Resource competition between sympatric sibling rotifer species

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ABSTRACT: Mechanisms underlying competitive interactions are important in understanding the structure of planktonic communities, particularly the coexistence of similar species. Here we present experimental results of exploitative competition among three sympatric sibling species of the *Brachionus plicatilis* complex for two differently-sized species of food microalgae. These three rotifer species are to be found in seasonal succession in brackish ponds on the Spanish Mediterranean coast; they can, however, co-occur for long periods. The functional and numerical responses of the three *Brachionus* species to both food microalgae, although similar, differed. Neither rotifer population growth nor grazing rates showed a clear positive correlation between rotifer and alga sizes. Tilman's models were applied to these results in order to predict the outcome of competition in two rotifer, two resources systems. For testing predictions and addressing the possibility of rotifer coexistence, we performed pairwise competition experiments in semicontinuous cultures, which introduces periodic disturbance as an additional factor. Results confirmed the pattern expected from Tilman's models regarding the competitive superiority of each rotifer species, when food composition was biased toward one of the two resources. This shows the relevance of the food threshold concept to predict the superior competitor. However, coexistence of rotifers was found in conditions in which Tilman's models had predicted an unstable equilibrium, with the winning species depending on the initial conditions. We hypothesize that variance in food availability mediated coexistence. Our results suggest that both food partitioning and disturbance are important in explaining the coexistence of these sibling species in nature.

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