REVIEWER'S REPORT

Manuscript No.: **IJAR-52681**   Date: 10-07-2025

Title: Effectiveness of Tea Residue to Reduce Heavy Metal Contents from Industrial Waste Water

Recommendation:
Accept as it is ....
Accept after minor revision.................
Accept after major revision ....
Do not accept (*Reasons below*) ....

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality			✓	
Clarity			✓	
Significance		✓		

Reviewer Name: Tahir Ahmad

Reviewer's Comment for Publication.

General Overview:
The manuscript presents a laboratory-based investigation into the use of tea residue (TR) as a low-cost, bio-adsorbent for the removal of heavy metals (Zn, Cr, and Pb) from industrial wastewater. The study uses a batch experimental design and includes multiple treatment combinations across different time intervals and TR concentrations. The focus on alternative, eco-friendly solutions to water pollution is relevant and meaningful, particularly for developing countries where access to high-end treatment facilities may be limited.

Abstract Evaluation:
The abstract effectively summarizes the research objectives, methodology, and major findings. It outlines the sampling process, experimental design, and results concerning physicochemical properties and metal removal efficiencies. The structure is logical, moving from problem identification to experimental execution and result interpretation. The detailed description of treatments and metal concentration ranges adds clarity. Overall, the abstract successfully communicates the essence of the study.

Technical Merit:
The study is methodologically well-framed, using a batch adsorption technique and spectrophotometric analysis (AA-7000) for metal quantification. The use of multiple time-based treatments and dosages (2g, 5g, 10g) adds robustness to the experiment. Inclusion of key physicochemical water parameters (pH, TDS, EC) offers additional insight into the water quality context. The analysis is grounded in real-world conditions, with samples sourced from four distinct industrial locations, which supports the study's relevance.

Significance and Relevance:
The paper addresses an important environmental issue—heavy metal contamination in wastewater—and investigates a practical, cost-effective solution that is especially applicable to resource-constrained

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settings. The potential reuse of a common agricultural by-product (tea residue) in pollution mitigation aligns well with sustainability goals and waste valorization initiatives. The study is particularly valuable in the context of developing countries like Bangladesh, where low-cost treatment options are in high demand.

Structure and Organization:
The manuscript maintains a clear and coherent structure. The flow from abstract to introduction is logical, and the background context is well-linked to the research aim. The treatment descriptions (T0–T9) are detailed and provide a solid framework for interpreting results. The data presentation is straightforward, and the organization of information is easy to follow.

Language and Clarity:
The manuscript is written in a clear, accessible style. Scientific terms are used appropriately, and the technical language is understandable without oversimplification. Minor grammatical issues do not detract from overall clarity. The tone remains objective, and the narrative supports the scientific reporting style.

Conclusion:
This research makes a valuable contribution to the field of environmental science and wastewater treatment by evaluating tea residue as a feasible biosorbent for heavy metal removal. The study is practical, well-executed, and offers strong empirical support for its conclusions. It contributes useful insights into sustainable waste management practices and highlights an innovative approach to mitigating industrial pollution in developing regions.