

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	○	○	○	○	○	○

<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°	2021/8/27	08:12	08:24	21.5	21.7	Gravel with sand	10YR4/3	None	0.55	>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°	2021/8/27	08:12	7.1	0.5	3.1	9.1	8.6	0.05	1.3	1	1.5	N.D.(0.0013)	0.0095	0.00091

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 _{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)			
											(%)	(%)	(%)	(%)	(%)	(%)	(mm)	(mm)			
D-4 a	37.7308°	140.9081°	2021/8/27	08:24	7.6	504	18.1	1.9	2.0	2.702	55.4	29.8	4.1	1.6	5.9	3.2	2.2	19	4.3	110	0.52

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°	2021/8/25	Vertebrata	Osteichthyes	Anguilliformes	Anguillidae	<i>Anguilla japonica</i>	Japanese eel	1	0.14	Immature fish	-	-	5.9	N.D.(1.5)	5.9	-	
				2021/8/27	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	46	1.1	Immature fish,Mature fish	-	-	5.8	N.D.(1.3)	5.8	0.18	
				2021/8/25	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Opsariichthys platypus</i>	Pale chub	8	0.066	Immature fish,Mature fish	-	-	5.0	N.D.(2.5)	5.0	-	
				2021/8/27	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Opsariichthys platypus</i>	Pale chub	22	0.36	Immature fish,Mature fish	-	-	12	N.D.(1.3)	12	-	
				2021/8/25	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i>	Common carp	3	0.078	Immature fish	-	-	3.4	N.D.(0.78)	3.4	-	
				2021/8/27	Vertebrata	Osteichthyes	Salmoniformes	Osmeridae	<i>Plecoglossus altivelis altivelis</i>	Sweetfish	192	2.8	Immature fish,Mature fish	-	-	15	N.D.(1.3)	15	0.12	
				2021/8/25	Vertebrata	Osteichthyes	Salmoniformes	Osmeridae	<i>Plecoglossus altivelis altivelis</i>	Sweetfish	6	0.21	Immature fish,Mature fish	-	-	16	N.D.(1.6)	16	-	
				2021/8/27	Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	Small mouth bass	1	0.046	Immature fish	Freshwater goby	-	-	8.7	N.D.(2.7)	8.7	-
					Vertebrata	Osteichthyes	Perciformes	Gobiidae	<i>Tridentiger brevispinis</i>	Dusky tripletooth goby	2	0.022	Mature fish	-	-	4.4	N.D.(2.0)	4.4	-	
					Vertebrata	Osteichthyes	Perciformes	Gobiidae	<i>Acanthogobius flavimanus</i>	Yellowfin Goby	2	0.048	Mature fish	-	-	2.7	N.D.(0.89)	2.7	-	
Vertebrata	Osteichthyes	Perciformes	Mugilidae		<i>Mugil cephalus cephalus</i>	Flathead mullet	20	0.21	Immature fish	-	-	20	N.D.(1.3)	20	-					
2021/8/25	Vertebrata	Osteichthyes	Siluriformes	Siluridae	<i>Silurus asotus</i>	Amur catfish	1	1.2	Mature fish	Empty stomach	-	-	16	N.D.(2.2)	16	0.40				
D-4 b	The main stream of the Mano River	37.7312°	140.9096°	2021/8/25	Algae/plant	-	-	-	-	Riverbed Deposits (Include algae)	-	0.0028	-	-	-	62	N.D.(12)	62	-	
					Algae/plant	Monocotyledoneae	Najadales	Potamogetonaceae	<i>Potamogeton bertholdii</i>	Small pondweed	-	0.10	-	-	-	-	8.9	N.D.(0.92)	8.9	-
					Arthropoda	Malacostraca	Decapoda	Cambaridae	<i>Procambarus clarkii</i>	Red swamp crawfish	5	0.080	Imago	-	-	16	N.D.(3.6)	16	-	
					Arthropoda	Malacostraca	Decapoda	Palaemonidae	<i>Palaemon paucidens</i>	Common prawn	15	0.026	Imago	-	-	7.5	N.D.(3.4)	7.5	-	
					Arthropoda	Malacostraca	Decapoda	Atyidae	<i>Paratya improvisa</i>	Freshwater shrimp	471	0.041	Juvenile,Imago	-	-	9.4	N.D.(3.4)	9.4	-	
					Arthropoda	Malacostraca	Decapoda	Varunidae	<i>Eriocheir japonica</i>	Japanese mitten crab	16	0.46	Juvenile	-	-	11	N.D.(2.5)	11	1.8	
