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RADIOACTIVITY SURVEY DATA in Japan

Part 1
= Environmental Materials =

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Radioactivity Survey Data in Japan Number 128

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Contents

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Environmental and Dietary Materials*

(Japan Chemical Analysis Center)

1. Collection and pretreatment of samples

(1) Rain and dry fallout

Rain and dry fallout was collected monthly on a sampling tray, approximately 5000cm^2 in area, which was filled with water to a depth of 1 cm at the beginning of every month.

Strontium and cesium carrier solutions were added after the sample was filtered. The tray was washed with 5ℓ of distilled water and the washing was combined to the filtrate.

The sample was passed through a cation exchange column (500mℓ of Dowex 50W X8, 50~100 mesh, Na form) at a rate flow of 80mℓ/min.

(2) Airborne dust

Airborne dust was collected by an electrostatic precipitator or a filter air sampler for every three-months at a rate of more than 3000m^3 per month.

The sampling was done 1 to 1.5 meters above the ground.

(3) Service water and freshwater

Service water, 100ℓ each, was collected at the intake of the water-treatment plant and at the tap after water was left running for five minutes. Strontium and cesium carriers were added to the filtered water sample. The subsequent process was the same as that described in the section (1). Freshwater was treated in the same way as the service water.

(4) Soil

Soil was collected from the location in the spacious and flat area without past surface disturbance caused by dust storms, inflow and out flow due to precipitation, etc.. Any places located under trees in a forest, in a stony area or inside of river banks were avoided. Soil was taken from two layers of different depths, 0-5cm and 5-20cm. The soil lumps were crushed by hands and dried in a drying oven regulated 105℃. The soil was then passed through a 2mm sieve to remove plant roots and pebbles.

(5) Sea water

Sea water was collected at the fixed stations where the effect of terrestrial fresh water from rivers was expected to be negligibly small. A special consideration was also given to weather conditions.

The sampling was carried out when there was no rainfall for the last few days. To prevent contamination, water samples were collected at the bow of a sampling boat just before she stood still by scooping surface water using a polyethylene bucket.

Immediately after the collection, the samples were acidified to a pH lower than 3 by adding concentrated hydrochloric acid in a ratio of 1mℓ to 1ℓ of sea water, and then stored in 20ℓ polyethylene containers. The sampling equipments as well as containers were thoroughly rinsed with dilute hydrochloric acid and then with distilled water before use. Two hundred milliliters of sea water was also collected at the same stations for the determination of chlorinity.

(6) Sea sediments

Sediment was collected in the same area as that for the sea water sample, taking the following criteria into account:

a. The depth of water exceeds 1m at low tide.
b. No significant sedimental movement is observed in the vicinity of concern.
c. Mud, silt and fine sand are preferable.

A conventional sediment sampling device was used for collecting the top few centimeters of surface sediment. Approximately 4kg of the sample in wet weight was spread on a stainless steel dish after removed of the pebbles, shells and other foreign materials, and dried in a drying oven regulated at 105℃.

(7) Total diet

A full one day ordinary diet including three meals, water, tea and other in-between snacks for five persons was collected as a sample of "total diet".

The sample in a large stainless steel pan was carbonized carefully by direct application of gas flame, and was transferred to a porcelain dish and then ashed at 450℃ in an electric muffle furnace.

(8) Rice

Polished rice was collected in producing districts at the harvest and in consuming areas when new crops were first put on sale. The sample was carbonized and ashed in a porcelain dish.

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* Samples were sent to the Center from 46 contracted prefectures.

(9) Milk

Raw milk was collected in producing districts and commercial milk was purchased in consuming districts. Milk in a stainless steel pan or a porcelain dish was evaporated to dryness followed by carbonization and ashing.

(10) Vegetables

Spinach and Japanese radish were selected as the representatives for left vegetables and for nonstarch roots, respectively. After removing soil, the edible part of vegetable sample was dried and carbonized in a stainless steel pan or a porcelain dish.

(11) Tea

Five hundred grams of manufactured green tea was collected, carbonized and ashed in a stainless steel pan or a porcelain dish.

(12) Fish, shellfish and seaweeds

a. Sea fish and freshwater fish

Fish was rinsed with water and blotted with a filter paper. Only the edible part was used in case of larger sized fish, and the whole part was used in case of smaller ones. Each sample was weighed and placed in a stainless steel pan or a porcelain dish. After carbonized, the sample was ashed in an electric muffle furnace.

b. Shellfish

Approximately 4kg of shellfish including the shells was collected or purchased. After removing the shells, it was treated in the same way as that for the sea fish.

c. Seaweeds

Edible seaweeds were collected and rinsed with water to remove sand and other adhering matters on the surface. These were removed of excess water, weighed dried and ashed.

Table 1 shows details of sample collection.

