

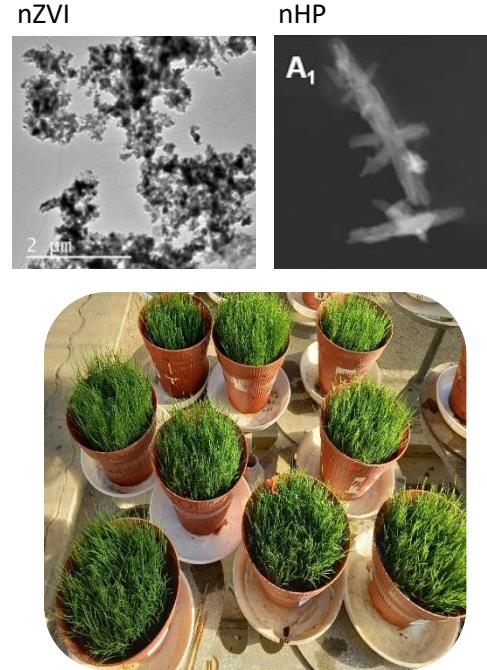
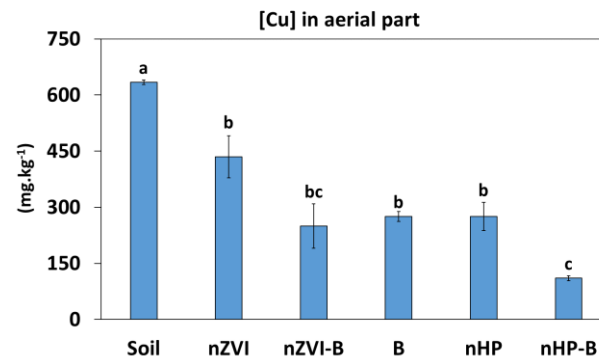
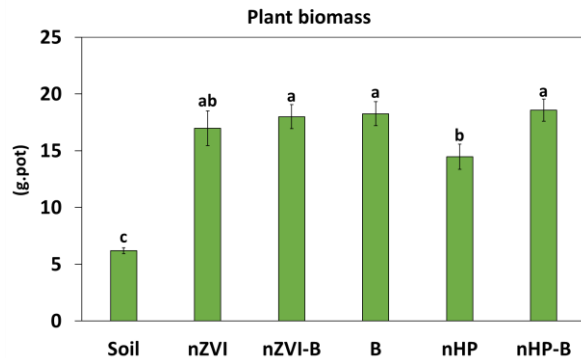
Greenhouse experiment

1 kg pots containing the polluted soil were amended with:

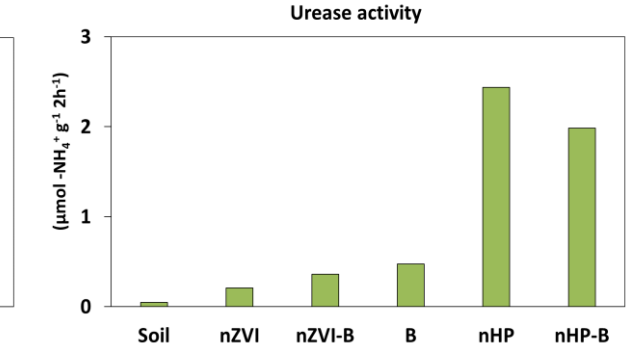
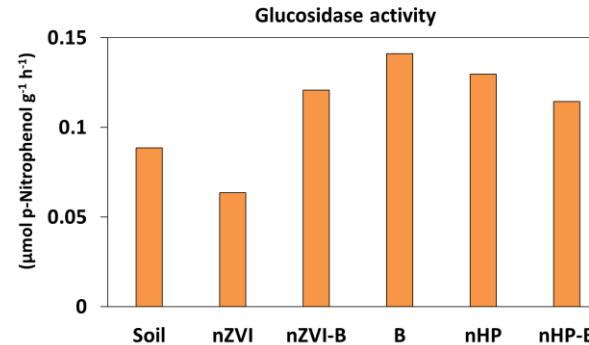
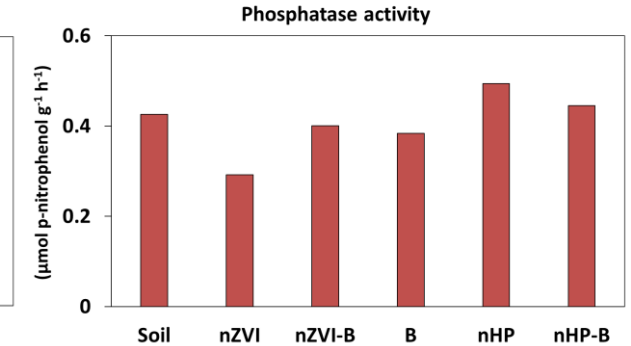
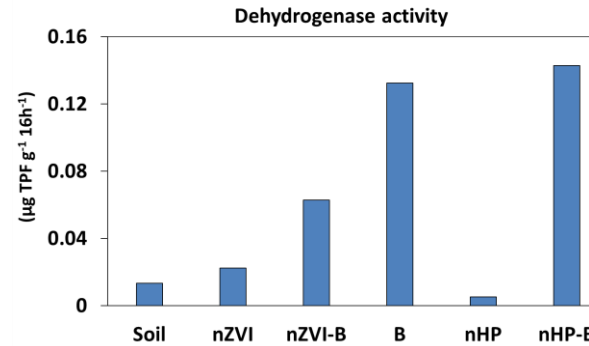
- 2% Zero Valent Iron nanoparticles (nZVI).
- 1% Hydroxyapatite nanoparticles (nHP).
- 5% Biochar (B).
- Combination of Biochar and each type of nanoparticle (NP).

For 45 days. *Lolium perenne* L. was used to evaluate the impact of the treatments on plant growth and metals accumulation. Furthermore, enzymatic activities (EA) in soils were determined as biological indicators.

Plant growth and metals accumulation



Biological indicators



Conclusions

In general, the application of the amendments favored plant development and decreased the Cu translocation to the aerial part. Furthermore, amendments increased the functioning of the overall microbial community, and those associated to C and N cycling. The soil amended with biochar, alone and in combination with NP, presented the greatest EA. Differences on EA (e.g. dehydrogenase and urease) between NP treatments were also detected.