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### Plasmid-Mediated Fluoroquinolone Resistance among Enterobacteriales in Africa: Systematic Review

*Résistance aux Fluoroquinolones Médiée par Plasmides parmi les Enterobacteriales en Afrique : Revue Systématique*

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#### ABSTRACT

**INTRODUCTION:** According to the World Health Organization, antimicrobial resistance (AMR) is a silent global pandemic that plagues everyone. It makes therapy of infectious diseases more difficult and eventually increases morbidity and mortality.

**AIM:** The purpose of this work is to examine existing data on plasmid-mediated quinolone resistance (PMQR), to assess the prevalence of PMQR genes in Enterobacteriales, and to determine any knowledge gaps from sub-Saharan Africa.

**METHODOLOGY:** The Preferred Reporting Items of Systematic Reviews and Meta-analyses (PRISMA) standard was followed when conducting this systematic review. The main internet databases examined for pertinent publications were PubMed, Google Scholar, and Ajol. A set of qualifying criteria were used to evaluate the qualified articles. Using the eligibility criteria, 56 full-text articles were chosen for screening.

**RESULT:** Thirty-two (32) articles with the majority originating from West and North Africa and only one article reporting a study carried out in Central Africa were selected for this review. *Escherichia coli* and Ciprofloxacin were the most reported Enterobacteriales and Quinolone respectively. The PMQR genes include qnr (qnrA, qnrB, qnrC, qnrD, and qnrS), aac (6') Ib, aac (6') Ib-cr, oqxAB and qepA gene. The most prevalent PMQR gene is the aac (6') Ib-cr gene (32%) followed by qnrS (26%).

**CONCLUSION:** This study highlighted the requirement for an efficient antimicrobial resistance surveillance system in the continent and revealed a significant incidence of PMQR genes.

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**KEYWORDS:** Enterobacteriales, *Escherichia coli*, Quinolone, Ciprofloxacin, PMQR, "aac(6')-Ib", "aac(6')-Ib-cr", "qnr", "qepA", "oqxAB", "Antibiotic resistance.

#### RÉSUMÉ

**INTRODUCTION:** Selon l'Organisation mondiale de la santé, la résistance aux antimicrobiens (RAM) est une pandémie mondiale silencieuse qui touche tout le monde. Elle rend le traitement des maladies infectieuses plus difficile et finit par augmenter la morbidité et la mortalité.

**OBJECTIF:** L'objectif de ce travail est d'examiner les données existantes sur la résistance plasmidique aux quinolones (PMQR), d'évaluer la prévalence des gènes PMQR chez les Enterobacteriales et de déterminer d'éventuelles lacunes de connaissances en Afrique subsaharienne.

**MÉTHODOLOGIE:** La norme Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) a été suivie lors de la réalisation de cette revue systématique. Les principales bases de données Internet examinées pour des publications pertinentes étaient PubMed, Google Scholar et Ajol. Un ensemble de critères d'admissibilité a été utilisé pour évaluer les articles qualifiés. En utilisant les critères d'éligibilité, 56 articles en texte intégral ont été choisis pour le dépistage.

**RÉSULTAT:** Trente-deux (32) articles, dont la majorité provient d'Afrique de l'Ouest et du Nord, et un seul article rapportant une étude menée en Afrique centrale, ont été sélectionnés pour cette revue. *Escherichia coli* et la ciprofloxacin étaient les Enterobacteriales et les quinolones les plus signalées respectivement. Les gènes PMQR comprennent les gènes qnr (qnrA, qnrB, qnrC, qnrD et qnrS), aac (6') Ib, aac (6') Ib-cr, oqxAB et qepA. Le gène PMQR le plus prévalent est le gène aac (6') Ib-cr (32%), suivi de qnrS (26%).

**CONCLUSION:** Cette étude a souligné la nécessité d'un système efficace de surveillance de la résistance aux antimicrobiens sur le continent et a révélé une incidence significative des gènes PMQR.

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**MOTS-CLÉS:** Enterobacteriales, *Escherichia coli*, Quinolone, Ciprofloxacin, PMQR, "aac(6')-Ib", "aac(6')-Ib-cr", "qnr", "qepA", "oqxAB", "résistance aux antibiotiques"

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