

*Report on DELP 1985 Cruises in the Japan Sea
Part VI: Preliminary Report on the Sediment Samples
Obtained during DELP 85 WAKASHIO Leg II
and KT85-15 Cruises*

Kiyoshi SHIMAMURA¹⁾, Kyu-Kui JUNG²⁾, Shin-ichi KURAMOTO³⁾,
Juichiro ASHI³⁾, Atsushi OSHIDA⁴⁾, Hidekazu TOKUYAMA³⁾
and Asahiko TAIRA³⁾

¹⁾ General Education, Faculty of Agriculture, Kyushu Tokai University

²⁾ Institute of Geology and Paleontology, Tohoku University

³⁾ Ocean Research Institute, University of Tokyo

⁴⁾ Department of Marine Science, University of the Ryukyus

(Received October 23, 1987)

Abstract

Surface sediments samples which are distributed around the area in the eastern and southern parts of the Japan Sea were taken at 28 localities during the DELP85 and KT85-15 cruises. The fine-grained sediments that show a prominent color variation were distributed in the eastern part (the Mogami Trough region). This color variation may be effected by volcanic activities with gas eruption on the sea floor. The Yamato Rise in the southern part is an outcropped area of rocks. The foraminiferal sand that contains shell fragments, etc. are distributed on the Yamato Rise.

The eastern and southern parts of the Japan Sea were investigated through the cruises of DELP85 of R/V Wakashio Maru and the KT85-15 of R/V Tansei Maru. Sampling of the surface sediments was done by piston corer with pilot corer, Okean grab, Photo-Boomerang grab and Cylinder type chain dredger (Tables VI-1, VI-2 and VI-3). Some features of the piston core and grab samples are briefly described. The dredged samples of the DELP85, Leg II cruise were reported by KIMURA *et al.* (1987; part VII of this report). Although the Photo-Boomerang grab was used in a tentative way in the KT85-15 cruise, it could not be recovered at the third operation.

Three piston core samples were taken during the DELP85, Leg II cruise by the R/V Wakashio Maru (Fig. VI-1 and Table VI-1). Their

Table VI-1. Location and depth of sampling stations during the DELP85, Leg II cruise.

Station No.	Sampler*	Position		Depth (m)	Remarks
		lat. (N)	lon. (E)		
P-1	P.C.	38°01.64'	135°18.37'	2996	Yamato Basin (0 cm)
P-1A	P.C.	38°00.91'	135°18.63'	2993	Yamato Basin (377 cm)
P-2	P.C.	39°20.85'	139°22.65'	890	Mogami Trough (245 cm)
P-3	P.C.	40°48.79'	139°05.58'	3317	Japan Basin (274 cm)

* P.C.; Piston Corer

Table VI-2. Location of the HF- series sampling stations during the DELP85, Leg II cruise.

No.	Position	
	lat. (N)	lon. (E)
HF- 1	38°18.19'	135°00.61'
HF- 2	38°12.34'	135°06.31'
HF- 3	38°04.52'	135°15.43'
HF- 4	38°01.77'	135°18.13'
HF- 5	39°21.49'	138°41.15'
HF- 6	39°20.93'	139°22.73'
HF- 7	39°12.21'	139°17.49'
HF- 8	39°20.95'	139°15.59'
HF- 9	39°21.50'	139°05.79'
HF-10	39°47.18'	139°15.08'

visual descriptions are shown in Fig. VI-2. These samples do not contain materials which are coarser than silt, with the exception of ash and organic materials. The most characteristic feature of these cored materials is the color variation. This color variation may reflect the chemical composition of sediments.

The core sample P-1 was obtained in the southern part of the Yamato Basin. The samples P-2 and P-3 were recovered on the right side bank of the Mogami Deep Sea Channel. Color variation is most prominent in the sample P-3. In the area around the sampling site of P-3, an anomalous reflector, possibly due to gas eruption, has been observed on the 3.5 kHz echogram record (part V of this report, YAMANO *et al.*, 1987; SATO *et al.* 1986). This fact suggests that the chemical composition influencing the color variation in the P-3 sample may be closely related to the gas due to the volcanic activity on the sea floor.

Table VI-3. Location and depth of sampling stations during the KT85-15 cruise.

