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Changes in the whole body mineral concentration of the Rainbow trout (*Oncorhynchus mykiss*Walbaum) yolk-sac fry exposed to various combinations of aluminium and calcium concentrations in two different acidic water

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Abstract: The effects of 12 combinations of pH (4.5 and 7.0), aluminium (4 and 8 $\mu\text{mol/L}$) and calcium (10 and 100 $\mu\text{mol/L}$) on survival and body mineral (Ca, Mg, K and Na) concentrations of rainbow trout (*Oncorhynchus mykiss*Walbaum) at the yolk-sac stage were investigated. Mortality was low (< 17%) in most combinations and increased (> 27%) in the presence of aluminium and low pH (4.5). Aluminium (4 and 8 $\mu\text{mol/L}$) impaired larval development, net uptake of calcium, potassium and sodium, and slightly increased the net loss of magnesium. It was found that these effects of aluminium were more severe at low calcium concentration (10 $\mu\text{mol/L}$) and low pH (4.5) than at high calcium concentration (100 $\mu\text{mol/L}$) and high pH (7.0). In the absence of aluminium, only the combination of low pH (4.5) and low calcium (10 $\mu\text{mol/L}$) significantly reduced body mineral concentrations.

Key Words: Aluminium, pH, calcium, rainbow trout, *Oncorhynchus mykiss*, body mineral concentration.

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