

Data book of the fossil diatoms after the Neogene
in the Horonobe town

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Japan Nuclear Cycle Development Institute
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Technical Cooperation Section,

Technology Management Division,

Japan Nuclear Cycle Development Institute

4-49 Muramatsu, Tokai-mura, Naka-gun, Ibaraki 319-1184, Japan

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Data book of the fossil diatoms after the Neogene in the Horonobe town

Ken-ichi Yasue*

Abstract

This data book is a summary of the analysis results of the fossil diatoms that Japan Nuclear Cycle Development Institute owns in July, 2005. Table shows the generic and specific names of diatom included in the sample. The generic and specific names are written with the normal style to be easy to read. In addition, the book indicates the data sources and the sampling locations.

All the samples were the Neogene and Quaternary in the Horonobe town. The samples were obtained from the outcrop sample of geological investigations, the core of shallow borehole investigations, and the core of deep borehole investigations (D1 and HDB series). The number of analyzed samples is about 500 samples in all. About 300 samples were taken from surface and subsurface. About 200 samples were taken from the deep borehole. The former is useful to the understanding of horizontal distribution; the latter is useful to the understanding of vertical distribution. Moreover, the about half of the analyzed samples is the sedimentary rock of the Koetoi formation, mainly diatomaceous mudstone. The remaining half is the rock of the Wakkanai, Yuchi, Sarabetsu formations, and the terrace deposits in order of abundance.

The quality of the data is uneven, because the sampling method and the standard of the analysis are different. When we use this data, it is necessary to note the data quality. I believe that these data will be of great value in interpreting the depositional age, paleogeography, and so on.

* Geotechnical Science and Engineering Group, Horonobe Underground Research Center

幌延町における新第三紀以降の珪藻化石データ集

安江 健一*

要 旨

本データ集は、幌延町内で実施された珪藻化石分析について、核燃料サイクル開発機構が所有する 2005 年 7 月までの分析結果をまとめたものである。本データ集では、各試料に含まれる珪藻の属名と種名を示している。属名と種名は、読みやすさを考慮して、イタリックを使用していない。また、データの詳細を確認できるように、各データについて、引用元と試料採取地点を示した。

分析試料は、地表地質調査で採取した露頭試料、数 m ～十数 m を対象にした浅層試錐のコア、長さ数百 m 以上の深層試錐 (D1 および HDB シリーズ) のコアなどである。分析した試料数は、全部で約 500 試料であり、その内、空間的な分布の検討に有効な地表および十数 m 以浅から採取した試料は約 300 試料、深度方向での検討に有効な深層試錐のコアから採取した試料は約 200 試料である。また、層序別の分析試料数を比べた場合、おおよそ半分は珪藻質泥岩からなる声間層で実施している。その他は、順に稚内層、勇知層、更別層、および段丘堆積物で実施している。

本データは、分析した年代によって試料採取方法や採取地点の精度、分析の基準が異なるため、データの品質にはばらつきがある。使用する際は、その点に留意する必要がある。今後、これらのデータを用いて、堆積物の年代や古地理などの解明が可能であると考えている。

*幌延深地層研究センター 深地層研究グループ

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1. Sampling Locations

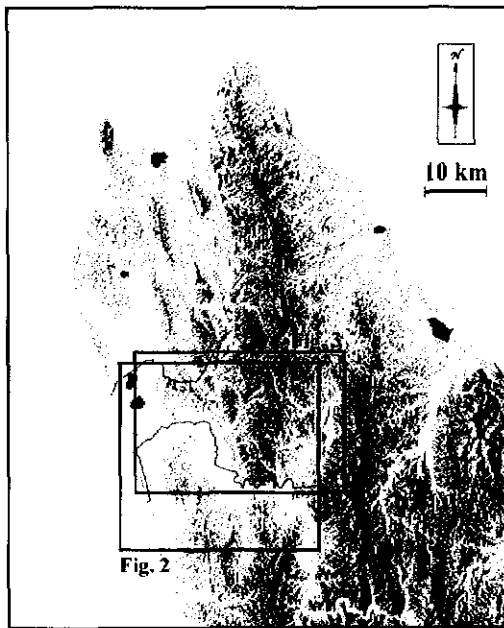


Fig. 1. Index map showing the Horonobe town, northern Hokkaido. Background topographic map is arranged using the Digital Map 50 m Grid of the Geographical Survey Institute (1997).

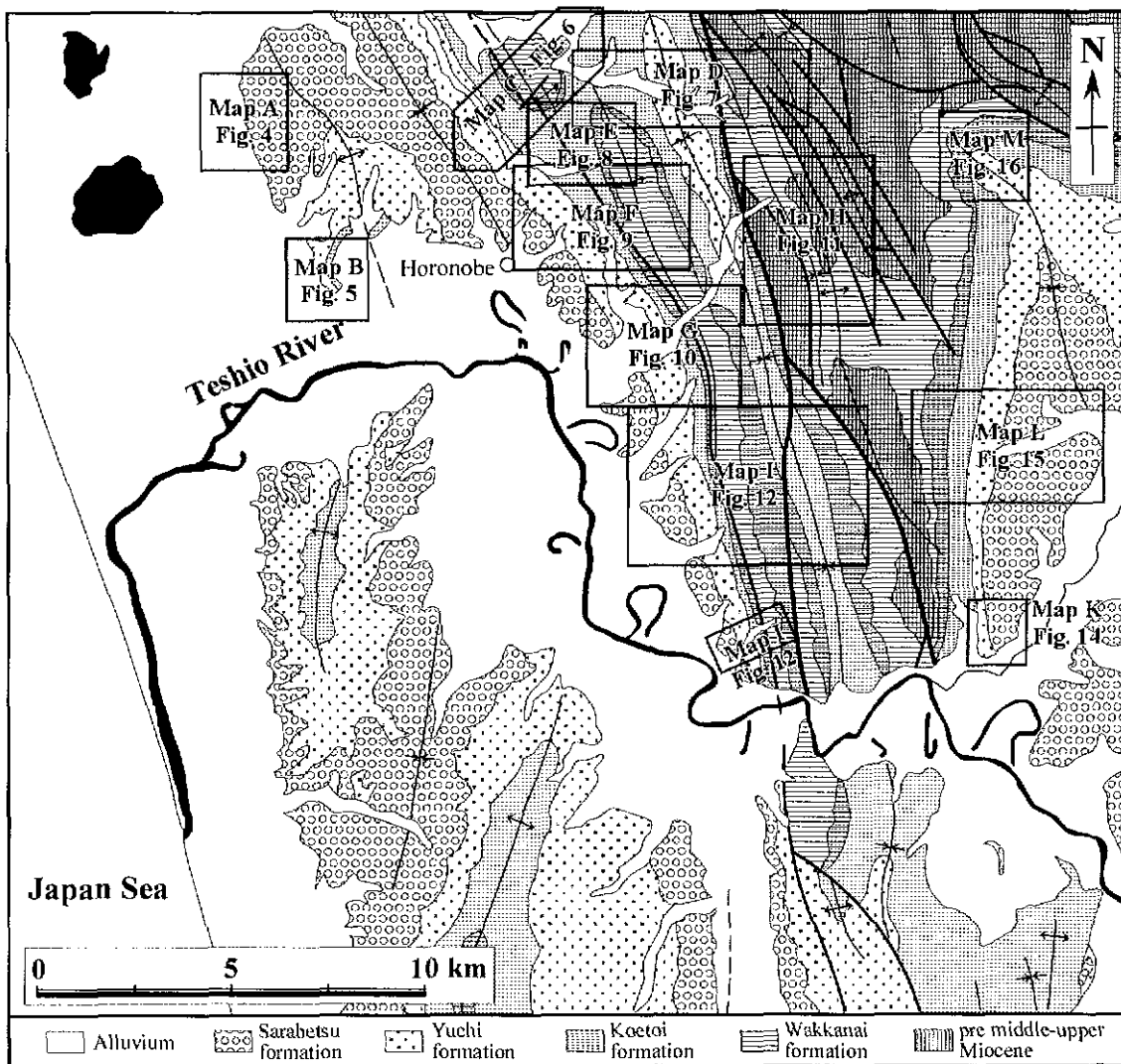


Fig. 2. Sampling area and simplified geologic map in and around the Horonobe town. Geologic map : modified from Hata et al. (1969) and Yamaguchi and Suda (1981).

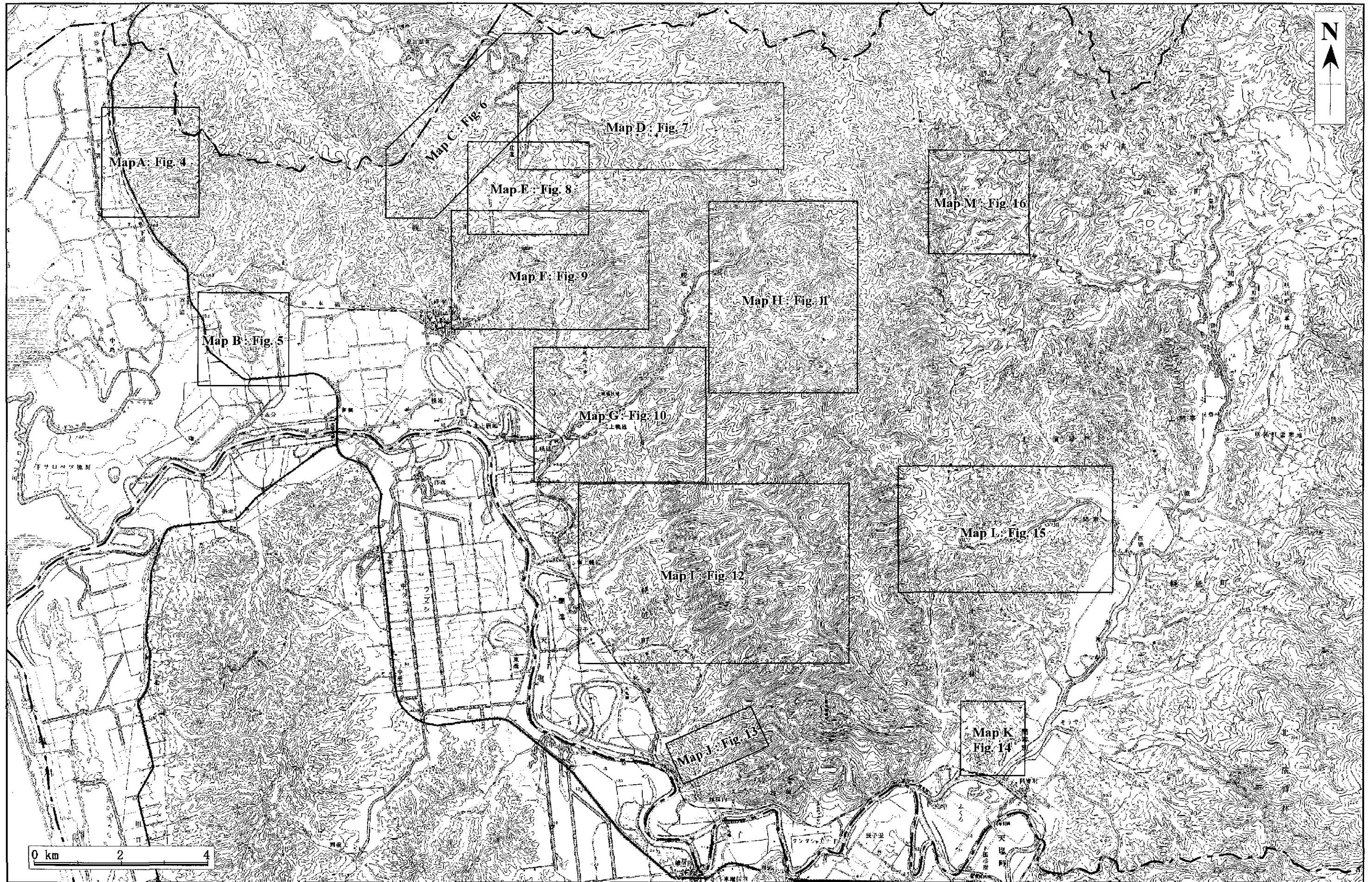


Fig. 3. Topographic map and rough location map of sampling place in the Horonobe town. Topographic map: Geographical Survey Institute (2001).

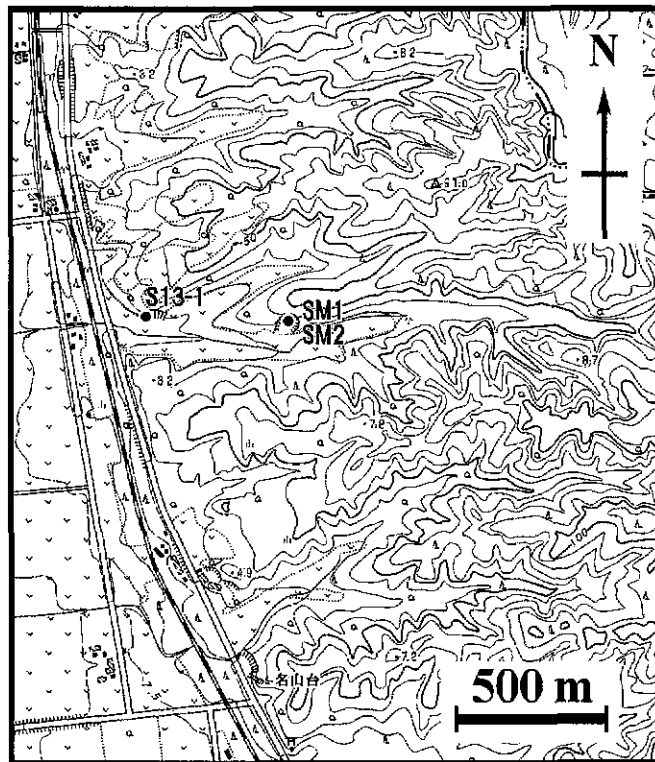


Fig. 4. Map (A) showing locations of analyzed samples around the Shimonuma area.
 Topographic map: Geographical Survey Institute (1999).
 S13-1: Table 7, SM-number: Table 19.

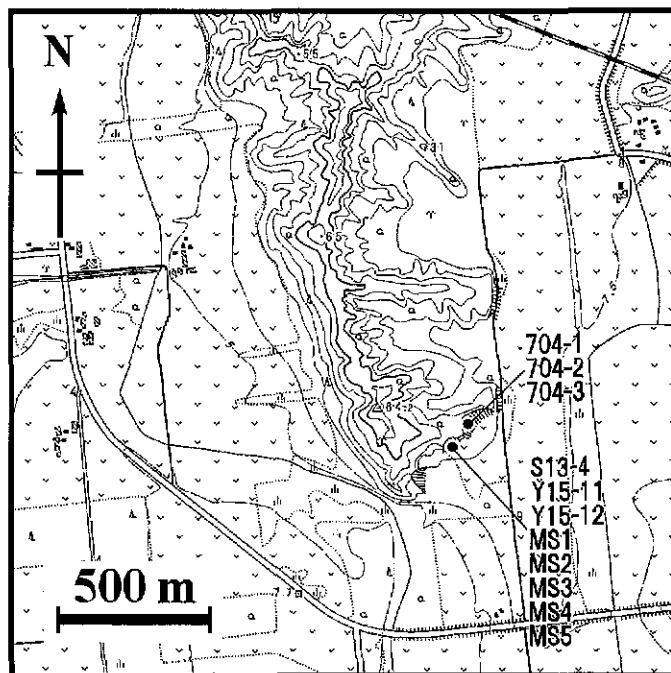


Fig. 5. Map (B) showing locations of analyzed samples around the South Shimonuma area.
 Topographic map: Geographical Survey Institute (1999).
 704-number: Table 5, S13-4: Table 7, Y15-number: Table 18,
 MS-number: Table 19.

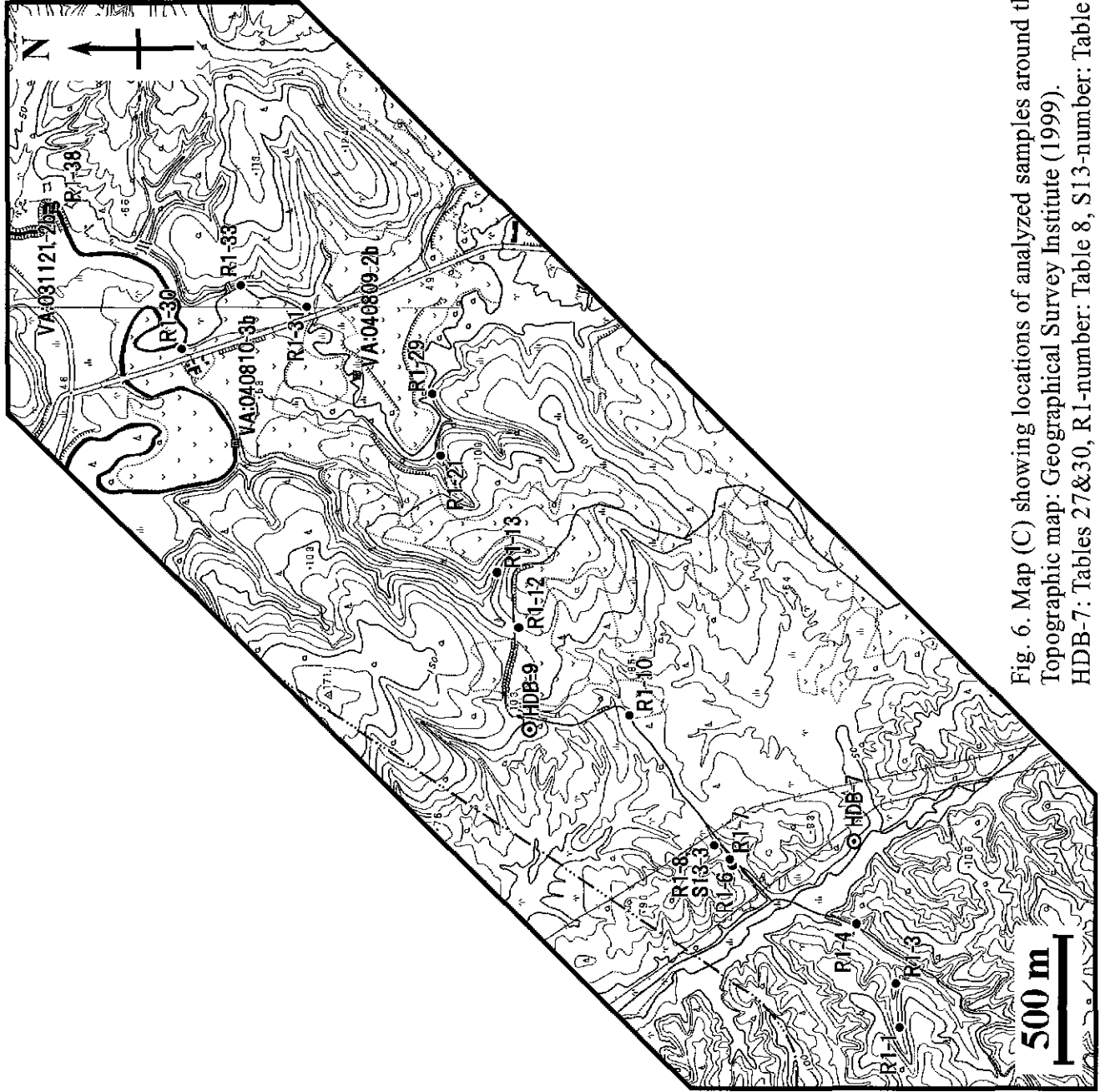


Fig. 6. Map (C) showing locations of analyzed samples around the North Hokushin area. Topographic map: Geographical Survey Institute (1999). HDB-7: Tables 27&30, R1-number: Table 8, S13-number: Table 7, VA: Volcanic ash.

