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Original Article

## Diversity of antibiotic-resistant Shiga toxin-producing *Escherichia coli* serogroups in foodstuffs of animal origin in northern India

Javed A. Khan, Ram S. Rathore, Hussein H. Abulreesh ✉, Abdullah S. Al-thubiani, Shaheen Khan, Iqbal Ahmad

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### Abstract

This study aimed to determine the diversity of antibiotic-resistant Shiga toxin-producing *Escherichia coli* (STEC) serogroups in 600 foodstuff samples of animal origin in the northern part of India. Of the 158 (26.33%) *E. coli* isolates that were detected in food samples the 'O' antigen-based serotyping revealed the abundance of serogroups O60, O86, O154, O73, O50, O8, and O68. Overall, 45 (28.4%) *E. coli* isolates were potentially verotoxin producers as determined by verotoxin assay and confirmed by polymerase chain reaction (PCR), of which 42.2% of the STEC isolates originated from raw beef. Among 45 STEC isolates, 51.1% harbored *vt*<sub>1</sub> gene whereas 48.9% of the serogroups carried *vt*<sub>2</sub> gene. Chi-squared test revealed significant difference ( $p = .001$ ) in the prevalence of STEC serogroups in different foodstuffs. STEC serogroups showed higher resistance to nalidixic acid (71.7%) followed by ampicillin (66.6%). Multidrug resistance (i.e., resistance to 3 or more antimicrobial classes) was exhibited by 55.6% of STEC serogroups.

### Practical applications

This investigation demonstrated the diversity of STEC, particularly multidrug-resistant serogroups in various foodstuffs, which is a matter of serious concern from a public health stand point. Foodstuffs of animal origin available for human consumption in the city of Bareilly, may pose significant health threats due to contamination of various toxigenic and multidrug-resistant non-O157 STEC serogroups, and call for public health authorities to

enhance surveillance/monitoring programs to prevent the spread of multidrug-resistant toxigenic non-O157 STEC serogroups in Indian communities and for better public health protection.

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