

OResults of Radioactive Material Monitoring of Aquatic Organisms (Locations A and B along the Abukuma River)

<Locations A and B along the Abukuma River: Samples collected>

Locations	General items		Radioactive materials			
	Water	Sediment	Water (Cs)	Water (Sr)	Sediment (Cs)	Sediment (Sr)
A-1	○	○	○	○	○	○
A-2	○	○	○	-	○	-
B-1	○	○	○	-	○	-
B-2	○	○	○	-	○	-
B-3	○	○	○	-	○	-

<Locations A and B along the Abukuma River: Site measurement item>

Locations	Latitude and longitude of the location		Survey date and time			Water	Sediment				Other	
	Latitude	Longitude	Date	Time (water)	Time (sediment)	Water temperature (degrees C)	Sediment temperature (degrees C)	Property	Color	Contaminants	Water depth (m)	Transparency (cm)
A-1(Surface layer)	37.6210°	140.5218°	2016/9/7	09:06	09:21	25.3	23.9	Sediment with sand	2.5Y2/1	None	5.60	>50 (0.9m)*
A-1(Bottom layer)				08:57		25.0						
A-2	37.5673°	140.3946°		10:57	11:07	20.6	20.6	Sediment with sand	2.5Y4/3	Roots	0.98	40
B-1	37.7843°	140.4924°		14:37	14:43	27.3	26.8	Sediment with sand	2.5Y4/3	None	0.64	46
B-2	37.8121°	140.5058°		13:46	13:51	26.3	24.1	Sand	2.5Y4/3	None	0.70	48
B-3	37.8182°	140.4679°		12:56	13:01	22.6	22.1	Sand	2.5Y4/2	None	0.50	>50

* The number in parentheses indicates Secchi disk depth.

<Locations A and B along the Abukuma River: General survey items/Analysis of radioactive materials Water>

Locations	Latitude and longitude of the location		Survey date and time		pH	BOD (mg/L)	COD (mg/L)	DO (mg/L)	Electric conductivity (mS/m)	Salinity	TOC (mg/L)	SS (mg/L)	Turbidity (FNU)	Cs-134 (Bq/L)	Cs-137 (Bq/L)	Sr-90 (Bq/L)
	Latitude	Longitude	Date	Time (water)												
A-1(Surface layer)	37.6210°	140.5218°	2016/9/7	09:06	7.3	1.1	4.4	8.3	15.6	0.08	1.6	13	4.9	0.0082	0.041	0.0013
A-1(Bottom layer)				08:57	7.4	1.3	5.1	8.4	15.7	0.08	1.8	15	6.3	0.019	0.10	-
A-2	37.5673°	140.3946°		10:57	7.5	0.9	4.6	9.2	8.8	0.05	2.0	4	3.2	0.0076	0.037	-
B-1	37.7843°	140.4924°		14:37	7.6	1.0	4.7	8.6	15.4	0.08	1.6	14	6.4	0.0077	0.037	-
B-2	37.8121°	140.5058°		13:46	7.6	1.0	4.1	8.8	15.0	0.08	1.6	14	6.2	0.0048	0.019	-
B-3	37.8182°	140.4679°		12:56	7.6	0.5	3.7	9.4	8.6	0.05	1.6	6	6.8	0.0034	0.018	-

<Locations A and B along the Abukuma River: General survey items/Analysis of radioactive materials Sediment>

Locations	Latitude and longitude of the location		Survey date and time		pH	Redox potential E _{NHE} (mV)	Water content (%)	IL (%)	TOC (mg/g-dry)	Soil particle density (g/cm ³)	Grain size distribution								Cs-134 (Bq/kg-dry)	Cs-137 (Bq/kg-dry)	Sr-90 (Bq/kg-dry)
	Latitude	Longitude	Date	Time (sediment)							Gravel (2-75mm) (%)	Coarse sand (0.85-2mm) (%)	Medium sand (0.25-0.85mm) (%)	Fine sand (0.075-0.25mm) (%)	Silt (0.005-0.075mm) (%)	Clay (Less than 0.005mm) (%)	Median grain diameter (mm)	Maximum grain diameter (mm)			
A-1	37.6210°	140.5218°	2016/9/7	09:21	7.4	110	56.0	10.3	26.7	2.610	0.0	0.7	1.8	8.5	46.1	42.9	0.0088	2.0	620	3500	0.92
A-2	37.5673°	140.3946°		11:07	7.0	173	54.8	8.9	22.9	2.644	1.6	5.0	21.9	24.2	27.5	19.8	0.099	9.5	150	880	-
B-1	37.7843°	140.4924°		14:43	7.2	217	47.5	5.0	5.1	2.679	0.0	0.1	12.5	40.3	29.3	17.8	0.10	2.0	150	740	-
B-2	37.8121°	140.5058°		13:51	7.1	283	27.5	2.0	2.4	2.728	0.1	4.0	55.6	33.6	1.6	5.1	0.29	4.8	22	160	-
B-3	37.8182°	140.4679°		13:01	7.4	256	12.8	1.1	2.1	2.665	46.4	34.2	14.8	2.9	0.5	1.2	1.9	9.5	19	85	-

