

Session 81- Polar and High Latitude Research: Land, Lakes, Ice, and Ocean

The influence of reduced light on the phytoplankton biomass and community structure during spring bloom in the Amundsen Sea Polynya, Antarctica.

Youngju Lee, *Eun Jin Yang, Jisoo Park, Jinyoung Jung, Eun Ho Ko, Tae Wan Kim, Chang-Sin Kim, SangHoon Lee

Division of Polar Ocean Environment, Korea Polar Research Institute, 26, Songdomirae-ro, Yeonsu-gu, Incheon 21990, Republic of Korea.

*Corresponding author: Tel.: +82 32 760 5399, ejyang@kopri.re.kr

Abstract

The Amundsen Sea, Antarctica, is one of the vulnerable area, where increased basal melting and upwelling have occurred. Phytoplankton community dominated by *Phaeocystis antarctica* (Prymnesiophytes) and/or diatoms during the bloom periods, and they play different roles in the biogeochemical cycle of the Amundsen Sea polynya (ASP). To understand the dynamics of phytoplankton community and the influential environmental factors in the ASP, the field surveys were conducted during January 2014 and January 2016, and bioassay experiments were investigated during January 2016 in deck incubators. The mean open water area of the ASP was largely extended during both austral summer of 2014 and 2016. The average insolation was dramatically lower in January 2016 with a lower phytoplankton biomass (Chl-a) than January 2014. Phytoplankton community dominated by *P. antarctica* in January 2014, while diatoms and *Dictyocha speculum* (Chrysophytes) were co-dominated in the ASP in January 2016. Each phytoplankton species responded differently to high light in the growth rate experiments, indicating that the light availability could be one of the important influential factors for phytoplankton biomass and community structure in the habitat conditions of rapidly thinning ice shelves and sea ice loss in the ASP.