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Virulence and antimicrobial resistance profiles of Shiga toxin-producing *Escherichia coli* O157 and non-O157 recovered from domestic farm animals in rural communities in Northwestern Mexico

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Shiga toxin-producing *Escherichia coli* (STEC) are zoonotic enteric pathogens associated with human gastroenteritis worldwide. Our study characterized the genotypic diversity and virulence profiles of O157 and non-O157 STEC strains, recovered from domestic animals in the agricultural Culiacan Valley in Northwestern Mexico. By using a selective enrichment and isolation protocol, serotype O157:H7 isolates were identified in 40% (26/65) of the recovered isolates from cattle, sheep and chicken feces. The clinically-relevant non-O157 serotypes O8:H19, O75:H8, O111:H8 and O146:H21 represented 35.4% (23/65) of the isolates, mostly from sheep. Analysis of the allelic diversity indicated that the O157:H7 isolates were highly related but a greater genotypic diversity was observed in the non-O157 isolates. Genotyping assays revealed the presence of virulence genes coding for adhesins, cytotoxins, effectors and Shiga toxin (Stx) subtypes in the tested strains. To examine the relative toxicities of the STEC strains, a fluorescent Vero cell based assay was employed to measure the inhibition of protein synthesis by Stx. Non-O157 strains with serotypes O8:H19 O75:H8 and O146:H8 were found to have an enhanced ability to inhibit protein synthesis in Vero cells while a reduced cytotoxicity was observed for all O157:H7 strains. The STEC strains exhibited antimicrobial resistance to aminoglycosides, tetracyclines, cephalosporins and penicillin which are commonly used in Mexico. In conclusion, zoonotic STEC with virulent genotypes are present in animals on small farms in the Culiacan Valley and these findings emphasize the need for the development of control measures and surveillance of antimicrobial resistance in an important agricultural region in Northwestern Mexico.

Biography

Beatriz Quinones has completed her PhD in Molecular and Cell Biology and Postdoctoral studies in Plant and Microbial Biology from the University of California at Berkeley. She is currently a Research Molecular Biologist in the Produce Safety and Microbiology Research Unit at the USDA/ARS-Western Regional Research Center. Her research projects are aimed at the detection and genotyping of bacterial and viral food borne pathogens and have resulted in the publication of more than 35 papers in peer-reviewed journals. Her ongoing collaborations with academic institutions in Mexico are focused on the detection of food borne pathogens in agricultural regions for export produce.

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