

IX. CORED MATERIAL

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Fifteen piston corings (P142–P157) and nineteen rock corings (RC45–RC63) were carried out during cruises GH79-2, 79-3, and 79-4, in order to study the compositions of the stratigraphic sequences and to get representative sedimentary sequences for this area. Of these corings, four rock corings (RC56–RC59) which were performed to test the currents and the sea bottom conditions before drilling with a marine drill, are excluded from this chapter. The cored sites and data are given in Fig. I-1, 2 and Tab. I-9, 10 and 11. Visual descriptions of the cored material are given in Fig. IX-1.

The Northwestern Pacific Ocean Basin

Two cores, P150 and P155, were taken from a flat ocean floor east of the Ogasawara Trench at depth of 5,475 m and 5,800 m respectively. Core P157, which was taken from the foot of a seamount on the upper outer trench slope of the Ogasawara Trench, is included in this area, because its sedimentary environment is similar to those of the above two cores. Core RC47 was attempted on Yabe Guyot so-named by SHIBA (1979), which is located in the Northwestern Pacific Ocean Basin, but no sediment was recovered.

P150 : This core is the longest core taken during these cruises. It is composed of brown to dark-brown clay with mottles throughout.

P155 : This core is composed brown to greyish-brown clay with some mottles. Some brown, thin, indistinct ash layers are present.

P157 : This core is composed of brown to dark greyish-brown clay with several thin ash layers.

The Ogasawara Trench

Two cores, P151 and P153, were taken from the bottom of the Ogasawara Trench at depths of 8,665 m and 9,410 m respectively.

P151 : This core is composed of olive to olive-grey clay with brown to olive coarse sand and granule layers. The thickest layer of coarser sediment exceeds 150 cm. The coarse grains of these layers are fragments of brown, pale-brown, and pink chert and claystone, the lithology of which is similar to that of the gravels dredged from the outer trench slope (St. 1560, D361). A few Cretaceous radiolarians (*Dictyomitra* spp. etc.) were found in the coarse sand layers.

P153 : This core is composed of olive-grey tuffaceous silt. Fragment of planktonic foraminiferal tests and nannoplanktons were observed in smear slides of the silt. A few well-preserved foraminiferal tests were found in the silt of the core catcher. Fine laminations are well developed throughout the core.

