

Title: PHYLOGENETIC GROUP DETERMINATION OF *ESCHERICHIA COLI* ISOLATED FROM ANIMAL SAMPLES

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Abstract:

Escherichia coli is a Gram-negative, fermentative, rod-shaped bacterium and is the major facultative anaerobic bacterium in the intestinal tract of most animal species. *E. coli* cause enteric and extraintestinal diseases in animals. *Escherichia coli* strains can be assigned to one of the seven phylogenetic groups. Phylogenetic studies are important to improve the understanding of *E. coli* population and the relation of strains and its hosts and disease. This study aims to analyze the occurrence and distribution of phylogenetic groups of *Escherichia coli* isolated from different domestic animals. *Escherichia coli* were isolated from fecal samples from cattle and water buffalo. The samples from poultry were collected in a slaughterhouse with federal inspection service and were obtained from the respiratory tract with signs of airsacculitis, liver and heart suspected of colibacillosis and carcasses with no clinical alteration. *E. coli* strains were tested by PCR for characterization of phylogenetic groups A, B1, B2, C, D, E and F. The Shannon and Simpson diversity indexes were calculated. Identification of phylogroups A ($P < 0.001$) and phylogroup F ($P = 0.002$) were associated with *E. coli* strains isolated from poultry, phylogroups B1 ($P < 0.001$) and E ($P < 0.001$) were associated with *E. coli* strains isolated from cattle, and phylogroups B2 ($P < 0.001$) and D ($P = 0.007$) were associated with *E. coli* strains isolated from water buffalo. Our results indicate that B1 is the main phylogroup of *E. coli* isolated from domestic animals, followed by phylogroup A. The diversity indices (Shannon and Simpson index) show that there is greater diversity in *E. coli* strains isolated from poultry than water buffalo and cattle. The results of chi-square test and the Correspondence Analysis agreed and showed that phylogroups B1 and E are associated with *Escherichia coli* strains isolated from cattle and phylogroups A and F with poultry. However, *E. coli* strains from water buffalo were associated with phylogroups B2 and D in the chi-square but the CA showed no clear association. In our study, most phylogroups were detected in all the three hosts studied, however, the chi-square test and the CA model indicates some host-specificity and can be used for molecular epidemiology studies.

Keywords: *Escherichia coli*; phylogroups; correspondence analysis; cattle; poultry; water buffalo

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