

Results of Radioactive Material Monitoring of Aquatic Organisms (Location D along the Mano River)

<Location D along the Mano River: Samples collected>

Items	General items		Radioactive materials			
	Water	Sediment	Water (Cs)	Water (Sr)	Sediment (Cs)	Sediment (Sr)
D-4 a	o	o	o	o	o	o

<Location D along the Mano River: Site measurement item>

Items	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)
D-4 a	37.7308°	140.9081°	2018/6/6	10:00	10:20	17.5	17.2	Sand	2.5Y4/3	None	0.25	>50

<Location D along the Mano River: General survey items/Analysis of radioactive materials Water>

Items	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)												
D-4 a	37.7308°	140.9081°	2018/6/6	10:00	7.1	<0.5	2.6	9.5	10.8	0.06	1.1	2	1.8	0.0016	0.013	0.00075

Note) N.D. means to be below the detection limit and figures in parentheses show the detection limit.

<Location D along the Mano River: General survey items/Analysis of radioactive materials Sediment>

Items	Latitude and longitude of the location		Survey date and time		pH	Redox potential E _{SCE} (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)			
D-4 a	37.7308°	140.9081°	2018/6/6	10:20	7.2	263	17.3	2.4	1.4	2.714	31.3	43.9	20.9	2.7	1.2	1.4	19	30	310	0.82

Note) N.D. means to be below the detection limit and figures in parentheses show the detection limit.