Station No.	Sampler*	Position		Depth (m)	Remarks
		lat. (N)	lon. (E)		
Pk-1	P.C.	38°57.09'	134°54.29'	2657	Yamato Rise (421 cm)
Pk-2	P.C.	38°36.97'	135°09.45'	1083	Yamato SMT. (30 cm)
Pk-3	P.C.	39°03.11'	133°58.11'	849	Yamato Rise (10 cm)
Pk-4	P.C.	39°11.21'	133°55.82'	2012	Kita Yamato Trough (700 cm)
Pk-5	P.C.	38°44.10'	133°11.80'	2569	Yamato Rise (700 cm)
G-1	O.G.	39°03.10'	134°20.80'	336	Yamato Rise
G-2A	O.G.	38°59.05'	134°02.85'	513	Yamato Rise
G-2B	O.G.	38°59.27'	134°02.97'	509	Yamato Rise
F-1	PBG	39°03.09'	134°20.47'	336	Yamato Rise
F-2	PBG	39°11.27'	133°55.85'	2012	Kita Yamato Trough
F-3	PBG	38°12.20'	132°35.00'	1340	Seamount
D-1	C.D.	38°57.68'–58.60'	134°54.19'–53.70'	2815–2503	Yamato Rise
D-2	C.D.	38°35.80'–36.10'	135°10.00'–10.30'	1542–1512	Yamato Seamount
D-3	C.D.	38°12.20'–12.80'	132°34.70'–34.70'	1234–1078	Seamount

* P.C.; Piston Corer, O.G.; Okean Grab, PBG; Photo-Boomerang Crab, C.D.; Cylinder Dredger

A muddy turbidite layer is recognized in the part between 80 and 100 cm from the sea floor in the sample P-3. This turbidite is possibly supplied by a sediment gravity flow from the Mogami Trough region through the Mogami Deep Sea Channel.

We were able to take ten sediment samples that were adherent to the weight of the heat flow probe (Fig. VI-1 and Table VI-2). They may be surface sediments and were comprised of clay or silty clay.

The surrounding area of the Yamato Rise was surveyed by the KT85-15, R/V Tansai Maru Cruise (Fig. VI-1 and Table VI-3). Sampling sites were located on the slope of the Yamato Rise (Pk-1, 3 and 5), the Kita Yamato Trough (Pk-4) and an unnamed seamount (Pk-2). Piston coring was conducted five times with the stainless core tube 800 cm in length. The core tube did not sufficiently penetrate into the sea floor at sites Pk-2 and Pk-3 (Table VI-3). The core tube was distorted and/or the core bit was crushed at these two sites. This means that the slope of the Yamato Rise and the flank of that seamount were outcropped areas of hard rocks. Unconsolidated sediments were taken at site Pk-2. These sediments were deformed and slightly flowed during the coring process. The schematic columnar section of Pk-2 sediments is shown in Fig. VI-3. Almost all of sediments are comprised of medium-grained sand with abundant foraminiferal tests and subangular pumice fragments.