Table 1 Details of sample collection

Sample	Frequency of sampling	Quantity of sample
=Environmental materials=		
(1) Rain and dry fallout		
1. For domestic program	monthly	
2. For WHO program	monthly	
(2) Airborne dust	quarterly	>3000 m^3/month
(3) Service water and freshwater		
1. Service water (source water)	semiyearly	100 ℓ
2. Service water (tap water)	semiyearly	100 ℓ
3. Freshwater	yearly (fishing season)	100 ℓ
(4) Soil		
1. 0~ 5 cm	yearly	4 kg
2. 5~ 20cm	yearly	4 kg
(5) Sea water	yearly	40 ℓ
(6) Sea sediments	yearly	4 kg
=Dietary materials=		
(7) Total diet	semiyearly	daily amount for 5 persons
(8) Rice		
1. Producing districts	yearly (harvesting season)	5 kg (polished rice)
2. Consuming districts	yearly (harvesting season)	5 kg (polished rice)
(9) Milk		
1. Producing districts for WHO program	quarterly (February, May, August and November)	3 ℓ
2. Producing districts for domestic program	semiyearly (February and August)	3 ℓ

Sample	Frequency of sampling	Quantity of sample
3. Consuming districts	semiyearly (February and August)	3 ℓ
4. Powdered milk	semiyearly (April and October)	2～ 3 kg
(10) Vegetables		
1. Producing districts	yearly (harvesting season)	4 kg
2. Consuming districts	yearly (harvesting season)	4 kg
(11) Tea	yearly (the first harvesting season)	500g (manufactured tea)
(12) Fish, shellfish and seaweeds		
1. Sea fish	yearly (fishing season)	4 kg
2. Freshwater fish	yearly (fishing season)	4 kg
3. Shellfish	yearly (fishing season)	4 kg
4. Seaweeds	yearly (fishing season)	2～ 3 kg

2. Preparation of samples for analysis

(1) Rain, service water and freshwater

Strontium and cesium were eluted with hydrochloric acid from the cation exchange column. The residue of rain sample on the filter paper was ashed in an electric muffle furnace and the ash was dissolved in hydrochloric acid. The insoluble part was filtered and washed. The filtrate and the washings were combined to the previous eluate and used for radiochemical analysis.

(2) Soil and Sea sediment

Dried soil was crushed to smaller ones than 0.25mm in size by a crusher. The sieved sample was ashed in an electric muffle furnace regulated at 450 ℃. The sample was then heated with hydrochloric acid, strontium and cesium carrier solutions and the mixture was heated. The insoluble constituent was filtered off and washed with water.

The dried sample was crushed to smaller ones than 0.25mm by a crushing machine. The further preparation of the sample was the same as that described in the section 2-(2).

(3) Rice

The ashed sample was pulverized with a porcelain mortar and passed through a 0.35mm sieve. The sieved sample to which both strontium and cesium carriers were added, was digested with nitric acid by heating. After the sample was heated again with nitric acid to dryness, strontium and cesium were extracted with hydrochloric acid and water. The insoluble constituent was filtered and washed. The filtrate and washings were combined for subsequent radiochemical analysis.

(4) Airborne dust, diet, milk, vegetables, fish and shellfish, seaweeds, tea and others

These ashed samples were treated with the same procedure as that described in the section 2-(4).

3. Separation of strontium-90 and cesium-137

(1) Strontium-90

Sample solutions, prepared as in the foregoing sections 2-(1) through 2-(4), were neutralized with sodium hydroxide. After sodium carbonate was added, the precipitate of strontium and calcium carbonates was separated. The supernatant solution was retained for cesium-137 determination.

The carbonates were dissolved in hydrochloric acid and strontium and calcium were precipitated as oxalates. The precipitate was dissolved in nitric acid and strontium was separated from calcium by successive fuming nitric acid separation. Iron scavenge was made after addition of ferric iron carrier followed by barium chromate separation after addition of barium carrier to remove radium, its daughters and lead. Strontium was recovered as carbonate, and the precipitate was dried and weighed to determine strontium recovery. The strontium carbonate was dissolved in hydrochloric acid and iron carrier was added. The solution was allowed to stand for two weeks for strontium-90 and yttrium-90 to attain equilibrium. Yttrium-90 was coprecipitated with ferric hydroxide and the precipitate was filtered off, washed and counted.

(2) Cesium-137

The supernatant separated from the strontium fraction was acidified with hydrochloric acid. While stirring, cesium was adsorbed on the ammonium molybdophosphate added.

After filtered off and washed with hydrochloric acid the precipitate was dissolved in 2.5N sodium hydroxide solution. The solution was adjusted to pH 8.2 with hydrochloric acid and allowed to cool. Resultant molybdenum hydroxide which separated

out in the solution, was filtered off and washed with water. EDTA was added to the filtrate and washings. Cesium and rubidium were adsorbed on a cation exchange column and cesium was separated from rubidium by eluting with hydrochloric acid.

The eluate was evaporated to dryness and was dissolved. The solution was filtered.
Chloroplatinic acid was added to precipitate cesium. The precipitate was filtered onto a tared paper using a demountable filter and washed with water and then ethanol. After drying, the chemical yield of cesium was determined by weighing the precipitate. Cesium-137 radioactivity was measured for this precipitate.

