

# SEDIMENTS AND ROCKS FROM THE IZU-OGASAWARA ARC AND TRENCH AREA

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Samples were taken from the Nishi-Shichito Ridge, Shichito-Iojima Ridge, Ogasawara Ridge, Ogasawara Plateau and the oceanic floor of the Northwest Pacific Basin. Samples are listed as follows;

Sediments: D18, 19, 20, 22, 23, 24, 25, 26, 27, 31, P4, 5, 6.

Sedimentary rocks: D26, 31.

Volcanic rocks\*: D18, 19, 20, 23, 24, 26, 27.

Manganese nodules and their fragments\*\*: D22, 23, 24, 26.

Coral: D21, 28, 29, 30.

The sampling stations and samples obtained are listed in Table 7.

## 1) Nishi-Shichito Ridge

Greyish-green silt or silty sand, and light greyish-brown medium sand were sampled.

\*including pyroclastics or hyaloclastics.

\*\*including the manganese oxide coating.

Table 7 List of sediment and rock samples obtained from

St. No.	Samp. No.	Date	Time	Position		Depth (m)	Sampler
				Latitude	Longitude		
27	D18	'74, June, 12	16: 48	27°13.5'N	140°53.6'E	175	Cylinder-type dredge
			17: 12	27°13.5'N	140°53.5'E	165	
28	D19	June, 12	18: 50	27°13.0'N	141°04.2'E	2,705	ditto
			20: 20	27°13.0'N	141°03.7'E	2,692	
29	D20	June, 13	8: 39	27°17.3'N	142°21.0'E	625	ditto
			9: 32	27°17.5'N	142°21.0'E	610	
30	D21	June, 13	13: 21	27°34.1'N	142°12.2'E	105	ditto
			13: 38	"	"	105	
31	D22	June, 13	15: 50	27°15.2'N	142°40.4'E	3,220	ditto
			17: 55	27°15.2'N	142°40.7'E	3,170	
32	P4	June, 14	9: 20 12: 25	27°11.0'N	142°10.0'E	5,530	Piston corer with pilot corer

These sediments include much pumice. Calcareous tuff which includes volcanic rock fragments and foraminifera was sampled at St. 40(D26), west of Torishima Island. This material seems to have been taken from an in situ outcrop of the sea bed and therefore age determination from the foraminifera is possible.

At St. 48 (D31) S.W. of Zenisu Shoal, greenish colored calcareous tuff was sampled. It seems to have been taken from an in situ outcrop and is rich in glass fragments and foraminifera. Greenish clay mineral (glauconite?) is found under the microscope.

## 2) Shichito-Iojima Ridge

Dredging work was carried out at five points on this Ridge, at St. 44, 45 and 46 (D28, 29 and 30), N.E. of Hachijojima Island, fragments of coral, sponge and limestone, of which the last consists of coral and shell fragments, were dredged.

Black volcanic sand, dark brownish-grey silty sand, and volcanic rocks were sampled at St. 27 and 28 (D18 and 19) near Nishinoshima Island in southern part of the surveyed area. Here, the submarine volcano which is named Shin-Nishinoshima Island erupted in 1973, and the dredged samples include hyaloclastics and pyroclastics from this time. However, volcanic rocks which are coated by coral and calcareous material or were a little rounded, were also sampled and they are probably older. The sampled volcanic rocks are hypersthene-augite andesite, olivine basalt and altered dolerite (rounded).

## 3) Ogasawara Ridge and Ogasawara Plateau

Izu-Ogasawara Arc and Trench area, during GH 74-3 cruise.

Samples	Remarks	Area
Black colored volcanic medium sand, bearing the volcanic rock fragments. Basalt, andesite, altered dolerite and tuff breccia were taken.		Near Nishinoshima Island.
Dark brownish grey silty sand and pumice, porous andesite, glassy andesite (?)		West of Nishinoshima Island.
Light brownish grey medium sand including volcanic rock fragments, shell, coral, and fossils. The sediment is very well sorted.		North of Chichijima Island.
Argal balls and coral.	It seems that argae and coral reef cover the shallow sea floor between Mukojima and Yome-shima Islands.	South of Mukojima Island.
Greyish white sand consists of foraminifera and shell fragments. Brownish clay coated by black colored material.		Northeast of Chichijima Island.
Red clay, 18 cm length. In the pilot corer the same material has been taken 57 cm length.		Oceanic floor east of Chichijima Island.

