



Relevant scales in zooplankton ecology: Distribution, feeding, and reproduction of the copepod *Acartia hudsonica* in response to thin layers of the diatom *Skeletonema costatum*

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ABSTRACT: We investigated the interaction of the copepod *Acartia hudsonica* in relation to thin layers of the diatom *Skeletonema costatum*. Thin layers have recently received much attention, since they are common and persistent features in the water column, often overlooked by traditional sampling methods. Their frequent abundance in coastal oceans and the high biomass associated with them has led to the assumption that they are important grazing sites of calanoid copepods. We employed 2-m tall tower tanks that allowed us to simulate thin layers. Three variables representative of three time scales were considered: the distribution of copepods in the tanks (time scale of minutes), fecal pellet production as a proxy for ingestion rate (time scale of hours), and egg production rate (time scale of >12 h). *A. hudsonica* responded significantly but very little to the thin layers in terms of their distribution. Given a choice, there was a slightly higher tendency to swim through a patch of diatoms than to swim around it. Fecal pellet production was slightly lower in the thin-layer treatments than in the homogeneous controls. Egg production was not influenced by differential distribution of diatoms in the tanks, which indicated that the copepods dealt equally well with patchy food as when the same numbers of cells were available in a homogeneous distribution. Time series experiments showed that ingested carbon is integrated over time scales of >12 h. Therefore, small scale fluctuations of food in space and time do not necessarily translate into small-scale fluctuations in reproductive output.

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