4. Determination of stable strontium, calcium and potassium

A weighed amount of soil or sea sediment was heated in a electric muffle furnace at 450°C and then treated with hydrochloric acid for extraction.
A weighed aliquot of ashed samples of total diet, vegetables, milk, fish, shellfish or seaweeds was digested with hydrofluoric acid and nitric acid.
The extract was made up to an appropriate volume with dilute hydrochloric acid. The sample solution was analyzed for calcium by titration with standard potassium permanganate solution after separating calcium as oxalate. Atomic absorption spectroscopy was applied when appropriate. Stable strontium and potassium were determined by atomic absorption and flame emission spectrometry, respectively.

5. Counting

After the radiochemical separation the mounted precipitates were counted for activity using low background beta counters normally for 60 to 90min. Net sample counting rates were corrected for counter efficiency, recovery, self-absorption and decay to obtain the content of strontium-90 and cesium-137per sample aliquot. From the results, concentrations of these nuclides in the original samples were calculated.

6. Resu

(1)-1 Strontuim-90 and Cesiumu-137 in Rain and Dry Fallout(for domestic program)
(form Oct.1998 to Mar.1999)

-continued from No. 126 for this publication-

Table (1)-1 Strontuim-90 and Cesiumu-137 in Rain and Dry Fallout

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Oct,1998								
Sapporo,HOKKAIDOU	32	83	0.0097	±	0.0081	0.01	±	0.0094
Aomori,AOMORI	32	153	0.005	±	0.01	0	±	0.012
Morioka,IWATE	32	160	0.011	±	0.0089	0	±	0.012
Onagawa-machi,MIYAGI	32	149	0.022	±	0.011	0	±	0.01
Yamagata,YAMAGATA	32	112	0	±	0.0077	0.015	±	0.01
Ookuma-machi,FUKUSHIMA	32	322	0.025	±	0.0083	0	±	0.009
Mito,IBARAKI	32	102	0	±	0.013	0.03	±	0.013
Kawachi-machi,TOCHIGI	32	149	0.003	±	0.013	0	±	0.0089
Ichihara,CHIBA	32	147	0.032	±	0.008	0.016	±	0.009
Urawa,SAITAMA	32	149	0.031	±	0.037	0.0022	±	0.0076
Maebashi,GUNMA	32	154	0.005	±	0.013	0.0047	±	0.009
Shinjuku,TOKYO	32	156	0	±	0.011	0.0036	±	0.0085
Yokohama,KANAGAWA	31	3	0.003	±	0.015	0.027	±	0.011
Koufu,YAMANASHI	32	176	0.01	±	0.013	0.013	±	0.016
Kosugi-machi,TOYAMA	32	202	0.0056	±	0.0073	0	±	0.0092
Shizuoka,SHIZUOKA	32	365	0.014	±	0.011	0.045	±	0.011
Gifu,GIFU	32	275	0.01	±	0.011	0	±	0.0094
Nagoya,AICHI	34	241.9	0.027	±	0.0084	0	±	0.011
Ootsu,SHIGA	32	279.4	0.007	±	0.0077	0.0082	±	0.0078
Tsu,MIE	32	289.5	0.016	±	0.016	0.013	±	0.0092
Kyoto,KYOTO	29	264	0	±	0.011	0.0064	±	0.0075

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Kyoto,KYOTO	31	9.5	0.026	±	0.014	0	±	0.0082
Nara,NARA	32	201.1	0.024	±	0.018	0	±	0.0088
Tottori,TOTTORI	32	134.6	0.06	±	0.016	0	±	0.0078
Kobe,HYOUGO	31	19.3	0.016	±	0.016	0.0024	±	0.0076
Wakayama,WAKAYAMA	34	310	0.016	±	0.014	0	±	0.0075
Matsue,SHIMANE	34	204.8	0.012	±	0.0052	0.0039	±	0.0055
Takamatsu,KAGAWA	32	9	0.029	±	0.015	0	±	0.008
Takamatsu,KAGAWA	29	164	0.021	±	0.013	0	±	0.0085
Hiroshima,HIROSHIMA	32	28.4	0.038	±	0.034	0.005	±	0.011
Matsuyama,EHIME	32	276	0.026	±	0.0096	0.014	±	0.0096
Ooita,OOITA	32	430.8	0.018	±	0.012	0	±	0.0081
Dazaifu,FUKUOKA	32	174.6	0	±	0.014	0.0036	±	0.0096
Saga,SAGA	32	167.7	0.003	±	0.012	0	±	0.081
Uto,KUMAMOTO	32	183.5	0.015	±	0.0071	0	±	0.0082
Miyazaki,MIYAZAKI	32	510.2	0.013	±	0.013	0	±	0.0079
Nagasaki,NAGASAKI	32	174	0.038	±	0.018	0.005	±	0.01
Nov,1998								
Sapporo,HOKKAIDOU	29	110	0.02	±	0.014	0.025	±	0.0097
Aomori,AOMORI	29	153	0.006	±	0.01	0.028	±	0.0092
Morioka,IWATE	29	21	0.046	±	0.016	0.009	±	0.013
Onagawa-machi,MIYAGI	29	24	0.047	±	0.02	0.0037	±	0.0089
Yamagata,YAMAGATA	29	62	0.026	±	0.0082	0.0054	±	0.0099
Ookuma-machi,FUKUSHIMA	29	8	0.022	±	0.0079	0.012	±	0.0097
Mito,IBARAKI	29	2	0	±	0.011	0.028	±	0.013
Kawachi-machi,TOCHIGI	29	0	0.013	±	0.012	0.011	±	0.0086
Ichihara,CHIBA	29	18	0.019	±	0.0077	0.02	±	0.0093

