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REVIEWER'S REPORT

Manuscript No.: IJAR-50657 Date: 17-03-2025

Title: Heavy metal bioaccumulation in Zea mays L. i Medicago sativa L. in the area of Zenica

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

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

Reviewer's Name: Tahir Ahmad

Reviewer's Decision about Paper: **Recommended for Publication.**

Comments (*Use additional pages, if required*)
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Reviewer's Comment / Report

The study titled "Heavy Metal Bioaccumulation in Zea mays L. and Medicago sativa L. in the Area of Zenica" presents a comprehensive investigation into the concentration and accumulation of heavy metals in soil and plants at selected locations in Zenica. The research, conducted between March and September 2018, focuses on key heavy metals such as iron (Fe), manganese (Mn), zinc (Zn), nickel (Ni), lead (Pb), vanadium (V), molybdenum (Mo), cadmium (Cd), chromium (Cr), copper (Cu), and cobalt (Co). The study examines their distribution in the soil and their subsequent bioaccumulation in Zea mays L. (corn) and Medicago sativa L. (alfalfa).

The abstract effectively outlines the research objectives, methodology, and key findings. It is clear and succinct, summarizing the critical aspects of the study. The introduction provides an extensive background on the significance of heavy metal contamination, particularly in industrial regions like Zenica. The discussion of previous studies establishes a strong foundation for the research, emphasizing the role of industrial activities in increasing heavy metal concentrations in soil and plants. The study effectively contextualizes the research within the existing literature and highlights the importance of assessing heavy metal bioaccumulation in plants used for agricultural purposes.

The materials and methods section is well-structured, providing detailed descriptions of the sampling locations, distances from industrial sources, and procedures for soil and plant sampling. The inclusion of precise geographic coordinates and altitudes for each location enhances the reproducibility of the study.

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The methodology for soil and plant sample preparation, including drying, sieving, and spectrophotometric analysis, is systematically presented. The description of heavy metal quantification through atomic absorption spectrophotometry ensures methodological clarity.

The results and discussion segment presents a thorough analysis of heavy metal concentrations in soil and plant samples. The study effectively identifies that soil at the selected locations contains elevated levels of manganese, nickel, vanadium, cadmium, and molybdenum beyond the permitted limits. The clear presentation of heavy metal concentrations in different parts of corn and alfalfa highlights the bioaccumulation patterns, with a notable distinction between root and above-ground parts. The research successfully establishes that corn roots tend to accumulate higher concentrations of vanadium, cadmium, chromium, and copper, while alfalfa roots predominantly accumulate iron. The study also indicates that manganese is concentrated in corn leaves, while nickel and lead are found in the above-ground part of alfalfa.

The data are presented in well-structured tables, which contribute to the clarity and accessibility of the findings. The initial soil analysis, heavy metal content in plant fractions, and post-plant removal soil analysis are systematically documented. The inclusion of soil pH values further enhances the interpretation of heavy metal mobility and plant uptake.

Overall, the study is well-executed and contributes valuable insights into the bioaccumulation of heavy metals in agricultural crops in industrially impacted regions. The research methodology is robust, and the findings are presented in a clear and structured manner. The study successfully meets its objectives of assessing heavy metal accumulation in corn and alfalfa and provides significant data that may inform future soil decontamination and environmental management strategies.

This research is a valuable contribution to environmental science and agricultural sustainability, particularly in areas affected by industrial pollution.