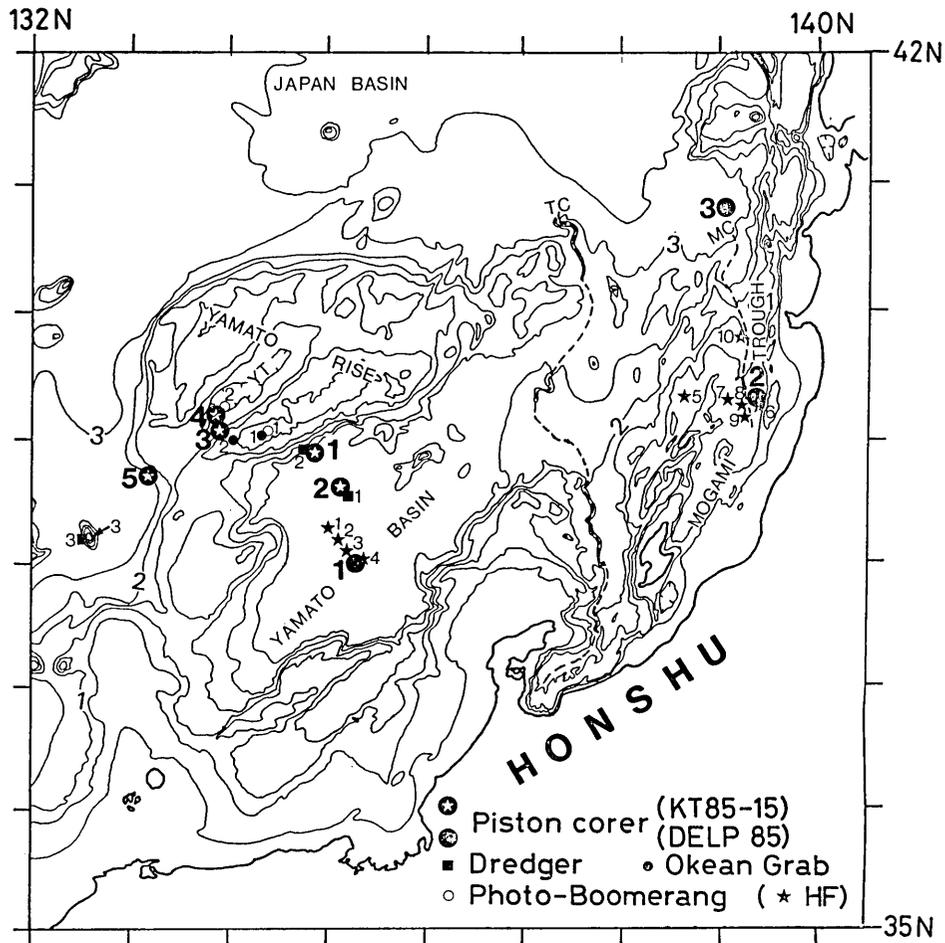


Fig. VI-1. Index map of sampling localities, the YT; Kita Yamato Trough, TC; Toyama Deep Sea Channel and MC; Mogami Deep Sea Channel.

Tests of micro-organisms, e.g., foraminifera, radiolaria, diatom, etc., are commonly included in the pilot core samples with the exception of Pk-1. In the case of the pilot core samples Pk-4 and Pk-5, calcareous tests are rare and the agglutinated benthonic foraminifera are included.

Grab samples, G-1 and G-2, were medium-grained sand and included abundant tests of micro-organisms, especially foraminifera and shell fragments.

All of samples described above are in safekeeping at the Ocean Research Institute, University of Tokyo.

DELP85 P-1A-1 VISUAL CORE DESCRIPTION

(0 - 150 cm)