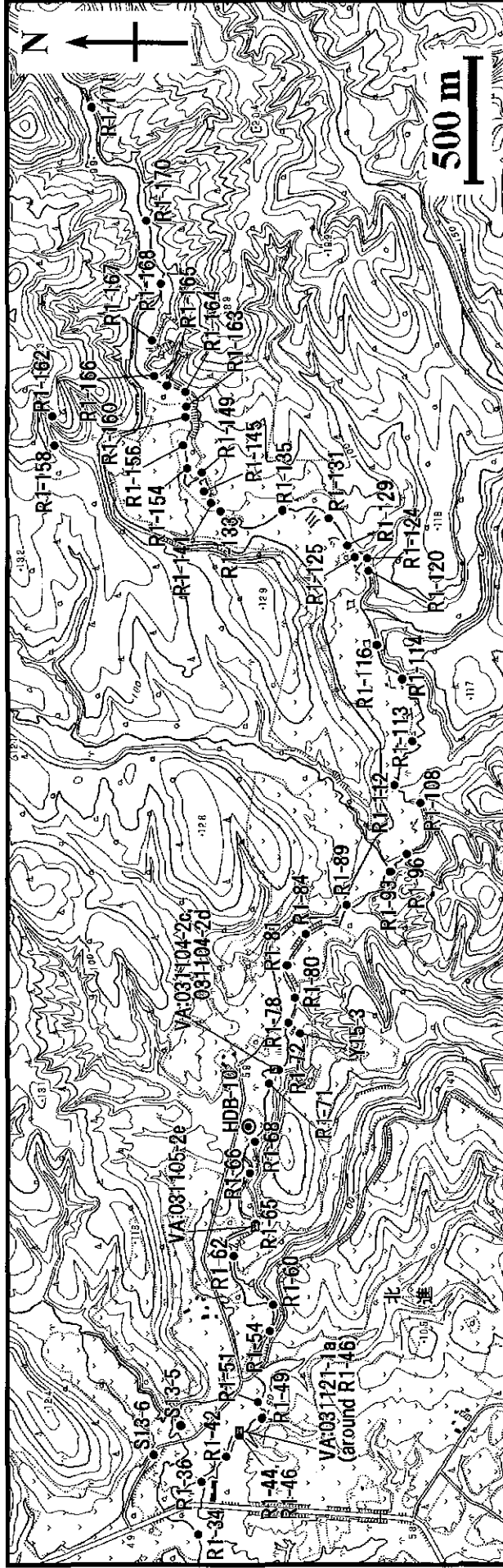


Fig. 7. Map (D) showing locations of analyzed samples around the Minamisawa area. Topographic map: Geographical Survey Institute (1999). HDB-10: Tables 29,30,&31, R1-number: Table 9, S13-number: Table 7, Y15-number: Table 18, VA: Volcanic ash.

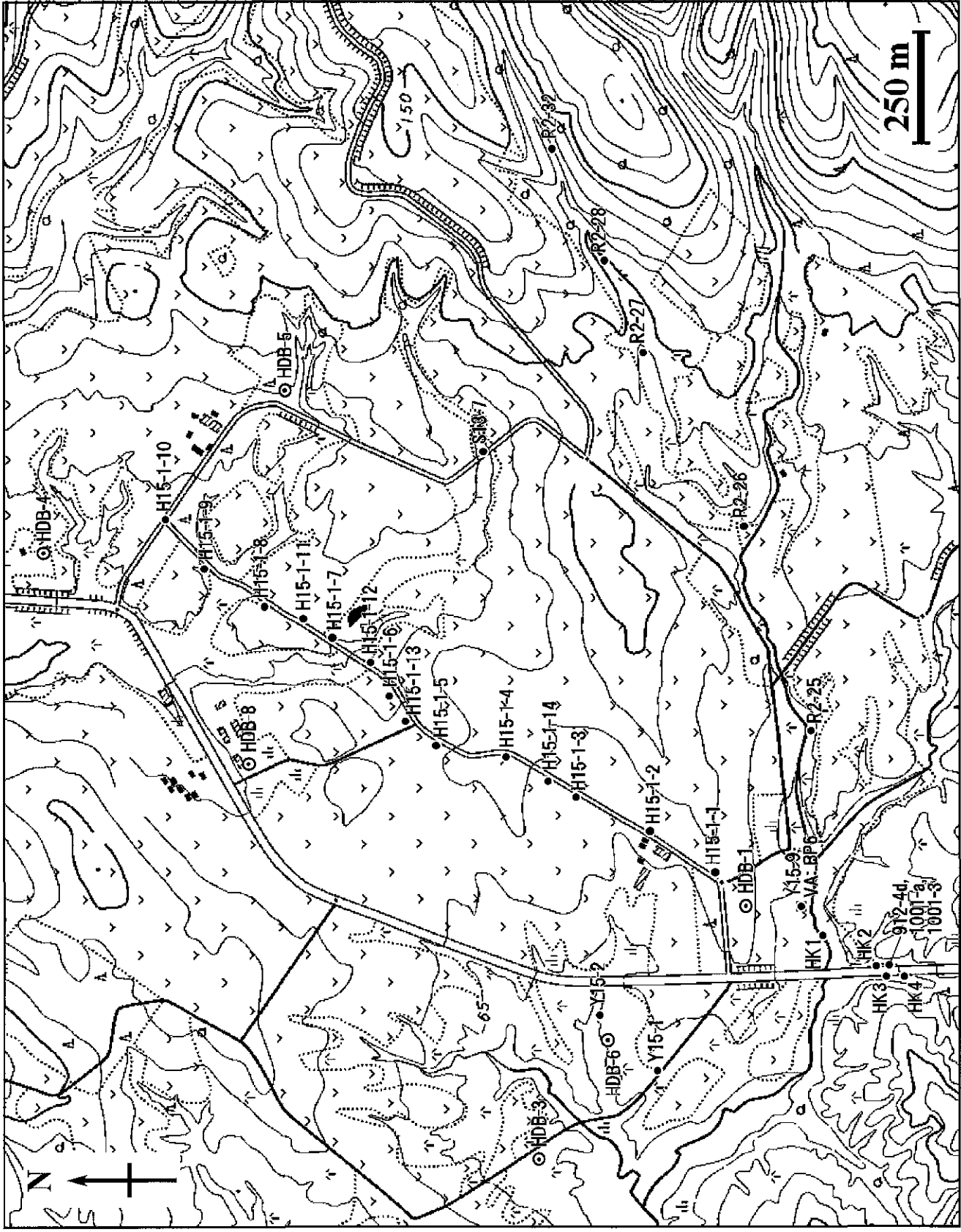


Fig. 8. Map (E) showing locations of analyzed samples around the Hokushin area. Topographic map: Geographical Survey Institute (1999). HDB-1: Table 21, HDB-3: Table 23, HDB-4: Table 24, HDB-5: Table 25, HDB-6: Table 26, HDB-8: Table 28, HDB-10: Table 30, S13-number: Table 7, HK-number: Table 19, H15-1-number: Table 15, 912-4d: 1001-3: Table 17, VA: Volcanic ash.

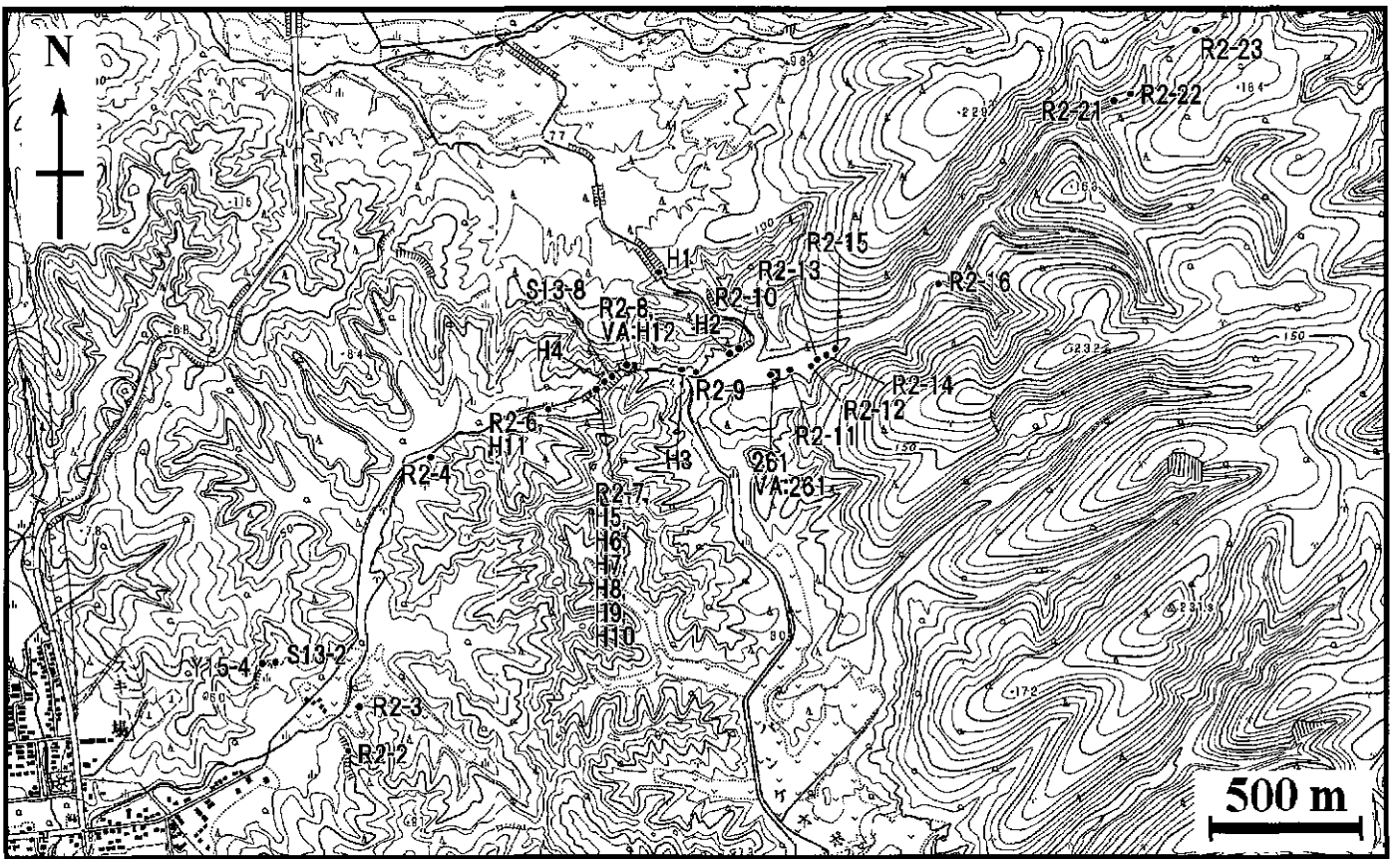


Fig. 9. Map (F) showing locations of analyzed samples around the Kumakosi-pass area.
 Topographic map: Geographical Survey Institute (1999).
 R2-number & 261: Table 11, S13-number: Table 7, H-number: Table 4, Y15-4: Table 18, VA: Volcanic ash.

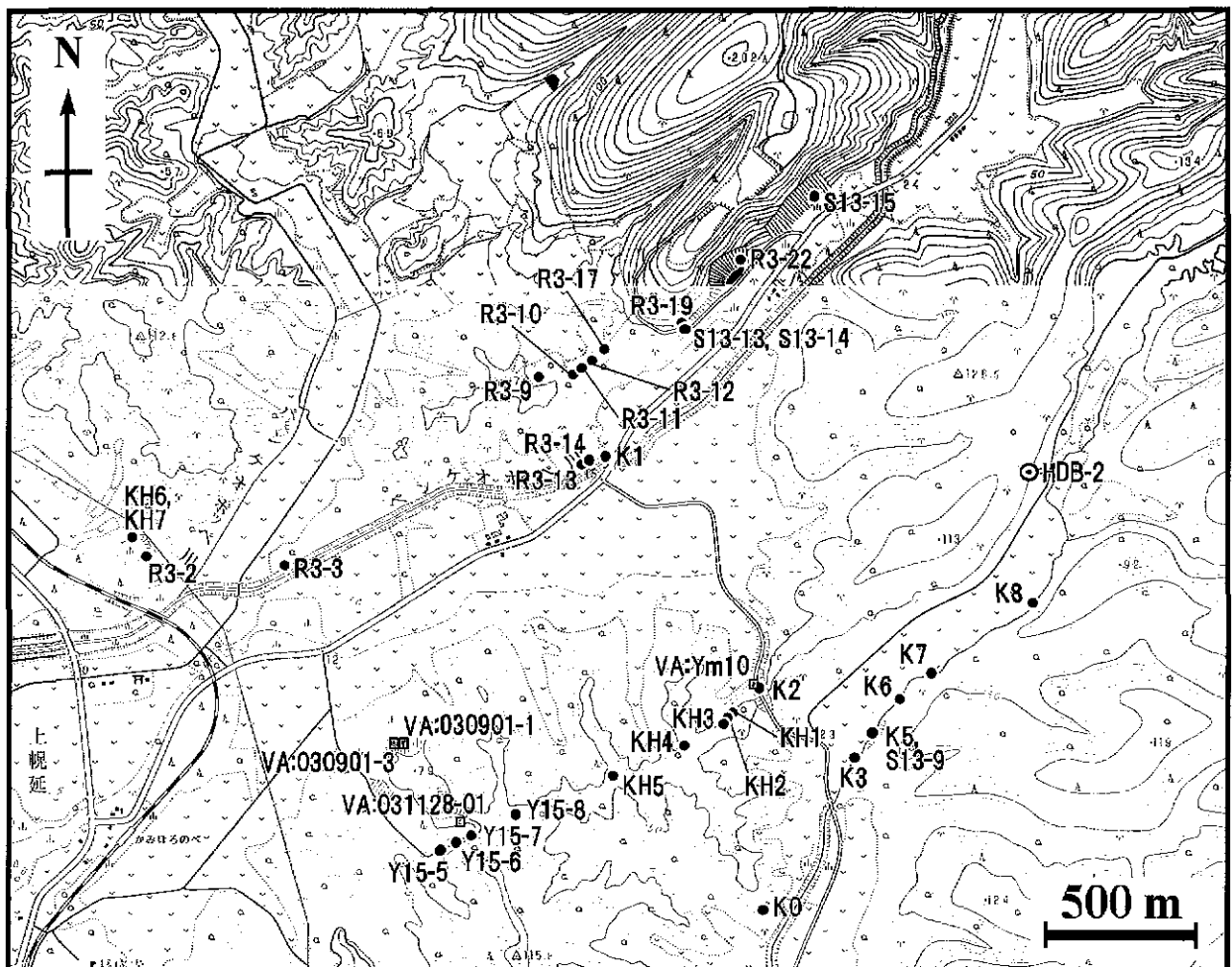


Fig. 10. Map (G) showing locations of analyzed samples around the Kamihoronobe area.
 Topographic map: Geographical Survey Institute (1999). HDB-2: Table 22, R3-number: Table 12,
 S13-number: Table 7, Y15-number: Table 18, KH-number: 19, K-number: Table 4, VA: Volcanic ash.

