

Abundance and distribution of euphausiid species in the southwestern Okhotsk Sea in spring and summer

Yoshizumi Nakagawa¹, Hiromi Kasai² and Yasuto Nishino²

¹*Faculty of Bioindustry, Tokyo University of Agriculture*

²*Hokkaido National Fisheries Research Institute, Fisheries Research Agency*

Euphausiids comprises 86 species and is widely distributed throughout the oceans of the world. In higher latitude sea area, euphausiids is considered a key stone species among the zooplankton assemblages because of their ecological characteristics such as transferring energy and materials of primary and secondary producers to higher trophic producers, and biological characteristics such as diel vertical migration and daytime surface swarming. Therefore, ecological studies of euphausiids have been conducted all over the world ocean. In the southwestern Okhotsk Sea, fishery productivity is very high. It is considered that higher productivity of lower trophic levels organisms such as euphausiids contributes to the higher fishery productivity. However, available ecological information of euphausiids in the area is very limited. The present study aimed to clear the relationship between abundance and distribution of euphausiids, and oceanographic conditions in the southwestern Okhotsk Sea in spring and summer. Sampling were conducted at 8 stations (St. S1, S2, S3, S4, N1, N2, N3, N4) in the southwestern Okhotsk Sea and 3 stations (St. A, B, C) in Japan Sea by RVs Hokko-Marui and Mizuho-Marui, Fisheries Research Agency, in spring (31 May–8 June) and summer (2–7 September) 2013. Zooplankton samples were collected obliquely with a ring net (with a mouth diameter of 130 cm and mesh aperture of 0.45 mm). Collected zooplankton samples were preserved in 5% buffered seawater formalin. Euphausiids was sorted under a dissecting microscope and then classified to species and stages, and then individual number was counted. The profiles of temperature and salinity were determined using a CTD at each station. From a view point of vertical profiles of water temperature and salinity, at the coastal stations (Sts. S1 and N1), Soya Warm Current (SWC) was distributed from surface to bottom layer in both seasons. At St. S2, SWC was found at the deeper than subsurface layer in spring and from surface to deeper layer in summer. It was judged that water masses at other 5 stations (S3, S4, N2, N3, N4) were originated from Okhotsk sea. However, at offshore stations (Sts. S3, S4 and N4), water masses originated from SWC was found at subsurface layer in summer. In the present study, euphausiids was identified to 4 species (*Euphausia pacifica*, *Thysanoessa inermis*, *T. longipes*, *T. raschi*). In the southwestern Okhotsk Sea, euphausiid abundances, excluded furcilia larvae, at offshore stations were high in both seasons. Whereas, those at coastal stations were extremely low. In spring, *E. pacifica* abundance was highest and next to *T. raschi*. In summer, *T. longipes* abundance was highest and next to *E. pacifica*. Juvenile abundances of *E. pacifica*, *T. longipes* and *T. inermis* in summer were higher than those in spring, while *T. raschi* juveniles was abundant in spring. In Japan Sea, adult was not found in both seasons. Furcilia larvae and juveniles of *E. pacifica* and *T. longipes* were found only in the sample taken from spring.