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Urawa, SAITAMA	29	5	0.034	±	0.017	0.025	±	0.0093
Maebashi, GUNMA	29	0	0.008	±	0.011	0.003	±	0.0088
Shinjuku, TOKYO	29	8	0	±	0.0011	0.0012	±	0.0082
Yokohama, KANAGAWA	28	71	0.017	±	0.009	0.012	±	0.0092
Koufu, YAMANASHI	29	1	0.008	±	0.013	0	±	0.013
Kosugi-machi, TOYAMA	29	263	0.015	±	0.0073	0.0095	±	0.0097
Shizuoka, SHIZUOKA	29	3	0.023	±	0.011	0.052	±	0.011
Fukui, FUKUI	29	227	0.074	±	0.04	0	±	0.046
Gifu, GIFU	29	10	0	±	0.0082	0	±	0.0086
Nagoya, AICHI	30	8.4	0.013	±	0.0078	0.003	±	0.011
Ootsu, SHIGA	29	4.2	0.012	±	0.0076	0.01	±	0.01
Tsu, MIE	29	6.5	0.045	±	0.016	0.0067	±	0.0084
Kyoto, KYOTO	28	38	0.007	±	0.0112	0	±	0.008
Nara, NARA	29	56.8	0.027	±	0.017	0	±	0.0094
Tottori, TOTTORI	29	101.6	0.044	±	0.015	0.021	±	0.0098
Kobe, HYOUGO	28	14.2	0.004	±	0.012	0.0044	±	0.0086
Wakayama, WAKAYAMA	27	14.5	0.052	±	0.045	0.012	±	0.0088
Matsue, SHIMANE	35	71	0.025	±	0.0059	0.016	±	0.0067
Matsue, SHIMANE	26	66.4	0.019	±	0.0053	0.0026	±	0.0069
Ishii-machi, TOKUSHIMA	29	2	0.074	±	0.025	0.058	±	0.014
Matsuyama, EHIME	29	39	0.012	±	0.012	0.018	±	0.014
Ooita, OOITA	31	24.7	0.015	±	0.012	0	±	0.009
Dazaifu, FUKUOKA	29	35.4	0.013	±	0.016	0	±	0.0086
Saga, SAGA	29	38.4	0.015	±	0.025	0	±	0.01
Uto, KUMAMOTO	29	12.8	0.017	±	0.012	0	±	0.013
Miyazaki, MIYAZAKI	29	34.6	0.0075	±	0.0058	0.012	±	0.0091

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Nagasaki, NAGASAKI	29	73.5	0.036	±	0.015	0.003	±	0.01
Yonagusuku-machi, Okinawa	28	342	0	±	0.013	0	±	0.009
Yonagusuku-machi, Okinawa	36	141.2	0	±	0.016	0.032	±	0.017
Dec, 1998								
Sapporo, HOKKAIDOU	27	82	0.015	±	0.011	0.017	±	0.015
Sapporo, HOKKAIDOU	35	84	0.025	±	0.0081	0.016	±	0.013
Aomori, AOMORI	34	72	0.004	±	0.01	0.02	±	0.0087
Morioka, IWATE	34	57	0.027	±	0.012	0.041	±	0.014
Onagawa-machi, MIYAGI	35	16	0.017	±	0.0073	0.045	±	0.016
Yamagata, YAMAGATA	34	77	0.023	±	0.015	0.006	±	0.013
Ookuma-machi, FUKUSHIMA	34	24	0.008	±	0.013	0.002	±	0.013
Mito, IBARAKI	34	34	0.009	±	0.011	0.019	±	0.013
Kawachi-machi, TOCHIGI	34	33	0	±	0.011	0	±	0.0075
Ichihara, CHIBA	34	50	0.053	±	0.0098	0.022	±	0.0089
Urawa, SAITAMA	34	46	0.01	±	0.018	0.045	±	0.0096
Maebashi, GUNMA	34	235	0.01	±	0.012	0.015	±	0.0086
Shinjuku, TOKYO	34	52	0.004	±	0.011	0.0064	±	0.0084
Yokohama, KANAGAWA	32	26	0.035	±	0.015	0.021	±	0.0096
Koufu, YAMANASHI	34	34	0.003	±	0.011	0.041	±	0.015
Kosugi-machi, TOYAMA	34	205	0.042	±	0.0082	0.017	±	0.011
Shizuoka, SHIZUOKA	34	38	0.041	±	0.013	0.083	±	0.013
Fukui, FUKUI	34	155	0.034	±	0.037	0.041	±	0.043
Gifu, GIFU	34	39	0.007	±	0.0083	0.0053	±	0.009
Nagoya, AICHI	34	38	0.023	±	0.009	0.012	±	0.0091
Ootsu, SHIGA	34	48	0.01	±	0.012	0	±	0.0077
Tsu, MIE	34	53.5	0.008	±	0.014	0.016	±	0.009

