

Seasonal variability in abundance and composition of zooplankton off Eocheong Island, the eastern Yellow Sea

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Abstract

Abundance and composition of zooplankton off Eocheong, the eastern Yellow Sea, were investigated. samples were collected using Norpac nets in June and October 2004, and February and March 2005. Water temperature, salinity, and chlorophyll-a concentration also were measured at the surface, middle, and bottom depths. The mean chlorophyll-a concentration was relatively higher in February and March (0.04-7.98 ug/l) than that in June and October (0.04-1.78 ug/l). 58 species were observed during the period of the study, of which 20 species belonged to copepods. The mean abundance of zooplankton ranged from 154.4 ind./m³ in March to 4,100 ind./m³ in October. The most dominant species varied seasonally: *Acartia hongii* in June, *Noctiluca scintillans* in October, Echinodermata larvae in February, and Euphausiacea larvae in March. The pelagic tunicate *Doliolum nationalis*, one of warm water species, occurred dominantly in October, indicating that the zooplankton community in waters near Eocheong Island may be different in some degree from that in the shallow waters along the coastal area of Korea.

Introduction

Zooplankton communities are characterized by their surrounding environments such as temperature, salinity, prey and predator, water quality, currents and etc. The patterns of the community structure may vary seasonally, spatially or geographically. The waters near Eocheong Island, located about 30 nautical miles away from the western coast of the Korean Peninsula, have the mixed physical characteristics observed in waters between open ocean and coastal water. Only a few studies were done in waters around Eocheong Island although most studies on the zooplankton community in the Yellow Sea have been carried out in the shallow waters along the coastal area of Korea (Shim and Yun, 1990; Park *et al.*, 1991; Choi and Park, 1993; Hwang and Choi, 1993; Zhang, 1995; Youn and Choi, 2003a; Youn and Choi, 2003b). The present study describes the seasonal abundance and composition of zooplankton in waters near Eocheong Island.

MATERIALS AND METHODS

- Samples were collected at 10-12 stations seasonally in the southeastern waters off Eocheong Island in June and October 2004, and February and March 2005.
- Norpac nets(45 cm diameter, 0.3 mm mesh aperture) were towed obliquely at each station between the surface and the bottom.
- Water temperature, salinity, and chlorophyll-a concentration were measured at the surface, middle, and bottom depths.

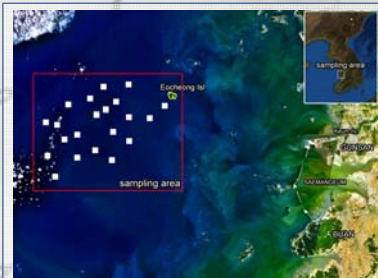


Fig. Map showing Eocheong Island and sampling stations

RESULTS AND DISCUSSION

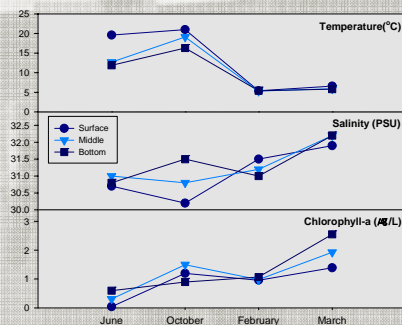


Fig. Seasonal variation in temperature, salinity, and chlorophyll-a concentration off Eocheong Island.

