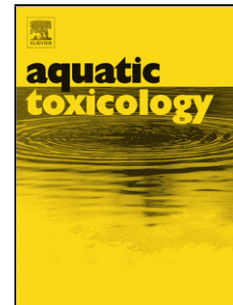


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Negative impacts of elevated nitrate on physiological performance are not exacerbated by low pH

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Highlights:

- Combined exposure to nitrate and pH reduced aerobic scope.
- Nitrate alone accounted for a 59 % reduction in maximum oxygen uptake.
- Exposure to low pH reduced survival and high nitrate concentrations reduced chelae strength and righting responses.

Abstract

Multiple environmental stressors, including nutrient effluents (i.e. nitrates [NO_3^-]) and altered pH regimes, influence the persistence of freshwater species in anthropogenically disturbed habitats. Independently, nitrate and low pH affect energy allocation by increasing maintenance costs and disrupting oxygen uptake, which ultimately results in impacts upon whole animal performance. However, the interaction between these two stressors has not been characterised. To address this, the effects of nitrate and pH and their interaction on aerobic scope and physiological performance were investigated in the blueclaw crayfish, *Cherax destructor*. Crayfish were exposed to a 2×3 factorial combination, with two pH levels (pH 5.0 and 7.0) and three nitrate concentrations (0, 50 and $100 \text{ mg L}^{-1} \text{NO}_3^-$). Crayfish were exposed to experimental conditions for 65 days and growth and survival were monitored. Aerobic scope (i.e. maximal – standard oxygen uptake) was measured at six time points (1, 3, 5, 7, 14, and 21 days) during exposure to experimental treatments. Crayfish performance was assessed after 28 days, by measuring chelae strength and whole animal activity

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