<Location D along the Mano 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					
D-3	The main stream of the Mano River	37.7051°	140.9623°	2018/6/1	Vertebrata	Osteichthyes	Salmoniformes	Osmeridae	<i>Plecoglossus altivelis altivelis</i>	Sweetfish	33	0.60	Immature fish, Mature fish	Attached algae	Viscera removed	25.9	1.9	24	-				
D-4 b	The main stream of the Mano River	37.7312°	140.9096°	2018/6/6	Algae/plant	-	-	-	-	Riverbed Deposits (Include algae)	-	0.0076	-	-	-	124	14	110	-				
					Algae/plant	Zygnematales	Zygnematales	Zygnematales	<i>Spirogyra sp.</i>	Spirogyra	-	0.28	-	-	-	-	30.0	2.0	28	-			
					Algae/plant	Monocotyledoneae	Poales	Poaceae	<i>Phragmites australis</i>	Common reed	-	0.20	-	-	-	-	-	23.7	2.7	21	-		
					Algae/plant	Monocotyledoneae	Najadales	Potamogetonaceae	<i>Potamogeton bertholdii</i>	Small pondweed	-	0.24	-	-	-	-	-	-	188	18	170	-	
					Arthropoda	Insecta	Ephemeroptera	Potamanthidae	<i>Potamanthus formosus</i>	Potamanthus formosus	-	-	-	-	-	-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Ephemeroptera	Isonychidae	<i>Isonychia valida</i>	Isonychia valida	-	-	-	-	-	-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Ephemeroptera	Siphonuridae	<i>Siphonuridae</i>	<i>Siphonuridae</i>	-	-	-	-	-	-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Ephemeroptera	Ephemerellidae	<i>Drunella ishiyama</i>	Drunella ishiyama	-	-	-	-	-	-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Ephemeroptera	Ephemeridae	<i>Ephemeridae sp.</i>	Ephemeridae	-	-	-	-	-	-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Trichoptera	Stenopsychidae	<i>Stenopsyche marmorata</i>	Stenopsyche marmorata	119	0.010	Larva	-	-	-	-	-	-	34	N.D.(4.3)	34	-
					Arthropoda	Insecta	Odonata	Cordulidae	<i>Macromia amphigena amphigena</i>	Macromia amphigena	-	-	-	-	-	-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Odonata	Cordulegasteridae	<i>Anotogaster sieboldii</i>	Anotogaster sieboldii	-	-	-	-	-	-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Stylogomphus suzuki</i>	Stylogomphus suzuki	-	-	-	-	-	-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Melligomphus viridicostus</i>	Melligomphus viridicostus	77	0.025	Larva(Dragonfly larva)	-	-	-	-	-	-	9.0	N.D.(2.0)	9.0	-
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	Sieboldius albardae	-	-	-	-	-	-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Davidius sp.</i>	Davidius	-	-	-	-	-	-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Odonata	Aeshnidae	<i>Boyeria maclachlani</i>	Boyeria maclachlani	-	-	-	-	-	-	-	-	-	-	-	-	-
					Arthropoda	Insecta	Megaloptera	Corydalidae	<i>Protohermes grandis</i>	Protohermes grandis	89	0.028	Larva	-	-	-	-	-	-	14.8	1.8	13	-
					Arthropoda	Malacostraca	Decapoda	Camburidae	<i>Procambarus clarkii</i>	Red swamp crawfish	2	0.056	Imago	-	-	-	-	-	-	59.0	5.0	54	-
					Arthropoda	Malacostraca	Decapoda	Palaemonidae	<i>Palaemon paucidens</i>	Common prawn	24	0.040	Imago	-	-	-	-	-	-	13.4	1.4	12	-
					Arthropoda	Malacostraca	Decapoda	Atyidae	<i>Paratya improvisa</i>	Freshwater shrimp	170	0.047	Juvenile, Imago	-	-	-	-	-	-	18.2	2.2	16	-
					Arthropoda	Malacostraca	Decapoda	Varunidae	<i>Eriocheir japonica</i>	Japanese mitten crab	8	0.15	Juvenile	-	-	-	-	-	-	22.1	2.1	20	-
					Mollusca	Bivalvia	Unionoida	Unionidae	<i>Inversunio jokohamensis</i>	Inversunio jokohamensis	4	0.025	Imago	-	-	-	-	-	-	65.7	6.7	59	-
					Mollusca	Gastropoda	Discopoda	Pleuroceridae	<i>Semisulcospira libertina</i>	Semisulcospira libertina	30	0.031	Imago	-	-	-	-	-	-	65.6	5.6	60	-
					Vertebrata	Osteichthyes	Anguilliformes	Anguillidae	<i>Anguilla japonica</i>	Japanese eel	4	1.1	Immature fish, Mature fish	Japanese dace, Cobitis biwae, Sieboldius albardae, Ephemerellidae	Viscera removed	110	10	100	0.13	-	-	-	
					Vertebrata	Osteichthyes	Scorpaeniformes	Cottidae	<i>Cottus pollux</i>	Japanese fluvial sculpin	25	1.3	Immature fish, Mature fish	Protohermes grandis, Mataeocephalus japonicus, Freshwater shrimp, Stenopsyche marmorata, Rhinogobius	Viscera removed	39.0	5.0	34	0.50	-	-	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Phoxinus lagowskii steindachneri</i>	Amur Minnow	17	0.071	Immature fish, Mature fish	-	-	-	-	-	-	12.2	1.2	11	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	5	0.026	Immature fish	-	-	-	-	-	-	22.1	2.1	20	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Opsariichthys platypus</i>	Pale chub	17	0.14	Immature fish	Obscure digesta	Viscera removed	18.8	1.8	17	-	-	-	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Gnathopogon elongatus elongatus</i>	Gnathopogon elongatus elongatus	2	0.0076	Immature fish	-	-	-	-	-	-	14	N.D.(6.0)	14	-
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Cobitis biwae</i>	Cobitis biwae	79	0.29	Mature fish	Obscure digesta	Viscera removed	19.1	2.1	17	-	-	-	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	Oriental weatherfish	25	0.23	Immature fish, Mature fish	Obscure digesta	Viscera removed	14.2	1.2	13	-	-	-	-	
Vertebrata	Osteichthyes	Salmoniformes	Osmeridae	<i>Plecoglossus altivelis altivelis</i>	Sweetfish	11	0.058	Immature fish	Attached algae	Viscera removed	49.7	5.7	44	-	-	-	-						
Vertebrata	Osteichthyes	Perciformes	Gobiidae	<i>Rhinogobius fluvialis</i>	Rhinogobius fluvialis	67	0.21	Mature fish	Obscure digesta	Viscera removed	24.3	2.3	22	-	-	-	-						
Vertebrata	Osteichthyes	Perciformes	Gobiidae	<i>Rhinogobius nagoyae</i>	Rhinogobius nagoyae	-	-	-	-	-	-	-	-	-	-	-	-	-					
Vertebrata	Osteichthyes	Perciformes	Gobiidae	<i>Tridentiger brevispinis</i>	Dusky tripletooth goby	7	0.14	Mature fish	-	-	-	-	-	-	20.6	2.6	18	-					
Vertebrata	Cephalaspidomorphi	Petromyzoniformes	Petromyzonidae	<i>Lethenteron reissneri</i>	Far eastern brook lamprey	6	0.010	Amocoetes(larva)	-	-	-	-	-	-	11	N.D.(4.4)	11	-					
Vertebrata	Amphibia	Azura	Rhacophoridae	<i>Buergeria buergeri</i>	Kajika frog	1	0.0032	Imago	-	-	-	-	-	-	175	15	160	-					
Coarse Particulate Organic Matter	-	-	-	-	-	-	-	-	Bottom fallen leaves	-	-	0.21	-	-	-	48.7	4.7	44	-				

*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.