					Mollusca	Bivalvia	Unionoida	Unionidae	<i>Inversunio jokohamensis</i>	Inversunio jokohamensis	13	0.056	Juvenile	-	-	6.7	N.D.(3.0)	6.7	-	
					Mollusca	Gastropoda	Discopoda	Pleuroceridae	<i>Semisulcospira libertina</i>	Semisulcospira libertina	28	0.025	Imago	-	-	7.2	N.D.(3.0)	7.2	-	
					Vertebrata	Osteichthyes	Anguilliformes	Anguillidae	<i>Anguilla japonica</i>	Japanese eel	2	0.50	Immature fish,Mature fish	Fish,Common prawn	-	-	13	N.D.(1.4)	13	-
					Vertebrata	Osteichthyes	Scorpaeniformes	Cottidae	<i>Cottus pollux</i>	Japanese fluvial sculpin	2	0.048	Immature fish	-	-	5.7	N.D.(3.0)	5.7	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	59	1.1	Immature fish,Mature fish	-	-	8.5	N.D.(3.1)	8.5	0.15	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Opsariichthys platypus</i>	Pale chub	212	1.6	Immature fish,Mature fish	-	-	4.9	N.D.(1.3)	4.9	0.24	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Pseudogobio esocinus esocinus</i>	Pseudogobio esocinus esocinus	10	0.13	Immature fish	-	-	5.0	N.D.(2.0)	5.0	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Gnathopogon elongatus elongatus</i>	Gnathopogon elongatus elongatus	6	0.025	Immature fish,Mature fish	-	-	4.0	N.D.(2.8)	4.0	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	Oriental weatherfish	1	0.019	Mature fish	-	-	6.0	N.D.(2.5)	6.0	-	
					Vertebrata	Osteichthyes	Salmoniformes	Osmeridae	<i>Plecoglossus altivelis altivelis</i>	Sweetfish	141	2.5	Immature fish,Mature fish	-	-	22.2	1.2	21	0.17	
					Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	Small mouth bass	4	0.25	Immature fish	Fish	-	-	9.7	N.D.(1.5)	9.7	-
					Vertebrata	Osteichthyes	Perciformes	Gobiidae	<i>Gymnogobius urotaenia</i>	Goby	1	0.017	Immature fish	-	-	6.3	N.D.(2.6)	6.3	-	
					Vertebrata	Osteichthyes	Perciformes	Gobiidae	<i>Rhinogobius fluviatilis</i>	Rhinogobius fluviatilis	48	0.17	Mature fish	-	-	8.2	N.D.(1.8)	8.2	-	
					Vertebrata	Osteichthyes	Perciformes	Gobiidae	<i>Rhinogobius nagoyae</i>	Rhinogobius nagoyae										
Vertebrata	Osteichthyes	Perciformes	Gobiidae	<i>Rhinogobius sp.</i>	Rhinogobius															
Vertebrata	Amphibia	Anura	Ranidae	<i>Rana japonica</i>	Japanese brown frog	4	0.048	Imago	-	-	10	N.D.(2.9)	10	-						
Course Particulate Organic Matter					-	-	-	-	-	Bottom fallen leaves	-	0.23	-	-	17	N.D.(1.5)	17	-		
D-5	The main stream of the Mano River	37.7214°	140.8889°	2021/8/25	Arthropoda	Malacostraca	Decapoda	Varunidae	<i>Eriocheir japonica</i>	Japanese mitten crab	1	0.090	Imago	-	-	8.5	N.D.(2.1)	8.5	-	
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	29	0.36	Immature fish	-	-	5.3	N.D.(1.6)	5.3	-	
				2021/8/27	Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou</i>	Yamame trout	3	0.079	Immature fish	-	-	6.4	N.D.(2.6)	6.4	-	
					Vertebrata	Osteichthyes	Perciformes	Gobiidae	<i>Rhinogobius fluviatilis</i>	Rhinogobius fluviatilis	5	0.020	Immature fish,Mature fish	-	-	13	N.D.(3.2)	13	-	
					Vertebrata	Osteichthyes	Perciformes	Gobiidae	<i>Rhinogobius nagoyae</i>	Rhinogobius nagoyae										
Vertebrata	Amphibia	Anura	Lithobates	<i>Lithobates catesbeianus</i>	American bullfrog	1	0.34	Imago	Japanese freshwater crab	-	-	16	N.D.(1.7)	16	-					

*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.