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INTERTIDAL MOLLUSCAN FAUNA IN MAGESHIMA ISLAND

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Abstract

Molluscan fauna of intertidal rocky shores were investigated at Mageshima Island, which is located 12 km west of Tanegashima Island, Kagoshima Prefecture, Japan. Eighty-four species belonging to 31 families were sampled and they included many subtropical species. Some characteristics of this fauna showed that intertidal rocky shores of Mageshima Island were environmentally comparable to cobble shores.

Keywords: Fauna, Intertidal, Mollusca

Introduction

Mageshima Island is located 12 km west of Tanegashima Island and has a 12 km coastline and is 8.5 km² in surface-area. It is a flat island with a maximum elevation of 71 m. Historically, this island had no residents and was used as a base for fishing or as a farm except from 1951 to 1980, when more than 500 people reclaimed the island and resided to cultivate sugarcane. The coast of the island is known for a good abalone fishery. Therefore, we can expect that this island has a preferable environment for coastal organisms because of very low human impact on intertidal shores and having subtidal shores which can persevere rich abalone resources.

There have been some studies dealing with terrestrial flora and fauna of Mageshima Island (SASAKI et al., 1960; NAKAMINE, 1976). One subspecies of sika deer, *Cervus nippon mageshima*, was described from this island (KURODA & OKADA, 1950). Flora and fauna were also studied along the coast of the island (ARAKAWA, 1955; TANAKA, 1976; ITONO, 1979), and it has been known to have various algal species including some tropical species (TANAKA, 1950). However, coastal fauna and flora were rarely studied after residents abandoned the island.

In this study, we investigated intertidal molluscan fauna on some rocky shores of this island to gain some insight about the coastal fauna and their environmental condition.

Methods

Preliminary surveys were carried out on September 1998 at five shores of Mageshima Island. One person surveyed rocks in the intertidal area for 30 to 60 minutes at each shore during low tide and noted species name.

We selected two shores located on the east and west coast of the island based on data from the preliminary survey areas and surveyed again on August 2000. Cross-shore transects were set from the upper to lower reaches of the intertidal zone. All molluscan species along these lines were sampled and fixed in 10% seawater formalin.

Table 1. List of molluscan species in intertidal rocky shores of Mageshima Island.

