P275-587: Occurrence, Virulence Characteristics, and Serogroups of Shiga Toxin-Producing Escherichia coli Isolated from Sheep and Goats in Razavi Khorasan Province, Iran

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Background and Aim : Shiga toxin-producing Escherichia coli (STEC) is known as a foodborne pathogen associated with human disease characterized by mild or bloody diarrhea hemorrhagic colitis and hemolytic uremic syndrome (HUS). The presence of STEC in livestock has been considered a serious risk to public health. The contribution of sheep and goats to the food production systems made them one of the main livestock species in developing countries. Hence, this study aimed to investigate the characteristics of STEC in sheep and goat isolates originating from Razavi Khorasan Province, Iran.

Methods : Among 70 faecal samples, isolated from April 2022 to June 2022, a total of 30 (42.8%) STEC strains were detected. The isolates were obtained from faecal samples of sheep (n=23) and goats (n=7) animal hosts. All isolates were subjected to Paton's multiplex-PCR assay to detect the major virulence genes (stx1, stx2, ehxA, eae) of the STEC strains. Then, they were tested for the top 13 important O-groups by conventional PCR amplification based on the protocol offered by the EU Reference Laboratory for E. coli and some other important serogroups by different PCRs.

Results : Of 30 STEC isolates, 33.3% harbored stx1 and stx2, 63.3% only stx1, and 3.3% stx2 solely; and 53.3% of the isolates were positive for ehxA and all the studied STEC (100%) were negative for eae gene. The predominant serogroups were O103 (46.6%), O128 (30.0%), O5 (16.6%), and O113 (6.6%) respectively.

Conclusion : The occurrence of STEC strains in sheep and goats reported here (42.8%) is in accordance with prior studies in Iran that have noted a similar distribution range of STEC in these animal sources which is considerable. Furthermore, it could be inferred that the STEC isolates related to sheep and goats are less important for human disease since the genes stx2 and intimin (eae)—which are well known to have a significant role in severe cases of the disease—were only detected in one isolate (3.3% for stx2 solely), and all were negative for intimin gene. Finally, the detection of O103 as the predominant serogroup in sheep and goats (46.6%), posed an unanticipated and interesting finding that future studies are recommended.

Keywords : Shiga toxin-producing Escherichia coli; STEC; serogroups; sheep and goats; Iran