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Peer Review

Review of: "Monitoring the Microbial Quality of Water"

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The author discusses the importance of monitoring the microbial quality of water, given the global impact of waterborne diseases. The study outlines pathogen detection methods, including molecular techniques and disinfection practices, while emphasizing the critical role of water quality control in infection prevention and mitigation. Overall, the manuscript addresses an important topic with significant public health implications. With revisions to improve clarity, depth of analysis, and presentation, it has strong potential for publication as an Original Research Article.

Points that can be improved:

I suggest correcting the title of the work to: Monitoring the Microbial Quality of Drinking Water.

For greater scientific accuracy, it would be appropriate to specify microorganism names, particularly when addressing public health–relevant pathogens. For example: pathogenic *Escherichia coli*, *Salmonella enterica* serovar *Typhi*, hepatitis A virus (HAV), and *Giardia duodenalis* (also known as *G. lamblia*).

The author might consider including, preferably in the introduction, examples of waterborne outbreaks caused by viruses, bacteria, and parasites.

I strongly advise incorporating more references from indexed databases to ensure the credibility of sources.

As this is an article on monitoring the microbiological quality of water, the author should provide a more detailed description of the microbial parameters typically analyzed. While the text correctly lists most essential physicochemical parameters and their acceptable ranges, some critical ones are missing—particularly nitrate, nitrite, residual chlorine, ammonia, and electrical conductivity, all of which are fundamental in routine drinking water assessments. Including these would offer a more comprehensive evaluation of water quality.

Throughout the text, the author provides numerous examples of bacteria but could place greater emphasis on parasites, which also serve as important public health indicators and reflect socio-environmental vulnerabilities. Pathogens such as *Giardia duodenalis* and *Cryptosporidium* spp. are particularly noteworthy, as they are frequently associated with inadequate sanitation and poor living conditions. These parasites highlight systemic inequalities in access to clean water and healthcare services, making their inclusion particularly relevant for a comprehensive discussion of water quality monitoring.

The methods cited in the article are appropriate and include several important modern techniques such as qPCR, 16S rRNA analysis, and flow cytometry. However, this does not represent a comprehensive list of currently available advanced methodologies. To ensure the article reflects current technological advances, it would be valuable to incorporate emerging techniques like next-generation sequencing (NGS) and biosensors, which are rapidly gaining traction in environmental and public health analyses. Furthermore, the described techniques could benefit from more detailed discussion, particularly regarding their respective advantages, limitations, and potential applications. The inclusion of a comparative table summarizing these key characteristics would significantly enhance the manuscript's utility, enabling readers to better evaluate and select appropriate methodologies for their specific needs.

For a paper addressing water microbiological quality, it is essential that the author includes references to current international standards and protocols that ensure methodological standardization and reliability. Key examples that should be incorporated include: US EPA Method 1623.1, ISO 15553, ISO 18744, and ISO 6222.

It is recommended that the author expand the discussion on disinfection methods, incorporating other relevant techniques such as filtration, ultraviolet (UV) radiation, and ozonation. The inclusion of these approaches would enrich the work, since each method presents distinct efficiencies, operational advantages, and specific limitations depending on the application context.

Declarations

Potential competing interests: No potential competing interests to declare.