Toxicity of Rotenone to Larval Amphibians

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Piscicide use in fisheries management is becoming increasingly common. Rotenone, specifically, is being used to remove non-native fish species from aquatic systems. While

the effects of this chemical on fish are well-studied, the impacts of rotenone on non-target species, such as amphibians, are not well known. This study was conducted to determine the toxicity of rotenone on two native species of tadpoles in Montana – *Rana luteiventris* and *Bufo boreas* – under laboratory conditions. For each species, tadpoles at three developmental stages were exposed to either a control or CFT Legumine (5% active rotenone) at one of four doses (0.1 mg/L, 0.5 mg/L, 1 mg/L, 2 mg/L). Total exposure time was 96 hours. Parameters measured included mortality at 96 hrs post treatment, and in the survivors, weight, Snout-Urostyle Length, and time to metamorphosis. In addition to the rotenone exposure trials, a recovery trial was conducted with early stage spotted frog tadpoles to determine survivability of tadpoles exposed to rotenone at 1 mg/L and then placed in clean water. Spotted frog tadpoles exposed to rotenone at 1mg/L – typical field application dose– experienced significantly greater mortality than control tadpoles. Although all stages of frog tadpoles exposed to rotenone were negatively affected by the chemical, the effect was worse at earlier life stages. Early stage toad tadpoles were significantly more resistant to rotenone exposure at 1 mg/L than early stage spotted frog tadpoles; however they were still negatively affected by the chemical. Sub-lethal effects, though statistically different between control and exposed survivors in two instances, were not consistent and therefore thought not to be biologically significant. Spotted frog tadpoles exposed to rotenone and then transferred to clean water experienced significantly lower mortality than those exposed for the full 96 hrs. Overall, rotenone exposure was found to be lethal to tadpoles of both species at all three developmental stages though mortality was not uniform across dosages or age groups.