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Assessing bioaccumulation of cadmium and lead in the Golden apple snail, *Pomacea diffusa,* under empirical conditions

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Bioaccumulation studies can be used to evaluate the level of pollution in aquatic ecosystems. Snails typically serve as good indicators due to their relatively low mobility in comparison to fish or other macroinvertebrates. The overall aim of the present study was to ascertain the accumulation levels for cadmium (Cd) and lead (Pb) using the Golden apple snail (*Pomacea diffusa*) through empirical exposure trials. Accordingly, five concentrations (5.0 to 25 µg dm^{-3}) were used with 12 snails per treatments/ control tank conducted in triplicate and continuously exposed over 28 days. Snails were collected from an aquarium. The weekly accumulation levels in dry snail flesh were analyzed using Atomic Absorption Spectrophotometry. Exposure to Cd and Pb at 5.0 µg dm^{-3} and above, caused accumulation of the heavy metals with the accumulation levels increasing with exposure in a significant and dose-dependent manner ($r = 0.95$, $p < 0.05$ for Cd and $r = 0.95$, $p < 0.05$ for Pb). The levels of accumulation at all exposures was also time dependent. Based on the results at the end of the trial (i.e. at day 28), the BAF (Bio Accumulation Factor) for Cd (6.58 µg kg^{-1} day^{-1}) was greater than that for Pb (4.03 µg kg^{-1} day^{-1}) indicating that, at least for *Pomacea diffusa*, there is a higher tendency for Cd uptake relative to the uptake of Pb. This suggests that a given species may show differential accumulation patterns for various heavy metal contaminants. Of significant concern is the fact that the concentrations used in the empirical trials fall within the levels Cd and Pb recorded from many local water bodies that support aquatic biota and from where mussels, fish and shell fish are frequently harvested for human consumption. The documented dose-dependent relationships between accumulation and exposure of heavy metals can be used to make predictions about the levels of contamination. In this respect, due to the absence of an apparent adverse effect on mortality and behavior, the invasive Golden apple snail (*Pomacea diffusa*) could be used as an ideal biomonitoring tool for pollution studies.

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