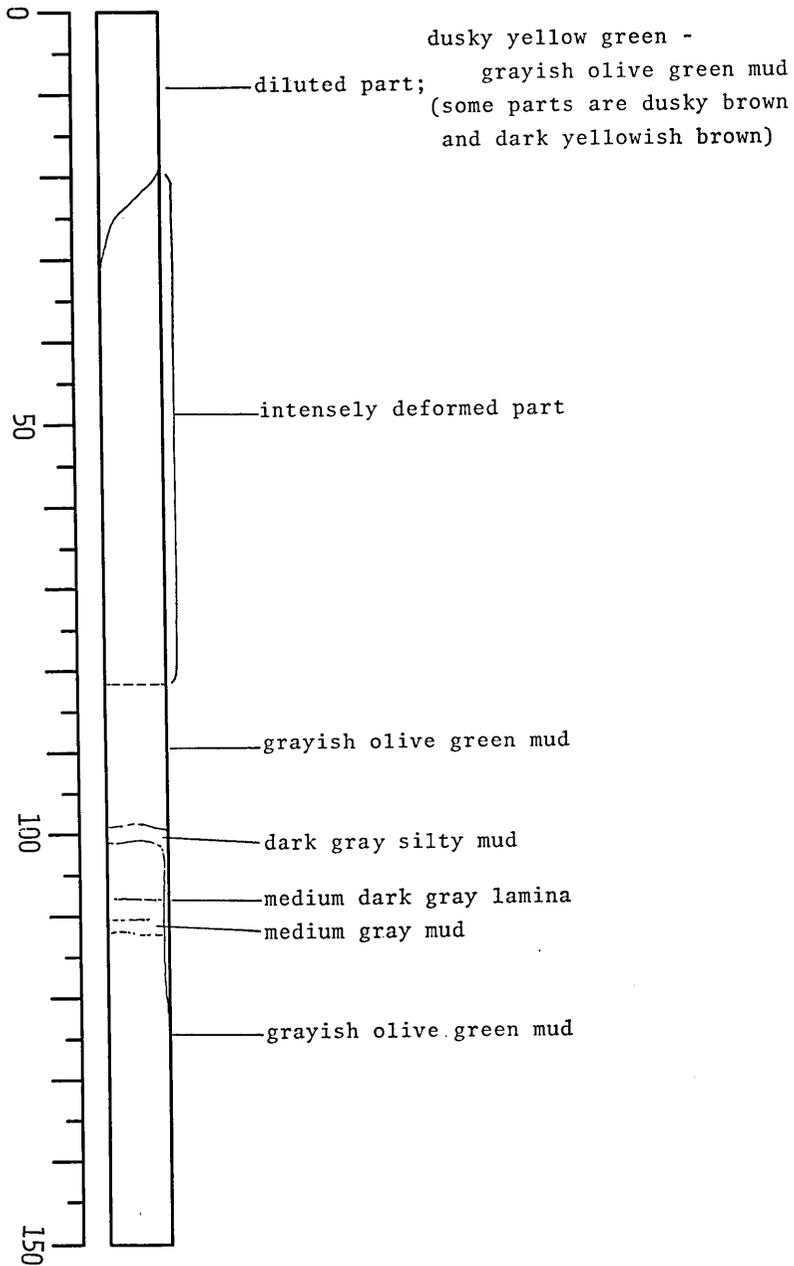


Fig. VI-2(a)

DELP85 P-1A-2 VISUAL CORE DESCRIPTION
(150 - 300 cm)

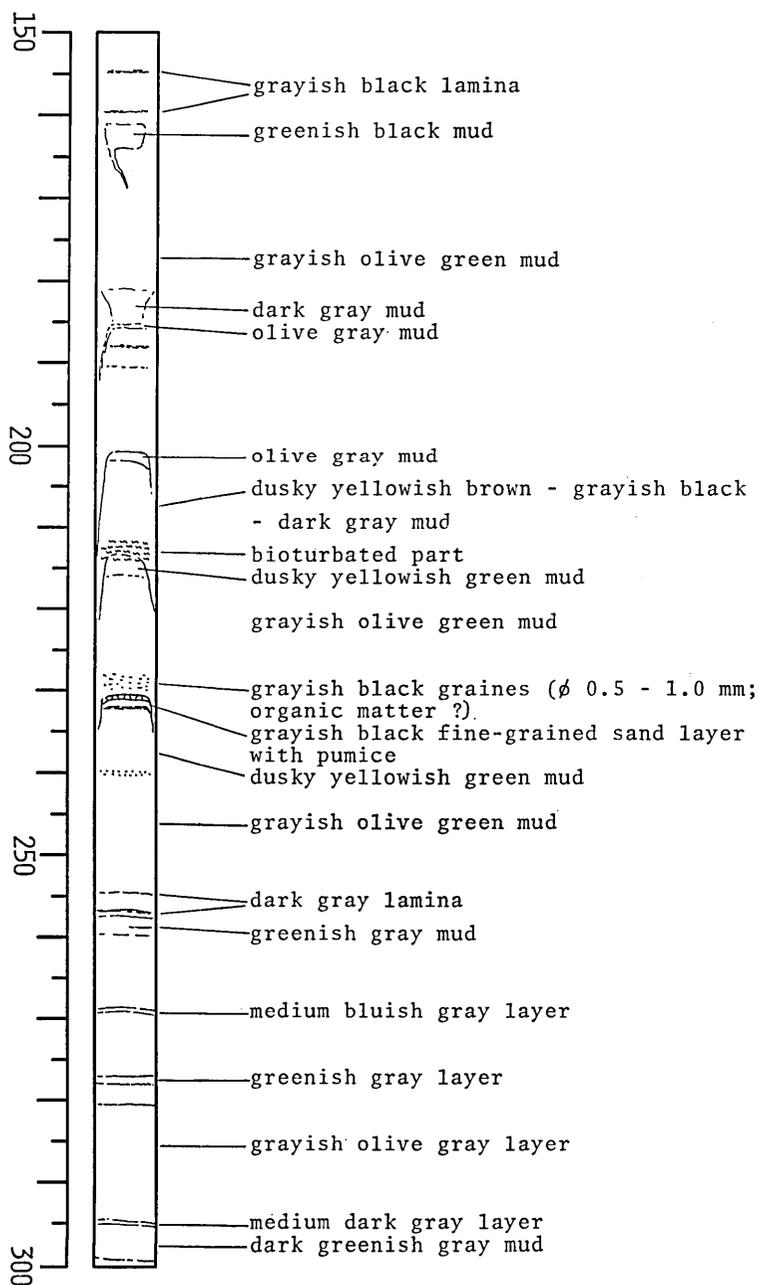


Fig. VI-2(a)

