

THE MESOZOOPLANKTON RESPONSE TO IRON FERTILIZATION IN THE
EASTERN EQUATORIAL PACIFIC

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ABSTRACT

In May/June 1995, 72 km² of surface ocean at 4°S, 105°W was enriched with Fe(II), resulting in a 10-fold increase in phytoplankton (mostly diatom) biomass within one week of iron infusion. Mesozooplankton community structure and grazing impact were measured both in and out of the patch throughout the 17-d experiment. Mean mesozooplankton carbon biomass and abundance remained nearly constant outside the patch. Inside the patch, biomass and abundance increased three-fold near the height of the phytoplankton bloom, primarily due to increases in the number of small calanoid and cyclopid copepods in the mixed layer. Two factors appeared to account for the increased copepods. First, significantly higher abundances of copepod nauplii in the patch indicated that adult copepods may have responded by increasing their reproductive rates. Second, changes in copepod vertical migration behavior in response to reduced light penetration and increased food abundance in the patch may also have contributed to the biomass increase. In addition to enhanced abundance, mesozooplankton gut fluorescence increased significantly inside the patch; but, due to concurrent increases in chlorophyll, daily grazing impact only doubled inside the patch. Therefore, although mesozooplankton demonstrated significant community responses to increased phytoplankton, these animals played a limited role in suppressing the response of phytoplankton to iron enrichment.