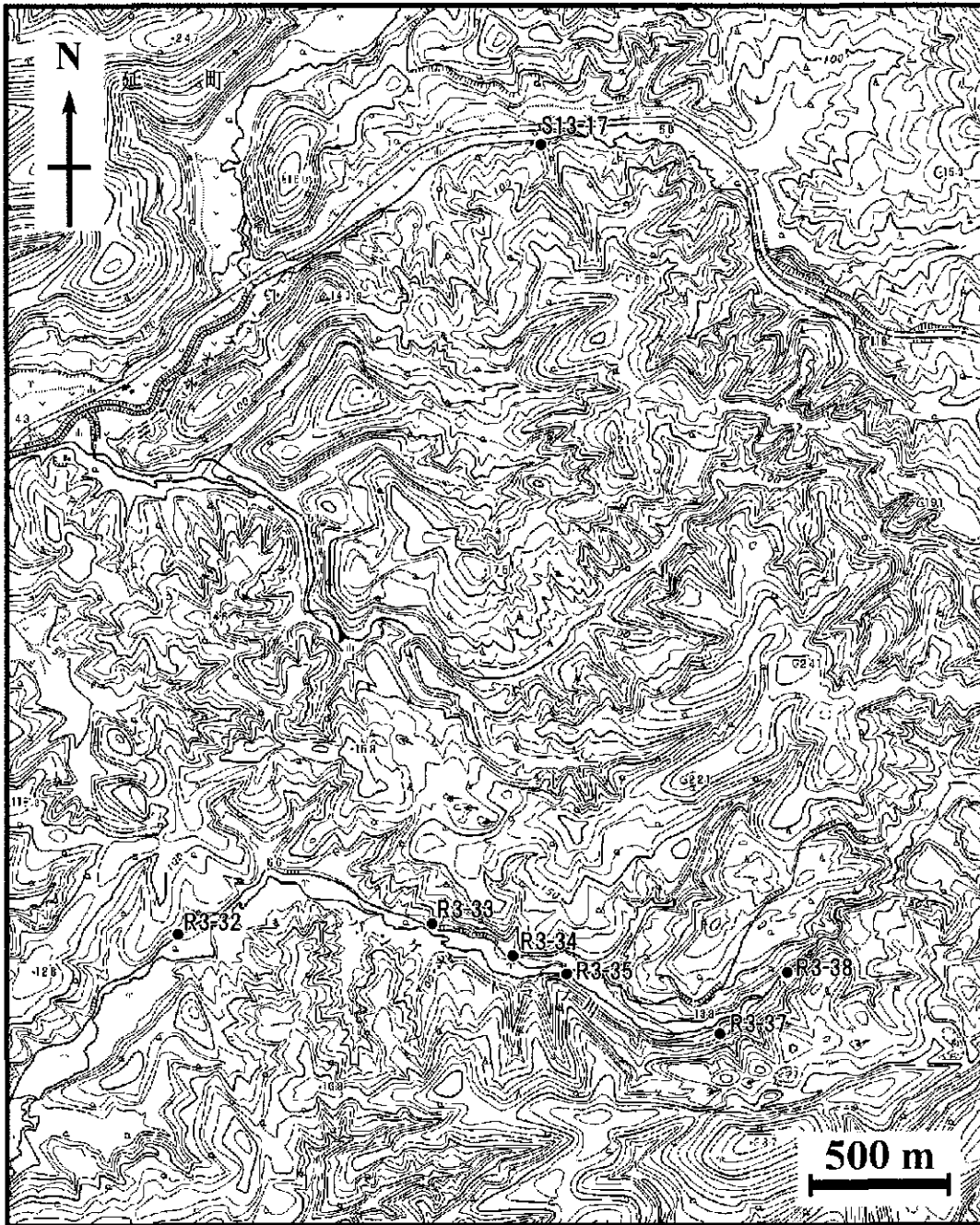


Fig. 11. Map (H) showing locations of analyzed samples around the East Kamihoronobe area. Topographic map: Geographical Survey Institute (1999). R3-number: Table 12, S13-number: Table 7, VA: Volcanic ash.

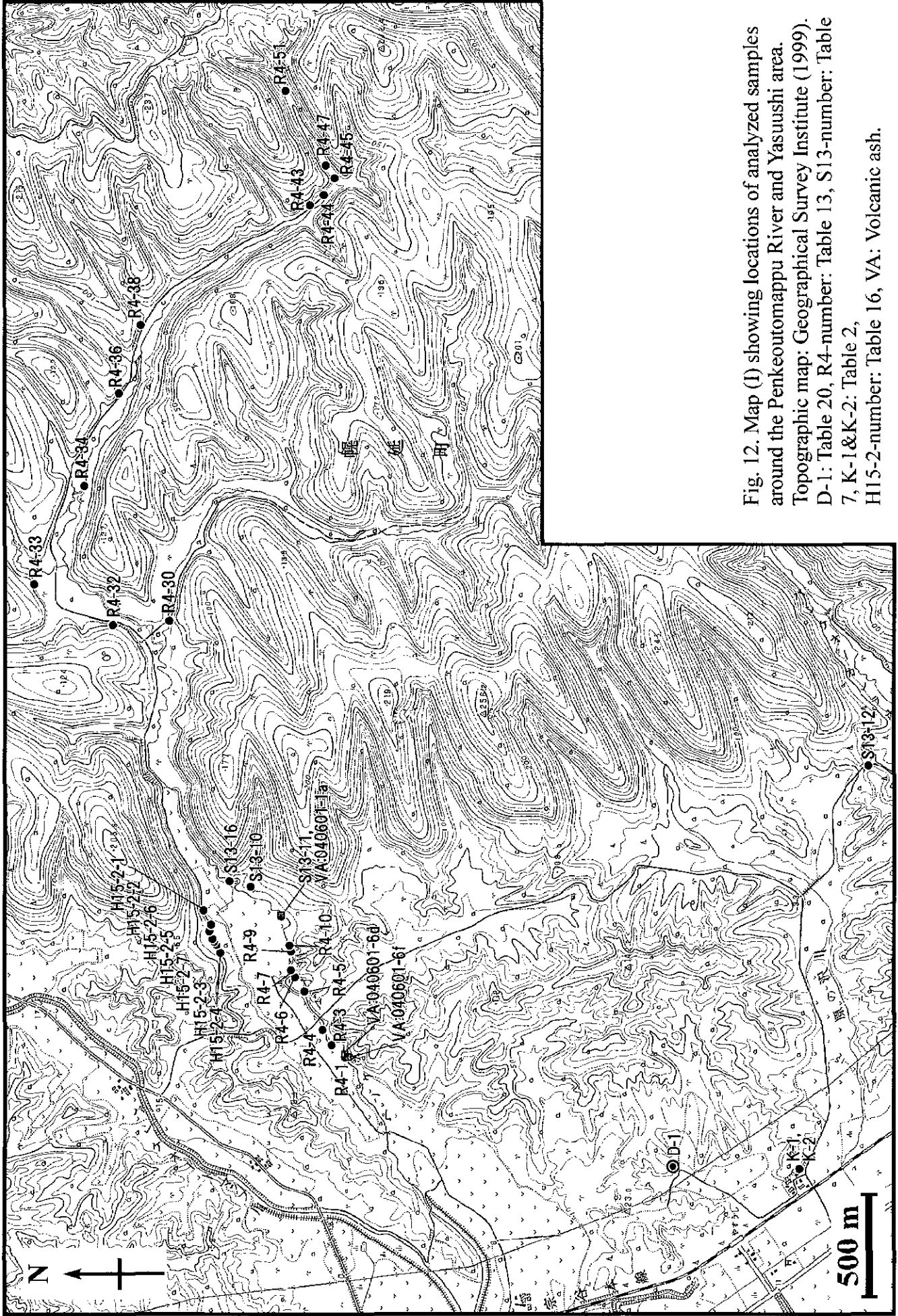


Fig. 12. Map (I) showing locations of analyzed samples around the Penkeutomappu River and Yasuushi area. Topographic map: Geographical Survey Institute (1999). D-1: Table 20, R4-number: Table 13, S13-number: Table 7, K-1&K-2: Table 2, H15-2-number: Table 16, VA: Volcanic ash.

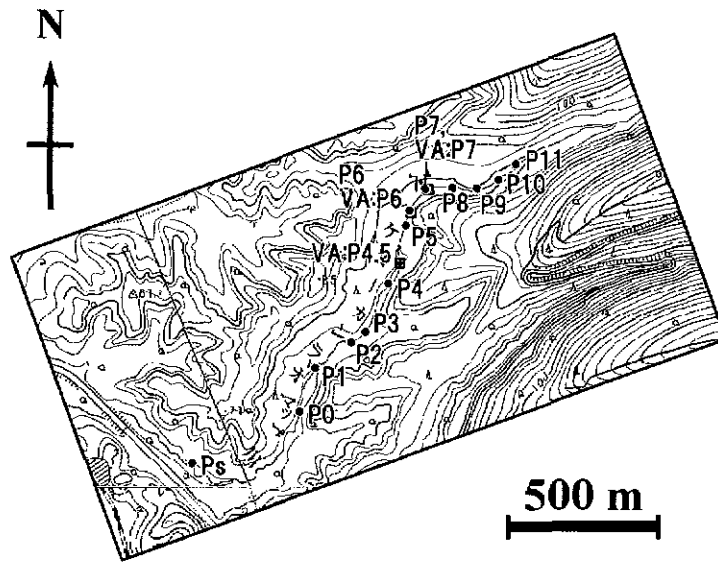


Fig. 13. Map (J) showing locations of analyzed samples around the Penkeoukanraomappu River area.
 Topographic map: Geographical Survey Institute (1999).
 P-number & Ps: Table 4, VA: Volcanic ash.

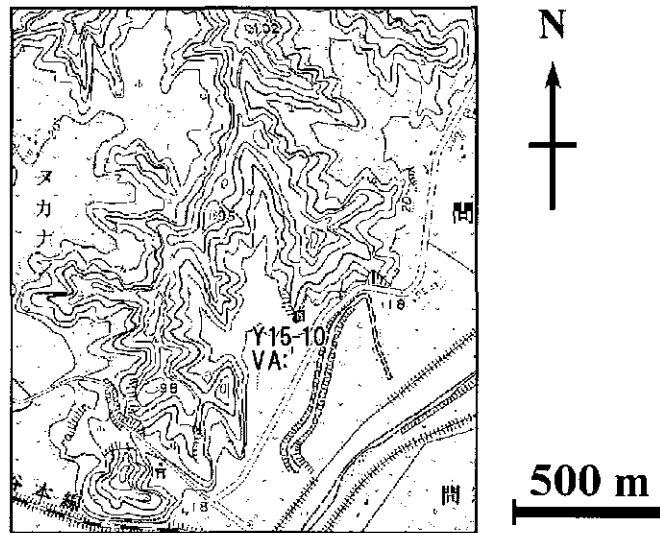


Fig. 14. Map (K) showing locations of analyzed samples around the Toikanbetsu area.
 Topographic map: Geographical Survey Institute (1999).
 Y15-10: Table 18, VA: Volcanic ash.

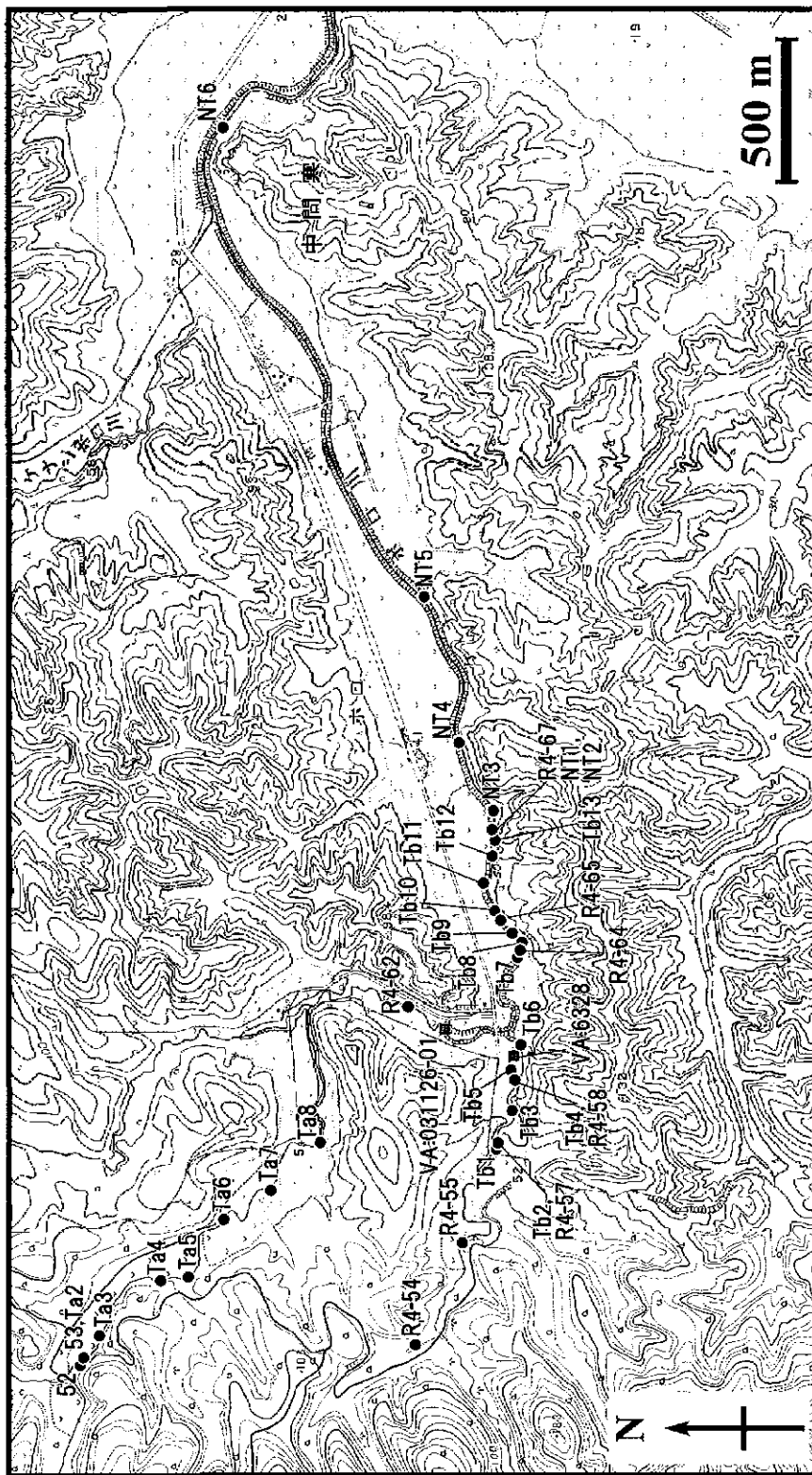


Fig. 15. Map (L) showing locations of analyzed samples around the Kenashiporo River area. Topographic map: Geographical Survey Institute (1999). R4-number: Table 14, Ta-number: Table 3, Tb-number: Table 3, NT-number: Table 19, VA: Volcanic ash.

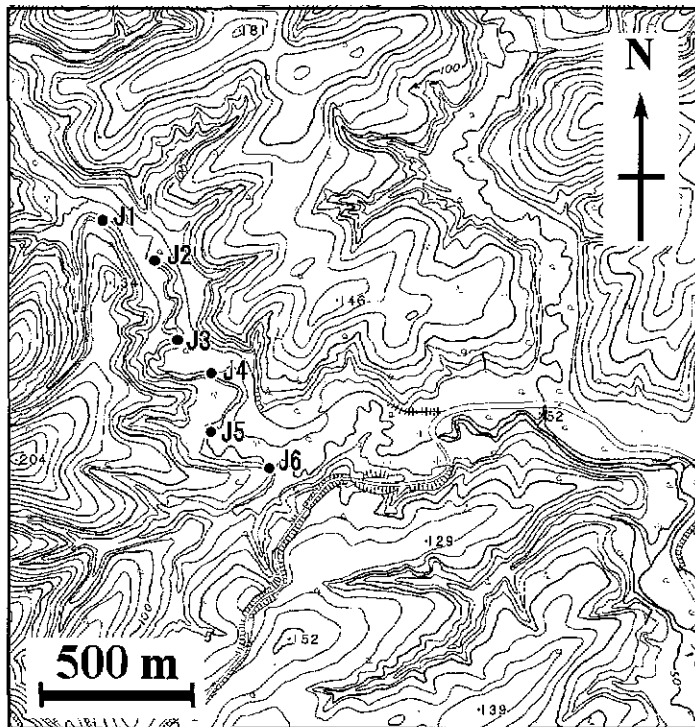


Fig. 16. Map (M) showing locations of analyzed samples around the Jyurokusen River area.
Topographic map: Geographical Survey Institute (1999).
J-number: Table 3

2. Occurrence Charts

Table 1. Abbreviation table.

Formation	LT : lower terrace deposit HT : higher terrace deposit Sb : Sarabetsu formation Yc : Yuchi formation Kt : Koetoi formation Wk : Wakkanai formation
Horizon	upp : upper mid : middle low : lower
Abundance	VA : very abundant A : abundant C : common R : rare VR : very rare ER : extremely rare ND : no diatoms VG : very good G : good M : moderate P : poor VP : very poor
Preservation	koi : Neodenticula koizumii Zone k-k : Neodenticula koizumii - N. kamtschatica Zone kam : Neodenticula kamtschatica Zone c : Rouxixia californica Zone y : Thalassiosira yaberi Zone h : Denticulopsis hayalina Zone nz : not zoned PD : poor diatoms ND : no diatoms ? : unknown
Diatom zone	Gray background : reworked fossil diatom
All	

Table 2. Occurrence chart of fossil diatoms from the Yasuushi area.

FORMATION	SAMPLE NUMBER		HT	
	Location (Fig.)		K-1	K-2
MARINE FORMS			12	12
Actinocyclus	senarius		-	1
Chaetoceros	cinctus		-	1
Cocconeis	costatum		1	-
C.	scutellum		1	3
Coccinodiscus	marginatus		2	-
Delphineis	kamtschatica		38	39
Nitzschia	rolandii		2	-
Paralia	sulcata		1	1
Rhaphoneis	surirella		-	2
Stephanopyxis	turris		3	1
Thalassionema	hirosakiensis		8	9
T.	nitzschioides		3	6
Thalassiosira	antiqua		2	1
T.	decepiens		1	1
T.	jacksonii		2	4
T.	jouseae		3	3
T.	gravidia		2	1
T.	nidulus		1	2
T.	oestrupi		1	5
T.	ochotensis		2	1
Thalassiothrix	longissima		-	5
Trochosira	spinosa		3	1
FRESH-WATER FORMS				
Cymbella	tumida		1	1
C.	turgida		-	1
Diatoma	hiemale		2	-
Gomphonema	spp.		6	4
Hantzschia	amphioxys		1	1
Navicula	mutica		1	1
Neidium	iridis		2	-
Pinnularia	borealis		1	-
Total number of specimens counted			100	100

Table 5. Occurrence chart of fossil diatoms from the South Shimonuma area.
Data from the chart of Yanagida (1995, 1996).

