Retrospective Evaluation of the Acute Fish Toxicity Test for Pesticide Registration

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The acute fish toxicity test is used to assess the potential risk of substances to aquatic organisms. In the United States (U.S.), the test is typically conducted in three different fish species: a cold and a warm freshwater species and a marine/estuarine species. Therefore, three separate acute fish toxicity tests are conducted for a single chemical, with each test potentially requiring 200 or more fish per chemical. We conducted a retrospective analysis of data submitted to the U.S. Environmental Protection Agency (EPA) to support pesticide registrations to determine whether reducing the number of species tested would impact the ability of pesticide risk assessments to identify and characterize potential risks to fish. Lethal concentration 50% (LC50) values and experimental details were extracted and curated from 762 acute fish toxicity studies submitted to EPA for pesticide registrations. From this data set, 87 substances had data from studies in three species that were considered acceptable based on defined criteria. Data were analyzed to determine any trends among species in terms of relative differences in acute toxicity LC50 values. Where a difference could be detected, coldwater species were most often the most sensitive species (26/45); for the remaining 42 substances there was no clear difference in species sensitivities. These results suggest that it may be possible to use data from as few as one species, thereby substantially reducing the number of fish required while still meeting risk protection goals. This project was funded in whole or in part with federal funds from the NIEHS, NIH under Contract No. HHSN273201500010C.