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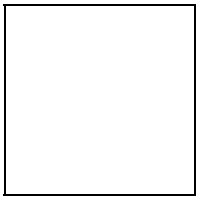

Abstract: Life-long somatic growth and egg production responses of Daphnia barbata, Daphnia gibba, Daphnia laevis, Daphnia pulex, Moina micrura and Diaphanosoma excisum were examined in relation to different food and suspended sediment levels, in factorial experiments at 20-degrees-C. Food treatments involved additions of 0, 100, 500 and 2500 mug C l-1 of Selenastrum to 20 mum filtered water, generally from source lakes. These food levels were tested at two suspended sediment levels in all species, viz. (i) natural source-lake nephelometric turbidities of 7-65 nephelometric turbidity units (NTU) (approximately 10-70 mg l-1 TSS) and (ii) approximately 3- to 4-fold enrichment of natural levels (8-fold in D.excisum). A third sediment-free treatment was tested in all species of Daphnia other than D.gibba. Growth in body length and reproductive output were assessed daily for individual animals. Main and interactive effects of food and sediment on growth were assessed at selected ages from day 3 through subsequent life using analysis of variance (ANOVA). Strong and highly significant positive food effects were apparent at all ages in all species examined, with the curious exception of D.excisum. The onset of maturity and fecundity were also positively related to food level. Sediment effects on growth, age of maturity and fecundity were variable, but tended to be much weaker than food effects. Both stimulatory (positive, especially at low food levels) and inhibitory (negative) effects of sediment on growth were apparent, both between and within species. Performance in sediment-free water was very poor, except in D.pulex. Food-sediment interaction effects were variable. Generally, turbidwater species were influenced less adversely by sediment than clear-water species, indicating the existence of environmentally appropriate adaptive responses. Overall, the findings indicate that light limitation of algal resources by suspended sediments, rather than the condition of high turbidity per se, is responsible for the apparently negative impact of suspended sediments frequently observed on natural populations of cladoceran zooplankters.