FORMATION		DIATOM ZONE			koi			k-k			
		SAMPLE NUMBER			Kt						
		704-1	704-2	704-3	6307	6314	6313	6229			
Location (Fig.)		5	5	5	?	?	?	?			
ABUNDANCE		C	C	C	C	C	C	C			
app. number of diatom valves per slide (×100)		108	72	72							
PRESERVATION		M	P	M	M	M	M	M			
MARINE DIATOMS											
Actinocyclus	curvatus Janisch		+	+	1						
A.	ingens Rattray	1	1	1	+	2	+				
A.	spp.		1								
Actinoptychus	senarius (Ehrenberg) Ehrenberg	+			+		+	+			
Amphora	spp.		+	1							
Azpeitia	sp.	+		+							
Bacteriosira	fragilis (Gran) Gran								+		
Cavitatus	jouseanus (Sheshukova) Williams			1							
Cocconeis	costata Gregory	1	1	1					+		
C.	scutellum Ehrenberg	+	2	+					+		
C.	spp.		+	1							
Coscinodiscus	marginatus Ehrenberg		4	+	11	8	2	4			
C.	oculus-iridis Ehrenberg		+	+							
C.	radiatus Ehrenberg		+								
C.	spp.	+	1	+	2	+	+	+			
Cosmodiscus	insignis Jouse				1						
Delphineis	surirella (Ehrenberg) Andrews			+	1				+		
D.	spp.								3	2	
Denticulopsis	spp.		3								
Diploneis	spp.	1	1	+							
Grammatophora	spp.		1						+		
Hyalodiscus	oboletus Sheshukova		+			1					
Isthmia	sp.			+							
Melosira	albicansu Sheshukova		12						1		
M.	sol (Ehrenberg) Kutz.	+	+	+					+		
Neodenticula	kamtschatica (Zab.) Akiba & Yanagisawa				1	6	30	46			
N.	koizumii Akiba & Yanagisawa	6	6	7	53	54	18	+			
N.	seminae (Sim. & Kan.) Akiba & Yanag.	13	5	4							
N.	cf. seminae (Sim. & Kan.) Akiba & Yanag.	7	2	5	4						
N.	spp.	38	11	23		5	4				
Nitzschia	cylindrus (Grun.) Hasle		1								
N.	aff. Extincta Koz.			+							
N.	cf. extincta Kozurenko & Sheshukova									1	
N.	cf. grunowii Hasle	+	3	+							
N.	sp.1				1	2	3				
Odontella	aurita (Lyngbye) Agardh			+	+	3	1				
Paralia	sulcata (Ehrenberg) Cleve	2	+	4		1					
Porosira	gracilis (Grun.) Joerg				+						
P.	cf. gracilis (Grun.) Joerg		+	2							
Pseudopodosira	cf. elegans Sheshukova	2	4	10							
Rhabdonema	japonicum Temp. & Brun		+								
Rhaphoneis	amphicerus Ehrenberg				1						
R.	spp.					1					
Rhizosolenia	barboi (Brun) Temp. & Perag.		1	+							
R.	cf. styliformis Brightwell	1	+	+							
R.	spp.		1	+							
Stephanogonia	hanzawae Kanaya			+							
Stephanopyxis	spp.	4	6	9	+	3	4	2			
Thalassionema	nitzschoides (Grun.) H. et M. Peragallo	9	5	17	7	4	14	24			
Thalassiosira	antiqua (Grun.) Cleve - Euler				3		3	+			
T.	cf. decipiens (Grun.) Joerg.	2	3	4	1						
T.	delicata (Barron) Akiba	+									
T.	gravida Cl.		14	1	+					+	
T.	gravida f. fossilis Jouse		2							1	
T.	hyalina (Grun.) Gran	3		+							
T.	jouseae Akiba	1	1	1							
T.	multiplora Schrader	+									
T.	nordenskioldii Cleve				2	1	1				
T.	tertiaria Sheshukova										1
T.	trifulta Fryxell & Hasle					1	+				
T.	zabelina Jouse				+						2
T.	spp.	8	8	7	11	7	15	13			
Thalassiothrix	longissima Cleve & Grunow	+		1		+	+				
T.	robsta (Schrader) Akiba										5
NONMARINE DIATOMS											
Aulacoseira	granulata (Ehrenberg) Simonsen s. l.	1		+		1					
Bacillaria	paradoxa Gmelin	+	1								+
Total number of diatoms counted											
Resting spores of Chaetoceros											

Table 6. Occurrence chart of fossil diatoms from the various area in Horonboe town. Data from the chart of Yanagida (1996).

FORMATION	DIATOM ZONE									
	nz					nz			kan	nz
	Sb	Yt	Ktu	Yt	Ktu	Yt	Ktu	Kt	Ktu	
SAMPLE NUMBER	6302	1115-1	6311-1	1115-2	1115-3	6291-3	6291-2	6291-1	Ym19	6310
SAMPLE NUMBER (96-)	1	2	3	4	5	6	7	8	9	10
Location (Fig.)										
ABUNDANCE	VR	VR	PD	VA	C	A	R	VA	VA	A
app. number of diatom valves per slide (×100)	2	7.2	0.1	144	72	72	4.2	72	216	120
PRESERVATION	VP	VP	VP	M	P	M	P	M	M	M
MARINE DIATOMS										
Achnanthes spp.								+		
Actinocyclus ingens Rattray	17	13	+	+	5		21	+		
A. spp.								1		1
Actinopterychus scnarius (Ehrenberg) Ehrenberg	1	+		+	1		1	2	1	1
Amphora spp.										2
Arachnoidiscus spp.	+						+			+
Azpeitia endoi (Kanaya) Sims & Fryxell		+					1			
Bacteriosira fragilis (Gran) Gran								+	1	
Cavitatus jouseanus (Sheshukova) Williams		+					1			
C. lanceolatus Akiba & Hiramatsu				+						
Cocconeis costata Gregory	1				+	+		3	+	+
C. scutellum Ehrenberg		3			1					12
C. spp.					+	1				1
Coscinodiscus marginatus Ehrenberg	14	11	4		1	1	3	22	2	2
C. oculus-iridis Ehrenberg							+			1
C. radiatus Ehrenberg							1	1		
C. symbolophorus Grun.		+			1					
C. spp.	4	+	1	+	+	+	1	2	+	+
Cosmiodiscus insignis Jouse	1								1	
Delphincis surirella (Ehrenberg) Andrews										1
D. spp.							2			
Denticulopsis dimorpha (Schrader) Simonsen				+						
D. bustedii (Sim. & Kan.) Simonsen s.l.					4	+	2	1		
D. hyalina (Schrader) Simonsen	3	6			6	1	10			1
D. lauta (Bailey) Simonsen					5		1			
D. spp.					3			1		
Diploneis spp.	+			+		+		+		1
Grammatophora spp.	1	1				1		+		
Hemiaulus polymorphus Grun.		1								
Hyalodiscus obsoletus Sheshukova		1								1
H. spp.					1					
Ikebea tenuis (Brun) Akiba	5	3			3		4			1
Melosira albicans Sheshukova						1				
M. cf. albicans Sheshukova						17		1		
M. sol (Ehrenberg) Kutz.	1	1			+	+	1	2		+
Navicula spp.						+				
Neodenticula kantschatica (Zab.) Akiba et Yanagisawa		8		3	21	1	5	6	65	35
N. koizumii Akiba & Yanagisawa					1	4		20		
N. seminae (Sim. & Kan.) Akiba & Yanag.						2		1		+
N. sp. A						29				
N. spp.						13				
Nitzschia cylindrus (Grun.) Hasle						1				
N. granulata Grun	3	1								5
N. cf. grunowii Hasle						5			+	
N. rolandii Schrader				+	2			1		
Odontella aurita (Lyngbye) Agardh						+	+			
Paralia sulcata (Ehrenberg) Cl.	+	1	1	+			2	3	+	
Rhabdonema japonicum Temp. & Brun										+
Rhizosolenia barboi (Brun) Temp. & Perag.	2	1			1	+	2	1		
R. cf. styliformis Bright.							2			
R. spp.		1		+	1		1	1		
Stephanogonia hanzawae Kanaya					1					
S. all hanzawae Kanaya (slender)					2					
Stephanopyxis dimorpha Schrader						1				
S. spp.	31	19	4	+	17	1	30	9	2	2
Thalassionema nitzschoides (Grun.) H. et M. Perag	9	16		1	11	4		1	6	11
T. schraderi Akiba		1								
Thalassiosira antiqua (Grun.) Cleve-Euler				+	1					+
T. cf. convexa Muchina								+		
T. delicata (Barron) Akiba					1					
T. decipiens (Grun.) Joerg. s. l.						1			+	2
T. gravida Cl.						1		3	+	+
T. gravida f. fossilis Jouse						+				
T. jouseae Akiba		1						4	+	+
T. manifesta Sheshukova							1			
T. marujamica Sheshukova		1								+
T. multipora Schrader						+				
T. tertiaria Sheshukova									1	
T. trifluta Fryxell et Hasle								2		
T. zabelinae Jouse	2	4		+					9	4
T. spp.	2	3			7	12	1	11	13	6
Thalassiothrix longissima Cleve & Grunow	+	+			+		+	+	+	+
T. robusta (Schrader) Akiba			2							
Triceratium arcticum Bright.	1									
T. condecorum Bright.	+									
Trochosira concava Sheshukova					1				+	
NONMARINE DIATOMS										
Achnanthes spp.										2
Aulacoseira granulata (Ehrenberg) Simonsen s. l.	1	1			2	1	9			
Cocconeis placentula v. euglypta (Ehrenberg) Cl.										1
Cymbella spp.	1									
Epithemia spp.				+		+				
Fragilaria sp.					89					
Gomphonema					1					1
Hantzschia spp.										1
Navicula spp.					5					2
Nitzschia spp.										1
Pinnularia spp.	+			1			+			2
Rhopalodia spp.										
Total number of diatoms counted	100	100	10	100	100	100	100	100	100	100
Resting spores of Chaetoceros	18	30	1	1	54	75	34	103	23	19

Table 9. Occurrence chart of fossil diatoms from the Minamisawa area. Data from the chart of Takahata et al. (2004). See Fig. 7 for location.

FORMATION	DIATOM ZONE	kan										kan										kan										c	PD	y	PD	h	ND															
		Kt					Yc					Kt					Kt																																			
		mid	low	mid	low	mid	mid	low	mid	low	mid	mid	low	mid	low	mid	mid	low	mid	low	mid																															
NUMBER	Sample number	34	36	42	44	46	48	51	54	60	62	65	66	68	71	72	78	80	81	84	89	91	96	108	112	113	114	116	120	124	125	129	131	135	133	141	145	149	153	156	160	163	164	165	158	166	162	167	168	170	171	
	Abundance	VA	VA	A	VA	VA	VA	VA	VA	A	A	VA	VA	A	A	A	A	A	C	C	C	C	A	C	VA	A	A	A	A	A	A	A	A	VA	VA	VA	VA	VA	A	A	A	VA	VA	A	vr	A	vr	C	ND	ND	ND	ND
	app. number of diatom valves per slide (×100)	180	180	180	108	360	180	180	360	144	108	144	108	60	72	39	48	21	36	72	60	72	48	60	180	90	24	0.4	72	108	90	180	180	108	108	90	72	144	72	144	90	60	-	32	3.3	45	-	-	-	-		
	Preservation	M	M	M	M	M	M	M	M	P	M	M	P	P	P	P	P	P	M	P	P	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
MARINE DIATOMS																																																				
Actinocyclus	granulata (Cleve) Grunow																																																			
Actinocyclus	causatus Janiich																																																			
A.	kuzingii (A. Schmidt) Simonsen s. l.																																																			
A.	ingens Ramay																																																			
A.	ingens (alt.)																																																			
A.	ochrolepis Jouse																																																			
A.	ectocarpus Ehrenberg																																																			
A.	serratus (Ehrenberg) Ehrenberg																																																			
Amphora	spp.																																																			
Achnanthes	spp.																																																			
Asteronothus	spp.																																																			
Ampella	endoi (Kanaya) Sims & Fryxell																																																			
A.	spp.																																																			
Bacteriosira	fragilis (Grunow) Gran																																																			
Biddulphia	romneyi (Bailey) Roppar																																																			
C.	miocena (Schroder) Akiba et Yanagisawa																																																			
Clavella	polymorpha Grunow																																																			
Coconeis	californica Grunow																																																			
C.	costata Gregory																																																			
C.	rotata Petit																																																			
C.	scutellum Ehrenberg																																																			
C.	spp.																																																			
Conchocelis	spp. (Mochizuki)																																																			
Conchocelis	convexus Grunow																																																			
C.	marginatus Ehrenberg																																																			
C.	oculiformis Ehrenberg																																																			
C.	radiatus Ehrenberg																																																			
C.	synobolus Grunow s. l.																																																			
C.	spp.																																																			
C.	spp. (alt.)																																																			
Coscinodiscus	isignis Jouse																																																			
C.	cf. miosachus Jouse																																																			
Coscinodiscus	peranobolus Akiba et Yanagisawa																																																			
Cyanosira	debyi Temp. et Brun																																																			
Delphinella	ovoides (Ehrenberg) Andrews																																																			
D.	cf. saccharinata (Sheshukova) Andrews																																																			
D.	spp.																																																			
Denticulopsis	dimorpha (Schroder) Simonsen																																																			
D.	hustedii (Sim. & Kan.) Simonsen s. l.																																																			
D.	hyalina (Schroder) Simonsen																																																			
D.	lata (Bailey) Simonsen																																																			
D.	pedunculata Barron ex Akiba																																																			
D.	spp.																																																			
Diploneis	spp.																																																			
Endiella	oceanica Ehrenberg																																																			
Goniolobos	rogersii Ehrenberg																																																			
Granatophora	spp.																																																			
Henricus	polymorpha Grunow																																																			
Hyalodiscus	obsoletus Sheshukova																																																			
H.	spp.																																																			
Isobea	lemis (Brun) Akiba																																																			
I.	spp.																																																			
Medialia	splendida Sheshukova																																																			
Melosira	albicansis Sheshukova																																																			
M.	spp. (Ehrenberg) Kuetzing																																																			
Navicula	spp.																																																			
Nandenticula	kanaschica (Zabellina) Akiba et Yanagisawa																																																			
N.	koizumii Akiba et Yanagisawa																																																			
N.	serinus (Sim. & Kan.) Akiba et Yanag.																																																			
N.	spp.																																																			
N.	spp.																																																			
Nitzschia	ovoides (Grunow) Haele																																																			
N.	cf. extincta Kozurenko & Sheshukova																																																			
N.	grunowii Haele																																																			
N.	heteropolica Schroder																																																			
N.	rolandii Schroder emend. Koizumi																																																			
N.	spp.																																																			
Odotella	viridis (Lyngbye) Agardh																																																			
Paralia	ulcata (Ehrenberg) Cleve																																																			
P.	spp.																																																			
Plagiogramma	stauropheum (Greville) Heiberg																																																			
Platysira	spp.																																																			
Perosira	gracilis (Grunow) Joerg																																																			
Perosira	barboi (Brun) Jordan et Fridolf																																																			
P.	presaboi Schroder																																																			
Pseudopodocira	elegans Sheshukova																																																			
P.	gracilis Temp. et Brun																																																			
Rhabdonema	japonicum Temp. & Brun																																																			
Rhizostoma	cf. hebetata f. hiemalis Gran																																																			
R.	cf. styliformis Brightwell																																																			
R.	spp. (Seada)																																																			
R.	spp.																																																			
Rosalia	millierica Peragallo																																																			
Rutilaria	estilon Greville																																																			
Stephanosira	kanasawa Kanaya																																																			
Stephanosira	dimorpha Schroder																																																			
S.	spp.																																																			
Silicodiscus	californicus Chevillet																																																			
Thalassiosira	nizschoides (Grunow) H. et M. Peragallo																																																			
T.	robusta Schroder																																																			
T.	schroderi Akiba																																																			
T.	antiqua Cleve-Euler																																																			
T.	cf. decipiens (Grunow) Joerg																																																			
T.	delicata (Barron) Akiba																																																			
T.	ecentris (Ehrenberg) Cleve																																																			
T.	gracilis Cleve																																																			
T.	gracilis f. fossilis Jouse																																																			
T.	hyalina (Schroder) Simonsen																																																			
T.	Jacksoni Koizumi et Barron																																																			
T.	cf. Jacksoni Koizumi et Barron																																																			
T.	jouseae Akiba																																																			
T.	leptopus (Grunow) Haele & Fryxell																																																			
T.	manifera Sheshukova																																																			
T.	marjanica Sheshukova																																																			
T.	cf. marjanica Sheshukova																																																			
T.	nidulus (Brun) Jouse																																																			
T.	punctata Jouse																																																			
T.	singulata Sheshukova																																																			
T.	cf. trapezoides var. reimeri Maheod et Barron																																																			
T.	tertiaria Jouse																																																			
T.	trifida Fryxell & Haele																																																			
T.	yabei (Kanaya) Akiba et Yanagisawa																																																			
T.	zabellinae Jouse																																																			
T.	cf. zabellinae Jouse																																																			
T.	spp.																																																			
Thalassiothrix	longissima Cleve et Grunow																																																			
Trachyneis	aspera (Ehrenberg) Cleve																																																			
Triceratium	arcicum Brightwell																																																			
Trichocapsa	conspicua Kuetzing																																																			
NON-MARINE DIATOMS																																																				
Achnanthes	granulata (Ehrenberg) Simonsen s. l.																																																			
Cyclotella	spp.																																																			
Diatoma	spp.																																																			
Epratheria	spp.																																																			
Navicula	spp.																																																			
Nitzschia	spp.																																																			
Panularia	spp.																																																			
Stephanodiscus	nianax Ehrenberg																																																			
Total number of diatoms counted		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Remaining species of Chamaecera		19	21	8	7	10	26	24	28	28	12	8	17	39	99	171	24	115	46	36	36	25	88	42	12	12	64	17	10	20	25	48	37	37	23	23	42	46	23	37	62	42	47	-	120	34	23	-	-			
Number of taxa recognized		36	18	22	27	21	35	30	21	17	11	22	24	24	30	38	30	32	31	49	30	48	27	14	21	41	26	24	9	36	19	19	29	34	29	25	39	29	35	37	32	39	32	6	35	13	22	0	0			

Table 10. Occurrence chart of fossil diatoms from the Hokushin area.
Data from the chart of Takahata et al. (2004). See Fig. 8 for location.