DELP85 P-1A-3 VISUAL CORE DESCRIPTION
(300 - 377 cm)

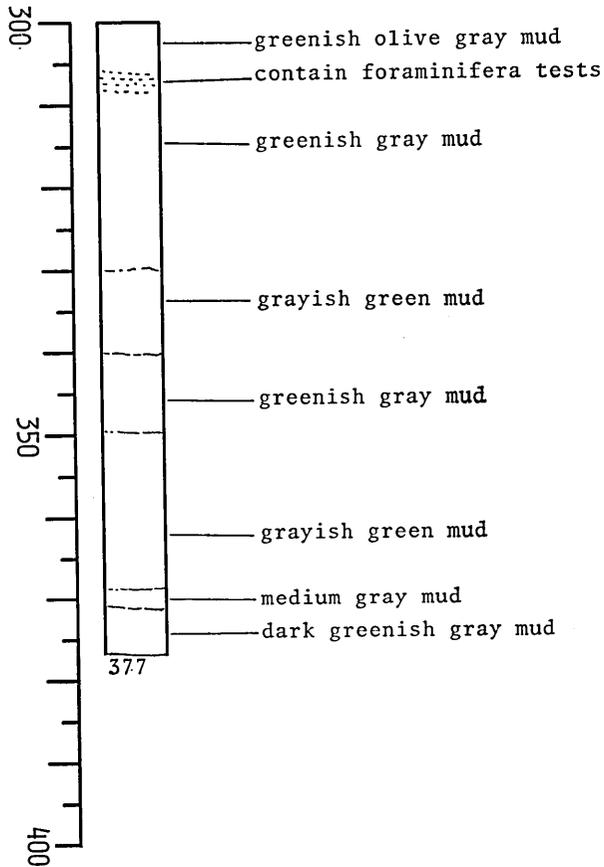


Fig. VI-2(a)

DELP85 P-2-1 VISUAL CORE DESCRIPTION
(0 - 150 cm)

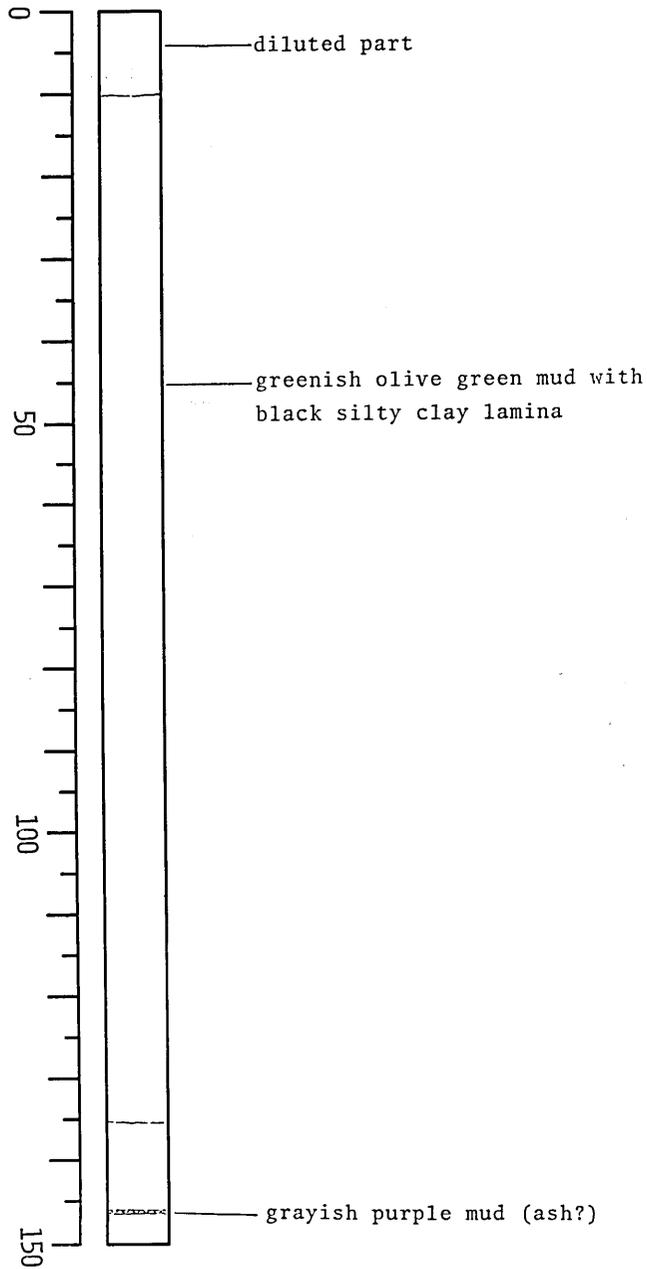


Fig. VI-2(b)

