Bayesian inference of dynamical model evaluating deltamethrin effect on daphnia survival

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Keywords: Ecotoxicology, parameter fitting, predictive survival analysis

The estimation of toxicokinetic and toxicodynamic (TK-TD) models parameters is a real problem in research. These models highlight a dynamics of internalisation of a toxic compound and a dynamics of the damage that this contaminant will cause on an organism and of possible repairs on the latter. This coupling TK-TD makes it possible to connect these measurements at different times with the same set of parameters sometimes very important in number. In this paper, the focus is on assessing the long-term impact of deltamethrin effects on a sample of daphnia magna survival. We apply the Bayesian inference method to our survival data available in the Interdisciplinary Laboratory of Continental Environments (L.I.E.C) for estimating parameters from a survival model developed in Soren Vogel et al 2016 [1]. As for the estimation of the survival model parameters applied to our data, we use the downloadable library deBInfer [2] in the Comprehensive R Archive Network (CRAN), the directory deposite of R packages. It is a powerful approach offering a rigorous methodology for parameters inference well by modeling the existing links between unobservable states of a model, parameters and observable quantities.

References

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