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The value of zebrafish as an integrative model in ecotoxicology

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Bioassays play a basic role in different aspects of scientific approaches. Meanwhile, bioassays with zebrafish (which is an established model organism in different research areas) are increasingly being utilized in effect direct analysis. In this study, we are aiming to contribute for the optimal application of zebrafish bioassays in effect direct analysis. Over the recent decades, zebrafish bioassays have guided effect direct analysis of natural products and environmental samples. A vast majority of studies performed bioassays with embryos and early larvae, which allowed small-scale experimental setups. Furthermore, biotesting applied zebrafish methods in both screening phase as well as for further investigations. For dosing, several studies were performed for solvent exchange of extracts and fractions to dimethyl sulfoxide (DMSO) as carrier. However, high DMSO concentrations were required for the testing of complex matrix extracts, indicating that future studies might benefit from the evaluation of alternative carrier solvents or passive dosing. Finally, a great advantage of zebrafish bioassays in effect direct analysis of environmental samples is the availability of mechanism- and endpoint-specific method for the identification of important classes of contaminants. The evaluation of estrogenic and non-estrogenic endpoints is considered to be a promising strategy to facilitate the identification of environmental contaminants and their impacts. Confirming that, the action of alkylphenols (APs) on zebrafish (*Danio rerio*) embryos were assayed. Embryos were subjected to different doses of APs to study the effect of such class of chemicals on the fish embryogenesis during the first 120 hours of fertilization. General morphological abnormalities and teratogenecity scores were analyzed.

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