



## The influence of food quality (P:C ratio) on RNA:DNA ratio and somatic growth rate of *Daphnia*

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**ABSTRACT:** Growth experiments with juvenile *Daphnia galeata* were performed to investigate how fast their RNA:DNA ratio responds to changes in food quality, the relationship between RNA:DNA ratio and somatic growth rate, and the effect of food quality (P:C ratio) on the RNA:DNA ratio. RNA and DNA concentrations in individual daphnids were measured with a single-dye (RiboGreen) fluorometric method. Algae were cultured in chemostats and different P:C ratios were obtained by altering the dilution rate and the P content of the medium. The RNA:DNA ratio of the daphnids responded within 5 h to differences in food quality. The RNA:DNA ratio was highly correlated with the somatic growth rate ( $r^2 = 0.94$ ), and the RNA:DNA ratio increased with increasing food P:C ratio below a threshold P:C ratio (by atoms) of approximately 0.005 (C:P = 200). The response in RNA:DNA ratio to changes in food quality is rapid and consistent with previously reported patterns for somatic growth rate. This enables short-term experiments that reduces the problems with keeping both food quantity and quality constant during incubation. Analysis of zooplankton RNA:DNA ratios in short-term experiments has a potential for addressing questions about when and where food quantity, quality, or both limit zooplankton growth in nature.

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