

Title: Phylogenetic relationship among enteroaggregative (EAEC) and uropathogenic (UPEC) *Escherichia coli* strains

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Abstract:

Escherichia coli may carry virulence factors that confer the ability to colonize different niches and cause a wide spectrum of intestinal and extra-intestinal diseases. *E. coli* strains that cause extra-intestinal diseases (ExPEC) are important agents of urinary tract infection (UTI), sepsis and meningitis. In addition, ExPEC causing UTI are called uropathogenic *E. coli* (UPEC). The diarrheagenic *E. coli* (DEC) comprise six pathotypes and, among these, enteroaggregative *E. coli* (EAEC) is defined as the pathotype that adheres to epithelial cells *in vitro* in the aggregative pattern. It is known that some UPEC strains harbor virulence properties of DEC, which are mainly associated with the EAEC pathotype. The objective of this study was to correlate EAEC and UPEC strains with respect to their phylogenetic groups. For this purpose, 30 EAEC strains with genetic markers of ExPEC (*papA/papC*, *sfa/foc*, *afa/dra*, *iutA* and *kpsMTII*), 10 UPEC harboring and 8 UPEC lacking EAEC virulence markers were selected for phylogenetic analysis by quadruplex PCR according to the revised phylotyping method of Clermont *et al* (Environ. Microbiol. Rep., 5:58-65, 2013). The EAEC strains with ExPEC genetic markers were classified in six phylogroups as follows: A (16 strains, 53.3%), D (6 strains, 20%), B2 (3 strains, 10%), B1 (2 strains, 6.7%), E (1 strain, 3.3%), F (1 strain, 3.3%) and 1 strain (3.3%) could not be classified according to this methodology. The UPEC strains with EAEC virulence markers were classified in the following phylogroups: E (3 strains, 37.5%), A (2 strains, 25%), D (2 strains, 25%) and B1 (1 strain, 12.5%). On the other hand, the UPEC strains without EAEC virulence markers were classified in phylogroups B2 (8 strains, 80%), A (1 strain, 10%) and E (1 strain, 10%). These results demonstrate a phylogenetic correlation between EAEC and UPEC strains with markers of EAEC, reinforcing the uropathogenic potential of these strains. Moreover, we observed differences in phylogenetic distribution among UPEC strains with and without EAEC markers.

Key words: enteroaggregative *Escherichia coli*, uropathogenic *Escherichia coli*, phylogeny.

Financial support: Capes