

Estimation of risk from bioassay data

Agnès Y. Renoux and Jean-Pierre Trépanier

Even though risk assessment procedures based on the modeling of environmental conditions are widely used, mistaken conclusions can be drawn if information from the specific site is missing (i.e. lack of reference values or chemicals not characterized). For this reason, emphasis on the development and use of ecotoxicological bioassays was proposed during the last decade as a complementary tool for risk assessment to predict the hazard to biological receptors at a specific site. However, the ecotoxicological studies can generate bioassay data difficult to manage and to compare with risk estimates obtained with the more traditional modeling approaches. This presentation proposes a method of calculating risk indices from the results of bioassays for organisms in direct contact with soil. This method has been designed so as to allow a direct comparison of the values of risk indices obtained from bioassays and from modeling and has been integrated into a software program for ecotoxicological risk assessment at contaminated sites, TerraSys v.1.0. This software supports the search for correlations between the bioassay results and the measured concentrations of chemicals on the site. The analyst may also use it to "integrate" the results of the two approaches, in such a way as to benefit from their complementary aspects, accounting for the strengths and weaknesses of each approach and considering the level of confidence attached to each result. A case study will be presented to illustrate the management of bioassay data with this method and the integrated assessment of risks with TerraSys.

Keywords: Bioassay; Soil; Risk; Software