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A consistent structure of phytoplankton communities across the warm–cold regions of the water mass on a meridional transect in the East/Japan Sea

Jung Hyun Kwak[a], Eunah Han[a], Sang Heon Lee[b], Hyun Je Park[c], Kyung-Ryul Kim[a], Chang-Keun Kang[a*]

[a]School of Environmental Science and Engineering, Gwangju Institute of Science and Technology, Gwangju 500-712, Republic of Korea,

[b]Department of Oceanography, Pusan National University, Busan 609-735, Republic of Korea

[c]Department of Marine Resource Development, Gangneung-Wonju National University, Gangneung 210-702, Republic of Korea

[*]Correspondence: Division of Environmental Science and Engineering, Gwangju Institute of Science and Technology, Gwangju 500-712, Republic of Korea. Tel.: 82+(0)62+715.2834; Fax: 82+(0)62+715.2434. ckkang@gist.ac.kr

ABSTRACT

Three cruises were undertaken along a meridional transect in the East/Japan Sea (EJS) in spring (May 2007), summer (July 2009), and fall (October 2012) to determine the geographic variations in phytoplankton biomass and community composition. This study revealed a gradient of surface temperature and a fluctuation of hydrographic conditions along the transect. Although a subpolar front (SPF) formed between the warm- and cold-water masses (37–40 °N), no significant differences in phytoplankton biomass and community composition were detected between the southern and northern parts of the EJS. These results disprove our initial hypothesis that different water masses may contain differently structured phytoplankton communities. In the present study, isothermal layers (≤ 12 °C) fluctuated over a depth of 50 m in both warm- and cold-water masses, depending on the SPF. In contrast, the nitracline (i.e. 2.5 μM nitrate isopleth) depth was recorded within a limited range of 20–40 m in spring, 30–50 m in summer, and 40–60 m in fall. The