
EFFECTS OF CARBON DIOXIDE ON RAINBOW TROUT LARVAE: APPLICATION FOR INVASIVE FISH ERADICATION

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Currently, efforts are underway to eradicate invasive fish species that threaten the ecological integrity of aquatic ecosystems. Several studies have examined the effects of anesthetizing fish for easier handling, surgical procedures, tagging and management. Carbon Dioxide (CO₂) is an approved and efficient anesthetic for adult fish in medicine and aquaculture and is favorable due to lack of residues, zero withdrawal period and does not need to be registered as its classification is generally regarded as safe (GRAS). Carbon dioxide has also shown to have lethal effects on other life history stages of fish. In this study, various early life stages of Rainbow trout (*Oncorhynchus mykiss*) larvae were exposed to CO₂ in the form of dry ice pellets to determine the critical period of sensitivity for mortality in a model salmonid species. Studies were conducted in aluminum tanks ($n = 3$ tanks per treatment, with three chambers in each tank with 40 larvae per chamber) with 68 liters of filtered creek water (dissolved CO₂ = 4 mg/l, dissolved O₂ = 8.125 mg/l, pH = 7.78, temperature = 12.9 °C, conductivity = -55 mV, Total alkalinity as CaCO₃ = 160 mg/l). Larvae exposed at post hatch day 10 had increased susceptibility to CO₂, when compared with earlier embryonic stages. The results of the experiment indicate that early rainbow trout life history stages are susceptible to CO₂ but only at late embryonic stages and may have implications for systematically eradicating invasive salmonids.