The Journal of the Oceanological Society of Korea
Vol. 21, No. 3, p. 146-155, September 1986.

Studies of the Plankton in the Southwestern Waters of the East Sea (Sea of Japan) (III)
Zooplankton-Standing Stock, Composition and Distribution

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東海 西南海域의 플랑크톤(Ⅲ)
동물플랑크톤- 현존량, 종조성 및 분포

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Abstract

Zooplankton samples of upper 50m layer in May, 1985 and of various depth intervals depending on thermal structure in October, 1985 were analyzed. Standing stock represents mean of 538 inds/m^3 in spring and 267 inds/m^3 and 508 inds/m^3 of whole column mean and *surface layer* in fall, respectively.

A total of 55 and 104 taxa is identified in each season and accumulated data list at least 123 species inhabiting in the study area. Copepods dominate in the zooplankton community, followed by protozoans and appendicularians in both seasons.

In surface layer, distribution of subtropical species and standing stock seems to illuminate the effects of the Tsushima Current and the North Korean Cold Watermass in cold season, whereas only standing stock shows discernable variation in warm season. Concerning whole water column, depth of permanent thermocline bottom, at about 120m in fall 1985, plays significant role as a barrier to the distribution of mesopelagic cold water species.

Serial sampling in October, 1985 does not reveal any perceivable diel vertical migration, which is considered to confirm the earlier suggest that owing to the lack of true abyssal species zooplankton biomass of deeper layer is very poor, so that diel vertical migration of the East Sea is weak.

요약 : 1984년 5월 50m수층과 1985년 10월 수온구조에 따른 여러 층에서 채집한 동물플랑크톤 시료를 분석한 결과, 현존량은 춘계에 평균 538 inds/m^3, 추계에는 전 수층 평균과 표층이 각기 267 inds/m^{3}와 508 inds/m^{3}를 나타낸다. 양 계절에 동정된 분류군은 각기 55종류, 104종류였으며 연구해역의 서식 분류군은 123 종류에 이른다. 동물플랑크톤 군집에서의 우점종의 순위는 양 계절 공히 copepods를 필두로 protozoans, appendicularians이다.

표층에서의 아열대성 종과 현존량의 분포는 동계에 있어 대마해류 및 북한한류수의 영향을 반영하는 것으로 사료되는 반면, 춘계에는 현존량만이 식별할 수 있는 변화를 보인다. 1985년 추계에는 전 수층에 걸쳐 영구 수온약층의 저부인 120m수심이 중층 냉수종의 분포에 대한 장벽으로서 중요한 역할을 한다.

1985년 10월에 연속 채집한 시료의 분석결과, 식별할 수 있는 주야 수직이동은 나타나지 않는데, 이는 동물플랑크톤 가운데 진정한 심해종의 결핍으로 심층에서의 생체량이 아주 빈곤하고 따라서 동해에서의 수직이동이 미약하다는 이론을 입증하는 것으로 사료된다.

The present studies were supported (in part) by the Basic Science Research Institute Program, Ministry of Education, 1985.

INTRODUCTION

Study area is known as one of the most complicated oceanographic environments of the Korean coastal waters because Tsushima Current inflows through narrow sill (Korea Strait) and its intensity and propagation path are of controversial problem which are not clearly solved yet. In addition to Tsushima Current, presence of North Korean Cold Watermass in the vicinity of Korean peninsula makes oceanographic data interpretation more difficult.

Studies on the zooplankton of south western area of the East Sea of Korea are being performed from the first survey of September, 1981. Results of September, 1981 cruise and of April, 1983 cruise were have already been reported (Shim et al., 1982, 1983). Main research scope of zooplankton may be summarized as to acquire basic informations which comprise species composition, distribution of species and standing stock for the advanced ecological study.

As previous studies, Vinogradov (1960) reviewed the preceding papers reported by U.S.S.R. planktonologists, and Zenkevich (1964) described the zooplankton of the East Sea in his literature. Authors concluded that owing to the lack of true abyssal species the plankton biomass of deep sea layer was very small. As a result of poor deep sea biota Zenkevich anticipated weak diel vertical migration and poor diversity of organisms (less than 80 species). In this context, the primary concerns of this study are focused to two points: does the zooplankton community consist of such a few species and does spatial distribution of zooplankton reflect regional difference of watermass.

MATERIALS AND METHODS

Zooplankton samples were taken by vertical hauling of Gulf-V high speed plankton sampler with 200 μm mesh aperture at a speed of 1 m/sec in May and October, 1985 (Fig. 1). Net was towed from 50 m depth throughout the study area in May. In October towing depth was determined by thermal profile of each sampling station after reading the mechanical bathythermograph data in situ. Net was towed two or three times at each station. The first one above the weak seasonal

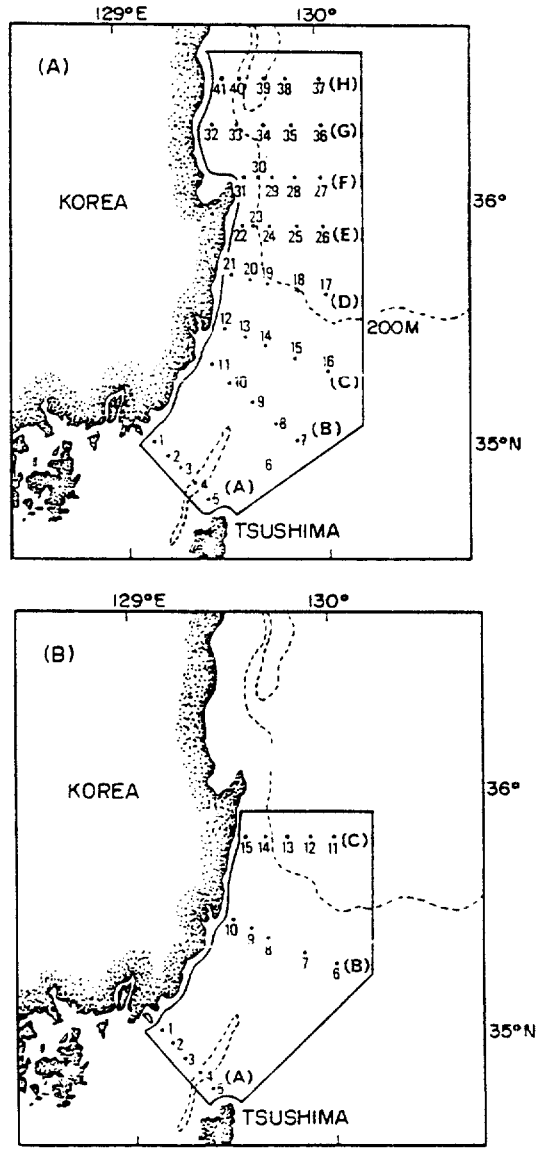

Fig. 1. Maps showing study areas and sampling stations, (A): Mag, 1985, B: October, 1985