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Kyoto, KYOTO	35	24	0	±	0.011	0.0085	±	0.0085
Nara, NARA	34	52.3	0.055	±	0.017	0.0024	±	0.0077
Tottori, TOTTORI	34	114.9	0.019	±	0.013	0.055	±	0.011
Kobe, HYOUGO	32	14.8	0.008	±	0.012	0.013	±	0.0082
Wakayama, WAKAYAMA	34	30.5	0	±	0.015	0.019	±	0.0084
Ishii-machi, TOKUSHIMA	36	22.3	0.034	±	0.0091	0.066	±	0.012
Takamatsu, KAGAWA	34	1.5	0.016	±	0.0089	0.016	±	0.014
Hiroshima, HIROSHIMA	35	0	0.058	±	0.026	0	±	0.015
Matsuyama, EHIME	34	5	0	±	0.011	0.005	±	0.014
Ooita, OOITA	32	0.5	0.011	±	0.011	0.0025	±	0.0083
Dazaifu, FUKUOKA	34	10.5	0.0093	±	0.007	0.018	±	0.014
Saga, SAGA	34	1.3	0.017	±	0.012	0	±	0.0084
Uto, KUMAMOTO	34	25.2	0.006	±	0.011	0.015	±	0.014
Miyazaki, MIYAZAKI	34	27.3	0.007	±	0.011	0	±	0.0065
Nagasaki, NAGASAKI	34	4.5	0.065	±	0.033	0	±	0.012
Jan, 1999								
Aomori, AOMORI	28	133	0.021	±	0.012	0.027	±	0.0093
Morioka, IWATE	28	18	0	±	0.011	0.064	±	0.012
Onagawa-machi, MIYAGI	27	4	0	±	0.0069	0.028	±	0.015
Yamagata, YAMAGATA	28	64	0	±	0.011	0.017	±	0.015
Ookuma-machi, FUKUSHIMA	28	6	0	±	0.0062	0.0028	±	0.0078
Mito, IBARAKI	28	1	0.014	±	0.0073	0.014	±	0.0085
Kawachi-machi, TOCHIGI	28	4	0.002	±	0.013	0.02	±	0.0098
Ichihara, CHIBA	28	18	0.021	±	0.011	0.003	±	0.008
Urawa, SAITAMA	28	9	0.024	±	0.012	0.013	±	0.0065
Maebashi, GUNMA	28	0.5	0.006	±	0.011	0.011	±	0.0084

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Shinjuku, TOKYO	28	23	0.013	±	0.014	0	±	0.0082
Yokohama, KANAGAWA	28	39	0.0004	±	0.0068	0.031	±	0.011
Koufu, YAMANASHI	28	9	0.021	±	0.013	0	±	0.0075
Shizuoka, SHIZUOKA	28	28	0.017	±	0.011	0.1	±	0.013
Fukui, FUKUI	28	276	0.022	±	0.07	0	±	0.046
Gifu, GIFU	28	64	0.001	±	0.011	0.016	±	0.0096
Nagoya, AICHI	28	35.3	0.012	±	0.0075	0.01	±	0.0086
Ootsu, SHIGA	28	33.4	0.012	±	0.014	0	±	0.013
Tsu, MIE	28	12.5	0.004	±	0.014	0.0079	±	0.0085
Nara, NARA	28	25.8	0.022	±	0.015	0	±	0.0078
Tottori, TOTTORI	28	163.7	0.058	±	0.017	0.18	±	0.017
Kobe, HYOUGO	28	42.3	0.002	±	0.011	0.0076	±	0.0088
Wakayama, WAKAYAMA	30	16.5	0.033	±	0.024	0.034	±	0.011
Matsue, SHIMANE	28	67.6	0.032	±	0.0099	0.044	±	0.0079
Ishii-machi, TOKUSHIMA	27	9.2	0.014	±	0.01	0.045	±	0.011
Takamatsu, KAGAWA	28	15.5	0.014	±	0.0099	0.002	±	0.013
Hiroshima, HIROSHIMA	27	0	0.038	±	0.013	0.043	±	0.019
Matsuyama, EHIME	28	27	0.011	±	0.011	0.024	±	0.009
Ooita, OOITA	29	40	0.008	±	0.011	0	±	0.0081
Dazaifu, FUKUOKA	28	56.6	0.015	±	0.0073	0.032	±	0.014
Saga, SAGA	28	43.1	0.034	±	0.016	0.013	±	0.0096
Uto, KUMAMOTO	28	23.5	0.016	±	0.012	0.012	±	0.0081
Miyazaki, MIYAZAKI	28	32.6	0.0112	±	0.0064	0.016	±	0.0089
Nagasaki, NAGASAKI	28	38.5	0.011	±	0.012	0.008	±	0.018
Yonagusuku-machi, Okinawa	27	168.1	0	±	0.014	0.028	±	0.013

