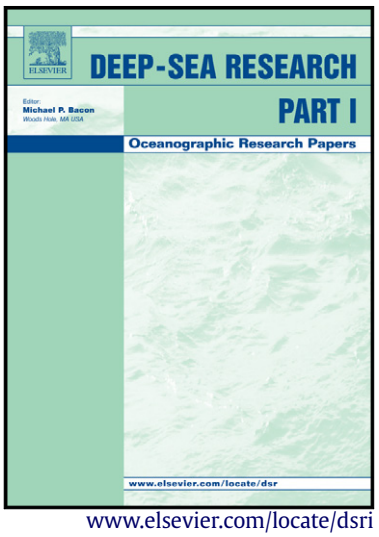

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Particle flux characterization and sedimentation patterns of protistan plankton during the iron fertilization experiment LOHAFEX in the Southern Ocean

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Abstract

The taxonomic composition and types of particles comprising the downward particle flux were examined during the mesoscale artificial iron fertilization experiment LOHAFEX. The experiment was conducted in low-silicate waters of the Atlantic Sector of the Southern Ocean during austral summer (January – March 2009), and induced a bloom dominated by small flagellates. Downward particle flux was low throughout the experiment, and not enhanced by addition of iron; neutrally buoyant sediment traps contained mostly faecal pellets and faecal material apparently reprocessed by mesozooplankton. TEP fluxes were low, ≤5 mg GX eq. m^{-2} d^{-1}, and few phytodetrital aggregates were found in the sediment traps. Only a few percent of the POC flux found in the traps consisted of intact protist plankton, although remains of taxa with hard body parts (diatoms, tintinnids, thecate dinoflagellates and foraminifera) were numerous, far more so than intact specimens of these taxa. Nevertheless, many small flagellates and coccoid cells, belonging to the pico- and nanoplankton, were found in the traps, and these small, soft-bodied cells probably contributed the majority of downward