Table. List of zooplankton occurred off Eocheong Island

Taxa	Species	2004.6	2004.1	2005.2	2005.3	Taxa	Species	2004.6	2004.1	2005.2	2005.3
Protozoa	<i>Noctiluca scintillans</i>	o	o			Euchaeta	<i>Euchaeta pilosa</i>		o		
Cnidaria	<i>Abyla leuckarti</i>		o			Labidocera	<i>Labidocera bipinnata</i>				
	<i>Obelia</i> sp.			o			<i>Labidocera euchaeta</i>	o	o		o
	<i>Diphyes</i> sp.			o			<i>Labidocera rotunda</i>	o	o		
	<i>Muggiesia atlantica</i>			o			<i>Chirona atlantica</i>	o	o	o	o
	<i>Zanclus maai</i>			o			<i>Chirona similis</i>				
Branchiopoda	Unidentified sp. I	o	o			<i>Oncaea venusta</i>			o	o	
	Unidentified sp. II		o			<i>Paracalanus indicus</i>	o	o	o	o	
Ctenophora	Unidentified sp. I			o		<i>Temora discoidata</i>		o			
Mollusca	<i>Lingula</i> sp. larvae					copepodites		o	o	o	o
	Bivalvia larvae	o	o	o	o	<i>Tylos</i> sp.		o	o	o	o
Annelida	Gastropoda larvae	o	o	o	o	Isopoda	Unidentified sp.				
	Polychaeta larvae	o	o	o	o		Amphipoda	<i>Paraphronima gracilis</i>		o	o
Chaetognatha	<i>Sagitta crassa</i>	o	o	o	o	Echinodermata	<i>Paraphronima crassispis</i>	o	o	o	o
	<i>Sagitta evitata</i>		o				Chordata	Unidentified sp. I			
Arthropoda	Cirripedia	Unidentified larvae	o	o		Euphausiacea	Unidentified sp. II			o	
		<i>Evadne tergestina</i>	o	o			<i>Euphausia pacifica</i>				o
	Cladocera	<i>Poedon polyphemoides</i>	o	o			<i>Euphausiid calyptis stage larvae</i>			o	o
		<i>Conchoecia</i> sp.			o		<i>Euphausiid furcilia stage larvae</i>	o	o	o	o
	Ostracoda	<i>Conchoecia</i> sp.			o	Myiidae	Unidentified larvae				
	Copepoda	<i>Acartia hongii</i>	o	o	o	Decapoda	<i>Lucifer</i> sp.			o	o
		<i>Acartia pacifica</i>		o			<i>Leptocheila gracilis</i>				o
	Echinodermata	<i>Calanus sinicus</i>	o	o	o		<i>Crangon affinis</i>			o	o
		<i>Centropages abdominalis</i>	o	o	o		Unidentified larvae			o	o
	Chordata	<i>Centropages furcatus</i>	o	o	o		Unidentified larvae			o	o
<i>Centropages tenuiremis</i>		o	o	o		<i>Doliolum mulleri</i>			o	o	
<i>Corycaeus affinis</i>		o	o	o	o	<i>Doliolum nationalis</i>			o	o	
<i>Corycaeus catus</i>		o	o	o	o	<i>Chloropleura cophocera</i>			o	o	
<i>Corycaeus clausi</i>		o	o	o	o	<i>Chloropleura albicans</i>			o	o	
<i>Eucalanus subcrassus</i>		o	o	o	o	Fish eggs & larvae			o	o	

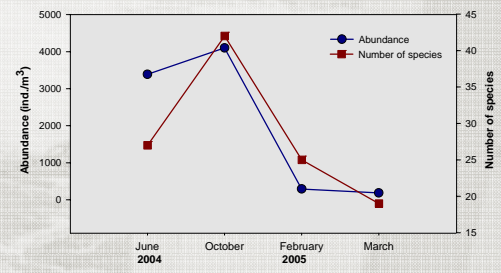


Fig. Seasonal variation in abundance and species number of zooplankton off Eocheong Island.

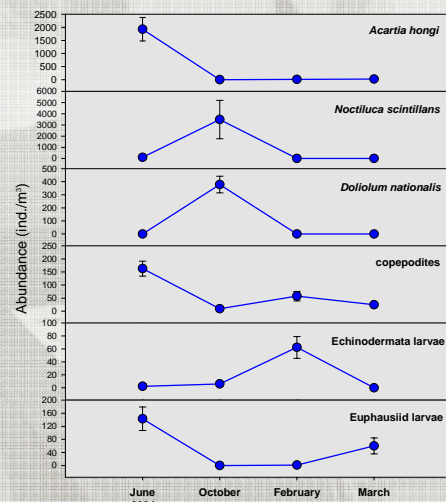


Fig. Seasonal variation in abundance of the six dominant species or groups off Eocheong Island.