

6-1-5

Daito Islands (Map 6-1-5)

Province: Okinawa Prefecture **Location:** ca. 360 km east off Okinawa Is., including Kitadaito, Minamidaito, and Okidaito Is. **Features:** Kitadaito and Minamidaito Is. are manned island **Population:** ca. 2,100 **Air temperature:** 23.1°C (annual average, at Minamidaito Is.) **Seawater temperature:** 25.1°C (annual average, at south off Daito Islands) **Precipitation:** 1,649.8 mm (annual average, at Minamidaito Is.) **Information on coral communities:** not available **Protected areas:** none

6-1-5-①

沖縄県
Okinawa Prefecture

北大東島
Kitadaito Is.

St. 1

北大東村
Kitadaito Village

St. 2

南大東島
Minamidaito Is.

St. 5

St. 4

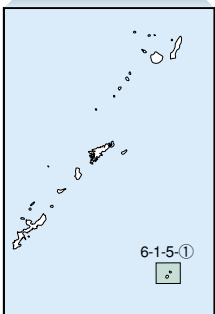
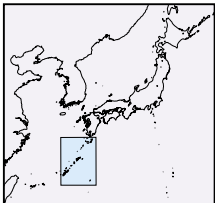
St. 3

南大東村
Minamidaito Village

St. 6



0 3 6km



6-1-5-①

Daito Islands

(Map 6-1-5-①)

Masanori Nonaka

1 Corals and coral reefs

1. Geographical features

While the Daito Islands belong to the Ryukyu Islands archipelago (Okinawa Prefecture), they are located approximately 360 km east of Okinawa Island and are geographically isolated from the Ryukyu Islands (which consists primarily of the Amami Islands, Okinawa and associated islands, Miyako Islands, and the Yaeyama Islands). The Daito islands did not appear on any map until they were discovered by finding on discovery by the Russians in 1820 onboard the vessel 'Borodino', and were named the 'Borodino Islands' after the Russian vessel. The first Japanese pioneers to set foot land on the islands was in 1899.

The Daito Islands primarily consist of three major islands: Kitadaito Island, Minamidaito Island and Okidaito Island; the last of which is uninhabited. Kitadaito Island and Minamidaito Island are located in close proximity, about 7 km apart, while Okidaito Island is about 150 km to the south, and is much smaller. Minamidaito Island is the largest island in the group. It is oval shaped. Its long axis extends 6.5 km, covering approximately 30.6 km², and supports a human population of about 1,400. Kitadaito Island is somewhat smaller covering 12.7 km², and supports about 600 people. These islands are basically raised atolls that lack rivers, but support many freshwater ponds distributed around the islands' center.

2. Coral distribution

During October 2-4 in 2001, visual census of corals and fishes was conducted at 6 sites (sites are described on the previous page). The islands support poorly-developed fringing reefs and coastline is mostly precipitous cliffs (Photo. 1). A gradual slope continues to about 20 m, and then suddenly drops steeply to approximately 2,000 m. Benthic organisms and seaweeds were sparse from the shoreline to 10 m depth (Photo. 2). However, 62 spe-



Photo. 1. The east coast of the Minamidaito Island. Coastline is mostly precipitous cliffs; fringing reefs surrounding the islands are poorly developed.



Photo. 2. Benthic organisms and seaweeds were sparse from the shoreline to 10 m depth.



Photo. 3. *Pocillopora eydouxi*.



Photo. 4. Large sponges.

Photo. 6. *Chaetodon daedalma*.Photo. 5. *Chaetodon quadrimaculatus*.Photo. 7. *Hamitaurichthys thompsoni*.

cies of hermatypic corals (hereafter, corals) were recorded at 10–20 m (Appendix 1-7-Table 1). Most of the confirmed coral species were the same as species reported on Okinawa Island. Dominant coral genera were *Porites* and *Pocillopora* (Photo. 3), while *Acropora* and faviids, which are very common on Okinawa, were not common on the Daito Islands. In contrast, *Astreopora* colonies, which are not commonly seen on Okinawa Island, were rather abundant. Mean coral coverage throughout the observed area was approximately 10 %.

3. Notable species and ecosystem

There was a remarkable contrast in invertebrate fauna compared with Okinawa and adjacent islands. Sponges, especially large colonies (more than 40 cm tall) (Photo. 4), were prolific. Fish fauna was also different than recorded on the more western Ryukyu Islands. Sixty species of coral reef fishes were recorded (Appendix 1-7-Table 2). *Chaetodon quadrimaculatus* (Photo. 5), *C. punctatofasciatus* and *C. reticulatus*, very rare in the western Ryukyu

Islands' were common on the Daito Islands. Also, *C. daedalma* (Photo. 6), *Centropyge flavissima* and *C. interrupta* have not been recorded in the Ryukyu Islands but were observed on Izu and Ogasawara Islands (Nakabo 2000). *Hamitaurichthys thompsoni* (Photo. 7), especially, has only once been recorded in Japan in Muko-jima in the Ogasawara Islands (Senou *et al.* 1997), but this species was common in Minamidaito Island.

2 Situation of usages

1. Tourism

Tourists are rare and the majority of visitors are fishers (100–120 people/year) and SCUBA divers (ca. 200 people/year). Recently, a cruise boat operation to the Daito Islands has commenced, transporting about 100 visitors annually.

2. Fishery

There are about 30 fishermen on Minamidaito Island, however only four are devoted to fishing full time. Others have side businesses, and attend agricultural plots or provide service industries. Most fishers target offshore tuna and mackerel using rods, harpoons, or by trolling. There is only one fisherman engaged in catching coral reef fishes, including parrotfish and grouper, using SCUBA. Sometimes fishers gather on the shallow coral reef to catch blue sprat using a net (and snorkel).

3 Threats and disturbances

The coral communities of the Daito Islands suffered severe damage during the 1998 coral-bleaching event, similar to other areas in the Ryukyu Islands. High coral coverage was observed all around Minamidaito Island before the 1998 bleaching event. The north sides of the islands, especially, were dominated by branching species (probably *Acropora*) that, according to local information, covered in places nearly 100 % of the substrate. In 2001, many *Acropora* spats (i.e., recruits) were observed and the communities appear to be recovering (Kohama personal communication). Mr. Hisao Kohama who has been a professional diver for more than 20 years, has seldom seen crown-of-thorns starfish (*Acanthaster planci*) in the Daito Islands. Therefore, it can be assumed that there have been no *A. planci* outbreaks in recent years.

Major anthropogenic threats to coral reefs in the Daito Islands are the development of ports, roads and shoreline protection structures. A common result is high sediment discharge, including red soil, on the coral communities. Other known sources of damage include (long) fishing nets that cover corals, often stemming from offshore fishing boats (Kohama, personal communication).

4 Necessary measures

The fisheries cooperative association of Minamidaito Island has prohibited waste disposal at sea. But so far there have been no coordinated conservative efforts among the island's residents. Therefore, it is necessary to develop an educational program on environmental problems particularly on marine and coral reef issues (Kohama, personal communication).