



Approach to study of Cu, Ni and Zn content in soil for ecotoxicological risk assessment

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Current Spanish legislation on contaminated soils defines contaminated soil as “that whose characteristics have been negatively altered by the presence of dangerous human-derived chemical components whose concentration is such that it is an unacceptable risk for human health or the environment and has been expressly declared as such by legal ruling”. Regarding heavy metals, the Spanish Autonomous Communities will promote measures to obtain generic reference values to declare a soil to be contaminated. In the Valencian Community, these reference values still do not exist. So if the protection of ecosystems is considered a priority to declare a soil to be contaminated and to assess the level of risk, emergency toxicity tests and seed growth in land plants are resorted to, or tests with aquatic organisms or other experiments with leached soils obtained by standard procedures are carried out. We studied the toxic effects of calcareous contaminated soils by Cu, Ni and Zn on marine bacterium *Vibrio fisheri* (MicrotoxR test assay) (1) and on barley (*Hordeum vulgare L.*) in plate (germination index) (2) and pot (UNE 77301) (3) experiments for the purpose of establishing the Cu, Ni and Zn concentrations in soil which may lead to toxicity in order to observe, therefore, whether there is any likelihood of these pollutants coming into contact with any receptor and if adverse effects exist for living beings and the environment. The results showed significant differences among the three types of tests done but, in all cases, the concentrations needed to reflect toxicity effect on organisms were around 20 -70 (Cu and Ni) to 1000 (Zn) times higher than the levels of the control soils. The sensitivity order of the bio-assay was: (1) < (3) < (2). We would like to thank Spanish government-MICINN for partial funding and support (MICINN, project CGL2006-09776).