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Measurement of temperature and salinity effects on oxygen consumption of *Artemia franciscana* K., measured using fibre-optic oxygen microsensors

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Abstract:

Oxygen consumption rates of nauplii of the brine shrimp *Artemia franciscana* Kellogg 1906 were determined over a range of salinities from 10 to 110 ppm, in temperatures from 0 to 30 °C, using a multi-factorial design. The oxygen micro-sensors employed have a fast response time and are capable of accurately measuring oxygen concentrations at temperatures well below 0 °C. Oxygen uptake rate ranged from 0.03 to 0.66 $\mu\text{mol O}_2 \text{ mg}^{-1} \text{ h}^{-1}$ and was sensitive to changes in both salinity and temperature. Temperature was the dominant factor affecting oxygen consumption rates, which showed a significant increase with increasing temperature. A slight decrease was measured in oxygen consumption with increasing salinity related to differential solubility of oxygen in waters of different salinities. Thermal sensitivity of oxygen consumption determined from calculations of Q_{10} , indicated physiological adaptation of *Artemia* nauplii to the ranges of temperatures tested.

Key-words: *Artemia*, brine shrimp, oxygen consumption, salinity, temperature, Q_{10}