Feb, 1999

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Sapporo, HOKKAIDOU	28	45	0.011	±	0.012	0.02	±	0.01
Aomori, AOMORI	28	131	0.006	±	0.011	67	±	0.011
Morioka, IWATE	28	20	0.017	±	0.0073	0.043	±	0.01
Yamagata, YAMAGATA	28	46	0.011	±	0.012	0.007	±	0.0081
Ookuma-machi, FUKUSHIMA	28	24	0.0019	±	0.0074	0.058	±	0.013
Mito, IBARAKI	28	44	0.021	±	0.012	0.0094	±	0.0094
Kawachi-machi, TOCHIGI	28	28	0	±	0.0085	0.012	±	0.082
Ichihara, CHIBA	28	55	0.021	±	0.012	0.079	±	0.013
Urawa, SAITAMA	28	32	0.039	±	0.012	0.11	±	0.012
Maebashi, GUNMA	19	2.5	0.001	±	0.012	0.0026	±	0.0085
Shinjuku, TOKYO	28	38	0.008	±	0.012	0.023	±	0.0098
Yokohama, KANAGAWA	33	174	0.025	±	0.014	0.058	±	0.012
Koufu, YAMANASHI	28	30	0.0062	±	0.0057	0.013	±	0.0091
Kosugi-machi, TOYAMA	28	194	0.038	±	0.013	0.03	±	0.011
Shizuoka, SHIZUOKA	28	89	0.027	±	0.012	0.14	±	0.015
Fukui, FUKUI	28	228	0.021	±	0.032	0.007	±	0.047
Gifu, GIFU	28	56	0.005	±	0.012	0	±	0.0073
Nagoya, AICHI	28	47.1	0.011	±	0.0058	0.016	±	0.0088
Ootsu, SHIGA	28	48.2	0.013	±	0.013	0.013	±	0.0088
Tsu, MIE	28	47.1	0.026	±	0.012	0.035	±	0.0097
Kyoto, KYOTO	28	55.5	0.018	±	0.013	0.059	±	0.013
Nara, NARA	28	49.6	0.002	±	0.016	0.0049	±	0.0089
Tottori, TOTTORI	28	187.8	0.051	±	0.051	0.043	±	0.011
Kobe, HYOUGO	33	112.9	0.014	±	0.012	0.043	±	0.01
Wakayama, WAKAYAMA	27	31.5	0.065	±	0.029	0.022	±	0.01
Matsue, SHIMANE	28	121.3	0.027	±	0.013	0.049	±	0.0081

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Ishii-machi, TOKUSHIMA	27	29.2	0.042	±	0.015	0.013	±	0.019
Takamatsu, KAGAWA	28	28	0.026	±	0.019	0.035	±	0.011
Hiroshima, HIROSHIMA	28	72.2	0.012	±	0.015	0.05	±	0.017
Matsuyama, EHIME	28	34	0.002	±	0.01	0.033	±	0.01
Ooita, OOITA	27	42.1	0.012	±	0.011	0.017	±	0.009
Dazaifu, FUKUOKA	28	44.9	0.021	±	0.011	0.022	±	0.0099
Saga, SAGA	28	43.8	0.025	±	0.015	0	±	0.0092
Uto, KUMAMOTO	28	35.7	0.012	±	0.012	0.034	±	0.013
Miyazaki, MIYAZAKI	28	76.5	0.014	±	0.0068	0.038	±	0.01
Nagasaki, NAGASAKI	28	52	0.024	±	0.015	0.017	±	0.0088
Yonagusuku-machi, Okinawa	28	22.7	0	±	0.011	0	±	0.0095
Mar, 1999								
Sapporo, HOKKAIDOU	31	48	0	±	0.007	0.026	±	0.0093
Aomori, AOMORI	31	65	0.038	±	0.014	0.043	±	0.01
Morioka, IWATE	31	74	0.0006	±	0.0082	0.017	±	0.0088
Onagawa-machi, MIYAGI	31	141	0.026	±	0.0081	0.026	±	0.011
Yamagata, YAMAGATA	31	86	0.008	±	0.011	0.046	±	0.011
Ookuma-machi, FUKUSHIMA	31	99	0.021	±	0.011	0.04	±	0.011
Mito, IBARAKI	31	108	0.034	±	0.013	0.051	±	0.011
Kawachi-machi, TOCHIGI	31	137	0.012	±	0.0099	0.01	±	0.0084
Ichihara, CHIBA	31	150	0.026	±	0.012	0.064	±	0.012
Urawa, SAITAMA	31	123	0	±	0.016	0.11	±	0.012
Fujimi-mura, GUNMA	31	72	0.039	±	0.014	0.073	±	0.012
Shinjuku, TOKYO	31	171	0.007	±	0.013	0.01	±	0.0087
Koufu, YAMANASHI	31	80	0.023	±	0.0068	0.033	±	0.0099
Kosugi-machi, TOYAMA	31	105	0.03	±	0.012	0.049	±	0.011