		DIATOM ZONE				
FORMATION	Horizon	kam				PD
		Kt				Wk?
NUMBER	Sample number	mid?				
	Another sample number (R2-)	MN009	MN010	MN013	MN014	MN015
		25	26	27	28	32
ABUNDANCE		VA	A	VA	VA	er
app. number of diatom valves per slide (×100)		360	108	360	216	+
PRESERVATION		M	M	M	P	VP
MARINE DIATOMS						
Actinocyclus	kutzingii (A. Schmidt) Simonsen s. l.		+			
A.	ingens Rattray	+	+			
A.	ochotensis Jouse	+		+		
Actinoptychus	senarius (Ehrenberg) Ehrenberg	1		+	+	
Arachnoidiscus	spp.	+				
Bacteriosira	fragilis (Gran) Gran			+		
Cocconeis	costata Gregory	+	+	+	1	
C.	scutellum Ehrenberg	+		+		
C.	spp.	+	+	1		
Corethron	sp. (Mochikubetsu)			+	+	
C.	marginatus Ehrenberg	+	1	+	+	
C.	oculus-iridis Ehrenberg		+	+		
C.	radiatus Ehrenberg		+			
C.	symbolophorus Grunow s. l.		+			
C.	spp.	+	1	+	+	
C.	spp. (altered)					3
Cosmiodiscus	cf. intersectus Jouse			+	+	
Cymatosira	debyi Temp. et Brun		+			
Delphineis	cf. sachalinensis (Sheshukova) Andrews	1		+		
Diploneis	spp.	+		+	+	
Grammatophora	spp.	+		+	+	
Hemiaulus	polymorphus Grunow		+			
Hyalodiscus	obsoletus Sheshukova	+		1		
Isthmia	sp.	+	+			
Melosira	albicansu Sheshukova	1		+		
M.	sol (Ehrenberg) Kuetzing		+	+	1	
Neodenticula	kamtschatica (Zabelina) Akiba et Yanagisawa	74	44	74	78	
Nitzschia	cylindrus (Grunow) Hasle	+				
N.	grunowii Hasle	+		+		
Odontella	aurita (Lyngbye) Agardh	+			+	
Paralia	sulcata (Ehrenberg) Cleve	+		+	+	
Porosira	gracilis (Grunow) Joerg.	+	+		+	
Pseudopodosira	elegans Sheshukova	+	+			
Rhabdonema	japonicum Temp. & Brun	+		+		
Rhaphoneis	spp.	+				
Rhizosolenia	cf. styliformis Brightwell		+	+	+	
R.	sp. (Sendai)				+	
R.	spp.	1				
Rutilaria	epsilon Greville	+				
Sawamuraia	biseriata Komura					1
Stephanopyxis	spp.	1	6	+	1	
Thalassionema	nitzschioides (Grunow) H. et M. Peragallo	6	32	15	4	
T.	robusta Schrader	+	5			
Thalassiosira	antiqua Cleve-Euler				2	
T.	cf. decipiens (Grun.) Joerg.	1	1	+	1	
T.	eccentrica (Ehrenberg) Cleve				+	
T.	gravida Cleve	1	+	+	1	
T.	gravida f. fossilis Jouse			+	+	
T.	cf. jacksonii Koizumi et Barron				+	
T.	jouseae Akiba	2	2	+		
T.	tertiaria Jouse	+				
T.	trifulta Fryxell & Hasle	+	+	1	1	
T.	zabelinae Jouse	6	1	2	+	
T.	spp.	5	7	6	9	
Thalassiothrix	longissima Cleve et Grunow		+	+	+	
Triceratium	aff. condecorum Brightwell	+				
Total number of diatoms counted		100	100	100	100	3
Resting spores of Chaetoceros		11	28	9	28	
Number of taxa recognized		37	27	32	28	1

Table 13. Occurrence chart of fossil diatoms from the Penkeoutomappu River area. Data from the chart of Takahata et al. (2004). See Fig. 12 for location.

FORMATION	DIATOM ZONE																					PD									
	nz										kam										Wk										
NUMBER	Horizon Sample number																				HT401	HT403	HT407								
	Another sample number (R4)	MN111	MN109	MN108	MN105	MN104	MN034	MN102	MN016	MN031	MN029	MN028	MN027	MN025	MN023	MN018	MN017	P	VP	P				VP	P	M	P	P	P	M	P
APPRECIATION		PRESERVATION																				P	VP	P	VP	P	P				
MARINE DIATOMS																															
Achnanthes	groenlandica (Cleve) Grunow																					+									
Achnanthes	curvatulus Janisch																					+									
A.	ingens Raitray	2	8	4	11	6	1	1		+																					
A.	ingens (alt.)		1		1	1																									
A.	ochotensis Jouse																					+									
Actinopyleus	senarius (Ehrenberg) Ehrenberg																					+									
Amphora	spp.																					+									
Arachnoidiscus	spp.																					+									
Bacteriosira	fragilis (Gran) Gran																					+									
Cavitatus	jouseanus (Sheshukova) Williams																					+									
C.	micocnica (Schrader) Akiba et Yanagisawa																					+									
Cocconeis	costata Gregory	+					2	1	+	1	1		+	+																	
C.	scutellum Ehrenberg	2			+		2	+	+	+	1	+																			
C.	spp.				+										1	1															
Corethron	sp. (Mochikubetsu)																					+									
Coccinodiscus	convexus Grunow																					+									
C.	marginatus Ehrenberg	1	1	1	1	3	1	+	+	+	+	1	+	1	+												26				
C.	oculus-iridis Ehrenberg																					+									
C.	radiatus Ehrenberg																					+									
C.	symbolophorus Grunow s. l.																					+									
C.	spp.	+	+	2	+	1	+	+	+	+	+	+	3	+	2	2	1	2	+	+											
C.	spp. (altered)																					+									
Cosmioidiscus	insignis Jouse																					+									
C.	cf. intersectus Jouse																					+									
Cymatosira	debyi Temp. et Brun																					+									
Dalpluneis	kippac Sanoctva																					+									
D.	surirella (Ehrenberg) Andrews	1																					+								
D.	cf. sachalinensis (Sheshukova) Andrews																					+									
D.	spp.																					+									
Denticulopsis	dimorpha (Schrader) Simonsen																					+									
D.	hustedtii (Sim. & Kan.) Simonsen s. l.	3																					+								
D.	hyalina (Schrader) Simonsen	1	1	1	4	7	+																								
D.	lauta (Bailey) Simonsen	+	1	7	7	8	+																								
D.	praehauta Akiba et Koizumi																					+									
Diploneis	spp.																					+									
Grammatophora	spp.																					+									
Hemiaulus	polymorphus Grunow																					+									
Hyalodiscus	obsoletus Sheshukova	1	1	1	1	+	1	+	+	+	+	+	1	2	8	1															
H.	spp.																					+									
Ikebea	tenuis (Brun) Akiba	+	2	2	2	+	+			1	2	1	+																		
Isthmia	sp.																					+									
Kisseleviella	carina Sheshukova																					+									
Melosira	albicans Sheshukova																					+									
M.	sol (Ehrenberg) Kuetzing	2	1	+	+	+	+			+	+		+	+	7																
Navicula	spp.																					+									
Neodenticula	kamtschatica (Zabelina) Akiba et Yanagisawa	34	+	1	20	9	10	57	30	79	58	69	64	75	67	63	76														
N.	koizumii Akiba & Yanagisawa																					+									
N.	seminae (Sim. & Kan.) Akiba & Yanag.																					+									
N.	spp.																					+									
Nitzschia	cylindrus (Grunow) Hasle																					+									
N.	granulata Grunow																					+									
N.	grunowii Hasle																					+									
N.	heteropolica Schrader	1																					+								
N.	rolandii Schrader emend. Koizumi	4	1	2			+																								
N.	spp.																					+									
Odontella	aurita (Lyngbye) Agardh																					+									
Paralia	sulcata (Ehrenberg) Cleve	2	2				1		1	+	1	1	+	2	1	1	+	11													
P.	sp.																					+									
Parosira	gracilis (Grunow) Joerg.																					+									
Proboscia	barboi (Brun) Jordan et Priddle																					+									
Pseudopodosira	clegans Sheshukova																					+									
Rhabdonema	japonicum Temp. & Brun																					+									
Rhizosolenia	cf. styliformis Brightwell																					+									
R.	sp. (Sendai)	+	1	1	1	1	1	1	1	1	+	1	1	1	1	1	1														
R.	spp.																					+									
Rutilaria	epsilon Greville																					+									
Stephanogonia	hanzawae Kanaya																					+									
Stephanopyxis	spp.	7	20	13	24	15	4	6	11	+	+	1	1	2	5	5	1	9	+												
S.	spp. (alt.)																					+									
Stictodiscus	californicus Greville																					+									
Thalassionema	nitzschoides (Grunow) H. et M. Peragallo	15	2	6	7	10	8	14	3	8	23	13	3	14	3	1	+														
T.	robusta Schrader																					+									
Thalassiosira	antiqua Cleve-Euler	1																					+								
T.	cr. castanea Akiba et Yanagisawa																					+									
T.	cf. decipiens (Grun.) Joerg.	1																					+								
T.	eccentrica (Ehrenberg) Cleve																					+									
T.	gravidata Cleve																					+									
T.	gravidata f. fossilis Jouse																					+									
T.	hyalina (Schrader) Simonsen																					+									
T.	jacksonii Koizumi et Barron																					+									
T.	cf. jacksonii Koizumi et Barron																					+									
T.	jouseae Akiba																					+									
T.	marujamita Sheshukova																					+									
T.	cf. marujamita Sheshukova																					+									
T.	oestrupii (Ostenfeld) Prostikina																					+									
T.	singularis Sheshukova																					+									
T.	cf. tetractropii var. reimeri Mahood et Barron																					+									
T.	temperai (Brun) Akiba & Yanagisawa																					+									
T.	tertiaria Jouse																					+									
T.	trifida Fryxell & Hasle																					+									
T.	yabei (Kanaya) Akiba et Yanagisawa																					+									
T.	zabchinna Jouse	3	+	1	3		1	2	32	2	+	1	1	3	5	5	5	3													
T.	cf. zabelinae Jouse	+	+	+	+		2	2	2	4									23												
T.	spp.	16	+	3	8		10	7	9	4	7	6	19	+	7	11	12														
T.	spp.	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+													
Thalassiothrix	longissima Cleve et Grunow																					+									
NON-MARINE DIATOMS																															
Achnanthes	spp.																					+									
Aulacoseira	granulata (Ehrenberg) Simonsen s. l.	1																					+								
Bacillaria	paradoxa Gmelin																					+									
Cymbella	spp.																					+									
Eunotia	spp.																					+									
Frustulia	sp.																					+									
Meridion	circulare Agardh																					+									
Navicula	spp.	1	2		1	2	8																								
Nitzschia	spp.	+	+		1	13																									
Pinnularia	spp.																					+									
Rhopalodia	spp.																					+									
Synedra	ulna (Nitzsch) Ehrenberg																					+									
Total number of diatoms counted		100	44	41	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0	0											
Resting spores of Chaetoceros		45	-	7	32	20	31	47	28	73	21	8	35	24	33	18	12	30													
Resting spores of Chaetoceros (altered)																															
Number of taxa recognized		41	17	16	39	36	57	27	34	24	28	21	19	24	24	30	27	16	3	5											
Recent non-marine diatoms (obvious contamination)		48	29			68																									

Table 14. Occurrence chart of fossil diatoms from the Kenashiporo River area. Data from the chart of Takahata et al. (2004). See Fig. 15 for location.

DIATOM ZONE		PD		e?		k-k		nz		ND	
FORMATION	Horizon	Wk		Kt		Yc		Sb			
		low?	mid?	upp	low	l-m	upp				
NUMBER	Sample number	MN077	MN076	MN089	MN088	MN093	MN094	MN083	MN085	MN086	MN095
	Another sample number (R4-)	52	53	54	55	57	58	62	64	65	67
ABUNDANCE		er	C	A	VA	VA	A	A	vr	er	ND?
app. number of diatom valves per slide (x100)		+	18	45	54	144	144	54	0.2	+	
PRESERVATION		VP	VP	M	M	M	M	M	Vp	VP	
MARINE DIATOMS											
Achnanthes	groenlandica (Cleve) Grunow					+					
Actinocyclus	kutzingii (A. Schmidt) Simonsen s. l.				1	2	+				
A.	ingens Rattray		2		+			+	1		
A.	ochotensis Jouse					+					
Actinoplychus	senarius (Ehrenberg) Ehrenberg		1	5	1	+	1	1			
Amphora	spp.					+					
Arachnoidiscus	spp.							+			
Aulacodiscus	sp.				+						
Azpeitia	spp.		1			+					
Bacteriosira	fragilis (Gran) Gran								+		
Cocconeis	antiqua Tempere & Brun						1				
C.	costata Gregory		1	1	6	1		1			
C.	scutellum Ehrenberg			1	2	+		1			
C.	spp.		1	1				+			
Coscinodiscus	marginatus Ehrenberg		+	18	7	6	2	+	+	3	
C.	oculus-iridis Ehrenberg					1	1	+	1		
C.	radiatus Ehrenberg		+	3	1			+	1		
C.	symbolophorus Grunow s. l.		+		+					+	
C.	spp.		+	4	+	+	1	+	+	+	+
Cosmidiscus	insignis Jouse					+					
Cyclotella	striata (Kutz) Grun.								+		
Cymatosira	debyi Temp. et Brun					1					
Delphineis	cf. sachalinensis (Sheshukova) Andrews						+		2		
D.	spp.					+			+		
Denticulopsis	spp.		+								
Diploneis	spp.		+				+				
Grammatophora	spp.		1	1				+			
Hyalodiscus	obsoletus Sheshukova		+	1	2				1		
Ikebea	tenuis (Brun) Akiba		4	4							
Melosira	albicansu Sheshukova							1	1		
M.	sol (Ehrenberg) Kuetzing				1	1		+	+		
Navicula	spp. (marine)				1						
Neodenticula	kamischatica (Zabelina) Akiba et Yanagisawa		+	3	3	16	72	71	37	5	2
N.	spp.					2					
Nitzschia	grunowii Hasle				+	+	2	2	3		
N.	heteropolica Schrader										+
N.	pliocena (Brun) Mertz			1							
N.	rolandii Schrader emend. Koizumi			1	8	6					
Odontella	aurita (Lyngbye) Agardh		5	1	+				+		
Paralia	sulcata (Ehrenberg) Cleve		3	+		1				1	
P.	sp.										+
Porosira	gracilis (Grunow) Joerg.			1				+	+		+
Proboscia	barboi (Brun) Jordan et Priddle			1		2	+				
Pseudopodosira	elegans Sheshukova				1				2		
Rhabdonema	japonicum Temp. & Brun		1	+		+					
Rhaphoneis	spp.									+	
Rhizosolenia	cf. styliformis Brightwell				1						
R.	spp.				1	1	1				
Rouxia	californica Peragallo				+						
Stephanogonia	hanzawae Kanaya			+							
Stephanopyxis	spp.		+	34	3	3		1	14	4	+
Stictodiscus	californicus Greville			+							
Synedra	camtschatica Grunow			1		+					
Thalassionema	nitzschioides (Grunow) H. et M. Peragallo		4	5	30	3	3	9	9	+	1
Thalassiosira	antiqua Cleve-Euler					2	1		+		
T.	cf. decipiens (Grun.) Joerg.						2	7	6		
T.	delicata (Barron) Akiba				+						
T.	gravida Cleve					3	1		1		
T.	gravida f. fossilis Jouse					+	+				
T.	hyalina (Schrader) Simonsen									+	
T.	jacksonii Koizumi et Barron					+					
T.	cf. jacksonii Koizumi et Barron					+					
T.	aff. jacksonii (fine & small)				+						
T.	jouseae Akiba			+			+	1	+		
T.	manifesta Sheshukova		1	1	+						
T.	marujamica Sheshukova				+						
T.	multiplora Schrader								1		
T.	nidulus (Brun) Jouse		1	+							
T.	punctata Jouse				+	+					
T.	temperei (Brun) Akiba & Yanagisawa				+						
T.	zabelinae Jouse		+	5	+	18	1	2	8	1	
T.	cf. zabelinae Jouse			1	4		+				
T.	spp.		+	1	21	23	6	5	10	2	+
Thalassiothrix	longissima Cleve et Grunow		+	+	+	+		+	+		
Trachyneis	aspera (Ehrenberg) Cleve					1	+				
Triceratium	arecticum Brightwell			+							
Trochosira	concava Kitton			2							
NONMARINE DIATOMS											
Navicula	spp. (non-marine)							+	+		
Nitzschia	spp.										+
Total number of diatoms counted		4	100	100	100	100	100	100	100	17	3
Resting spores of Chaetoceros		2	49	62	77	19		46	105	2	1
Resting spores of Chaetoceros (altered)										1	
Number of taxa recognized		9	35	38	35	33		20	35	10	6

Table 15. Occurrence chart of fossil diatoms from the Hokushin area.
Data from the chart of Takahata et al. (2004). See Fig. 8 for location.

