

Response of macrozooplankton to Environmental variation.

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Zooplankton are sentinels of climate variation throughout the global oceans, with species reflecting the impacts of environmental variability in their biogeographic distributions and abundances. Over the past 50+ years, increased sea temperature, higher CO<sub>2</sub>, lower pH, and lower oxygen have resulted from both natural oscillations and human activities. Insight into the response of species to environmental change can be gained from study of species in extreme habitats. The Red Sea represents an end point of environmental conditions in the world oceans, with high surface temperature and salinities, high water temperatures (>21.5°C) in mesopelagic and bathypelagic depths, very high salinities (> 40 PSU), and hypoxic conditions in mid-depths. The Red Sea thus provides a laboratory setting for the study of the environmental controls on the distribution and abundance of widely distributed plankton species as well as those endemic to the Red Sea. The results of a recent study of the vertical distribution and vertical migration of five Red Sea euphausiid species indicate that widely-distributed species of zooplankton exhibit broad tolerance ranges for key environmental variables (e.g., temperature, salinity, and dissolved oxygen), and/or that these species may have considerable potential to adapt physiologically to variable and changing conditions throughout their geographic ranges. This talk will highlight some of these changes and describe research needed to better predict zooplankton responses to ecosystem changes expected in the next several decades.

Key words: Red Sea, Euphausiids, Diel Vertical Migration, Vertical Distribution, DNA Barcodes, environmental forcing.

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