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Shizuoka, SHIZUOKA	31	244	0.032	±	0.013	0.21	±	0.017
Fukui, FUKUI	31	109	0.051	±	0.063	0	±	0.039
Gifu, GIFU	31	164	0.005	±	0.02	0.02	±	0.0082
Nagoya, AICHI	31	121	0.017	±	0.0077	0.032	±	0.0098
Tsu, MIE	31	113	0.036	±	0.012	0.049	±	0.011
Kyoto, KYOTO	31	158.2	0.024	±	0.012	0.034	±	0.014
Kyoto, KYOTO	31	133.5	0.035	±	0.015	0.053	±	0.012
Nara, NARA	31	172.3	0.035	±	0.014	0.023	±	0.01
Tottori, TOTTORI	31	127.6	0.061	±	0.014	0.027	±	0.0092
Kobe, HYOUGO	-335	150.5	0.006	±	0.016	0	±	0
Wakayama, WAKAYAMA	30	95	0.049	±	0.024	0.03	±	0.01
Matsue, SHIMANE	31	127.6	0.053	±	0.01	0.094	±	0.01
Ishii-machi, TOKUSHIMA	31	74	0.1	±	0.021	0.12	±	0.019
Takamatsu, KAGAWA	31	65.5	0.016	±	0.012	0.03	±	0.013
Hiroshima, HIROSHIMA	31	109.2	0.048	±	0.017	0.034	±	0.013
Ooita, OOITA	31	136.4	0.041	±	0.015	0.024	±	0.01
Dazaifu, FUKUOKA	31	78.9	0.028	±	0.012	0.044	±	0.01
Saga, SAGA	31	100.7	0.021	±	0.013	0.037	±	0.011
Uto, KUMAMOTO	31	139.7	0.018	±	0.013	0.038	±	0.013
Miyazaki, MIYAZAKI	31	358.9	0.023	±	0.0076	0.047	±	0.01
Nagasaki, NAGASAKI	31	101	0.023	±	0.016	0.028	±	0.013
Yonagusuku-machi, Okinawa	31	201.7	0.001	±	0.012	0.037	±	0.016

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(1)-2 Strontuim-90 and Cesiumu-137 in Rain and Dry Fallout(for WHO program)
(form Oct.1998 to Mar.1999)

-continued from No. 126 for this publication-

Table (1)-2 Strontuim-90 and Cesiumu-137 in Rain and Dry Fallout(for WHO program)

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Oct,1998								
Akita,AKITA	32	274	0.022	±	0.011	0	±	0.0093
Niigata,NIIGATA	32	148	0.037	±	0.013	0.007	±	0.0082
Ichihara,CHIBA	32	157	0.01	±	0.017	0	±	0.01
Nagano,NAGANO	31	106	0.047	±	0.023	0	±	0.011
Kanazawa,ISHIKAWA	31	282	0.008	±	0.014	0.048	±	0.011
Osaka,OSAKA	32	187.4	0.025	±	0.023	0.042	±	0.014
Okayama,OKAYAMA	32	195.9	0.027	±	0.0087	0	±	0.0098
Kochi,KOCHI	32	421.2	0.064	±	0.011	0	±	0.013
Yamaguchi,YAMAGUCHI	31	246	0.022	±	0.0084	0	±	0.0066
Kagoshima,KAGOSHIMA	31	60	0.042	±	0.0092	0.02	±	0.014
Kagoshima,KAGOSHIMA	29	286.5	0.015	±	0.0071	0.015	±	0.013
Nov,1998								
Akita,AKITA	29	207	0.03	±	0.011	0.03	±	0.014
Niigata,NIIGATA	29	251	0.006	±	0.01	0.014	±	0.0086
Ichihara,CHIBA	29	13	0.03	±	0.015	0.028	±	0.012
Nagano,NAGANO	29	7	0.02	±	0.016	0.0018	±	0.0091
Kanazawa,ISHIKAWA	28	106	0.021	±	0.014	0.039	±	0.0098
Osaka,OSAKA	29	19.3	0	±	0.0097	0.0061	±	0.0092
Okayama,OKAYAMA	29	12.3	0.001	±	0.011	0	±	0.0079
Kochi,KOCHI	29	18.8	0.046	±	0.0098	0.0084	±	0.0099
Yamaguchi,YAMAGUCHI	30	23	0.015	±	0.0077	0.0024	±	0.0096
Kagoshima,KAGOSHIMA	28	8	0.042	±	0.0086	0	±	0.013

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)			137Cs (MBq/km2)		
Dec, 1998								
Akita, AKITA	34	195	0	±	0.013	0.057	±	0.011
Niigata, NIIGATA	34	178	0.014	±	0.012	0.027	±	0.0098
Ichihara, CHIBA	34	47	0.005	±	0.013	0.01	±	0.011
Nagano, NAGANO	32	16	0	±	0.011	0.0019	±	0.0086
Kanazawa, ISHIKAWA	32	110	0.052	±	0.0085	0.17	±	0.016
Osaka, OSAKA	34	38.2	0.025	±	0.015	0	±	0.009
Okayama, OKAYAMA	34	4.3	0.017	±	0.013	0.014	±	0.0089
Kochi, KOCHI	34	15.3	0.14	±	0.021	0.038	±	0.019
Yamaguchi, YAMAGUCHI	34	7	0.006	±	0.014	0	±	0.012
Kagoshima, KAGOSHIMA	32	27	0.13	±	0.02	0.029	±	0.013
Jan, 1999								
Akita, AKITA	28	162	0.026	±	0.0074	0.1	±	0.014
Niigata, NIIGATA	28	134	0.012	±	0.012	0.071	±	0.012
Ichihara, CHIBA	28	18	0.016	±	0.012	0.018	±	0.0077
Nagano, NAGANO	30	29	0.016	±	0.0071	0.003	±	0.0083
Kanazawa, ISHIKAWA	28	167	0.024	±	0.007	0.027	±	0.0096
Osaka, OSAKA	28	20.7	0	±	0.015	0.016	±	0.0091
Okayama, OKAYAMA	28	24.8	0.019	±	0.012	0	±	0.012
Kochi, KOCHI	28	29.5	0.013	±	0.017	0.0046	±	0.0097
Yamaguchi, YAMAGUCHI	28	40	0	±	0.011	0.0061	±	0.0091
Kagoshima, KAGOSHIMA	31	87	0.097	±	0.017	0.037	±	0.014
Feb, 1999								
Akita, AKITA	28	108	0.012	±	0.0068	0.047	±	0.011
Niigata, NIIGATA	28	128	0.005	±	0.011	0.047	±	0.011
Ichihara, CHIBA	28	52	0.022	±	0.014	0.0076	±	0.0064
Nagano, NAGANO	28	33	0.0056	±	0.0059	0	±	0.0074
Kanazawa, ISHIKAWA	31	122	0.034	±	0.0075	0.043	±	0.012