DIATOM ZONE		kam														
FORMATION		Kr														
NUMBER	Sample number (H15-1-)	1	2	3	14	4	5	13	6	12	7	11	8	9	10	
ABUNDANCE		VA	VA	VA	VA	VA	VA	A	VA	A	A	VA	VA	A	VA	
app. number of diatom valves per slide (×100)		360	360	360	360	360	180	108	360	90	108	216	144	108	180	
PRESERVATION		M	VG	G	G	M	G	P	G	P	M	M	G	G	M	
MARINE DIATOMS																
Achnanthes	groenlandica (Cleve) Grunow			+	+					1				+		
Actinocyclus	kutzingii (A. Schmidt) Simonsen s. l.		+													
A.	ingens Ratfray	+					+		+		+	+	+	+	+	
A.	ochotensis Jouse			+	1					+	+	+	+	+	+	
Actinoptocyclus	senarius (Ehrenberg) Ehrenberg	+		+	+	+	1	3	+	+	+	+	+	+	+	
A.	splendens (Shadbol) Ralfs														+	
Amphora	spp.	+			+		+					+				
Arachnoidiscus	spp.												+	+		
Bacteriosira	fragilis (Gran) Gran	+	+	+			+									
Cocconeis	antiqua Tempere & Brun			+												
C.	californica Grunow	+														
C.	costata Gregory	+	+	2	+	+		+	+	+			1	+	1	
C.	notata Potit						+						+			
C.	scutellum Ehrenberg	+	+	+	+		+	1	1			+	+	+		
C.	spp.	+	+	+		+				+		1	+	+	+	
Corcthron	sp. (Mochikubetsu)		+				+									
Coscinodiscus	convexus Grunow														+	
C.	marginatus Ehrenberg	+		+	+	+	+		+	+	+	+	1	+	+	
C.	nitidus Gregory								1		+			1		
C.	radiatus Ehrenberg	+	+						+				+		+	
C.	symbolophorus Grunow s. l.						+		+							
C.	spp.	1	+	+	+	+	+	+	+	+	+	+	+	1	+	
Cosmidiscus	cf. interscetus Jouse						+		+	+	+		+			
Cyclotella	striata (Kütz) Grun.	+							+	+	+		+			
Cymatosira	debyi Temp. et Brun			+	+		1		+	1		3				
Delphineis	surirella (Ehrenberg) Andrews			+		+										
D.	cf. sachalinensis (Sheshukova) Andrews	+				+						+			+	
D.	spp.					+		1			+			+	1	
Denticulopsis	hustedtii (Sim. & Kan.) Simonsen s.l.	1			1		1									
D.	hyalina (Schrader) Simonsen					+										
Diploneis	spp.	+					+	+	+							
Endietya	occantica Ehrenberg											+				
Goniothecium	rogersii Ehrenberg			+												
Grammatophora	spp.				+	+	+			+						
Hemidiscus	cuneiformis Wallich				+											
Hyalodiscus	obsoletus Sheshukova	+	+	+	+	+	+		+				+	+	+	
H.	spp.											+				
Ikebea	tenuis (Brun) Akiba					+										
Isthmia	sp.				+											
Melosira	aibicansu Sheshukova		3	1		3	3		1	1	1		2			
M.	sol (Ehrenberg) Kuetzing		+						+	+			+		+	
Navicula	spp.			1												
Neodenticula	kamtschatica (Zabelina) Akiba et Yanagisawa	80	45	80	86	87	60	64	74	42	74	75	58	74	75	
Nitzschia	grunowii Hasle	+	4	+	+	+	4	2	+	+			1	+		
N.	rolandii Schrader emend. Koizumi						1									
N.	spp.				1											
Odontella	aurita (Lyngbye) Agardh	+			+	+	+				1	+		+		
Paralia	sulcata (Ehrenberg) Cleve	+	1	+	+						1		+	+	1	
P.	sp.		+													
Pleurosigma	spp.							+								
Porosira	gracilis (Grunow) Joerg.			+	+	+	+		1			+		+	+	
Proboscia	barboi (Brun) Jordan et Priddle	+		+	+	+								+		
Pseudopodosira	elegans Sheshukova		1													
Rhabdonema	japonicum Temp. & Brun				+			+								
Rhizosolenia	cf. styliformis Brightwell	1	1	+			1	+	1		+	1			1	
R.	sp. (Sendai)															
R.	spp.			1	1	+	2	1			1		+	+		
Stephanopyxis	spp.	4	4	3	4	1	+	3	1	6	+	5	5	1	1	
Thalassionema	nitzschioides (Grunow) H. et M. Peralgallo	3	32	3	2	1	16	11	12	35	10	7	15	14	2	
T.	robusta Schrader		+		+		+	+		1		+	+		1	
Thalassiosira	antiqua Cleve-Euler	+	+	3	1	3	2	4	1	2	1	2	+	+	3	
T.	cf. decipiens (Grun.) Joerg.	+	1	3	1	+	+	2	1	+	1	2	1	2	2	
T.	eccentrica (Ehrenberg) Cleve				+			2							+	
T.	gravidata Cleve	+	1	+		+	+			+		+	1	+	+	
T.	gravidata f. fossilis Jouse	+		+	+	+	+			1		+	+	+		
T.	hyalina (Schrader) Simonsen									+						
T.	cf. jacksonii Koizumi et Barron			+											3	
T.	jouseae Akiba	+	2		+	1			1	+	1		+			
T.	manifesta Sheshukova											+				
T.	cf. marujamica Sheshukova			+			+			1						
T.	nidulus (Brun) Jouse		+	+						+						
T.	cf. tetraoestrupii var. reincri Mahood et Barron				+										+	
T.	tertiaria Jouse	+	+													
T.	trifluta Fryxell & Hasle	+	+		+			+	+	+				+	+	
T.	zabelinae Jouse	+	1	+	+	+	+	+		3	1	1	1	1	+	
T.	cf. zabelinae Jouse	1	+			+	1		+		1	+	1			
T.	spp.	10	4	2	2	4	7	6	5	6	7	3	13	6	7	
Thalassiothrix	longissima Cleve et Grunow	+	+	+	+	+	+	+	+	+	+	+	1	+	+	
Trachyneis	aspera (Ehrenberg) Cleve						+		+						+	
Triceratium	arcticum Brightwell														+	
T.	condecorum Brightwell														+	
NONMARTINE DIATOMS																
Aulacoseira	granulata (Ehrenberg) Simonsen s. l.								+							
Bacillaria	paradoxa Gmelin												+			
Cymbella	spp.			+												
Hantzschia	amphioxys (Ehrenberg) Grunow				+											
Nitzschia	spp.								+							
Pinnularia	spp.							+								
Total number of diatoms counted		100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Resting spores of Chaetoceros		29	38	19	7	28	28	14	10	26	10	18	23	13	18	
Number of taxa recognized		34	31	37	36	30	38	24	33	27	24	29	29	30	29	

Table 16. Occurrence chart of fossil diatoms from the Penkeoutomappu River area. Data from the chart of Takahata et al. (2004). See Fig. 12 for location.

DIATOM ZONE		nz	k-k		kam			
FORMATION		Yc	Kt					
NUMBER	Sample number (H15-2-)	4	3	7	5	6	2	1
ABUNDANCE		C	C	A	C	A	A	A
app. number of diatom valves per slide (×100)		24	27	40	60	54	216	108
PRESERVATION		P	P	M	P	P	M	M
MARINE DIATOMS								
Achnanthes	groenlandica (Cleve) Grunow	+		+				
Actinocyclus	kutzingii (A. Schmidt) Simonsen s. l.		1					
A.	ingens Raltray	1	4					
A.	ingens (alt.)		+					
A.	ochotensis Jouse		+					+
A.	octonarius Ehrenberg				+			
Actinoptochus	senarius (Ehrenberg) Ehrenberg		+	+		1	+	1
Amphora	spp.		+					
Arachnoidiscus	spp.				+			
Asteromphalus	sp.	+	+					
Azpeitia	spp.		+					
Bacteriosira	fragilis (Gran) Gran		3			1	+	
Cocconcis	californica Grunow	+						
C.	costata Gregory		1		1	1		
C.	scutellum Ehrenberg	1	+					
C.	spp.		+	+	1			1
Corethron	sp. (Mochikubetsu)		+					
Coscinodiscus	convexus Grunow					1	+	
C.	marginatus Ehrenberg	+	+	4	+	+	+	+
C.	nitidus Gregory			+				
C.	radiatus Ehrenberg	1				1	+	
C.	symbolophorus Grunow s. l.		+					
C.	spp.	2	+	+	1	1	+	+
C.	spp.(altered)	+						
Cosmidiscus	insignis Jouse						+	
C.	cf. intersectus Jouse							+
Cymatosira	debyi Temp. et Brun		1					
Delphineis	kippac Sancetta	5						
D.	surirella (Ehrenberg) Andrews		+	+				
D.	cf. sachalinensis (Sheshukova) Andrews			1	+			+
D.	spp.			+				
Denticulopsis	dimorpha (Schrader) Simonsen	1						
D.	hustedtii (Sim. & Kan.) Simonsen s.l.		+	2	1			
D.	lauta (Bailey) Simonsen	+	1					
Diploneis	spp.	+	+	+			+	
Genus et species indet.			2					
Grammatophora	spp.		+					+
Hyalodiscus	obsoletus Sheshukova			1		1	1	1
Melosira	albicansu Sheshukova		1					
M.	sol (Ehrenberg) Kuetzing		+					+
Navicula	spp.	1	2	+	+			
Neodenticula	kamtschatica (Zabelina) Akiba et Yanagisawa	2	1	20	30	47	88	89
N.	koizumii Akiba & Yanagisawa	9	4	4	+			
N.	seminac (Sim. & Kan.) Akiba & Yanag.	17	5					
N.	sp. A		9					
N.	spp.	19	7	2	3			
Nitzschia	cylindrus (Grunow) Hasle		3					+
N.	aff. extincta Kozurenko & Sheshukova	1						
N.	grunowii Hasle		3					+
N.	heteropolica Schrader		+					+
N.	rolandii Schrader emend. Koizumi		+					
N.	spp.	1						
Odontella	aurita (Lyngbye) Agardh	5	1	+				
Paralia	sulcata (Ehrenberg) Cleve	+	+	2	1			
Pleurosigma	spp.		+					
Porosira	gracilis (Grunow) Joerg.		1	+	+	1	+	
Proboscia	barboi (Brun) Jordan et Priddle		+			+		+
Pseudopodosira	elegans Sheshukova		1					
Rhabdonema	japonicum Temp. & Brun				+			
Rhizosolenia	cf. styliformis Brightwell	+	1					1
R.	spp.	1	1					+
Rouxia	californica Peragallo		+					
Stephanopyxis	dimorpha Schrader	1						
S.	spp.	1	8	11	7	7	1	+
S.	spp.(alt.)	+						
Thalassionema	nitzschioides (Grunow) H. et M. Peragallo	6	2	3	11	14	1	2
T.	robusta Schrader				7	1	+	
Thalassiosira	angust-lineata (A. Schmidt) Fryxell & Hasle	1						
T.	antiqua Cleve-Euler	+					+	+
T.	cf. decipiens (Grun.) Joerg.	3	3	3	1	+		
T.	ceccentrica (Ehrenberg) Cleve							1
T.	gravida Cleve	+	3	1		2		
T.	gravida f. fossilis Jouse		3	1		+	+	
T.	hyalina (Schrader) Simonsen	1	+					
T.	jouseae Akiba	1	3		1	1		1
T.	multipora Schrader	+	2					
T.	cf. nordenskioldii Cleve	1						
T.	cf. tetraoestrupii var. reimeri Mahood et Barron			35	17			
T.	tertiaria Jouse			+				
T.	trifurca Fryxell & Hasle		1				2	
T.	zabelinae Jouse	+	1		+	5	+	1
T.	spp.	16	20	10	18	15	7	2
Thalassiothrix	longissima Cleve et Grunow		+	+	+			
Trachyneis	aspera (Ehrenberg) Cleve			+				
NON MARINE DIATOMS								
Aulacoseira	granulata (Ehrenberg) Simonsen s. l.		+					
Bacillaria	paradoxa Gmelin		+					
Cymbella	spp.		+					
Hantzschia	amphioxys (Ehrenberg) Grunow		+					
Navicula	spp.	1	+					
Nitzschia	spp.		+					
Pinnularia	spp.		+					
Rhopalodia	spp.		1					
Synedra	ulna (Nitzsch) Ehrenberg	1						
Total number of diatoms counted		100	100	100	100	100	100	100
Resting spores of Chaetoceros		56	84	58	56	37	18	9
Resting spores of Chaetoceros (altered)			1					
Number of taxa recognized		44	61	28	25	21	22	20

Table 17. Occurrence chart of fossil diatoms from the Hokushin area.
Data from the chart of the study of postdoctoral fellow (Yasue). See Fig. 8 for location.

FORMATION		HT		Yc
NUMBER		912-4d	1001-a	1001-3
Location (Fig.)		8	8	8
DIATOMS				
Actinocyclus	curvatus	2?		4
A.	ingens		1	
A.	oculatus			5
Actinoptychus	senarius	*		*
Bacillaria	spp.		*	*
Bacterosira	fragilis			4
Cavitatus	jouseanus			1
Chaetoceros	spp. (Resting spore)	**	**	**
Cocconeis	costata	4		1
Coscinodiscus	marginatus	10		
Cymatosira	sp.			1
Cymbella	spp.	1		4
Delphineis	surirella	2		
Denticulopsis	lauta			3
D.	praedimorpha	2		
D.	praekatayamae			1
D.	sp.			2
Diploneis	smithii		2	
D.	sp.	1		
Eunotia	spp.	1	14	1
Fragilariopsis	cylindrus			27
F.	oceanica	3		3
Gomphonema	sp.		2	
Hantzschia	spp.		2	
Hyalodiscus	obsoletus	*		
Ikebea	tenuis			1
Kisseleviella	ezoensis			1
K.	carina			2
Merosira	albicans	4		24
Navicula	spp.		2	2
Neodenticula	kamtschatica	156	30	10
N.	koizumii	45	1	13
N.	seminae			5valve?
Nitzschia	cf. rolandii	2		*
Pinnularia	spp.	49	10	
Plagiogramma	sp.		1	
Proboscia	barboi	*		
Pseudopodosira	elegans	1		
Odontella	sp.			*
Rhopalodia	sp.			1
Rhizosolenia	hebetata f. semispina	2		
R.	spp.		1	2
Stephanopyxis	sp.	3		*
Synedra	sp.		3	1
Thalassionema	bacillare			5
T.	frauenfeldii			2
T.	hirosakiensis	1		
T.	nitzschioides	14	5	54
Thalassiosira	antiqua	1	2	2
T.	gravida	2		
T.	jouseae	3		2
T.	nidulus	2		
T.	oestrupii	3	2	7
T.	trifulta			1
T.	spp.	11	*	59
Thalassiothrix	longissima	2		1
Miscellaneous		60	8	26
Total counts of 1/2-valves		385	86	273

* Present, ** Abundantly present

Table 20. Occurrence chart of fossil diatoms from D-1 borehole.

Data from the chart of Yanagida and Tanaka (1992) and Yanagida (1998). See Fig. 12 for location.

FORMATION	DEPTH (m)	Yc													
		977	1027	1073	1091	1124	1151	1161	1190	1207	1242	1312	1322	1342	
ABUNDANCE		R	R, VR	R	C, R	C, R	C	C, R	R	R	C	C, R	VR	VR	
app. number of diatom valves per slide (×100)		12	4.5	9	12	72	12	9	6	5.14	12	12	0.1	0.1	
PRESERVATION		P	P	M	P	P	M	P	M	P	M	P	VP	VP	
MARINE DIATOMS															
Actinocyclus	curvatus Janisch	2				+				2		2			
A.	ingens Rattray	7	11	3	10	4	2	1	3	5	2	5			
A.	ingens Rattray (altered)	+	3				1	1						3	
A.	ochotensis Jouse					3		2	1						
A.	spp.										1				
Actinoptychus	senarius (Ehrenberg) Ehrenberg	2	2		1	4	+	+	1		+				
Amphora	spp.	2		+	1	5		8	+			+			
Arachnoidiscus	spp.	1	+	+		+						1			
Bacteriosira	fragilis (Gran) Gran						1					1			
Cocconeis	costata Gregory		2	2	1	2	+	1	3		2	1			
C.	scutellum Ehrenberg	7			3	1	+		+		1	1			
C.	spp.			3	+	3	1		1	1	+				
Coscinodiscus	marginatus Ehrenberg	10	10	4	12	14	3	7	4	10	8	17			
C.	marginatus (altered)													8	
C.	oculus-iridis Ehrenberg						+				1				
C.	spp.	1		1	+	4	+	1	2	4	5	5			
C.	spp.(altered)												5	3	
Cosmidiscus	insignis Jouse						1								
Cymatosira	dobyi Temp. & Brun											4			
Delphineis	surirella (Ehrenberg) Andrews	1	3	2	4	7	2				+				
D.	spp.			1											
Denticulopsis	dimorpha (Schrader) Simonsen						2		1		1				
D.	hustedtii (Sim. & Kan.) Sim. s.l.			+							1				
D.	hyalina(Schrader) Simonsen	5	2	3	4	3		2	7	1	2				
D.	lauta (Bailey) Simonsen				1		2		3		1				
D.	spp.								2		1	1			
Diploneis	spp.		3	2	2	2	2	2	3	+		5			
Grammatophora	spp.	2	3		+	1		1	+		1	+			
Hyalodiscus	obsoletus Sheshukova	+	1	1	1	1			2		1				
Ikebea	tenuis (Brun) Akiba	2							1	1	+				
Isthmia	spp.								+						
Melosira	sol (Ehrenberg) Kutz.	3	1	+	3	1		1	+	1	1	2		+	
Navicula	lyra Ehrenberg			+											
N.	spp.	2	1	1		1	2	3	3			1			
Neodenticula	kamtschatica (Zabelina) Akiba et Yanagisawa	9	8	7	12	15	9	8	11	1	10	6			
N.	koizumii Akiba & Yanagisawa		1	5	1	1	1	2	3	3	2	1			
N.	seminae (Sim. & Kan.) Akiba & Yanag.			2					+						
N.	cf. seminae (Sim. & Kan.) Akiba & Yanag.		1									+			
N.	sp. A								1						
N.	spp.			1											
Nitzschia	cf. grunowii Hasle						1		1						
N.	rolandii Schrader			1		1			1			1			
N.	spp.	+	2	1				3	1						
Odontella	aurita (Lyngbye) Agardh	1	2	3		+	+	1			+	2			
O.	sp.			+											
Paralia	sulcata (Ehrenberg) Cleve		2	3	2		2		3	15					
P.	praecarboi (Schrader) Jordan et Priddle														
Podosira	gracilis	1						2							
Prosira	cf. gracilis (Grun.) Joerg.			+					+						
Rhabdonema	japonicum Temp. & Brun					1									
Rhizosolenia	barboi (Brun) Temp. & Perag. ?	1						1		1		+			
R.	curvirostris Jouse ?	1													
R.	cf. styliformis Brightwell				1							1			
R.	spp.						1					3			
Rouxia	californica Perag.								+						
Stephanogonia	hanzawae Kanaya	+										1			
Stephanopyxis	spp.	16	22	18	15	10	17	13	13	15	30	7			
S.	spp. altered									2			+		
Thalassionema	nitzschoides (Grunow) H. et M. Peragallo	10	12	21	5	7	11	13	13	33	30	8			
T.	robusta Schrader						1								
Thalassiosira	antiqua Cleve-Euler						1		+		1				
T.	antiqua (Grun.) Cleve-Euler	1			1										
T.	cf. decipiens (Grun.) Joerg.			2					1						
T.	gravida Cl.						9		8		6				
T.	gravida Jouse	2			5			15		1		9			
T.	gravida f. fossilis Jouse	2			1		4	5	1		+	2			
T.	jouseae Akiba	1	+	1	3	1	12	+	4		2	3			
T.	leptopus (Grun.) Hasle & Fryxell				1										
T.	manifesta Sheshukova		1												
T.	nidulus (Brun) Jouse			1											
T.	zabelinac Jouse	3	2	2	2	1	+	+		1		+			
T.	spp.	3	4	8	8	7	11	5	6	3	6	11			
Thalassiothrix	longissima Cleve et Grunow	+			+				+	+	+	+			
Trachyneis	aspera (Ehrenberg) Cleve								+			+			
NONMARINE DIATOMS															
Achnanthes	spp.							+							
Aulacoseira	granulata (Ehrenberg) Simonsen s. l.		1	1			1	1	2		1				
Cymbella	spp.					+									
Epithemia	spp.											+			
Eunotia	spp.	1													
Pinnularia	borealis Ehrenberg								1						
Pinnularia	spp.	1	+	+	+	+		1							
Synedra	spp.							+							
Total number of diatoms counted		100	100	100	100	100	100	100	100	100	100	100	5	14	
Resting spores of Chaetoceros		38	37	18	60	134	131	172	106	169	74	51			

Table 23. Occurrence chart of fossil diatoms from HDB-3 borehole.
Data from the chart of Yamamoto et al. (2003a). See Fig. 8 for location.

