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Phytoplankton and protozooplankton community structure and biomass in coastal polynya of the Amundsen sea

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The studies on phytoplankton and protozooplankton in the coastal polynya of the Amundsen Sea are still poorly documented. As a part of the ANA01 program, we investigated biomass and composition of plankton groups in coastal polynya and adjacent water of the Amundsen Sea between December in 2010 and January in 2011. The phytoplankton assemblage was significantly higher within coastal polynya than in the adjacent water. The average chlorophyll-a concentration in coastal polynya was 9.3 ug/L, whereas it was 2.5 ug/L in adjacent water. In coastal polynya, phytoplankton consisted of 76.1% *Phaeocystis antarctica* and 37.4% diatom, whereas in adjacent water phytoplankton assemblage was dominated by diatom (78.8% of phytoplankton biomass). Protozooplankton biomass, ranging from 4.8 to 98.2 ugC/L, was usually much less than 50% of phytoplankton biomass and did not show any distinct difference between coastal polynya and adjacent water. In coastal polynya, protozooplankton assemblage consisted of 65.6% heterotrophic dinoflagellates, 14.6% ciliates and 29.8% heterotrophic nanoflagellates. Heterotrophic dinoflagellate was the most dominant groups in both areas. Phytoplankton biomass was positively correlated with protozooplankton biomass in both areas. In coastal polynya and adjacent water, protozooplankton consumed an average of 91.3% and 85.3% of daily phytoplankton production, respectively. Therefore, protozooplankton was the major consumers of phytoplankton community, and protozooplankton grazing is one of the most important loss processes affecting phytoplankton biomass in costal polynya of the Amundsen Sea.

Keywords: Coastal polynya, Phytoplankton, Protozooplankton