

Gene sequencing of class 2 integrons of *E. coli* isolated from bovine milk

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Integrons are gene systems that mediate the integration of genes by site-specific recombination mechanisms consisting of a conserved region formed by an *int* gene, the common promoter responsible for the expression of the gene cassettes inserted between the conserved regions, and one recombination site. These gene cassettes confer resistance to most classes of antimicrobials. Mobile genetic elements of antimicrobial resistance can be transmitted vertically, during cell division, or horizontally via transduction, conjugation or transformation intra or inter bacteria species or genera. We sent for sequencing amplicons of the genes *attI2* and *orfX* related to the class 2 integron from 7 *E. coli* isolated from bovine milk. Sequence analyzes were performed using the BLAST program available at NCBI platform. These analyzes showed that the class 2 integron of *E. coli* studied were carrying *dfr* cassettes, *sat*, *folA*, *dhfrI* and *aadA*, that conferred resistance to aminoglycosides and trimethoprim, and whose sequences were identical to those deposited in GenBank for integrons of class 2 and/or plasmids from *E. coli*. In conjunction assays we found that the strains carrying integrons showed capacity for conjugation the studied resistance markers. These findings from cow's milk isolates reveal the presence of the elements necessary for recombination and high capacity for dissemination of resistance genes in bacterial virulence in milk production environment. Others studies using Enterobacteriaceae (*E. coli*, *Proteus* spp., *Klebsiella* spp., *Enterobacter* spp.) isolated from the urine of human patients found class 2 integrons carrying, mainly, *dfrA1*, *sat1* and *aadA*, which shows similarity between the isolates from bovine milk and human urine isolates. Regardless of origin of the isolates, these findings highlight the possibility of transmission of resistance genes between humans and animals. The sequencing of these mobile elements allows the knowledge of the most common genes transmitted by bacteria studied.

Keywords: gene cassettes, Enterobacteriaceae, bacterial resistance, dairy cattle

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