



Benha University

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Bacteriological and Molecular Characterization of Quinolone-resistant *E. coli* Isolated from Broiler Chickens

A Thesis Submitted by

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Abstract

Title:	Bacteriological and Molecular Characterization of Quinolone-resistant <i>E. coli</i> Isolated from Broiler Chickens
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Abstract	
<p>Antibiotic resistance in <i>Escherichia coli</i> has been a serious concern for veterinary practice and public health worldwide. The objective of this study was to investigate the phenotypic and genotypic characteristics of quinolones (Qs) resistance in <i>E. coli</i> isolated from broiler chickens in Egypt. In doing that, 300 samples (150 cloacal swabs from apparently normal and 150 internal organs from septicemic broilers) collected from farms and live bird markets were subjected to bacteriological examination for isolation and identification of the <i>E. coli</i>. From them, 227 (75.7%) were found positive for <i>E. coli</i>. The antimicrobial susceptibility of confirmed 161 <i>E. coli</i> isolates against 7 Qs antibiotics using disc diffusion method revealed that 87.6% of the isolates were resistant to at least one antibiotic, while 27.3% were resistant to all tested Qs. The highest resistance rates were observed against flumequine (79.5%) and nalidixic acid (78.9%), while the lowest resistance rate was observed against levofloxacin (31.1%). A total of 36 isolates, highly resistant to Qs, were then screened for plasmid-mediated quinolone resistance (PMQR) genes by PCR. The results revealed that 83.3% harboured at least one PMQR gene, with <i>qnrS</i> being the most frequent (77.8%). The <i>qepA</i>, <i>qnrB</i> and <i>aa (6')-Ib-cr</i> genes occurrence was 54.2%, 11.1% and 2.8% respectively, while <i>qnrA</i> was not detected in any isolate. Four Phenotypically resistant isolates, negative to PMQR genes, were then analyzed for mutations in the <i>gyrA</i> and <i>parC</i> genes by PCR and sequencing. The results revealed that all 4 isolates showed missense mutations at positions Ser83 and Asp87 of the <i>gyrA</i>, and Ser80 of <i>parC</i>. Simultaneously, novel mutations were observed and repeated in different rates between the tested isolates. The high prevalence of FQs resistance, and resistance determinants in <i>E. coli</i> from chicken could pose a serious public health hazard, which requires effective monitoring and surveillance systems.</p>	
Keywords: antimicrobial resistance, chickens, <i>Escherichia coli</i> , fluoroquinolones	