RELATIONSHIP BETWEEN BIOMASS, GROWTH RATE, RESPIRATION AND ETS ACTIVITY IN THE BRINE SHRIMP *ARTEMIA SALINA*

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Zooplankton respiratory metabolism and biomass are keys to understanding energy flow, population abundance, community structure, as well as other variables of marine plankton communities. Zooplankton respiratory electron transport activity (ETS) measures potential respiration (Φ) and is a proxy for both respiratory oxygen consumption and biomass. Interpreting ETS measurements is not well understood and requires experimental research into the effects of age, physiological states, temperature, pressure, etc. Here, using controlled cultures of the crustacean *Artemia salina*, we investigate the relationships between biomass (as protein or as carbon), ETS activity, respiration and growth rate and their sensitivity to culture age.

Observed growth rates ($\mu = 0.21 \pm 0.27$ day^{-1}) and potential respiration rates ($\Phi = 11.76 \pm 18.49$ μL O_2 h^{-1} animal^{-1}) were in the range found in the literature for similar experiments. They were unrelated to each other. Specific ETS activity, as metabolism, was regressed against biomass, as protein, in the logarithmic form of Kleiber's allometric equation (Kleiber, 1961). The slope was 0.75 as one would expect for a metabolism proxy, from zooplankton metabolism studies of King and Packard, 1975, and from Whitfield's (2006) recent book. The respiration measurements defined a rate of $R = 0.331 \pm 0.076$ μL O_2 h^{-1} animal^{-1}, but the measurement range was too limited to define a relationship with either ETS activity or biomass. Investigations of the ratios, R/biomass, Φ/biomass, and R/Φ showed that all three declined with the culture age. Here we discuss the role food-limitation plays in the decline of these ratios.