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.

I appreciate the comprehensive research conducted on the synthesis, characterization, and the positive impact of iron oxide nanoparticles on saline-stressed Zea mays. The manuscript provides valuable insights into the potential use of nanotechnology to enhance the stress tolerance of important agricultural crops like maize. The detailed analysis of nanoparticle behavior and their ameliorative effects on plant stress response highlights the importance of this study in the field of agricultural science. By adding a few points, we can improve the manuscript strategies that can contribute to the significance of this research in addressing crucial challenges in food security and crop resilience, thus helping the betterment of the manuscript.

Comments to authors:

1. In the introduction part, connect the present concept to the UN SDGs to link to sustainability.
2. What specific properties or bioactivities of Diodella sarmentosa led researchers to investigate its potential applications, **as a reducing agent for FeONP synthesis**?
3. Were any controls used during the extraction process? If so, what were they and why were they important?
4. Mention what potential limitations or drawbacks might exist in using the heating method for extracting bioactive compounds from plant materials.
5. Beyond the mentioned applications (photocatalysis, biomedicine, etc.), are there any other potential areas where the extracted compounds from Diodella sarmentosa could be explored?
6. Is further research needed to characterize and understand the potential applications of the isolated compounds from the crude extract?
7. **What is the intended application of the FeONPs synthesized using the Diodella sarmentosa extract?**
8. **Why was deionized water used for the initial reconstitution of the extract?**
9. **What is the rationale behind the prescribed concentration of $FeCl_3.6H_2O$ solution (0.02 M)?**
10. What specific rationale exists for choosing a 4% sodium hypochlorite solution and a 1-minute sterilization duration for the Zea mays grains?
11. Were any additional steps taken to ensure the sterility of the soil beyond sieving?
12. What is the research question or hypothesis being addressed through this experiment?
13. Why were three different treatments (NaCl, FeONP, $FeCl_3$) used for pots B, D, and E, and why were these specific

substances chosen?

14. Was there a reason for only providing potable water for the first 15 days of growth before introducing the treatments?
15. What specific parameters were measured and analyzed after the 45-day growth period?
16. What controls were used in this experiment, and how were they incorporated?
17. What specific plant species was used for this experiment, and was there a specific reason for choosing this plant?
18. Why was the supernatant, obtained after centrifugation, chosen for further analysis and not the entire homogenate?
19. While the references for the methods used are provided, can the text be simplified by briefly explaining the general principles behind the assays for SOD and CAT activities?
20. What were the expected outcomes or hypotheses regarding the levels of SOD and CAT activity in the plant tissues?
21. Were any controls employed in these assays, and if so, what were they and how were they included?

1. **How was the chlorophyll and carotenoid content measured in the Zea mays plants, and can the text be improved by providing more specific details about the methods used?**
2. **What specific activities of SOD and CAD enzymes were measured, and how were these activities assessed?**
3. **Were any control groups included in the experiment (e.g., plants not treated with FeONPs or plants exposed to salinity without FeONPs)?**
4. **Beyond the observations of increased chlorophyll, carotenoid content, and enzyme activity, were any other parameters measured to assess the impact of FeONPs on plant health and salinity tolerance (e.g., plant growth, biomass)?**
5. **What are the potential limitations or drawbacks of using FeONPs as a strategy for enhancing plant tolerance to salinity, and are there any environmental or safety concerns to consider?**