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.

Manuscript No: **3JQEXB**

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

Comments To the Editor: Please find the comments on the manuscript after reviewing:

Manuscript **3JQEXB** under review contains the synthesis of nickel nanoparticles from Amaranthus viridis and their antibacterial activity. The authors have made a good effort to express their results systematically with proper discussion. However, there are many technical & scientific discrepancies in the present work. Hence, this manuscript is recommended for major revision.

Response: **Recommended for publication with major revision**

Comments to Authors:

1. The manuscript needs technical/grammatical modifications, so read & revise it carefully.
2. Use the SI System of units for all physical quantities.
3. Use only a single style for Amaranthus Viridis, Aeromonas hydrophilia, Staphylococcus aureus, and Escherichia coli, etc., throughout the manuscript.
4. Result & Discussion section:

3.1 UV-Vis analysis of Ni NPs:

(i) The whole section is wrong because it belongs to section 2.

(ii) Authors must discuss here the UV spectra for NPs, i.e., Figure 1, and calculate the optical bandgap from the absorption edge. For this, they can use & must cite the paper: **DOI: 10.1515/msp-2016-0033**

(iii) In Figure 1, the x-axis; check the spelling of wavelength and the y-axis; it must be absorbance (%).

3.2. FTIR analysis:

(i) The wavenumber unit must be cm^{-1} throughout the section.

(ii) In Figure 2, the x-axis; add the title wavenumber (cm^{1})

(iii) There must be Ni-O and Ni-Ni band existence **<550 cm^{-1}.** Therefore, check the peak analysis. The following paper must be included in this regard: **https://doi.org/10.1515/ijmr-2023-0281**

3.3. X-ray diffraction analysis (XRD)

(i) The Debye-Scherrer formula either works for size calculation from a prominent peak or the average size calculated from all peaks. Also, there is only one sample; hence, the size by XRD must be a single value. Authors must cite the following work here: **doi: 10.5101/nbe.v13i2.p172-178**

3.5. Field emission scanning electron microscopy (FESEM)

(i) Authors must describe why they have Cl and Ag peaks in the EDX spectra.

(ii) Figure 5 must have indications (a) and (b) for FESEM & EDX.

3.6. Zeta size and zeta potential

(i) Figure 6 must have indications (a) and (b) for DLS & Zeta Potential.

(ii) In particle size analysis, Figure 6, the second peak also lies around 10000 nm. So the authors must give a reason for it also.

Authors must cite this paper here: **https://doi.org/10.1007/s00339-023-07138-3**

3.7. Anti-bacterial activity

(i) Authors must specify why nanoparticles diffuse the bacterial growth using & citing this paper.
https://doi.org/10.1007/s00339-021-