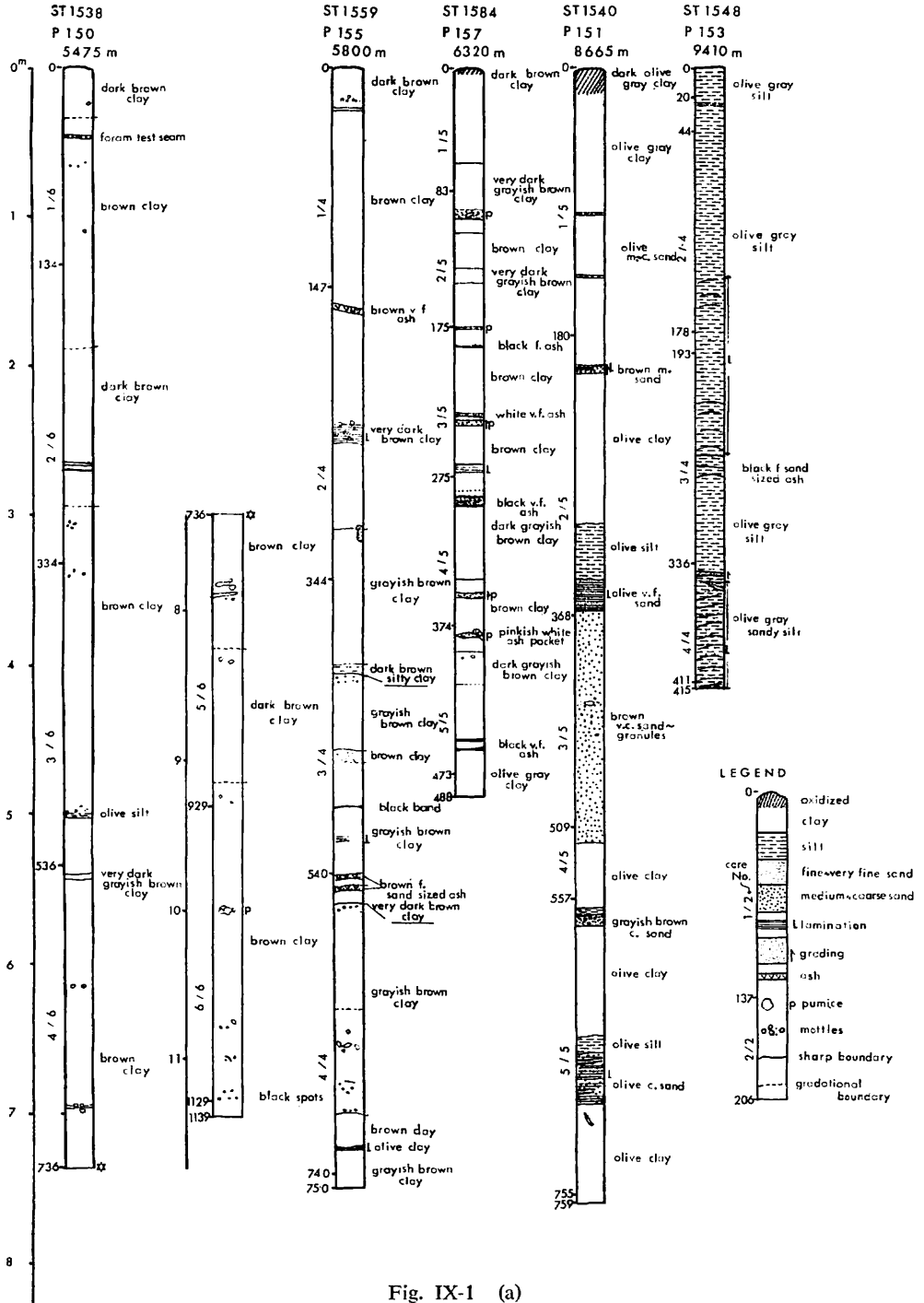


Fig. IX-1 (a)
Fig. IX-1 Columnar sections of the piston cores and rock cores.

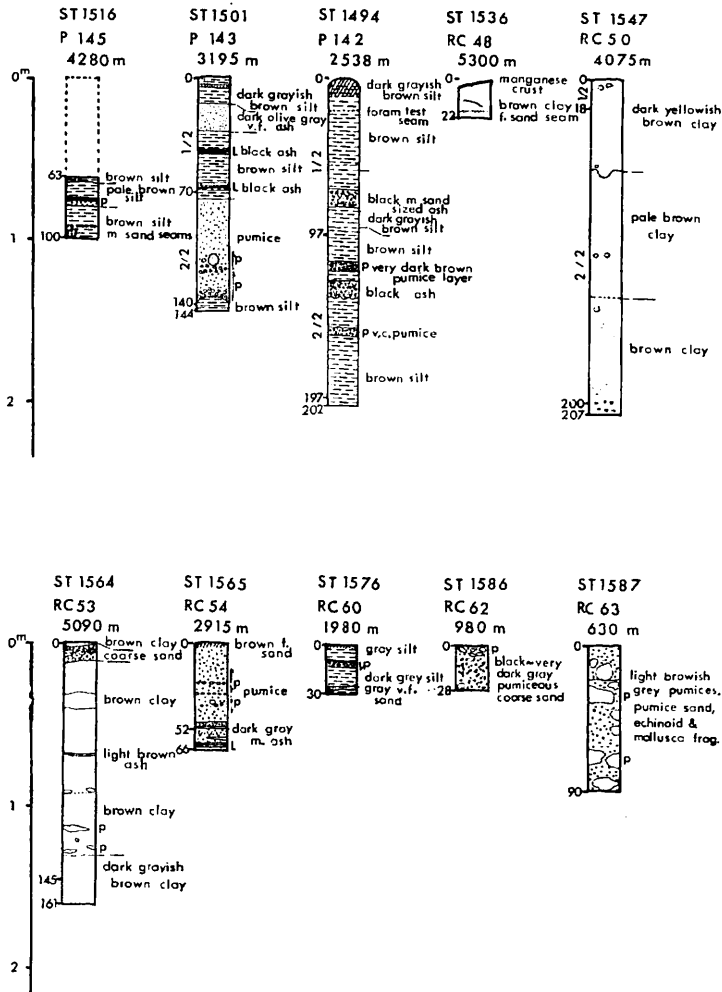


Fig. IX-1 (b)

The Mariana Ridge

Between the Mariana Ridge and the Mariana Trench, three cores were taken from a small basin (P145), a slope (P143) and a small high on the inner trench slope (P142).

