

Investigating Potential for Effects of Environmental Endocrine Disrupters on Wild Populations of Amphibians in UK and Japan: Status of Historical Databases and Review of Methods

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Concern over global declines among amphibians has resulted in increased interest in the effects of environmental contaminants on amphibian populations, and more recently, this has stimulated research on the potential adverse effects of environmental endocrine disrupters in amphibians. Laboratory studies of the effects of single chemicals on endocrine-relevant endpoints in amphibians, mainly anurans, models are valuable in characterizing sensitivity at the individual level and may yield useful bioassays for screening chemicals for endocrine toxicity (for example, thyroid disrupting activity). Nevertheless, in the UK and Japan as in many other countries, it has yet to be demonstrated unequivocally that the exposure of native amphibians to endocrine disrupting environmental contaminants results in adverse effects at the population level. Assessing the potential of such effects is likely to require an ecoepidemiological approach to investigate associations between predicted or actual exposure of amphibians to (endocrine disrupting) environmental contaminants and biologically meaningful responses at the population level. In turn, this demands recent but relatively long-term population trend data. We review two potential sources of such data for widespread UK anurans that could be used in such investigations: records for common frogs and common toads in several databases maintained by the Biological Records Centre (UK Government Centre for Ecology and Hydrology), and adult toad count data from 'Toads on Roads' schemes registered with the UK wildlife charity 'Froglife'. There were little abundance data in the BRC databases that could be used for this purpose, while count data from the Toads on Roads schemes is potentially confounded by the effects of local topology on the detection probabilities and operation of nonchemical anthropogenic stressors. For Japan, local and regional surveys of amphibians and national ecological censuses gathering amphibian data were reviewed to compile survey methodologies and these were compared with methods used in the UK and other countries. Substantial consensus exists in amphibian survey methodologies and this should be exploited in the initiation of coordinated monitoring programs for widespread and common anuran amphibians in Japan and the UK to generate long-term robust and standardized population trend data. Such data would support comparative ecoepidemiological assessments of the impact of environmental endocrine disrupters in these two cooperating countries.