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REVIEWER'S REPORT

Manuscript No.: IJAR-57081

Title: Antibiotic Resistance Profile of Waterborne Bacterial Isolates from Drinking Water Sources,

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Recommendation:
Accept after minor revision

Rating	Excel.	Good	Fair	Poor
Originality		✔,		
Techn. Quality		✔,		
Clarity	✔,			
Significance	✔,			

Reviewer Name: Dr. Bilqees Hamza

Detailed Reviewer's Report

The article titled "Antibiotic Resistance Profile of Waterborne Bacterial Isolates from Drinking Water Sources" presents an essential investigation into the intersection of environmental microbiology and public health. By analyzing 246 drinking water samples from the Moradabad district, the study addresses the dual threat of microbial contamination and the environmental dissemination of antibiotic-resistant pathogens. The research is particularly pertinent given the global rise of antimicrobial resistance (AMR), which increasingly challenges the effectiveness of standard clinical treatments. The findings—highlighting a 40.7% contamination rate and notable resistance to common antibiotics like ampicillin and tetracycline—underscore the critical need for robust water quality monitoring and the implementation of "One Health" strategies that link human, animal, and environmental health.

The primary strength of the manuscript lies in its clear comparative analysis between urban and rural water sources. The author successfully demonstrates that rural and untreated water sources exhibit a higher prevalence of resistant bacterial isolates, a finding that points directly to deficiencies in local sanitation and water treatment infrastructure. The organism-wise analysis, specifically the observation that Escherichia coli showed higher resistance compared to Vibrio spp., provides valuable data for local health authorities. By focusing on commonly used antibiotics such as gentamicin, ciprofloxacin, and imipenem, the study offers practical insights into which treatments remain viable for waterborne infections in this specific geographic context.

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The methodology employed—utilizing the Kirby-Bauer disc diffusion method—is a standardized and reliable approach for assessing antibiotic susceptibility. However, from a peer-review perspective, the manuscript could be significantly strengthened by moving beyond phenotypic descriptions to include molecular characterization. While the study identifies "moderate resistance" (30%) against ampicillin and tetracycline, the lack of data regarding the genetic determinants of this resistance, such as the presence of plasmids or specific resistance genes (e.g., blaTEM or tet genes), limits the paper's impact. Including molecular data would allow the author to discuss the potential for horizontal gene transfer among environmental bacteria, which is a major driver of the AMR crisis.

Furthermore, the "Background" section provides a solid foundation, but the "Results" section would benefit from more detailed statistical rigor. While the percentages of growth and resistance are provided, the author should include p-values to denote the statistical significance of the differences observed between urban and rural samples. For instance, is the "relatively higher resistance" in rural areas statistically significant, or is it a localized trend? Providing this level of detail is essential for a high-impact journal and would help differentiate the work from a purely observational report.

The discussion on the potential transmission of resistant pathogens through water sources is timely, but it could be expanded to explore the sources of this resistance. The author mentions "microbial contamination," but a more critical evaluation of the proximity of water sources to agricultural runoff, hospital waste, or untreated sewage would provide a clearer picture of how these resistant isolates entered the drinking water system. This would transform the paper from a descriptive survey into a diagnostic tool for public health intervention. Integrating the "One Health" perspective more explicitly—perhaps by citing recent literature on the role of environmental reservoirs in the clinical AMR cycle—would also enhance the scholarly value of the work.

From a structural standpoint, the language is clear and the narrative follows a logical progression from sampling to identification and susceptibility testing. However, the author should ensure that the bibliography is updated to include more recent global reports on environmental AMR from the last three years (2023-2026). The current references are solid but leaning on newer studies would help frame the Moradabad findings within the most current global trends. Additionally, the inclusion of more visual data, such as a map of the sampling sites or a comparative bar chart showing resistance profiles across different bacterial species, would make the results more accessible to the reader.

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In conclusion, "Antibiotic Resistance Profile of Waterborne Bacterial Isolates" is a necessary and well-executed study that highlights a significant public health vulnerability. It provides a localized snapshot of a global problem and offers a clear call to action for improved water treatment and antibiotic stewardship. With minor revisions focused on enhancing the statistical analysis, exploring the sources of contamination, and potentially adding molecular insights, this article has the potential to become a key reference for environmental health researchers and policymakers in the region.

Recommendations:

1. Include statistical significance testing (p-values) for the comparisons between urban and rural resistance profiles to bolster the reliability of the findings.

2. Expand the discussion to explore the likely sources of antibiotic resistance in the environment, such as proximity to animal husbandry or inadequate disposal of pharmaceutical waste.

3. If possible, perform molecular screening for common resistance genes in a subset of the E. coli isolates to identify the genetic basis of the observed phenotypic resistance.

4. Update the bibliography to include more recent (2023-2026) peer-reviewed literature on the "One Health" approach to waterborne antimicrobial resistance.

5. Provide a more detailed map or table of sampling locations to clarify the "nearby regions" mentioned in the methodology.

6. Ensure all tables and figures have clear, descriptive titles and that the Y-axis units for resistance percentages are consistent throughout the text.

Recommendation: Recommend for publication with minor revision.