P145 : The upper part of this core was not recovered because the core barrel bent. The lower part is composed of brown silt with a pumice layer.

P143 : This core is composed of dark greyish-brown to brown silt. A dark olive-grey, very-fine-sand-sized ash layer and two thin scoria layers are present in the lower part.

P142 : This core is composed of a brown silt rich in foraminiferal tests. Two scoria layers and two pumice layers are present.

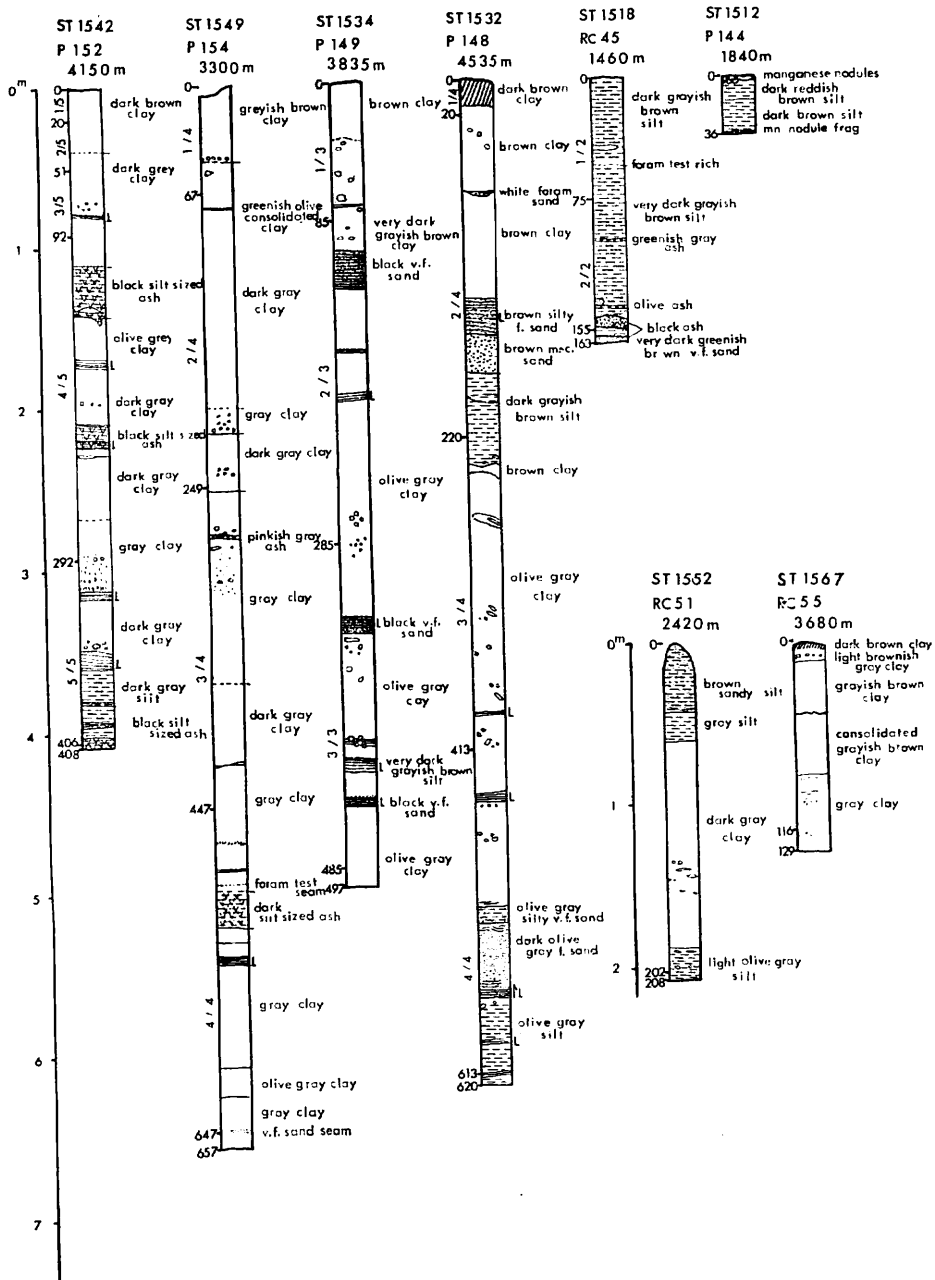


Fig. IX-1 (c)

A small amount of olive-grey, medium sand was taken from the top of a small high on the trench slope (RC46).

