: Efflux pump; multiresistance; RND; MFS; SMR.

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