Review of: "Toxicity of NiO nanoparticles to soil nutrient availability and herbage N uptake from poultry manure"

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The article is of interest due to the use of organic amendments as a soil fertilizer is a way to valorise a residue by taking advance of its nutrients. The introduction of NiO NPs to test their effects on the nutrient assimilation from the poultry manure (PM) by plants or microorganisms is justified because the presence of these nanoparticles in the environment is increasing. Considering that Ni cannot be degraded in soil, it is expected that this metal will accumulate over time. Therefore, from an environmental point of view, the introduction of a high test concentration of NiO NPs is useful to establish a maximum acceptable concentration for this chemical in the presence of PM. The work includes the study of different parameters in the soil and in organisms. It is well designed and structured.

However, despite the general positive consideration some weak points are the following.

1. The introduction is a bit confusing because it talks about issues that are not addressed in the work, such as the effects of metallic nanoparticles on aquatic organisms or on the biochemical parameters (biomarkers) of soil organisms. This diverts attention away from the topics actually studied.
2. The methodology used to quantify the root Ni uptake by the washing of the roots under tap water, is not sufficient. Metal cannot be fully desorbed from the root surface by this method as demonstrated Zhou et al. (2011) for CuO NPs. It is necessary to rinse the roots with complexing agents or at least slightly acidic water. I´m afraid that results in Ni uptakes by roots are overestimated, and the figure 5B is quantifying not only Ni uptake but Ni adsorbed on roots as well. Additionally, I miss the determination of available Ni in soil. It is true that the total Ni content is included in Fig3A, but this is no the available fraction of metal for plants and microorganism. Perhaps the available Ni could better explain the Ni uptake by roots.
3. The authors determine the available P and K in soil and say that N, P and K are immobilized by microorganisms. Literally “The microbial biomass acted as a sink of different nutrients in the soil”. However, in the plants´ tissues, only N is determined but P and K not. Despite available P and K in soil did not change, the P and K in plants could be higher than those of the controls due to the increased microbial activity in the rhizosphere, which can induce a greater absorption of nutrients.

The discussion of results is well done and relates the data in a very coherent way. As a result, the conclusions are clear and allow establishing the range of concentrations of NiO NPs that improve the use of PM nutrients, mainly for soil microorganisms.

Overall the work is very interesting.