(continued)

Table 7

St. No.	Samp. No.	Date	Time	Position		Depth (m)	Sampler
				Latitude	Longitude		
34	D23	June, 17	9: 28	25°55.5'N	143°55.0'E	2,300	Cylinder-type dredge
			11: 10	25°55.9'N	143°56.0'E	2,280	
35	D24	June, 17	14: 06	26°10.5'N	143°23.0'E	2,640	ditto
			15: 51	26°10.5'N	143°24.0'E	2,630	
37	P5	June, 18	9: 11 12: 50	29°00.7'N	144°12.5'E	5,580	Piston corer with pilot corer
38	P6	June, 18	16: 00	29°31.5'N	143°45.0'E	5,620	ditto
39	D25	June, 19	13: 13	30°32.4'N	141°34.0'E	3,370	Cylinder-type dredge
			16: 00	30°32.3'N	141°34.7'E		
40	D26	June, 20	16: 20	30°59.5'N	138°46.5'E	1,670	Chain-bag type and cylinder-type dredges
			18: 23	"	"		
41	D27	June, 21	13: 42	31°41.0'N	138°36.0'E	2,900	ditto
			17: 04	31°42.5'N	138°36.5'E	2,350	
44	D28	June, 26	13: 18	33°32.3'N	140°06.5'E	180	ditto
			13: 44	"	"		
			13: 49	33°33.1'N	140°07.3'E	180	
			14: 13				
45	D29	June, 26	14: 58	33°30.1'N	140°09.5'E	190	ditto
			15: 48	33°30.1'N	140°09.5'E	160	
46	D30	June, 26	16: 53	33°29.5'N	140°16.7'E	225	ditto
			17: 47	33°29.3'N	140°16.5'E	205	
48	D31	June, 27	15: 42	33°50.0'N	138°32.0'E	1,000	Chain-bag type and cylinder-type dredges
			17: 40	33°48.1'N	138°30.5'E	700	

From the Ridge and Plateau calcareous sand or semiooze including foraminifera and shell fragments were sampled. At St. 39 (D25), black volcanic sand and partly rounded pumice (about 1 millimeter in diameter) are included in the calcareous sand. Brownish mudstone (rock fragments?) which is coated by manganese oxide(?) is included in the

(continued)

Samples	Remarks	Area
Light brownish-grey calcareous semi-ooze, bearing black grains. Pumice coated by black material.		On the south flank of a sea mount southeast of Chichijima Island.
Light brownish-grey calcareous semi-ooze or coarse sand bearing foraminifera and manganese oxide coating pumice. Manganese nodules, 2 cm in diameter.		Col between two sea mounts southeast of Chichijima Island.
Red clay, including a little tuffaceous materials in part, but except them almost homogeneous. Core is 330 cm long.		Abyssal plane east of the Trench.
Homogeneous red clay, only 13 cm long.	Pilot corer did not arrive at the bottom, therefore piston corer did not fall and arrived at the bottom directly.	ditto
Light brownish-grey silty sand and black colored medium sand which seems to be volcanic. Much pumice of which diameters are less than 1 mm are present.		Northwest of Torishima Island.
Light greyish-brown medium sand. Calcareous sandstone (tuffaceous?), which includes foraminifera, partly coated black material. Pumice. Fragments of manganese nodule.		ditto
Greyish-green silt or clay, and greyish-brown silt or clay. Two pumice.		Southwest of Hachijima Island.
Sponge, coral and limestone which consists of coral and shell fragments.		South of Mikurajima Island, flat top of a hill.
Sponge, coral and limestone which consists of coral and shell fragments. Organism of crustacea.		Ditto At a small cliff.
Coral fragments and limestone which consists of coral and shell fragments.		Ditto At a flank of the flat-topped hill.
Greyish-green sandy silt, ill sorted and including granules and pebbles. Greyish-green tuff which seems to be autochthonous sedimentary rock. Brown sandstone. Pumice.		South slope of Zenisu Shoal.

calcareous sand at St. 31 (D22). Between Yome-jima Island and Muko-jima Island rock sampling was attempted, but only coral was taken.

Calcareous sand was also taken at St. 34 (D23) on the Ogasawara Plateau. The sand includes fine-grained black sand and rounded pumice. At St. 35 (D24) manganese

Table 8 Rocks sampled during GH 74-3 cruise.

Sample No.	Name	Remarks
D18-A	aug-hy andesite	Phenocryst; pl > hy > aug. Mostly smaller than about 0.3 mm. Groundmass consisting of plagioclase, clinopyroxene and opaque minerals.
D18-B	hy-aug andesite	Porous. Fine grained.
D18-C	aug-ol basalt	Phenocryst; pl > ol > aug. Groundmass; pl > ol > clpx(?). Porous.
D18-SS1	aug-hy basalt	Phenocryst; Some augite occurs as a reaction rim around hypersthene or in parallel growth with hypersthene. Groundmass; pl > clpx.
D18-SS2	dolerite	All mafic minerals altering to green colored clay minerals.
D19-1	hy-aug andesite	Porous.
D19-2	aug andesite	Glassy.
D19-3	hy-aug andesite	Hypersthene occurs in parallel growth with augite.
D26	calcareous sandy tuff	Consists of volcanic rock fragments and an abundant foraminifera.
D31	calcareous tuff	Consists of glassy fragments and foraminifera. Green colored clay mineral (glauconite?) is present.

aug: augite, hy: hypersthene, ol: olivine.

nodules (about 2 centimeters in diameter) and pumice coated by manganese oxide were sampled.

#### 4) Oceanic floor east of the Izu-Ogasawara Trench

A piston corer was used for the sampling. At all sampling stations red clay was sampled. Cores were 13 and 330 centimeters in length. The clay is almost homogeneous but has some bands and patches which are probably tuffaceous.