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Original Articles

Antimicrobial drug resistance and genetic diversity of commensal Escherichia coli from caeca of chickens in Grenada

Harry Hariharan*, Simone Oliveira¹, Shiplap Sharma, Vanessa Matthew, Alfred Chikweto,
Department of Paraclinical Studies, School of Veterinary Medicine, St. George’s University, St. George’s, Grenada, West Indies; ¹University of Minnesota, Veterinary Diagnostic Laboratory, 1333 Gortner Ave #244, Saint Paul, MN 55108, USA;
*Corresponding author: E-mail: hhariharan@sgu.edu

Abstract
The main goal of this study was to generate baseline data on resistance to 11 antimicrobial drugs of global importance among commensal Escherichia coli from healthy chickens in Grenada. For this purpose, a total of 183 commensal Escherichia coli isolates from 197 chickens (147 broilers and 50 layers) originating from 11 poultry farms in Grenada were studied using a standard disk diffusion method. The isolates were further studied for their haemolytic properties using sheep blood agar, and genotypes using the enterobacterial repetitive intergenic consensus sequence PCR (ERIC-PCR). Sixty-six isolates were positive for alpha haemolysis, and the remaining were non-haemolytic. There was no difference in antimicrobial susceptibility between haemolytic and non-haemolytic isolates. Resistance was highest against tetracycline (58.5%) followed by streptomycin (44.3%) and lowest to chloramphenicol (0.55%). Only three isolates (1.6%) showed resistance to fluoroquinolones. Resistance rates to tetracycline, streptomycin, and gentamicin were significantly lower among isolates from layers, compared with those from broilers. Multiple resistance to three or more classes of drugs was found in 10.4% of total isolates; the most common R-profile was Amp, Str, Tet. Twenty genotypes were identified among 24 randomly selected isolates that originated from 11 unrelated farms and 5 geographical locations. Isolates sharing similar genomic fingerprints by ERIC-PCR had different resistance profiles, whereas isolates with different genotypes shared similar profiles. In conclusion, this study showed the genetic diversity of chicken isolates from Grenada, and that E. coli isolates from layers had lower resistance rates to certain drugs when compared with isolates from broilers. The haemolytic patterns of E. coli isolates of chicken-origin, and their significance, and the epidemiological significance of ERIC-PCR genotypes among poultry isolates need further study.
Key words: Escherichia coli, Chicken, Grenada, Drug resistance, ERIC-PCR

Introduction
Antimicrobial drug resistance is not only a problem in the treatment of poultry diseases caused by Escherichia coli, but also a potential public health hazard to consumers of poultry products. Drug-resistant bacteria persisting in the animal until slaughter can contaminate edible tissues and may be transferred to humans via the food chain. Commensal E. coli has been used as a ‘sentinel’ or ‘indicator’ bacterial species for antimicrobial resistance in different parts of the world, including the USA, the Caribbean, Europe, and Japan. The commensal E. coli may serve as reservoirs of transferable antimicrobial drug resistance genes. Whether they carry virulence factors or not is a debatable matter. The emergence of bacteria that are