



Assessment of the effects on ecosystems, ecotoxicity and environment.

Title of Research:

18_S04-01

Exploring roles and simple estimation methods of species sensitivity distribution for deriving PNECs

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Summary of Research:

Species sensitivity distribution (SSD) has been internationally used to derive predicted no effect concentration (PNEC) in ecological risk assessment. In this study, we aimed to (1) develop statistical models to estimate log-normal SSD parameters (i.e., mean and standard deviation of SSD) based on limited data and (2) quantify the uncertainties associated with risk assessments by using SSD. For the former study (1), we first collected acute ecotoxicity data, and estimated SSDs for 64 chemicals. We developed best models for estimating those SSD parameters based on Akaike information criterion. In addition, we collected chronic ecotoxicity data, derived SSDs for 15 chemicals, and performed some preliminary analysis. For the latter study (2), we published a peer reviewed paper based on the results obtained last year and presented the results at the SETAC Europe 29th Annual Meeting. Based on standard deviations of acute SSDs estimated in the study (1), we also determined the magnitude of assessment factors required to determine more accurate PNECs for the ecosystem protection.

Timeline:

March 1, 2019 – February 29, 2020

Topics:

Poster presentation at JCIA LRI Annual Workshop 2019 “Exploring roles and simple estimation methods of species sensitivity distribution for deriving PNECs” (Tokyo, August 30th, 2019)

Publications:

1. Kiyon Sorgog and Masashi Kamo. Quantifying the precision of ecological risk: Conventional assessment factor method VS. species sensitivity distribution method. *Ecotoxicology and Environmental Safety*. Volume 183, 15, November 2019.
<https://doi.org/10.1016/j.ecoenv.2019.109494>
2. Poster presentation at the 29th SETAC Europe Annual Meeting at Helsinki, Finland from the 26th till the 30th of May 2019, titled Assessment factor and SSD methods: which one provides more protective threshold for the ecosystem against adverse effects of toxicants? by Kiyon Sorgog, Masashi Kamo, Yuichi Iwasaki, Wataru Naito.
3. Poster presentation at 25th annual meeting of the Japanese society of environmental toxicology, Tsukuba, Ibaraki, September 2019, titled Developing a new approach to predicting the species sensitivity distribution by limited data by Kiyon Sorgog, Yuichi Iwasaki.
4. Poster presentation at 54th Annual Conference of Japan Society on Water Environment, titled Comparison of performance ability of various assessment method by Kiyon Sorgog, Yuichi Iwasaki (March 16-18th 2020 at campus of Iwate university).