

## VIII. DESCRIPTION OF ROCKS AND SEDIMENTS

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The sampled sites, their depth and kinds of hauls were previously listed in Table I-4. Here, the characteristics of individual samples, especially for rocks, that were taken by dredge and rock-coring, are described.

Sampling was attempted at 24 stations during the regional extensive survey of the areas of the East China Sea off the west coast of Kyushu and the southwestern part of the Japan Sea off the San-in district. The sampling methods are as follows; 12 sites for dredge, 7 sites for rock-coring, and 5 sites for piston-coring.

### **i) East China Sea off the west coast of Kyushu**

The surveyed area is located in the eastern margin of the East China Sea where the continental shelf is wide. In the eastern margin of the shelf, the Goto Canyon and the Danjo Basin develop in the northeast extension of the Okinawa Trough, and these hollows give the rough to monotonous topography.

A part of the area was previously surveyed from 1969 to 1973 by the marine geological research group of G.S.J. and the results were published in part as Marine Geology Map Series 1, Submarine Geological Map around Koshikijima Islands (KIMURA *et al.*, 1975) and Marine Geology Map Series 2, Bottom Sediment Map, Tsushima and Goto Islands area (OSHIMA *et al.*, 1975). Here were five sampling sites including a piston coring site. Dredge and rock-coring holes were selected to confirm the correlation of the basement rocks in air gun profiles.

Dredging was carried out at the knolls of Danjo Basin (2 holes) and the uneven surface on the continental shelf northwest off Fukue Island (one hole). A rock-coring hole was drilled on the flat bottom west off Fukue Island.

Medium coarse and consisting of shell fragments, and coquinite were abundantly obtained from the knolls of Danjo Basin. Additionally, beach sandstone was found in the D213 haul, which consists of rounded grains of quartz and lithic fragments agglutinated by a calcareous matrix. A small amount of fragments of metamorphic rocks (?) and siliceous rocks were obtained from D214. The relation between these rocks and these occurring in western Kyushu is not clear.

A fine-grained quartz diorite was taken from the outcropped area of basement rock west off Fukue Island.

### **ii) Southwestern part of Japan Sea and Tsushima Strait**

Two dredge sites and one rock-coring hole were selected in the Tsushima Strait. Four dredge sites and five rock-coring holes in the shelf off San-in, and three dredge sites were selected off the east coast of the Korean Peninsula. Piston coring was carried out at four sites in Tsushima Basin.

A large amount of pebbles with shell fragments bearing medium sand were dredged

from the slope on the Korean side of Tsushima Strait (D216 and D217). These pebbles seem to have been supplied from the Korean Peninsula, for topographically it gradually increases in depth toward the south. The pebbles of sedimentary composition sandstone, siltstone, shale and slate, some of which had been thermally metamorphosed to have the mineral assemblage of biotite–cordierite–muscovite–plagioclase–quartz. The pebbles of igneous composition were biotite–hornblende granite, porphyritic dolerite, and rhyolite.

No rocks were sampled from the rock-coring holes, but only 185 cm length cores of soft sandy silt were taken.

Five rock-coring trials were made with the aim of sampling the basement rocks outcropping mainly on the continental shelf off San-in, and the sampler hit basement rock on the two sites RC3 and RC6. Shell fragments bearing coarse and tuffaceous sandstone in RC3 and greyish fine sandstone in RC6 were obtained. Four dredges were carried out in this area. Silty clay and pumice was obtained from the continental slope at a depth of 810 meters. Various sedimentary rocks consisting of limestones and sandstones were sampled from three dredge holes (Table VIII-1). Micropaleontological consideration of the rocks will be mentioned in another chapter.

Lithic tuff was found in the D218 dredge haul. It is remarkably altered, and almost all the mafic minerals and glassy fragments have become caly minerals. Clinopyroxene rarely remains. Lithic grains are composed of many acid volcanic rock fragments.

Off the east coast of the Korean Peninsula, three dredge holes were carried out. Rocks suggested to be in situ were obtained from two (D223 and D224) of them. Silt, pumice and minor pebbles were sampled from the west of Ullung Island (Utsuryo-to). Many granitic rocks and minor gneiss were obtained from the slope of the Korean Plateau off Wonsan (D223). The Granitic rocks are divided into two types, coarse-grained and fine-grained ones. Mafic mineral assemblages are green hornblende + biotite (sometimes greenish colored) for the former one and muscovite (very minor) + biotite for the latter one. The mineral assemblage of the gneiss is muscovite + biotite + quartz + tourmaline.

Trachytic volcanic breccia and a minor amount of augite–olivine basalt were taken from the slope of the high to the southeast of Takeshima Island. There are two types of rubble trachyte. One has augite and biotite as mafic phenocryst minerals and the other

Table VIII-1.

Sample No.	Calcite* %	Grains	Remarks
D218-1	62	Qz, kf, pl, pale green hld	organic matter abundant
D218-3	66	Qz, kf, pl, green hld, brown hld	
D219-1	98	Qz	
D219-2	65	Qz, pl, white mica, kf, clpx	
D219-3	52	Qz, kf, pl, white mica, green hld	heterogeneous
D219-4	79	Qz, kf, pl	
D220-3	42	Qz, kf, pl	coarse-grained calcite
D220-5	49	Qz, kf, pl, white mica, biotite, green hld, garnet, allanite(?)	

\* All as matrix matter.

biotite only. Simultaneously, minor pebbles composed of thermally metamorphosed lithic tuff, were also obtained. This hornfels is suggested to be xenoliths of trachytic volcanic rocks.

#### Reference Cited

- KIMURA, M., HIROSHIMA, T., MIZUNO, A. and ONODERA, K. (1975) *Submarine geological map around Koshikijima Islands*. Marine Geology Map Series 1, Geological Survey of Japan.
- OHSIMA, K., YUASA, M., ONODERA, K. and KURODA, K. (1975) *Bottom sediment map, Tsushima and Goto Islands area*. Marine Geology Map Series 2, Geological Survey of Japan.