



DOI: [10.5958/2249-7137.2021.02116.9](https://doi.org/10.5958/2249-7137.2021.02116.9)

## A REVIEW ON SIDE EFFECT OF HEAVY METALS IN AGRICULTURE

Dr. Subrata Das\*; Dr. Sudheesh Shukla\*\*; Mr. Vikas Kumar\*\*\*

<sup>1,2</sup>School of Biomedical Engineering,  
Faculty of Engineering and Technology,  
Shobhit Institute of Engineering and Technology,  
(Deemed to be University), Meerut, INDIA

Email id: [subrata.das@shobhituniversity.ac.in](mailto:subrata.das@shobhituniversity.ac.in), [sudheesh.shukla@shobhituniversity.ac.in](mailto:sudheesh.shukla@shobhituniversity.ac.in)

\*\*\*School of Agriculture Technology and Agriinformatics,  
Faculty of Engineering and Technology,  
Shobhit Institute of Engineering and Technology,  
(Deemed to be University), Meerut, INDIA  
Email id: [vikas.panwar@shobhituniversity.ac.in](mailto:vikas.panwar@shobhituniversity.ac.in)

### ABSTRACT

*When heavy metals are exposed to stress, they declinate into molecular oxygens, releasing highly reactive transitional chemical products such as hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), superoxide radicals, and hydroxyl radicals, all of which are classified as reactive oxygens. Heavy metal pollution is a serious global environmental problem because it disrupts plant growth and causes genetic dissimilarity. Heavy metals, both necessary and non-essential, have similar fatal effects on plants, such as poor biomass accretion, chlorosis, growth inhibition, photosynthetic inhibition, altered water balance and nutrient integration, and senescence, which ultimately leads to plant disease. The goal of the research was to look at the impacts of heavy metals on plants and biological systems, as well as remediation techniques. Precipitation, Biosorption, Ion Exchange, and Filtration are all efficient techniques for overcoming this issue, but they are not cost-effective. Phytoremediation was shown to be the most efficient and cost-effective method in this respect. Although bioremediation seems to be the greatest option, it does have certain drawbacks. In order to use this technique effectively, a longer study must be accompanied in order to decrease the constraint.*

**KEYWORDS:** Agriculture, Anthropogenic, Metals, Pollution, Soil.

**REFERENCES**

1. S. J. Parikh and B. R. James, "Soil: The Foundation of Agriculture Agriculture," *Nat. Educ. Knowl.*, 2012.
2. B. Sanjai and W. Resources, "Soil : The Foundation of Agriculture Agriculture and Human Society," *Nat. Educ. Knowl. Proj.*, 2014.
3. J. A. Sandor and J. A. Homburg, "Anthropogenic Soil Change in Ancient and Traditional Agricultural Fields in Arid to Semiarid Regions of the Americas," *J. Ethnobiol.*, 2017, doi: 10.2993/0278-0771-37.2.196.
4. D. R. Montgomery, "Soil erosion and agricultural sustainability," *Proc. Natl. Acad. Sci. U. S. A.*, 2007, doi: 10.1073/pnas.0611508104.
5. A. Zaidi, M. Oves, E. Ahmad, and M. S. Khan, "Importance of Free-Living Fungi in Heavy Metal Remediation," 2011.
6. A. Mahar *et al.*, "Challenges and opportunities in the phytoremediation of heavy metals contaminated soils: A review," *Ecotoxicology and Environmental Safety*. 2016, doi: 10.1016/j.ecoenv.2015.12.023.
7. A. N. Ganeshamurthy, L. R. Varalakshmi, and H. P. Sumangala, "Environmental risks associated with heavy metal contamination in soil, water and plants in urban and periurban agriculture," *J. Hortic. Sci.*, 2008.
8. S. Arora, "Review of Heavy Metal Contamination in Soil," *Int. J. Environ. Sci. Nat. Resour.*, 2017, doi: 10.19080/ijesnr.2017.03.555625.
9. T. Rahman and M. F. Seraj, "Available Approaches of Remediation and Stabilisation of Metal Contamination in Soil: A Review," *Am. J. Plant Sci.*, 2018, doi: 10.4236/ajps.2018.910148.
10. M. Monachese, J. P. Burton, and G. Reid, "Bioremediation and tolerance of humans to heavy metals through microbial processes: A potential role for probiotics?," *Applied and Environmental Microbiology*. 2012, doi: 0.1128/AEM.01665-12.