



Title: Microbial Response to the Application of Amendments in a Contaminated Soil with Trace Elements

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Abstract: Problem Statement: The anthropogenic activities can cause adverse effects in soils, increasing in some situations trace elements contents, impacting negatively both the microbial biomass and activity. Among the practices used for the recovery of soil quality we can find the application of organic amendments or the product of their composting. These can adsorb trace elements decreasing their availability and increasing the soil microbial biomass. The microorganisms of the soil use to be considered as sensitive biological indicators of the changes produced in the soil quality. Approach: One processes to quantify soil biological activity is the respiration. The aim was to evaluate the effects of two organic amendments application on soil microbial activity, in a soil contaminated with copper (Cu), zinc (Zn) and chromium (Cr). To prove the raised aim we quantified CO₂-C release. Results: The results showed that at the end of the incubation period, as much in contaminated soils as in soils without contamination, the total activity of microorganisms was significantly increased by the application of organic amendments ($p = 0.0062$ and $p = 0.0005$, respectively). The application of both composts to slightly acid soils increased the initial and final values of pH. There was no evidence of modification in Electrical Conductivity (EC) because of compost application. At the end of the incubation period a negative relationship was observed between EC and CO₂-C ($R^2 = 0.74$, $p = 0.0028$). Conclusions: The obtained results in this study suggested that it was possible to increase the total activity of soil microorganisms and to reduce the bioavailability of Cu, Cr and Zn in a contaminated soil. As a result, CO₂-C release is a sensitive index of the soil quality, at least in the experimental conditions of this essay.