Title: DETECTION OF VIRULENCE GENES IN Escherichia coli ISOLATED FROM MILK PRODUCTION LINE

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Abstract:

Bovine mastitis is an endemic disease that causes great damage to milk production. The Escherichia coli have been described as prevalent and highly pathogenic in environmental mastitis etiology. Some strains can produce enterotoxin, codified by the stx1 and stx2 genes and may also express the intimin protein, encoded by the eae gene responsible for intimate adherence of the bacteria to the epithelial cells altering microvilli of intestinal epithelium. The objective of this study was to detect these genes in E. coli isolated from milk production line in a property located in Barra do Pirai-RJ. A total of 93 milk samples were collected from 31 lactating cows in three consecutive weeks. Also 31 samples of fecal material of these animals and water samples from five different points related to the milk production line were collected. Phenotypic analysis of milk and fecal material also Most Probable Number (MPN) of water was performed in the LABAC-VET/ UFRRJ. Phenotypic identification provided 18.27% (17/93) belonging to the Enterobacteriaceae family, confirming the presence of E. coli in 76.47% (13/17). The presence of E. coli was detected in 22.22% (2/9) of water samples from the stream which runs through the property and as expected, also in all fecal samples. E. coli isolates were taken to the Enterobacteriaceae Laboratory of FIOCRUZ, to carry out the polymerase chain reaction assays in the search for the following virulence genes: eaeA, stxl and stxlII yielding fragments of 570 pb, 388 pb, 807 bp respectively. Among the isolates from milk, a total of 38.46% (5/13) amplified gene eaeA. No strain was positive for stxl and stxlI. In the fecal samples eaeA gene could be detected in 36,36% (12/33) and stxl gene in only 6.06% (2/33). The stxl II gene was not found in these isolates. None of the E. coli isolates from water samples amplified any eaeA, stxl and stxlII genes. The detection of virulence genes in pathogenic isolates of E. coli from bovine mastitis is worrying because it may represent the synthesis of bacterial toxins potentially important in public health issues for both humans and herd animals. The understanding of the molecular basis of bacterial virulence of E. coli can light up the mechanisms of pathogenesis associated with this group of bacteria.

Keywords: bovine mastitis, enterobacteria, virulence factor

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