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Títol de la tesi	Ecotoxicological bioassays as complementary tools for the risk assessment of contaminated soils
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(Mínim 1 i màxim 4, podeu veure els codis a http://doctorat.upc.edu/gestio-academica/impresos/tesi-matricula-i-diposit/codis-unesco)

Resum de la tesi de 4000 caràcters màxim (si supera els 4000 es tallarà automàticament)

Environmental impacts associated to the unstoppable growth of human population are threatening ecosystems worldwide. Among them, soil ecosystems are becoming increasingly degraded due to their unsustainable use and management, which is leading to the loss of a key resource that is fundamental to life on the planet. As the interface between land, air and water, soil ecosystems perform many cultural, economic, environmental, and social functions that are worthy of protection. During the last decades, several legislative tools have been created with varying success aiming to ensure soil protection. Even so, soils are major sinks of anthropogenic pollutants and, in consequence, human-induced contamination still represents a serious threat for soil ecosystems due to the massive release of metals, hydrocarbons and pesticides (among others). In this context, the application of methodologies for the proper assessment and remediation of contaminated soils has become mandatory if their ability to perform their functions is to be preserved. The risks associated to soil contamination have been traditionally evaluated through chemical quantification of pollutants. Unfortunately, such techniques have proven insufficient to properly assess soil pollution because they can only focus on concentrations of specific contaminants and they obviate the interactions between pollutants, soil matrix and soil inhabiting organisms. Ecotoxicity bioassays, on the other hand, do integrate all these interactions and can become very valuable tools for a better and more realistic assessment of the effects of contaminants in soil ecosystems. In this work, chemical analysis together with terrestrial and aquatic ecotoxicity bioassays are applied to samples from contaminated sites and to artificially-contaminated soils in order to evaluate their associated ecological risks. The suitability of different ecotoxicity tests is assessed according to the nature of the soil contaminant, and the parameters responsible of the toxicity to organisms are analyzed. The selected bioassays include measurements on different endpoints (mortality, reduced growth, etc.), exposure times (acute or chronic), effective responses (lethal or sublethal), and organisms (earthworms, collembolans, plants, bacteria, algae, daphnids and fishes). This study proves that the application of ecotoxicity bioassays is not only useful but also desirable as a complementary tool for a reliable assessment of contaminated soils.

In Chapter 1, the problem of soil contamination, the main soil pollutants and the available tools for soil risk assessment are briefly introduced. The hypothesis of this work and its main objectives are also presented. Finally, the methodology applied during the performance of this work is summarized.

In Chapter 2, the environmental threats of soils surrounding and abandoned mercury mine in Valle del Azogue (Almería, Spain) are studied.

Chapter 3 assesses the risks associated to an abandoned F-Ba-Pb-Zn mining area in Osor (Girona, Spain).

Chapter 4 evaluates the ecological impacts of soils from the abandoned mercury mining district of Almadén (Ciudad Real, Spain).

In Chapter 5, the remediation procedure of a hydrocarbon-contaminated soil is assessed through ecotoxicity tests and chemical analysis and their suitability as monitoring tools of hydrocarbon degradation is studied.

In Chapter 6, the risks that field doses of the (until recently) massively-applied insecticide imidacloprid (commercial formulation Confidor®) pose for the terrestrial and aquatic compartments are studied.

Chapter 7 presents an alternative procedure to test the behavioral response of collembolans Folsomia candida in avoidance tests.

Chapter 8 includes the most relevant information and presents the main conclusions.

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