FORMATION	DIATOM ZONE		kam										PD - ND		
	DEPTH (m)	ABUNDANCE	Kt										Wk		
			49.90	100.50	119.90	146.70	174.90	199.90	239.90	296.50	350.35	399.00	450.12	506.40	
			VA	A	VA	A	VA	A	VA	A	C	PD	ND		
app. number of diatom valves per slide (×100)			360	360	216	108	180	108	90	144	108	90	+		
PRESERVATION			M	P	M	M	M	M	M	M	M	P	P		
sample dissolved (g) among 0.5g sample used			0.3	0.1	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.2	tr.	
water used to suspend sample (ml=g)			160	160	300	300	300	160	300	160	300	250	100	100	
app. number of diatom valves in 1 g sample (×100,000)			19.2	57.6	21.6	10.8	27	5.8	9	7.7	10.8	11.3	+		
MARINE DIATOMS															
Actinocyclus	<i>ingens</i> Ratray			+		+									
A.	<i>ochotensis</i> Jouse					+			2	+	+				
A.	spp.					1				+					
Actinoptychus	<i>senarius</i> (Ehrenberg) Ehrenberg		+	+	+	+	1		2	1	+	1	+		
Arachnoidiscus	spp.				+										
Cocconeis	<i>costata</i> Gregory		+					+				+			
C.	<i>scutellum</i> Ehrenberg							+				+			
C.	spp.					+				+	1	+	+		
Coscinodiscus	<i>marginatus</i> Ehrenberg		+	+	+	1	+		+	2	1	1	1		
C.	<i>marginatus</i> (altered)														
C.	<i>oculus-iridis</i> Ehrenberg		+			+	+				+		+		
C.	<i>radiatus</i> Ehrenberg			1	+										
C.	spp.		+	+	+	+	+		+	1	+	+	+		
Cosmiodiscus	<i>insignis</i> Jouse					+									
C.	cf. <i>intersectus</i> Jouse											+			
Cymatosira	<i>debyi</i> Temp. et Brun								+	1		1			
Delphineis	<i>surirella</i> (Ehrenberg) Andrews			+							+				
D.	spp.					+	+		1	1	1	+		+	
Denticulopsis	<i>hustedtii</i> (Sim. & Kan.) Simonsen s.l.											+	+		
D.	<i>hyalina</i> (Schrader) Simonsen				+										
D.	<i>lauta</i> (Bailey) Simonsen											+			
Diploneis	spp.		+						+	1		1			
Endictya	<i>oceanica</i> Ehrenberg			+											
Grammatophora	spp.				+					+	+	+			
Hyalodiscus	<i>obsoletus</i> Sheshukova				+		+			+	+	+			
H.	spp.											+			
Ikebea	<i>tenuis</i> (Brun) Akiba									+					
Isthmia	sp.		+												
Melosira	<i>albicansu</i> Sheshukova						1			1		1			
M.	<i>sol</i> (Ehrenberg) Kutz.		+						+		1		+		
Navicula	spp.				+										
Neodenticula	<i>kamtschatica</i> (Zabelina) Akiba et Yanagisawa		83	85	55	62	81		71	72	78	79	93		
Nitzschia	<i>grunowii</i> Hasle		+	3	+	1				+					
Odontelia	<i>aurita</i> (Lyngbye) Agardh					1				+					
Paralia	<i>sulcata</i> (Ehrenberg) Cleve		1		1	1	+		+		+		1		
Plagiogramma	<i>staurophorum</i> (Grev.) Heib.						1								
Proboscia	<i>barboi</i> (Brun) Jordan et Priddle		+		+	+							+		
Rhabdonema	<i>japonicum</i> Temp. & Brun			+						+		+			
Rhizosolenia	cf. <i>hebetata</i> Gran									+		2			
R.	cf. <i>styliiformis</i> Brightwell		+	+	2		1		1	1	3	2	+		
R.	spp.		+	+	+	+	+								
Stephanopyxis	spp.		3	+	3	2	2		+	1	+	1	1	+	
Thalassionema	<i>nitzschioides</i> (Grunow) H. et M. Peragallo		3	7	30	25	4		3	9	6	3	3	+	
T.	<i>robusta</i> Schrader								+						
Thalassiosira	<i>antiqua</i> Cleve-Euler				1	+	+		3	1	+	1			
T.	cf. <i>decepiens</i> (Grun.) Joerg.		2		+	+	1						+		
T.	<i>eccentrica</i> (Ehrenberg) Cl.					1									
T.	<i>gravida</i> Cl.		+			1			+		+		+		
T.	<i>gravida</i> f. <i>fossilis</i> Jouse		+			+				+	+				
T.	<i>jacksonii</i> Koizumi et Barron													+	
T.	cf. <i>jacksonii</i> Koizumi et Barron					+	1		11	1	1	+			
T.	<i>jouseae</i> Akiba			+	+		+					+			
T.	<i>nidulus</i> (Brun) Jouse				+	1				1					
T.	cf. <i>tetraoestrupii</i> var. <i>reimeri</i> Mahood et Barron			+							1				
T.	<i>trifulta</i> Fryxell & Hasle									+					
T.	<i>zabelinae</i> Jouse		2	1	5	1	1		1	1	4	5	1		
T.	spp.		6	3	3	2	6		6	3	3	5	+	+	
Thalassiothrix	<i>longissima</i> Cleve et Grunow		+	+			+		+	+	+	+	+		
Trachyneis	<i>aspera</i> (Ehrenberg) Cleve			+							+				
NONMARINE DIATOMS															
Aulacoseira	<i>granulata</i> (Ehrenberg) Simonsen s. l.								1						
Total number of diatoms counted			100	100	100	100	100		100	100	100	103	100	0	0
Resting spores of Chaetoceros			19	20	27	42	29		17	19	11	8	12		

Table 24. Occurrence chart of fossil diatoms from HDB-4 borehole.
Data from the chart of Yamamoto et al. (2003b). See Fig. 8 for location.

DIATOM ZONE		kam		PD - ND			
FORMATION		Kt		Wk			
DEPTH (m)		50.00	100.10	199.00	299.60	399.90	506.70
ABUNDANCE		VA	A	ND	ND	ND	VR
app. number of diatom valves per slide ($\times 100$)		144	144				+
PRESERVATION		M	P				VP
sample dissolved (g) among 0.5g sample used		0.3	0.2	0.2	0.2	0.1	tr.
water used to suspend sample (ml=g)		160	160	160	160	250	100
app. number of diatom valves in 1 g sample ($\times 100,000$)		7.7	11.5				+
MARINE DIATOMS							
Actinocyclus	ochotensis Jouse		1				
Actinoptychus	senarius (Ehrenberg) Ehrenberg		+				
Cocconeis	costata Gregory		1				
C.	spp.		+				
Coscinodiscus	marginatus Ehrenberg		+				
C.	marginatus (altered)						1
C.	spp.		+				
C.	spp.(altered)						1
Delphineis	surirella (Ehrenberg) Andrews	1					
D.	spp.		2				
Diploneis	spp.		+				
Hyalodiscus	obsoletus Sheshukova	+	1				
Ikebea	tenuis (Brun) Akiba	1	1				
Melosira	albicansu Sheshukova	1					
Neodenticula	kamtschatica (Zabelina) Akiba et Yanagisawa	76	71				
Paralia	sulcata (Ehrenberg) Cleve		1				
Proboscia	barboi (Brun) Jordan et Priddle		+				
Rhizosolenia	cf. styliformis Brightwell	1	3				
R.	spp.		1				
Stephanopyxis	spp.	4	+				
Thalassionema	nitzschioides (Grunow) H. et M. Peragallo	2	8				
Thalassiosira	antiqua Cleve-Euler	1	1				
T.	cf. decipiens (Grun.) Joerg.	+	1				
T.	eccentrica (Ehrenberg) Cl.		+				
T.	gravida Cl.		1				
T.	cf.jacksonii Koizumi et Barron	7	+				
T.	zabelinae Jouse		3				
T.	spp.	6	3				
T.	spp.(altered)						
Thalassiothrix	longissima Cleve et Grunow	+	+				
Trachyneis	aspera (Ehrenberg) Cleve		+				
NONMARINE DIATOMS							
Bacillaria	paradoxa Gmelin		1				
Total number of diatoms counted		100	100	0	0	0	6
Resting spores of Chaetoceros		27	16				

Table 25. Occurrence chart of fossil diatoms from HDB-5 borehole.
Data from the chart of Yamamoto et al. (2003c). See Fig. 8 for location.

FORMATION	DIATOM ZONE	kam	PD - ND																				
			Wk																				
		DEPTH (m)	48.70	100.00	133.70	147.90	176.00	203.70	225.80	253.90	278.00	309.00	324.00	347.93	374.96	401.58	421.18	450.60	472.08	503.65	518.00		
		ABUNDANCE	VA	ND	ND	PD	ND	ND	PD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
		app. number of diatom valves per slide ($\times 100$)				0.1		0.2															
		PRESERVATION	M VP																				
		sample dissolved (g) among 0.5g sample used	0.3			0.1		0.1		0.2		tr.		0.1		0.1		0.1		0.1		0.3	
		water used to suspend sample (ml=g)	350			100		300		100		150		160		300		150		150		100	
		app. number of diatom valves in 1 g sample ($\times 100,000$)	16.8			+																	
MARINE DIATOMS																							
Actinocyclus	ochotensis Jouse	+																					
Actinocyclus	senarius (Ehrenberg) Ehrenberg	1																					
Cocconeis	costata Gregory	+																					
C.	scutellum Ehrenberg	+																					
C.	spp.	+																					
Coscinodiscus	marginatus Ehrenberg	1																					
C.	spp.	+																					
C.	spp.(altered)																						
Coscinodiscus@?	spp.(v. heavily altered)	7																					
Delphinoidis	spp.	+																					
Diploneis	spp.	+																					
Grammatophora	spp.	+																					
Hyalodiscus	obsoletus Sheshukova	+																					
Melosira	albicansu Sheshukova	+																					
M.	sol (Ehrenberg) Kutz.	+																					
Neodenticula	kamtschatica (Zabelina) Akiba et Yanagisawa	82																					
Nitzschia	grunowii Hasle	+																					
Odontella	aurita (Lyngby) Agardh	+																					
Paralia	sulcata (Ehrenberg) Cleve	1																					
Proboscia	barboi (Brun) Jordan et Priddle	+																					
Rhizosolenia	cf. styliformis Brightwell	6																					
R.	spp.	+																					
Stephanopyxis	spp.	+																					
Thalassionema	nitzschoides (Grunow) H. et M. Peragallo	+																					
Thalassiosira	antiqua Cleve-Euler	+																					
T.	eccentrica (Ehrenberg) Cl.	+																					
T.	gravidia Cl.	1																					
T.	jouseae Akiba	+																					
T.	cf. tetraoestrupii var. reimeri Mahood et Barron	+																					
T.	zabelinae Jouse	2																					
T.	spp.	6																					
Thalassiothrix	longissima Cleve et Grunow	2																					
Trachyneis	aspera (Ehrenberg) Cleve	+																					
Total number of diatoms counted		100	0	0	7	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Resting spores of Chaetoceros		8																					
Resting spores of Chaetoceros(heavily altered, mould?)		29																					

Table 26. Occurrence chart of fossil diatoms from HDB-6 borehole.
Data from the chart of Yamamoto et al. (2004a). See Fig. 8 for location.

FORMATION	DIATOM ZONE	kam									?	ND		
		Kt										Wk		
DEPTH (m)		35.2	56.8	93.8	116.5	162.2	181.4	215.6	242.9	271.4	313.3	337.8	358.2	389.9
ABUNDANCE		A	A	A	A	VA	VA	A	VA	vr	ND	ND	ND	ND
app. number of diatom valves per slide (×100)		90	144	108	90	180	144	72	144	2.3				
PRESERVATION		M	M	M	M	M	M	M	M	P				
sample dissolved (g) among 0.5g sample used		0.150	0.100	0.150	0.125	0.125	0.125	0.150	0.150	0.050	0.025	0.025	0.025	0.050
app. number of diatom valves in 1 g sample (×100,000)		120	288	144	144	288	230	96	192	9	0	0	0	0
MARINE DIATOMS														
Actinocyclus	curvatus Janisch			+										
A.	kutzingii (A. Schmidt) Simonsen					+								
A.	ingens Rattray							+		1				
A.	ochotensis Jouse	1						+	+					
A.	cf. oculus Jouse					+								
A.	spp.			1	+		+		1	5				
Actinoptychus	senarius (Ehrenberg) Ehrenberg	1		2	3	1		+	+	+				
Amphora	spp.							+						
Biddulphia	tuomeyi (Bailey) Ropper									+				
Cocconeis	californica Grunow								+					
C.	costata Gregory		2	+	+				1					
C.	scutellum Ehrenberg	+		1					1	1	2			
C.	spp.					+			1		1			
C.	marginatus Ehrenberg		+	1					+	+	2			
C.	oculus-iridis Ehrenberg							+			1			
C.	radiatus Ehrenberg				+	+								
C.	spp.	1	+	+	+	+	+	+	+	+	+			
Cosmidiscus	cf. intersectus Jouse							+		1				
Cymatosira	debyi Temp. et Brun			1	+									
Delphineis	cf. sachalinensis (Sheshukova) Andrews			+										
D.	spp.	2	+	+	+	+		1	+					
Denticulopsis	hustedtii (Sim. & Kan.) Simonsen s.l.	1												
Diploneis	spp.			+									+	
Endictya	oceanica Ehrenberg												+	
Grammatophora	spp.					+		2	+	+	2			
Hyalodiscus	obsoletus Sheshukova			+	+		+				7			
H.	spp.				+					+	2			
Isthmia	sp.												+	
Melosira	albicansu Sheshukova	1			+	+	+	1						
M.	sol (Ehrenberg) Kuetzing								+		7			
Navicula	spp.		+					1					+	
Neodenticula	kamtschatica (Zabelina) Akiba et Yamagisawa	68	82	74	83	84	74	79	83					
Nitzschia	grunowii Hasle							1						
N.	rolandii Schrader emend. Koizumi			1										
Odontella	aurita (Lyngbye) Agardh				+	+								
Paralia	sulcata (Ehrenberg) Cleve			+	+	+		+	2	9				
P.	sp.			+						4				
Porosira	gracilis (Grunow) Joerg.	1		+										
Proboscia	barboi (Brun) Jordan et Priddle						+		+	2				
Rhabdonema	japonicum Temp. & Brun	+												
Rhizosolenia	cf. hebetata Gran							1		1				
R.	cf. styliformis Brightwell	1	+	1		+	2							
Rouxia	californica Peragallo				+									
Rutilaria	epsilon greville			+										
Stephanogonia	cf. hanzawae Kanaya								+					
Stephanopyxis	spp.	1	4	1	1	2	+	1	+	10				
Thalassionema	nitzschoides (Grunow) H. et M. Peragallo	4	2	10	3	2	12	6	2	1				
Thalassiosira	antiqua Cleve-Euler	1	+	3	+	1								
T.	cf. decipiens (Grun.) Joerg.	1	1	1		1	2	1	1					
T.	delicata (Barron) Akiba								1					
T.	eccentrica (Ehrenberg) Cleve			+										
T.	gravida Cleve							+	+					
T.	gravida f. fossilis Jouse					+			+					
T.	hyalina (Schrader) Simonsen						+							
T.	jacksonii Koizumi et Barron						+		+					
T.	cf. jacksonii Koizumi et Barron	9	6	1	1	+			+					
T.	jouseae Akiba				+									
T.	zabelinae Jouse				2	+	3	3	2	6				
T.	cf. zabelinae Jouse			+	2			1		35				
T.	spp.	7	3	2	5	9	1	6	5	2				
Thalassiothrix	longissima Cleve et Grunow						+	+	+	+				
Trachyneis	aspera (Ehrenberg) Cleve				+									
NONMARINE DIATOMS														
Aulacoseira	granulata (Ehrenberg) Simonsen s. l.					+								
Total number of diatoms counted		100	100	100	100	100	100	100	100	100	0	0	0	0
Resting spores of Chaetoceros		49	17	26	16	19	16	21	12	-				
Number of taxa recognized		17	15	25	22	22	23	24	23	28	0	0	0	0

Table 28. Occurrence chart of fossil diatoms from HDB-8 borehole.
Data from the chart of Yamamoto et al. (2004c). See Fig. 8 for location.