DELP85 P-2-2
(150 - 245 cm)

VISUAL CORE DESCRIPTION

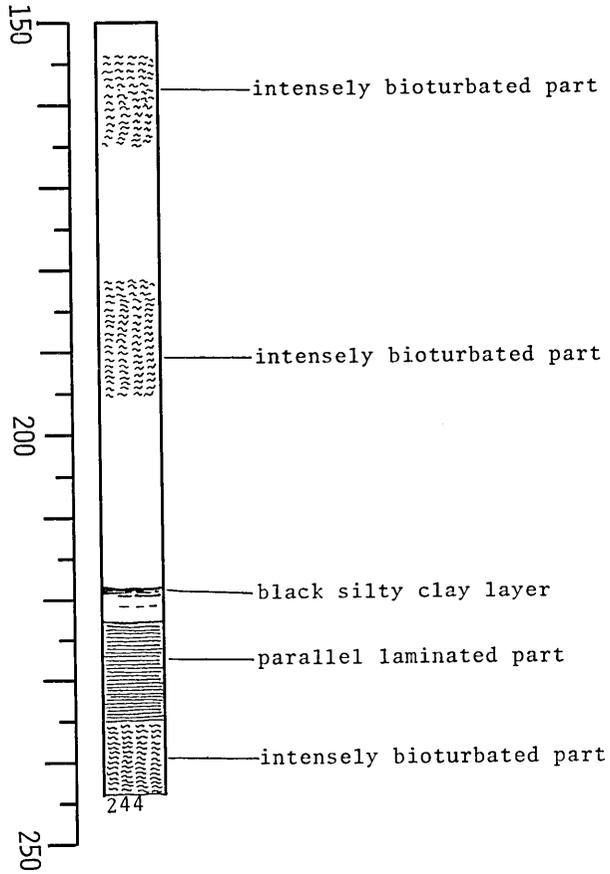


Fig. VI-2(b)

DELP85 P-3-1

VISUAL CORE DESCRIPTION

(0 - 150 cm)

