



Differential effects of phosphorus and fatty acids on *Daphnia* growth and reproduction

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ABSTRACT: We investigated the effects of various mineral and biochemical limitations on *Daphnia magna*. These daphniids have much lower saturation thresholds for growth for the polyunsaturated fatty acids (PUFA) eicosapentaenoic acid (EPA), and arachidonic acid (ARA) than has been previously described for other *Daphnia* species. Daphniids take up large amount of fatty acids from food, and different fatty acids are handled differently by *D. magna*. The saturated fatty acid (20:0; EPA) was not retained, and metabolized, the PUFAs were preferably stored. There were also differences among the PUFAs: EPA was found in higher concentrations in the eggs than ARA. In contrast, although there were some variations in *D. magna* phosphorus levels with varying levels of phosphorus in the food, these differences were small compared with the changes in *D. magna* fatty-acid concentrations. Independent of these small changes, the P content of eggs was constant at 14 mg P (g dry wt)⁻¹. Storage of EPA, but not P, fully compensated *D. magna* growth during periods of bad food quality. Egg production was a major drain of fatty acids from female *D. magna*.

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