DIATOM ZONE		kam			ND			
FORMATION		Kt			Wk			
DEPTH (m)		33.7	65.5	89.8	120.0	150.0	183.2	206.9
ABUNDANCE		VA	A	C	ND	ND	ND	ND
app. number of diatom valves per slide ($\times 100$)		216	108	32				
PRESERVATION		M	M	P				
sample dissolved (g) among 0.5g sample used		0.125	0.075	0.100	0.025	0.050	0.125	0.050
app. number of diatom valves in 1 g sample ($\times 100,000$)		346	288	64	0	0	0	0
MARINE DIATOMS								
Achnanthes	groenlandica (Cleve) Grunow		+					
Actinocyclus	ingens Rattray	+						
A.	ochotensis Jouse			1				
A.	spp.	+		1				
Actinoptychus	senarius (Ehrenberg) Ehrenberg	+		1				
Cocconeis	californica Grunow	+						
C.	costata Gregory	1	1	1				
C.	scutellum Ehrenberg		+	+				
C.	spp.		+					
Coscinodiscus	marginatus Ehrenberg		1	1				
C.	radiatus Ehrenberg			+				
C.	spp.	+	+	+				
Delphineis	spp.	+						
Denticulopsis	hustedtii (Sim. & Kan.) Simonsen s.l.	+		1				
Hyalodiscus	obsoletus Sheshukova			+				
Neodenticula	kamtschatica (Zabelina) Akiba et Yanagisawa	81	79	70				
Odontella	aurita (Lyngbye) Agardh		1					
Paralia	sulcata (Ehrenberg) Cleve	+	+	+				
Proboscia	barboi (Brun) Jordan et Priddle		+	+				
Rhabdonema	japonicum Temp. & Brun	+						
Rhizosolenia	cf. hebetata Gran			+				
R.	cf. styliformis Brightwell			3				
Stephanopyxis	spp.	3	+	3				
Thalassionema	nitzschoides (Grunow) H. et M. Peragallo	3	12	8				
Thalassiosira	antiqua Cleve-Euler	2	+	2				
T.	cf. decipiens (Grun.) Joerg.	+	+	+				
T.	gravida Cleve			+				
T.	gravida f. fossilis Jouse	+						
T.	jacksonii Koizumi et Barron			1				
T.	cf. jacksonii Koizumi et Barron	6	1	2				
T.	jouseae Akiba	+						
T.	cf. tetraoestrupii var. reimeri Mahood et Barron		+					
T.	trifulta Fryxell & Hasle		+					
T.	zabelinae Jouse	+		1				
T.	cf. zabelinae Jouse	+		1				
T.	spp.	4	5	3				
Thalassiothrix	longissima Cleve et Grunow	+	+					
Trachyneis	aspera (Ehrenberg) Cleve		+					
Trochosira	concaeva Kitton	+						
NONMARINE DIATOMS								
Aulacoseira	granulata (Ehrenberg) Simonsen s. l.	+						
Total number of diatoms counted		100	100	100	0	0	0	0
Resting spores of Chaetoceros		17	9	22				
Number of taxa recognized		24	20	25	0	0	0	0

Table 29. Occurrence chart of fossil diatoms from HDB-10 borehole.
Provisional analysis table. See Fig. 7 for location.

DIATOM ZONE		k-k	kam						
FORMATION	DEPTH (m)	Kt							
	ABUNDANCE	31.2	64.3	93.1	127.4	183.8	220.6	241.1	279.6
	app. number of diatom valves per slide ($\times 100$)	A	A	A	A	A	A	A	A
	PRESERVATION	M	M	M	M	M	M	M	P
	sample dissolved (g) among 0.5g sample used	0.15	0.25	0.15	0.20	0.20	0.20	0.15	0.15
	app. number of diatom valves in 1 g sample ($\times 100,000$)	120	58	120	72	90	144	120	80
MARINE DIATOMS									
Achnanthes	groenlandica (Cleve) Grunow		+						+
Actinocyclus	ingens Rattray	+			+	+			
Actinoptychus	senarius (Ehrenberg) Ehrenberg		1	1	+		+	+	
Arachnoidiscus	spp.		+	+					
Cocconeis	costata Gregory	+	1			+	+		
C.	scutellum Ehrenberg	+	+	+					
C.	spp.		+	1			+	+	
Coscinodiscus	marginatus Ehrenberg	1	8	2	5		2	3	8
C.	oculus-iridis Ehrenberg				+		1	1	
C.	radiatus Ehrenberg			+			+	2	
C.	symbolophorus Grunow s. l.	+							
C.	spp.	+	+	+	+	+	+	+	+
Delphineis	spp.		1						
Denticulopsis	hustedtii (Sim. & Kan.) Simonsen s.l.	1							
D.	lauta (Bailey) Simonsen					1			
Diploneis	spp.	+	+	+	+				
Endictya	oceanica Ehrenberg								+
Grammatophora	spp.						1		
Hemidiscus	cuneiformis Wallich	1		+					
Hyalodiscus	obsoletus Sheshukova		+			+	1		
H.	spp.								+
Ikebea	tenuis (Brun) Akiba		1						
Melosira	albicansu Sheshukova		1					1	
M.	sol (Ehrenberg) Kuetzing	+	1		1	+	+		+
Navicula	spp.	1		1					
Neodenticula	kamtschatica (Zabelina) Akiba et Yanagisawa	34	17	51	56	38	56	46	41
N.	koizumii Akiba & Yanagisawa	+							
Nitzschia	grunowii Hasle	+		+					
Odontella	aurita (Lyngbye) Agardh	+		+		+			
Paralia	sulcata (Ehrenberg) Cleve	1		5	+		+		2
P.	sp.						+		
Porosira	gracilis (Grunow) Joerg.			+	+	1	+	+	
Proboscia	barboi (Brun) Jordan et Priddle			1				+	+
Pseudopyxilla	americana Forti	+							
Rhabdonema	japonicum Temp. & Brun			+					
Rhizosolenia	cf. styliformis Brightwell						+		
R.	spp.	+	+			+			
Stephanopyxis	spp.	3	9	6	10	6	5		6
Thalassionema	nitzschioides (Grunow) H. et M. Peragallo	15	11	14	12	34	8	1	31
T.	robusta Schrader	8	4	+	2	2	1		4
Thalassiosira	antiqua Cleve-Euler			+					
T.	cf. decipiens (Grun.) Joerg.	2		4	3	2			+
T.	gravida Cleve	+		+		1			+
T.	jouseae Akiba	1	+	1		1	+	1	2
T.	cf. oestrupi (Ostenfeld) Proshkina						+		
T.	cf. tetraoestrupii var. reimeri Mahood et Barron	20	21		2				
T.	tertiaria Sheshukova			+					
T.	trifulta Fryxell & Hasle	1	+				+		
T.	zabelinae Jouse	2	5	1	3	1	13	36	+
T.	cf. zabelinae Jouse						3		
T.	spp.	9	19	12	6	12	9	9	6
Thalassiothrix	longissima Cleve et Grunow	+	+	+	+		+		+
Trachyneis	aspera (Ehrenberg) Cleve			+					
NONMARINE DIATOMS									
Aulacoseira	granulata (Ehrenberg) Simonsen s. l.					1			+
Total number of diatoms counted		100	100	100	100	100	100	100	100
Resting spores of Chaetoceros		52	48	31	43	23	12	4	19
Number of taxa recognized		29	25	29	18	19	25	16	17

Table 30. Additional occurrence chart of fossil diatoms from HDB-7 and HDB-10 boreholes. Data from the chart of the study of postdoctoral fellow (Yasue). See Figs. 6 & 7 for location.

DIATOM ZONE		HDB-7					HDB-10
		koi			k-k		nz
NUMBER	FORMATION	Kt					Wk
	Serial number	1	2	3	4	5	6
DEPTH (m)		365.6	374.0	381.8	489.9	519.9	478
ABUNDANCE		C	C	C	A	A	extr
app. number of diatom valves per slide (×100)		24	20	18	72	72	+
PRESERVATION		P	P	P	P	M	VP
MARINE DIATOMS							
	Actinocyclus curvatus Janisch	+					
A.	ingens Rattray	+		1	+		
A.	kutzingeri (A. Schmidt) Simonsen				1		
A.	ochotensis Jouse	2		+		+	
A.	spp.	1		1			
	Actinopterychus senarius (Ehrenberg) Ehrenberg	+	+	+			
	Bacteriosira fragilis (Gran) Gran	1	1				
	Cocconeis costata Gregory	+			+		
C.	scutellum Ehrenberg	+			+		
C.	spp.	1	1	2		+	
	Coscinodiscus marginatus Ehrenberg	5	10	6	3		
C.	oculus-iridis Ehrenberg			+			
C.	radiatus Ehrenberg		2		1		
C.	spp.	+	+	+	+	+	+
C.	spp.(altered)			1			
	Delphineis sachalinensis (Sheshukova) Andrews				+		
D.	surirella (Ehrenberg) Andrews	+					
D.	spp.		1	1			
	Denticulopsis dimorpha (Schrader) Simonsen		2				
D.	hustedtii (Sim. & Kan.) Simonsen s.l.		2	2		+	
	D. hyalina (Schrader) Simonsen	+					
D.	lauta (Bailey) Simonsen		1	1	+		
	Diploneis spp.		1	+		+	
	Grammatophora spp.			3		+	
	Hyalodiscus obsoletus Sheshukova	+		1	+	+	
	Ikebea tenuis (Brun) Akiba					2	
	Melosira sol (Ehrenberg) Kuetzing			1		1	
	Navicula spp.		1	1			
	Neodenticula kantschatica (Zabelina) Akiba et Yanagisawa			+	16	30	
N.	koizumii Akiba & Yanagisawa	3	7	25	4	2	
N.	cf. seminae (Sim. & Kan.) Akiba & Yanag.	+	2	1			
N.	sp. A		2				
N.	spp.	14	13	20	4		
	Odontella aurita (Lyngbye) Agardh	2	+				
	Paralia sulcata (Ehrenberg) Cleve	1		3		1	
	Porosira gracilis (Grunow) Joerg.				2	+	
P.	barboi (Brun) Jordan et Priddle	2	2		+		
	Rhabdonema japonicum Tempere et Brun	+					
	Rhizosolenia cf. styliformis Brightwell	+	3	+			
R.	spp.		+	+		1	
	Rutilaria spp.		+				
	Stephanopyxis spp.	2	20	7	3	5	+
	Thalassionema nitzschioides (Grunow) H. et M. Peragallo	5	2	5	3	22	+
	Thalassiosira antiqua Cleve-Euler					+	
T.	cf. decipiens (Grunow) Joerg. s. l.	3		+		3	
T.	eccentrica (Ehrenberg) Cl.		2	+			
T.	gravida Cleve	+	3	2	+	+	
T.	gravida f. fossilis Jouse	1					
T.	hyalina (Grunow) Gran	+	+				
T.	jouseae Akiba				1	+	
T.	cf. tetraoestrupii var. reimeri Mahood et Barron		1		53	3	
T.	zabelinae Jouse	+		+	1		
T.	spp.	54	21	12	8	30	+
	Thalassiothrix longissima Cleve et Grunow	+	+		+		
	Trachyneis aspera (Ehrenberg) Cleve				+		
	Trochosira concava Kitton			1			
NONMARINE DIATOMS							
	Aulacoseira granulata (Ehrenberg) Simonsen s. l.	2		1			
	Ceclotella comta (Ehrenberg) Kuetzing			1			
	Diatoma sp.	+					
	Navicula mutica Kuetzing			1			
	Navicula spp.	1					
	Pinnularia borealis Ehrenberg	+					
	Rhopalodia spp.	+					
	Stephanodiscus niagarae Ehrenberg	+					
Total number of diatoms counted		100	100	100	100	100	+
Resting spores of Chaetoceros		41	46	72	38	103	
Number of taxa recognized		37	29	35	24	22	4

Table 31. Additional occurrence chart of fossil diatoms from HDB-10 borehole.

Data from the chart of the study of postdoctoral fellow (Yasue). See Fig. 7 for location.

DIATOM ZONE		FORMATION		k-k															
NUMBER	Serial number	Kt																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
DEPTH (m)		8.5	26.0	41.0	52.5	72.5	85.6	105.2	115.0	139.7	151.1	162.0	172.0	194.6	206.0	260.0	290.0		
ABUNDANCE		A	C	A	C	A	C	A	A	A	A	A	C	A	A	R			
app. number of diatom valves per slide (×100)		54	40	48	45	72	18	72	72	72	90	90	144	54	108	30	14		
PRESERVATION		M	P	M	P	M	P	M	M	M	M	M	M	M	M	M	P		
MARINE DIATOMS																			
Actinocyclus	curvatus Janisch		+														+		
A.	ingens Rattray			+		+	1	1	+	+	1		+		+		1		
A.	ingens Rattray(alt.)																+		
A.	kutzingii (A. Schmidt) Simonsen																1		
A.	octonarius Ehrenberg				1														
Actinoptychus	senarius (Ehrenberg) Ehrenberg		+						+	+		2	2	+	2		1 3		
Arachnoidiscus	spp.												+						
Bacteriosira	fragilis (Gran) Gran	1	1	1		1					1								
Cocconeis	costata Gregory	1		1	+	+	+	1	1	1									
C.	scutellum Ehrenberg		+			+							1						
C.	spp.		+	2	+	+	+	+		1	+	+	+	+		+	+		
Coscinodiscus	marginatus Ehrenberg	4	+	2	4	4	2	1	+	+	+	1	+	+	3	5	4		
C.	oculus-iridis Ehrenberg		+				+			+	+	1					+		
C.	radiatus Ehrenberg		+	+	+	1					+	+	+		+	+	+		
C.	spp.		+	1	+	+	+	+	+	+	+	+	+	+	+	+	+		
C.	spp.(altered)		+																
Cyclotella	cf. striata (Kuetz) Grun.								+										
Cymatosira	debyi Temp. & Brun		+		1								1						
Delphineis	surirella (Ehr.) Andrews																		
D.	spp.										+	+			+		+		
Denticulopsis	hustedtii (Sim. & Kan.) Simonsen s.l.	1	3	2		+					1					+	+		
D.	hyalina (Schrader) Simonsen		+														+		
D.	spp.							1											
Diploneis	spp.		+	+	+	1	1						+		+		+		
Entictya	oceanica Ehrenberg							+											
Grammatophora	spp.	1	+			+					+	+					1		
Hemidiscus	cuneiformis Wallich							1											
Hyalodiscus	obsoletus Sheshukova	+	+	+	1	+			2			1	+	1	2	+	+		
H.	spp.				1												+		
Ikebea	tenuis (Brun) Akiba				2	1													
Isthmia	spp.												+						
Melosira	albicans Sheshukova	1			1		1			1				1	1				
M.	sol (Ehrenberg) Kuetzing	+	+		+		+						+	+			+		
Navicula	spp.	1									1								
Neodenticula	kamtschatica (Zabelina) Akiba et Yanagisawa	31	30	27	33	31	20	64	44	47	61	35	30	78	74	38	23		
N.	koizumii Akiba & Yanagisawa	5	3	+															
N.	spp.		+	1															
Nitzschia	grunowii Hasle									1									
N.	rolandii Schrader emend. Koizumi																		
Odontella	aurita (Lyngbye) Agardh		1					+	+								+		
Paralia	sulcata (Ehrenberg) Cleve					4					+					1	1		
Porosira	gracilis (Grunow) Joerg.			1				+	+	+	+	+	+	+	+	+			
Proboscia	barboi (Brun) Jordan et Priddle	+		+															
Rhabdonema	japonicum Tempere et Brun	+										+							
Rhaphoneis	spp.		+																
Rhizosolenia	cf. styliformis Brightwell				2												2		
R.	spp.						1	+											
Sawamuraia	biseriata Komura																+		
Stephanopyxis	spp.	17	8	9	12	5	8	4	8	7		3	2	1		9	25		
S.	spp. (alt.)						+												
Thalassionema	nitzschioides (Grunow) H. et M. Peragallo	10	31	26	10	7	30	15	26	20	24	28	19	6	2	23	32		
T.	robusta Schrader	+	6	5	2		11		2	5	3	11	20	4	2	8	1		
Thalassiosira	antiqua Cleve-Euler	1							1			1	3		1				
T.	cf. decipiens (Grunow) Joerg. s. l.	3	+	2			2	+		1	1		+		+				
T.	gravida Cleve	+	+			+			1		+	+	3	1	+	2	1		
T.	gravida f. fossilis Jouse		1			1		+											
T.	cf. jacksonii Koizumi et Barron																1		
T.	jouseae Akiba		1				1		1	+	+	2	2	+	+		1		
T.	cf. tetraoestrupii var. reimeri Mahood et Barro	9	9	4	13	5		1		1		+	4						
T.	tertiaria Jouse	+		1								+		+	1	1			
T.	trifluta Fryxell & Hasle	+			1	3	+		1		1		1				1		
T.	zabelinae Jouse		+	4	2	5	6	2		3	+	1	1	2	9	7	2		
T.	cf. zabelinae Jouse														1	3			
T.	spp.	14	6	10	8	34	14	9	13	10	7	15	11	3	7		1		
Thalassiothrix	longissima Cleve et Grunow	+		+		+		+		+	+		+				+		
Triceratium	arcticum Brightwell												+						
NONMARINE DIATOMS																			
Aulacoseira	granulata (Ehrenberg) Simonsen s. l.				2												1		
Eunotia	spp.			1															
Pinnularia	spp.										+								
Total number of diatoms counted		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
Resting spores of Chaetoceros		83	51	53	30	23	41	26	25	25	13	20	17	20	14	10	22		
Number of taxa recognized		31	27	23	26	23	24	21	17	24	20	24	25	16	18	17	31		

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