The Ogasawara Ridge

Four rock corings were attempted between the Ogasawara Trench and the Ogasawara Ridge, but only two cores were successfully taken, one from a small high (RC48) and another from a small basin on the trench slope (RC50).

RC48 : This core is very short and composed of brown consolidated clay with a manganese-coated surface.

RC50 : This core is composed of dark yellowish-brown clay in the upper part, pale-brown clay in the middle part, and brown clay in the lower part.

Grey clay was attached to the rock corer after an attempt was made to take a core on a narrow, flat plain on the Ogasawara Ridge (RC49). Pumiceous fine sand was recovered from a small bench on the eastern slope of the Ogasawara Ridge (RC52).

The Shichito Ridge

Between the Ogasawara Trench and the Shichito Ridge, core RC53 was taken from the inner trench slope and RC54 from a hollow near the trench slope break. RC62 was taken from the slope of the Shichito Ridge and RC63 from a central hollow of a seamount of this ridge adjacent to Hachijo Island.

RC53 : This core is composed of brown clay with pumice scattered through the lower part. There is a coarse sand layer near the top.

RC54 : Most of the core is composed of volcanic material. Pumice layers in the middle part show both normal grading and reverse grading. The lower part of the core is composed of dark-grey, medium-sand-sized ash.

RC60 : This core is composed of grey and dark-grey silt with a pumice layer.

RC62 : This core is composed of pumice and dark-grey pumiceous coarse sand.

RC63 : This core is composed of pumice and pumiceous sand. Fragments of echinoid spines and molluscs are found in the pumiceous sand.

The Mariana Trough

Core RC45 was taken from the northern margin of the Mariana Trough at a depth of 1,460 m. This core is composed of dark greyish-brown silt, intercalated by greenish-grey, olive, and black ash layers.

The Ogasawara Trough

Though three corings were attempted on the flat plain of the Ogasawara Trough, only one core (P152) was successfully taken. It was recovered from the northern part of the trough at a depth of 4,150 m. Core P152 is composed of dark-grey clay with some mottles and laminations in parts. Some thick scoria layers are present.

The West Mariana Ridge

Core P144 was taken from a slope between the Mariana Trough and the West Mariana Ridge at a depth of 1,840 m. This core is only 36 cm long and composed of dark reddish-brown silt in the upper part and dark brown silt in the lower part. Manganese nodules were found at the top of the core.

Between the Shichito Ridge and the Izu Ridge

From the flat plain of the basin between these two ridges, two cores (P149 and P154) were taken at depths of 3,300 m and 3,835 m respectively.

P149 : This core is composed of brown clay in the upper 100 cm and olive-grey clay in the lower part. Black, laminated, very-fine-sand layers are intercalated in the massive clay. Some mottles were observed in the clay.

P154 : This core is composed of grey clay, except for 80 cm of brown clay at the top. There are two ash layers.

The Izu Ridge

Two cores (RC51 and RC55) were taken from the slope of the Izu Ridge at depths of 2,420 m and 3,680 m respectively.

RC51 : This core is composed of brown to grey silt and clay containing foraminiferal tests.

RC55 : The upper part of this core is composed of greyish-brown clay and the lower part of consolidated greyish-brown and grey clay.

The Shikoku Basin

Core P148 was taken from the flat plain of the eastern margin of the Shikoku Basin at a depth of 4,535 m. This core is composed of brown clay in the upper part and olive-grey clay and silt in the lower part. Mottles and laminations are common.

In the ocean basin east of the trench, pelagic sediment with only thin ash layers suggests a calm environment. On the other hand, at the bottom of the Ogasawara Trench, well laminated tuffaceous silts with the tests of calcareous organisms and chert fragments indicate a supply of sediments from shallower areas. Grey to olive clay with a large number of ash layers indicates a large supply of volcanic material from the ridge areas, in the flat plains of the Ogasawara Trough, the basin between the Shichito and the Izu Ridges, and the Shikoku Basin. Many cores taken around the ridges show various sedimentary sequences influenced by the water depth, volcanic activity, and geological history of the ridges.

Reference Cited

- SHIBA, M. (1979) Geological history of the Yabe Guyot to the east of the Ogasawara Islands. *Jour. Geol. Soc. Japan*, vol. 85, p. 209-220.