<Locations A and B along the Abukuma River: Analysis items Aquatic organisms>

Locations	Sampling point	Latitude and longitude of the location		Sampling date	Division	Class	Order	Family	Scientific name	English name	Population	Sample weight (kg-wet)	Note			Radioactive cesium (Bq/kg-wet)			Sr-90 (Bq/kg-wet)		
		Latitude	Longitude										Growth stage	Stomach contents	Measurement site	Total	Cs-134	Cs-137			
A-2	Harase River	37.5673°	140.3946°	2016/8/19	Arthropoda	Insecta	Odonata	Corduliidae	<i>Macromia amphigena amphigena</i>	Macromia amphigena	10	0.0066	Larva (Dragonfly larva)	-	-	-	32.9	6.9	26	-	
					Arthropoda	Insecta	Odonata	Cordulegastriidae	<i>Anotogaster sieboldii</i>	Anotogaster sieboldii											
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	Sieboldius albardae											
					Arthropoda	Malacostraca	Decapoda	Atyidae	<i>Neocaridina sp.</i>	Neocaridina											
					Mollusca	Gastropoda	Discopoda	Pleuroceridae	<i>Semisulcospira libertina</i>	Semisulcospira libertina											
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Phoxinus lagowskii steindachneri</i>	Amur Minnow											
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	Oriental weatherfish											
					Vertebrata	Amphibia	Anura	Ranidae	<i>Rana rugosa</i>	Wrinkled Frog											
					Vertebrata	Amphibia	Anura	Ranidae	<i>Rana porosa porosa</i>	Tokyo Daruma pond frog											
Particulate Organic Matter	-	-	-	-	Bottom fallen leaves	-	0.20	-	-	-	62	10	52	-							
B-2	The main stream of the Abukuma River	37.8121°	140.5058°	2016/8/7	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	4	1.3	Mature fish	Obscure digesta	Viscera removed	17.8	2.8	15	0.25		
				2016/9/2	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Hemibarbus barbus</i>	Hemibarbus barbus	4	6.0	Mature fish	Amorphous Residue	Viscera removed	52.1	9.1	43	0.44		
				2016/8/13	Vertebrata	Osteichthyes	Salmoniformes	Osmeridae	<i>Plecoglossus altivelis</i>	Sweetfish	59	2.6	Immature fish, Mature fish	-	-	28.9	4.9	24	0.19		
				2016/8/7	Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	Small mouth bass	2	0.69	Immature fish, Mature fish	Japanese mitten Crab	Viscera removed	12.9	1.9	11	-		
				2016/8/26	Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	Small mouth bass	1	1.6	Mature fish	Fish	Viscera removed	40.9	5.9	35	0.31		
					Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	<i>Ictalurus punctatus</i>	Channel catfish	2	7.1	Mature fish	Ephoron shigae	Viscera removed	22.2	3.2	19	0.059		
B-3	Surikami River	37.8182°	140.4679°	2016/8/20	Algae/plant	-	-	-	-	Riverbed Deposits (Include algae)	-	0.012	-	-	-	97	16	81	-		
					Arthropoda	Insecta	Trichoptera	Stenopsychidae	<i>Stenopsyche marmorata</i>	Stenopsyche marmorata	212	0.057	Larva	-	-	-	44.0	8.0	36	-	
					Arthropoda	Insecta	Odonata	Corduliidae	<i>Macromia amphigena amphigena</i>	Macromia amphigena	137	0.038	Larva (Dragonfly larva)	-	-	-	2.0	N.D.(1.0)	2.0	-	
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Onychogomphus viridicostus</i>	Melligomphus viridicostus											
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	Sieboldius albardae											
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Davidius sp.</i>	Davidius											
					Arthropoda	Insecta	Megaloptera	Corydalidae	<i>Protohermes grandis</i>	Protohermes grandis	54	0.029	Larva	-	-	-	3.8	N.D.(1.5)	3.8	-	
					Arthropoda	Insecta	Megaloptera	Corydalidae	<i>Parachauliodes japonicus</i>	Parachauliodes japonicus											
					Arthropoda	Malacostraca	Decapoda	Cambaridae	<i>Procambarus clarkii</i>	Red swamp crawfish	1	0.025	Imago	-	-	-	13.0	3.0	10	-	
					Vertebrata	Osteichthyes	Scorpaeniformes	Cottidae	<i>Cottus pollux</i>	Japanese fluvial sculpin	10	0.11	Immature fish	-	-	-	5.31	0.91	4.4	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Phoxinus lagowskii steindachneri</i>	Amur Minnow	7	0.016	Immature fish, Mature fish	-	-	-	4.9	N.D.(2.8)	4.9	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	2	0.031	Immature fish	-	-	-	6.6	N.D.(1.2)	6.6	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Nipponocypris temminckii</i>	Dark chub	14	0.11	Immature fish, Mature fish	-	-	-	5.91	0.71	5.2	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Noemacheilus barbatulus</i>	Stone loach	11	0.10	Immature fish	-	-	-	4.30	0.80	3.5	-	
					Vertebrata	Osteichthyes	Salmoniformes	Osmeridae	<i>Plecoglossus altivelis</i>	Sweetfish	5	0.25	Mature fish	-	-	-	13.2	2.2	11	-	
					Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou</i>	Yamame trout	7	0.25	Immature fish	Stenopsyche marmorata	Viscera removed	8.3	1.1	7.2	-		
					Particulate Organic Matter	-	-	-	-	Bottom fallen leaves	-	0.15	-	-	-	-	12.8	1.8	11	-	

*1: Organisms were collected in or around the targeted water areas.

*2: When multiple types of aquatic organisms were collected, a sample was prepared by mixing them.

*3: For a sample made of multiple types of aquatic organisms, the English name of the dominant one largest in number is underlined.

*4: Basically, measurement was conducted for all organism samples. Viscera (stomach and bowels) were removed for the measurement when possible so that undigested food and sediments, etc. in the digestive system would be excluded.

*5: Plankton (suspended algae) is the residue remaining after the filtration of lake water or seawater with a plankton net (40µm-mesh).

*6: River bottom materials (incl. algae) are algae, etc. that were scratched off stones with a brush, etc. and may include very fine particles such as inorganic silt and clay.

*7: N.D. means to be below the detection limit and figures in parentheses show the detection limit.

*8: Activity concentrations include counting errors, but the details are omitted here.