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THE NON-LINEAR RESPONSE OF ARTEMIA DEVELOPMENT TO FOOD AVAILABILITY RESULTS IN LARGE VARIATIONS IN PEAK ADULT ABUNDANCES IN HYPERSALINE MONO LAKE, CALIFORNIA

Long-term (20-yr) monitoring of plankton dynamics in hypersaline Mono Lake, California reveals a 4-fold variation in summer peak abundance of adult brine shrimp (Artemia monica). The summer population consists of overlapping generations of individuals, those hatched in spring from overwintering cysts and those produced ovoviviparously during June-July. A persistent feature of the seasonal pattern of Artemia abundance is that during years with smaller or delayed spring generations much larger summer populations develop. This occurs despite relatively small year-to-year differences in ovoviviparous reproduction. Detailed stage-specific analysis indicates near cessation of development in early instars and increased mortality when algal biomass declines to below 1 μg chlorophyll a l-1. During years with smaller or delayed first generations, algal biomass declines more slowly to these critical concentrations and adult recruitment is markedly enhanced. A detailed understanding of this highly non-linear response is necessary for interpreting long-term changes due to fluctuating hydrological regimes and salinity.

SS1.01 CS39

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