

Image analysis of microzooplankton in a cyclonic eddy off south-western Madagascar

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Mesoscale eddies are major features in ocean dynamics that significantly enhance ocean production. Image analysis with a FlowCam was used to explore the microzooplankton community within a cyclonic eddy off south-western Madagascar. Our main objective was to investigate whether microzooplankton abundance and community composition varied within the different eddy zones (core, periphery and outer zones) as well as on the continental shelf, the likely source region. Sampling was conducted on board the RV *Algoa* during a cruise in July 2013. Water samples (5 L) were collected from the surface and depth of maximum fluorescence on the southern Madagascar shelf and along a transect through the eddy using a CTD-rosette sampler. Samples were pre-filtered through 200- μm mesh and collected on 20- μm mesh. Total microzooplankton abundance was highest in the eddy core (surface mean = 294 L⁻¹), and was significantly higher than on the shelf (74 L⁻¹) and in the eastern periphery and outer zone (136 & 97 L⁻¹ respectively), but not the western periphery and outer zone (177 & 151 L⁻¹ respectively, ANOVA and Tukey HSD test). Abundance of hetero-/mixotrophic dinoflagellates was significantly higher in the eddy core (mean = 137 L⁻¹) compared to the other eddy zones (22-62 L⁻¹), but there were no significant differences between zones for other abundant groups (ciliates, radiolarians, crustacean nauplii). Elevated dinoflagellate abundance in the eddy core was likely due to enhanced primary production through upwelling of nutrients from deeper layers to the euphotic zone. We also explore zonal differences in microzooplankton size composition.

Keywords: microzooplankton, mesoscale eddies, dinoflagellates, image analysis

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