



Contents lists available at ScienceDirect

Journal of Asia-Pacific Biodiversity

journal homepage: <http://www.elsevier.com/journals/journal-of-asia-pacific-biodiversity/2287-884x>



Original article

A study on the biodiversity of benthic invertebrates in the waters of Seogwipo, Jeju Island, Korea



In-Young Cho^a, Dong-Won Kang^a, Jisoon Kang^b, Hosung Hwang^b, Jeong-Hye Won^c, Woon Kee Paek^b, Su-Yuan Seo^{d,*}

^a General Planning and Management Division, Planning Office for Marine Biodiversity Institute of Korea, Seochon-gun, South Korea

^b Natural History Research Team, National Science Museum, Daejeon, Korea

^c Resources Research Division, Planning Office for Marine Biodiversity Institute of Korea, Seochon-gun, Korea

^d Ewha Womans University Natural History Museum, Seoul, Korea

ARTICLE INFO

Article history:

Received 21 January 2014

Received in revised form

11 February 2014

Accepted 13 February 2014

Available online 19 March 2014

Keywords:

Invertebrate

Jeju Island

Seogwipo

ABSTRACT

The biodiversity of benthic invertebrates in the intertidal and subtidal regions of Gapado, Beomseom, and Munseom islets was surveyed twice in May and September 2013 to study the state of biodiversity in Seogwipo, Jeju Island. As a result, a total of 77 species, 46 families, 25 orders, 14 classes, and nine phyla of benthic invertebrates were found. The species which were found, by taxon, consisted of the following: 26 species of Cnidaria (34%), 24 species of Mollusca (31%), seven species of Chordata (9%), six species of Arthropoda (8%), six species of Porifera (8%), five species of Echinodermata (7%), one species of Bryozoa (1%), one species of Annelida (1%), and one species of Ctenophora (1%).

Copyright © 2014, National Science Museum of Korea (NSMK) and Korea National Arboretum (KNA).

Production and hosting by ELSEVIER. All rights reserved.

Introduction

Jeju Island, Korea's southernmost island, is geographically affected by the Taiwan current; as a consequence, it becomes a place where temperate and subtropical creatures coexist, with a higher diversity of species and unique formation of biota (Song et al., 2009). In this regard, the waters near Seogwipo are included in the biosphere reserve designated by the United Nations Organization for Education, Science, and Culture. In particular, three islets named Munseom, Beomseom, and Seopseom, which serve as a natural breakwater in these waters, were designated as a core zone with more valuable structures of biota even in this biosphere

reserve. This area is the representative soft coral community and was designated Natural Monument No. 442 by the Cultural Heritage Administration. The adjacent waters around Munseom islet were designated as a marine sanctuary in November 2002 and have been managed in accordance with Article 25 of the Act on Conservation and Management of Marine Ecosystem, which has a higher academic value.

Although numerous studies have been conducted on the marine invertebrates in Seogwipo waters by taxon, no comprehensive research or reports on the entire group of marine invertebrates are available. Recently, the Jeju Special Self-governing Province published the 2012 Underwater Monitoring Project in Marine & Stream Areas of the Biosphere Reserve Report, which describes the biota and ecology research efforts undertaken in Seogwipo waters (Jeju Special Self-governing Province, 2013).

This study was conducted in the intertidal and subtidal regions of Gapado, Beomseom, and Munseom islets in Seogwipo waters as part of a joint survey with the National Biodiversity Institutions to investigate the biodiversity of benthic invertebrates in the area. The purpose of this study is to establish a list of benthic invertebrates found in Seogwipo area by comparing (and subsequently arranging) the list of species found in this study with those in previous studies.

* Corresponding author. Tel. +82 2 3277 3426.

E-mail address: syseo@ewha.ac.kr (S.-Y. Seo).

Peer review under responsibility of National Science Museum of Korea (NSMK) and Korea National Arboretum (KNA).

