Review of: "Synthesis of Nickel Nanoparticles Using Ionic Liquid-Based Extract from Amaranthus viridis and Their Antibacterial Activity"

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Potential competing interests: No potential competing interests to declare.

Reviewer's Report: Synthesis of Nickel Nanoparticles Using Ionic Liquid-Based Extract from *Amaranthus viridis* and Their Antibacterial Activity

The manuscript investigates the synthesis of nickel nanoparticles (Ni NPs) using a green chemistry approach, employing an ionic liquid-based extract of *Amaranthus viridis* and its subsequent antibacterial activities. The research addresses an important topic in nanotechnology and materials science, particularly in the growing field of environmentally friendly nanoparticle synthesis. The manuscript is well-structured, providing a coherent narrative from synthesis methods to antibacterial efficacy. However, there are some areas that require attention, clarification, and improvement before being suitable for publication.

- The introduction provides sufficient background on nanoparticle synthesis but lacks depth in discussing the specific advantages of using *Amaranthus viridis*. Further elaboration on why *A. viridis* was chosen and how it compares to other plant-based synthesis methods should be included.
- The problem statement regarding the global issue of antibiotic resistance is too brief. Expanding on how Ni NPs address this specific problem would strengthen the study's relevance.
- The paper mentions zones of inhibition but provides no statistical analysis. To support claims of antibacterial efficacy, replicates and statistical analysis should be included. It is also important to compare the efficacy of Ni NPs with commercially available antibiotics to provide context.
- The discussion lacks a detailed mechanism explaining how Ni NPs exert antibacterial effects. A deeper dive into the interaction between Ni NPs and bacterial cell walls or the production of reactive oxygen species (ROS) would improve understanding.
- The discussion is largely descriptive and lacks critical comparison with existing literature on Ni NPs or other nanoparticles synthesized using green methods. More comparative analysis and exploration of the benefits and limitations of this particular approach are needed.
- There are a few typographical and grammatical errors. A thorough proofreading is needed.
- Bacterial scientific names are not italicized.

Overall, the study shows potential, but it requires revisions. It is acceptable for publication after major revisions that

address the methodological concerns, enhance the discussion, and provide more statistical and comparative analyses.