Review of: "Synthesis, Characterization and Ameliorative Effect of Iron Oxide Nanoparticles on Saline-Stressed Zea Mays"

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Potential competing interests: No potential competing interests to declare.

The study on the synthesis of iron oxide nanoparticles (FeONPs) using Diodella sarmentosa leaf extract and their application in mitigating salinity stress in Zea mays has significant findings. However, more research is needed to understand the specific roles and mechanisms of FeONPs in influencing photosynthetic pigments and antioxidant activities in plants under salt stress. The impact of nanoparticle size on effectiveness, environmental implications, and long-term effects on plant growth and soil health should be addressed. Comparisons between foliar application methods and other nanoparticle treatments and potential phytotoxicity risks need clearer articulation and mitigation strategies. Optimization of the synthesis process and understanding how functional groups on FeONPs influence their interaction with plant biological systems will strengthen the study's contribution to plant nanotechnology and stress physiology.

Comments:

1. What specific features of the Diodella sarmentosa leaf extract contribute to the effective synthesis of iron oxide nanoparticles (FeONPs)?
2. How do the sizes of the synthesized FeONPs influence their efficacy in ameliorating salinity stress in Zea mays?
3. Can authors provide details on the mechanism by which FeONPs enhance photosynthetic pigments and antioxidant enzyme activities in Zea mays under salt stress?
4. How does the foliar application method of FeONPs compare to other application methods in terms of efficiency and uptake by Zea mays?
5. Could the presence of specific functional groups identified by FTIR analysis be correlated with the stability and biological activity of FeONPs?
6. What are the potential environmental impacts of using FeONPs in agriculture, particularly concerning soil health and non-target organisms?
7. How does the amorphous nature of the synthesized FeONPs contribute to their activity in plants?
8. Can authors elaborate on the role of the different absorption peaks identified in the UV-vis spectra in determining the properties and reactivity of FeONPs?
9. What are the long-term effects of using FeONPs on Zea mays growth, yield, and quality?
10. Is there a risk of phytotoxicity associated with the foliar application of FeONPs, and how can it be mitigated?
11. How do the changes in root and shoot length of Zea mays treated with FeONPs compare with those treated with

traditional salt stress ameliorators?

12. Can the synthesis process of FeONPs be optimized to improve their efficacy in salt stress amelioration?
13. How do the identified functional groups on the surface of FeONPs influence their interaction with plant cells and biological molecules?
14. What are the specific roles of catalase and superoxide dismutase activities in mitigating oxidative stress in salinized Zea mays treated with FeONPs?
15. Could authors explore the potential synergistic effects of FeONPs with other nanoparticles or treatments to further enhance the tolerance of Zea mays to salinity stress?