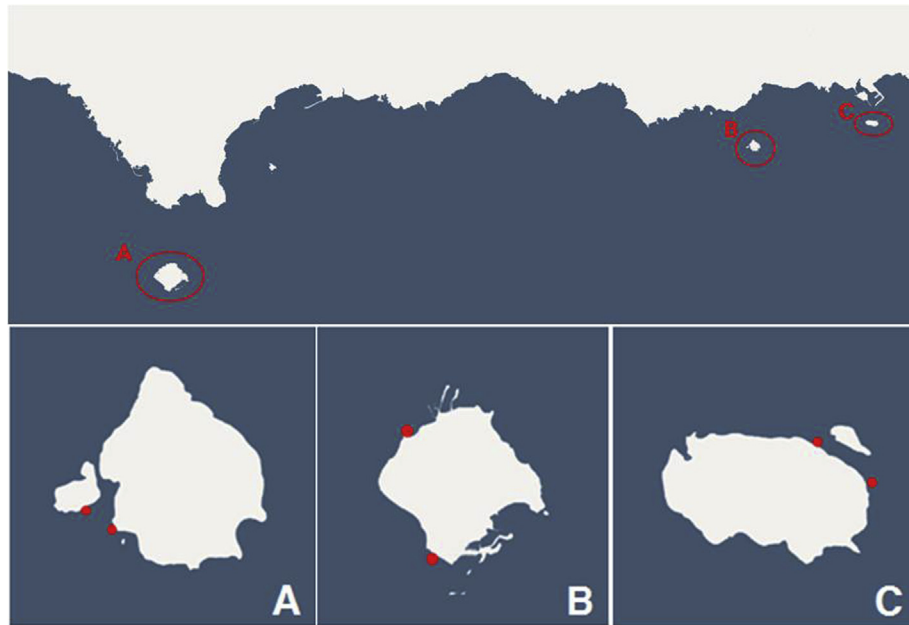


Fig. 1. Survey areas: (A) Gapado, (B) Beomseom, (C) Munseom (red dot: sampling sites).

Materials and methods

This survey was conducted twice, in May and September 2013, at a total of six sites around the Seogwipo region, including the islets of Gapado, Munseom, and Beomseom (Fig. 1). At each site, the researchers (using a chisel and tweezers) collected benthic invertebrates living in the intertidal zone. In the subtidal zone, surveys were performed by personnel in SCUBA gear who dove (up to a depth of 28 m) underwater at four sites around the islets of Munseom and Beomseom. The collected organisms were anesthetized for 4 to 5 hours by taxon, fixed in ethyl alcohol (70–100%) or formalin (5–10%) as necessary, and then transported to the sampling laboratory, where they were photographed and specimens were immersed. The researchers referred to Cnidaria (Song, 2004; Park, 2010), Echinodermata (Shin and Rho, 1996; Shin, 2010), Mollusca (Choi, 1992), and Arthropoda (Kim, 1973) and Ascidiacea (Rho, 1977), while looking at the taxonomy of the list of animals in Korea (Korean Society of Systemic Zoology, 1997) and WoRMS (World Register of Marine Species, 2014). In addition, they prepared a list of benthic invertebrates based on the reports that surveyed the same areas in Seogwipo (Jeju Special Self-governing Province 2013).

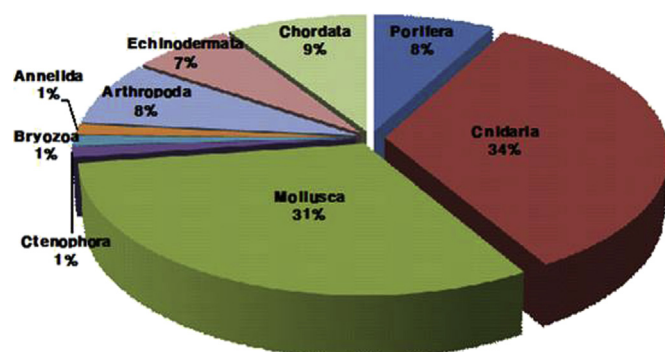


Fig. 2. Rate of taxonomic appearing species.

Results

The appearing species by taxon

This survey revealed nine phyla, 14 classes, 25 orders, 46 families, and 77 species of benthic invertebrates in total. The appearing species by taxon include: 26 species of Cnidaria (34%), 24 species of Mollusca (31%), seven species of Chordata (9%), six species of Arthropoda (8%), six species of Porifera (8%), five species of Echinodermata (7%), one species of Bryozoa (1%), one species of Annelida (1%), and one species of Ctenophora (1%). Overall, Cnidaria had the highest frequency of appearance (Fig. 2). The trend of regional appearing species revealed 23 species in the intertidal zone around Gapado Islet, where Mollusca had the highest frequency of appearance (61%). In the intertidal and subtidal zones around Beomseom Islet, a total of 51 species of invertebrates were found, of which Cnidaria had the highest frequency of appearance (35%). In the intertidal and subtidal zones of Munseom, 26 species

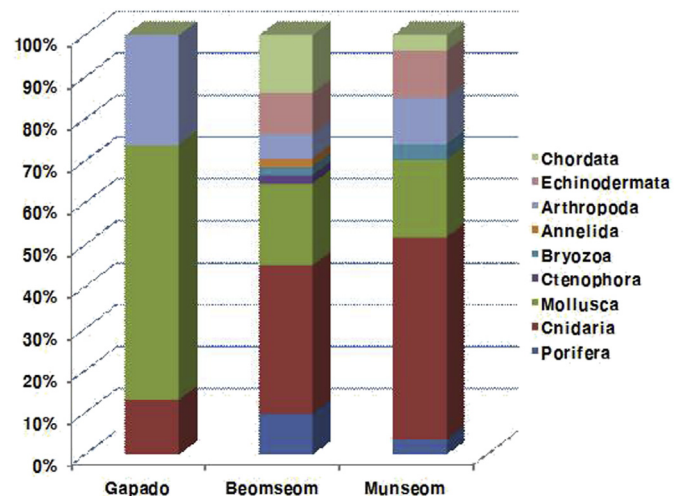


Fig. 3. Regional rate of taxonomic appearance.

Download English Version:

<https://daneshyari.com/en/article/4395037>

Download Persian Version:

<https://daneshyari.com/article/4395037>

[Daneshyari.com](https://daneshyari.com)