Family	Species	Family	Species
Ischnochitonidae	<i>Ischnochiton comptus</i>	Muricidae	<i>Muricodrupa fusca</i>
Chitonidae	<i>Acanthopleura gemmata</i>		<i>Muricodrupa sp.</i>
	<i>Acanthopleura loochooana</i>		<i>Morula granulata</i>
	<i>Acanthopleura japonica</i>		<i>Morula musiva</i>
	<i>Onithochiton hirasei</i>		<i>Morula nodicostata</i>
Acanthochitonidae	<i>Acanthochiton rubrolineatus</i>		<i>Morulaanaxeres</i>
Patellidae	<i>Scutellastraflexuosa</i>		<i>Drupa ricinus ricinus</i>
Nacellidae	<i>Cellana treuma</i>		<i>Thais savignyi</i>
	<i>Cellana grata</i>		<i>Thais clavigera</i>
Fissurellidae	<i>Emarginula variegata</i>		<i>Purpura panama</i>
	<i>Motfortula picta</i>	Coralliophilidae	<i>Coralliophila clathrata</i>
	<i>Diodra quadriradiatus</i>	Columbellidae	<i>Euplica varians</i>
Lottidae	<i>Patelloida saccharina</i>	Buccinidae	<i>Japeuthria ferrea</i>
	<i>Patelloida pygmaea</i>	Mitridae	<i>Strigatella scutula</i>
	<i>Collisella heroldi</i>		<i>Strigatella retusa</i>
	<i>Nipponacmea schrenckii</i>		<i>Strigatella zebra</i>
	<i>Nipponacmea fuscoviridis</i>		<i>Strigatella paupercula</i>
	<i>Nipponacmea concinna</i>		<i>Strigatella litterata</i>
	<i>Nipponacmea radula</i>	Costellariidae	<i>Pusia dichroa</i>
	<i>Nipponacmea nigrans</i>	Conidae	<i>Conus ebraeus</i>
Trochidae	<i>Chlorostoma xanthostigma</i>		<i>Conus chaldaeus</i>
	<i>Monodonta labio</i>		<i>Conus coronatus</i>
	<i>Monodonta perplkexa</i>		<i>Conus boeticus</i>
	<i>Cantharidus callichroa</i>		<i>Conus flavidus</i>
Neritidae	<i>Nerita helicinoides</i>		<i>Conus sp.</i>
	<i>Nerita helicinoides tristis</i>	Arcidae	<i>Barbatia lima</i>
	<i>Nerita striata</i>		<i>Barbatia virescens</i>
	<i>Nerita plicata</i>		<i>Barbatia fusca</i>
	<i>Nerita insculpta</i>	Mytilidae	<i>Mytilus coruscus</i>
	<i>Nerita albicilla</i>		<i>Septifer bilocularis</i>
Litiopidae	<i>Alaba picta</i>		<i>Septifer virgatus</i>
Littorinidae	<i>Littoraria intermedia</i>		<i>Modiolus nipponicus</i>
	<i>Littoraria articulata</i>	Pteriidae	<i>Pinctada maculata</i>
	<i>Nodilittorina radiata</i>		<i>Pinctada martensii</i>
	<i>Nodilittorina trochoides</i>	Isognomonidae	<i>Isognomon acutirostris</i>
	<i>Nodilittorina vidua</i>		<i>Isognomon perna</i>
Rissoidae	<i>Zebina affinis</i>		<i>Isognomon sp.</i>
Cypraeidae	<i>Cypraea annulus</i>	Pinnidae	<i>Pinna muricata</i>
Ranellidae	<i>Cymatium tenuiliratum</i>	Ostreidae	<i>Saccostrea mordax</i>
Epitoniidae	<i>Gyroscala lamellosa</i>	Carditidae	<i>Cardita variegata</i>
Eulimidae	<i>Eulima sp.</i>	Veneridae	<i>Periglypta reticulata</i>
Muricidae	<i>Cronia margariticola</i>		<i>Gafrarium dispar</i>

Result and Discussion

A total of 84 species belonging to 31 families were sampled during this survey (Table 1). This number is almost equivalent to the total number of species in nine coasts of the Satsuma Peninsula (YANO, 2001). Since the latter study dealt with an area more than ten times as larger than this study, we can say that Mageshima Island has a more diversified intertidal molluscan fauna than that of the Satsuma Peninsula. Intertidal molluscan fauna in Mageshima Island was also more diversified than that of Chiringashima Island at the mouth of Kagoshima Bay, which is an uninhabited island. The latter has 57 molluscan species including 42 gastropoda.

Among 84 molluscan species in Mageshima Island, 61 were gastropoda, while only 17 species of bivalves were sampled. Since most rocky shores of Mageshima Island also had cobble stones, we sampled few settlement species including many intertidal bivalves. Among 61 gastropod species, at least 26 were carnivorous including many subtropical species belonging to Muricidae and Conidae. The ratio of carnivorous species to all gastropod species in Mageshima Island (26 to 61) was almost equivalent to that of the intertidal cobble shores found in Sakurajima Island (7 to 23) (INADOME, 2002). Since a large ratio of carnivorous species are characteristic to molluscan fauna in cobble shores, it can be said that the environmental conditions of intertidal rocky shore in Mageshima Island were intermediate between that of a rocky shore and a cobble shore.

Three species of gastropoda (*Acanthopleura gemmata*, *Nerita helicinoides tristis* and *Pusia dichroa*) are reported to be distributed only south of Amami Island. Some other species, e.g., *Nerita plicata* have their northernmost limit of distribution at Tanegashima Island. These species were also sampled from the southern part of the Satsuma Peninsula and thought to be an irregular distribution without any reproductive capacity. In Mageshima Island, they have enough density to have reproductive capacity and to be able to conserve their population.

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