Prediction of Cadmium Toxicity to *Paronychiurus kimi* Using Central Composite Design (CCD) Related to pH and Organic Matter in OECD Artificial Soil

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Statistical experiment design was used to quantify the effect of soil characteristics (pH and organic matter) on the toxicity of cadmium to *Paronychiurus kimi* in OECD artificial soil. The toxicity of cadmium was affected by pH and organic matter significantly. The relationship between soil characteristics and toxicity was either linear or quadratic. These soil characteristics were very important for determining the 4 week survival rate, reproduction rate, and instantaneous rate of population increase (r_i). Using central composite design, response surface curve was developed to predict 4 week LC_{50}, EC_{50} for reproduction, and $r_i=0$ of cadmium to *P. kimi* as a function of pH and organic matter. The toxicity of cadmium to *P. kimi* increased with decreased pH and organic matter of artificial soil. The prediction model developed here can be used for more realistic risk assessments of metal contaminated soil in Korea.

Key words: Central Composite Design, *Paronychiurus kimi*, cadmium, soil ecotoxicology, soil characteristics