

Biodiversity of plankton community in the waters around Japan

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Plankton community relates significantly to the ambient environment in the ocean ecosystem and its feature reflect the oceanographic conditions. Although very high biomass of mesozooplankton appear in the Bering Sea in the North Pacific Ocean, high biomass area are also extent from offshore of Tohoku to Sea of Okhotsk. The biomass in the waters around Japan is one of the highest values in the world ocean except with upwelling regions (see website COPEPOD, <http://www.st.nmfs.noaa.gov/copepod/>). The high biomass might be caused by high nutrient supply from deep water to surface layer in the western North Pacific Ocean. Biodiversity of the plankton communities has been well studied in the recent years. For example, the study based on the foraminifer community represented very high biodiversity in the water around Okinawa Islands. And also the study of chaetognatha revealed very high biodiversity in the Kuroshio waters. Those result suggest the biodiversity plankton community is very high the waters around Japan. However the study for the copepod community is few around Japan. Copepod is the one of the most important group in the plankton community in the ocean ecosystems. Because they connect trophic levels between primary to third producer and play important role of carbon cycling in the ocean ecosystems. Therefore the biodiversity of copepod will be important to understand the marine ecosystem around Japan. We studied the biodiversity of copepod community in the waters around Japan. The zooplankton samples were collected by vertical haul of NORPAC nets (mouth diameter 45cm, mesh size 0.33mm) from 150 or sea bottom to sea surface in the 90 stations in April 2012 around Japan. The samples were identified in species level and counted abundance under the microscope. 190 species of copepod appeared in this study. The species number was high in the Pacific Ocean and low in the Sea of Japan. Species number in the eastern China Sea was higher than in the Sea of Japan and lower than in the Pacific Ocean. We also investigated the geographical variation of community structure based on the cluster analysis. The copepod community were classified 4 groups as 1) Pacific oceanic, 2) eastern China Sea to western Sea of Japan, 3) coastal, and 4) subarctic group. 1) Pacific groups was mainly composed by subtropical kuroshio related species. The group of 2) eastern China Sea to western Sea of Japan group was considered to originate in the eastern China Sea. 3) coastal group was mainly composed by coastal shallow water species. 4) subarctic group was mainly composed by large and abundant species. The biomass of the group is high the biodiversity is lowest among groups. Those results suggest the copepod community represented high biodiversity in the waters around Japan, and it will be caused by complex and diverse oceanographic environment.

Keywords: biodiversity, copepoda, plankton, western north Pacific