Nutritional quality of food resources for zooplankton (Daphnia) in a tidal freshwater system (Sacramento[San Joaquin River Delta)

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ABSTRACT: We examined the relative nutritional values of natural phytoplankton and particulate detritus for zooplankton growth in a detritus-rich environment. Seston was collected seasonally from four different habitat types in a tidal freshwater system and fed to juvenile *Daphnia magna* under controlled culture conditions by use of a flow-through design. Seston particulate organic carbon (POC) and chlorophyll a contents ranged from ~330 to 3,800 μg L^{-1} POC and 1.4 to 45 μg L^{-1} Chl a. A partial residual analysis revealed that detrital carbon concentrations were only weakly related to *Daphnia* growth, whereas Chl a proved to be highly predictive of *Daphnia* growth rates across all investigated habitat types. Overall, habitat type had a strong effect on growth rates, whereas season of seston collection did not, but differences among habitats could be attributed to differing Chl a concentrations. The results from this study imply that, even in systems with overwhelming amounts of detrital carbon from a variety of sources, nutritional factors associated with phytoplankton can be dominant in regulating zooplankton growth.