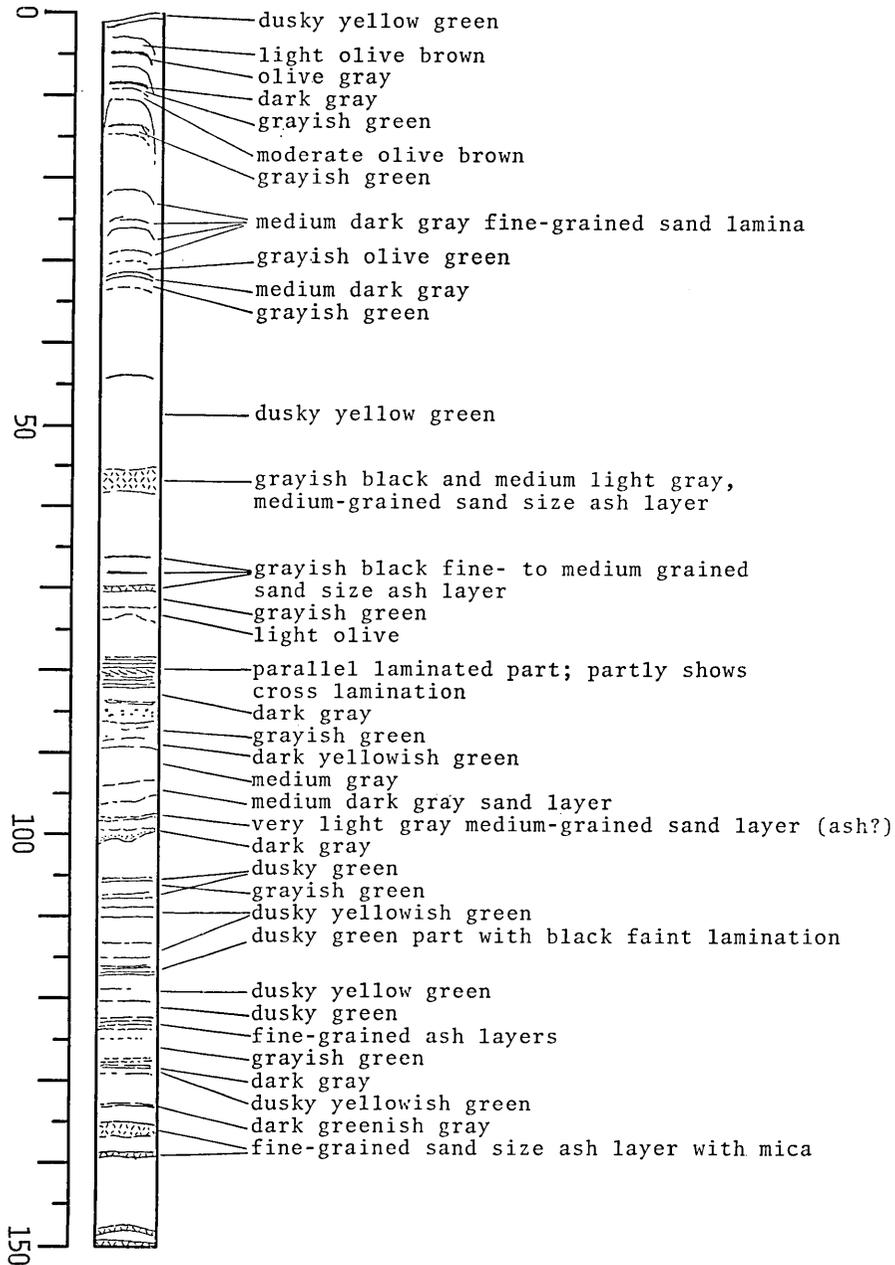


Fig. VI-2(c)

DELP85 P-3-2
(150 - 274 cm)

VISUAL CORE DESCRIPTION

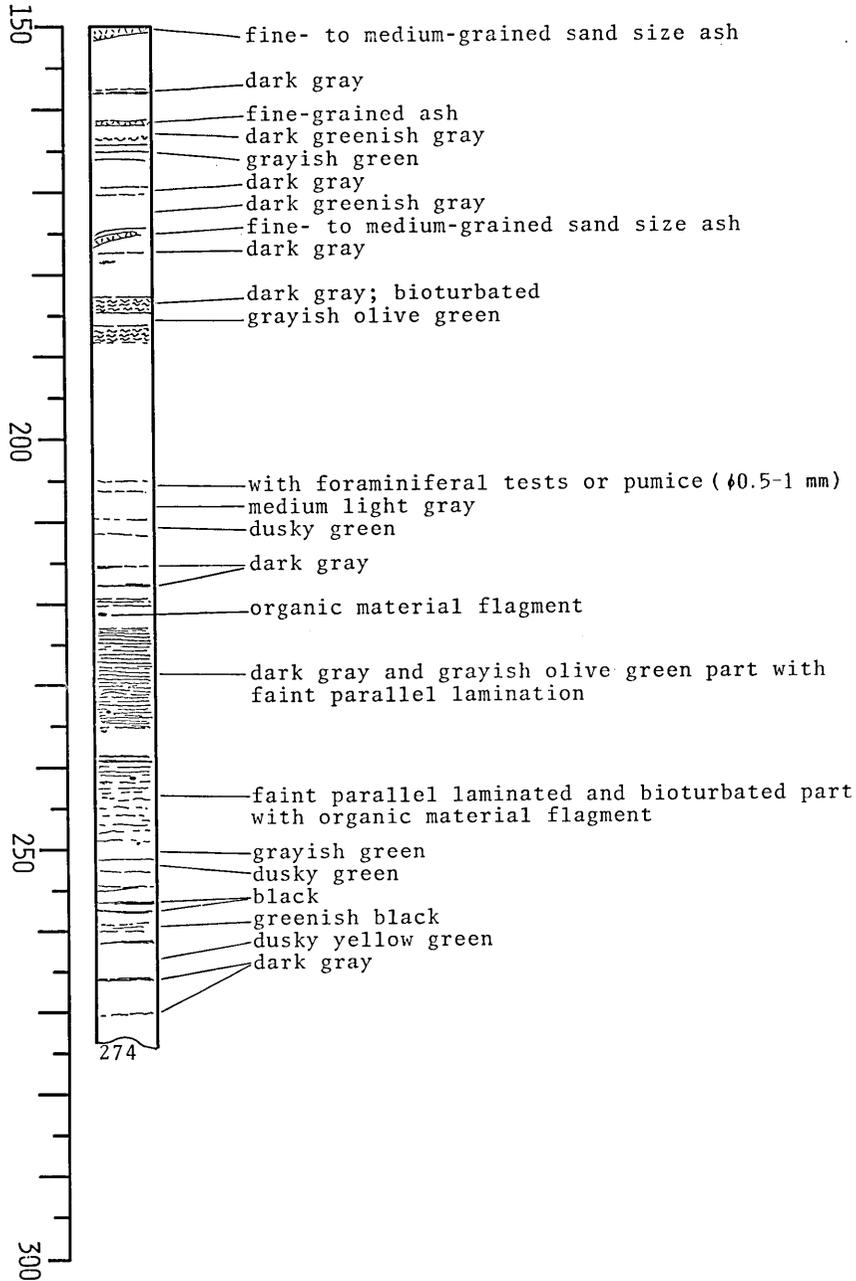


Fig. VI-2(c)

Fig. VI-2. Sketches and descriptions of core sample that were taken during the DELP85, Leg II cruise.

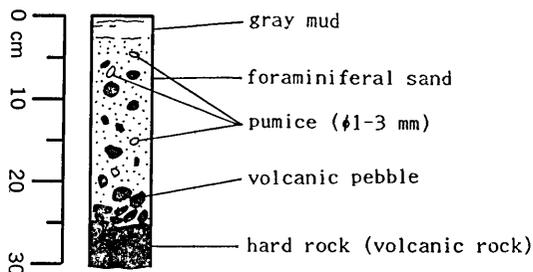


Fig. VI-3. Schematic columnar section of the KT85-15, PK-2 core sample.

We are grateful to Professor Seiya Uyeda, Earthquake Research Institute, University of Tokyo and Professor Masaaki Kimura, University of the Ryukyus. We also thank Captain K. Miki, Mr. T. Kato and the other crew members of the R/V *Wakashio Maru*, and Captain H. Igarashi and the crew of the R/V *Tansei Maru*.

References

- KIMURA, M., T. MATSUDA, H. SATO, I. KANEOKA, H. TOKUYAMA, N. ISEZAKI, S. KURAMOTO, A. OSHIDA, K. SHIMAMURA, K. TAMAKI, H. KINOSHITA and S. UYEDA, 1987, Report on DELP 1985 Cruises in the Japan Sea, Part VII: Topography and geology of the Yamoto Basin and its vicinity, *Bull. Earthq. Res. Inst., Univ. Tokyo*, **62**, 447-483 (in this report).
- SATO, H., M. YAMAMO, S. UYEDA, H. TOKUYAMA, T. MATSUDA, M. KIMURA and S. KURAMOTO, 1986, On the presence of a Quaternary volcano in southeast margin of the Japan Basin, *Bull. Volcanol. Soc. Japan*, **31**, 193-201 (in Japanese with English abstract).
- YAMANO, M., S. UYEDA, M. UYESIMA, M. KINOSHITA, S. NAGIHARA, R. BOH and H. FUJISAWA, 1987, Report on DELP 1985 cruises in the Japan Sea, Part V: Heat flow measurements. *Bull. Earthq. Res. Inst., Univ. Tokyo*, **62**, 417-432 (in this report).

DELP 1985 年度日本海研究航海報告

VI. DELP 85, Leg II および KT85-15 航海で採集された
堆積物試料について

嶋村 清¹⁾・鄭 圭楨²⁾・倉本真一³⁾・芦寿一郎³⁾
押田 淳⁴⁾・徳山英一³⁾・平 朝彦³⁾

1) 九州東海大学農学部

2) 東北大学理学部

3) 東京大学海洋研究所

4) 琉球大学理学部

DELP 85 および KT 85-15 航海を通じ、日本海東部（最上舟状海盆周辺）および日本海南部（大和堆周辺）において 28 ヶ所で表層堆積物試料を採集した。最上舟状海盆周辺には色の変化に富む細粒堆積物が存在し、海底火山活動に伴うガス噴出の影響を受けていると考えられる。また最上深海チャンネルを通じて運搬されたと考えられる混質乱泥流堆積物が認められる。大和堆は北大和舟状海盆周辺を除き露岩域である。大和堆上には貝殻片等を含む有孔虫砂が分布する。