Location	Duration (Days)	Precipitation (mm)	90Sr (MBq/km2)	137Cs (MBq/km2)
Osaka,OSAKA	28	52.4	0.025 ± 0.015	0.02 ± 0.01
Okayama,OKAYAMA	28	43.4	0.009 ± 0.011	0.021 ± 0.017
Kochi,KOCHI	28	47.7	0 ± 0.015	0.13 ± 0.016
Yamaguchi,YAMAGUCHI	28	50	0.019 ± 0.015	0.045 ± 0.011
Mar,1999				
Akita,AKITA	31	133	0.03 ± 0.012	0.02 ± 0.0093
Niigata,NIIGATA	31	96	0.011 ± 0.012	0.051 ± 0.011
Ichihara,CHIBA	31	150	0.037 ± 0.015	0.037 ± 0.009
Nagano,NAGANO	31	46	0.012 ± 0.0059	0.028 ± 0.01
Osaka,OSAKA	30	108.5	0.033 ± 0.014	0.028 ± 0.01
Okayama,OKAYAMA	31	83.4	0.035 ± 0.021	0.048 ± 0.016
Kochi,KOCHI	31	234.8	0.09 ± 0.024	0.1 ± 0.02
Yamaguchi,YAMAGUCHI	31	154	0.034 ± 0.012	0.024 ± 0.013
Kagoshima,KAGOSHIMA	30	185.5	0.047 ± 0.036	0.012 ± 0.014

(2) Strontuim-90 and Cesiumu-137 in Airborn Dust
(form Oct.1998 to Mar.1999)

-continued from No. 126 for this publication-

Table (2) :Strontuim-90 and Cesiumu-137 in Airborn Dust

Location	Sampling period	Absorption (m2)	90Sr (mBq/m3)			137Cs (mBq/m3)		
October～December, 1998								
Morioka, IWATE	10 ～ 12	9788.0	0.0021	±	0.00037	0	±	0.00073
Akita, AKITA	10 ～ 12	10920.0	0	±	0.00052	0	±	0.00028
Yamagata, YAMAGATA	10 ～ 12	12960.0	0.00008	±	0.00045	0	±	0.00023
Ookuma-machi, FUKUSHIMA	10 ～ 12	11764.0	0	±	0.00044	0	±	0.00026
Niigata, NIIGATA	10 ～ 12	10644.0	0.00052	±	0.00048	0	±	0.0004
Kawachi-machi, TOCHIGI	10 ～ 12	14363.0	0	±	0.00036	0	±	0.00021
Ichihara, CHIBA	10 ～ 12	10154.0	0	±	0.0003	0.00038	±	0.00033
Maebashi, GUNMA	10 ～ 12	13506.0	0	±	0.00048	0	±	0.0002
Nagano, NAGANO	10 ～ 12	11664.0	0.00066	±	0.00052	0.00034	±	0.00039
Yokohama, KANAGAWA	10 ～ 12	10170.0	0	±	0.00034	0	±	0.0003
Koufu, YAMANASHI	10 ～ 12	12538.0	0.00037	±	0.00032	0.00012	±	0.00024
Kosugi-machi, TOYAMA	10 ～ 12	18206.0	0.00013	±	0.00021	0	±	0.0137
Hamaoka-machi, SHIZUOKA	10 ～ 12	10153.0	0.00041	±	0.00064	0	±	0.00044
Fukui, FUKUI	10 ～ 12	13213.0	0.00047	±	0.00049	0.00002	±	0.00024
Gifu, GIFU	10 ～ 12	12125.0	0.00022	±	0.00038	0	±	0.00023
Nagoya, AICHI	10 ～ 12	9519.0	0.00027	±	0.00039	0.00025	±	0.00032
Ootsu, SHIGA	10 ～ 12	12606.0	0	±	0.00045	0.001	±	0.00022
Tsu, MIE	10 ～ 12	14364.0	0	±	0.00036	0	±	0.00022
Kyoto, KYOTO	10 ～ 12	9871.0	0.00028	±	0.00067	0	±	0.00046
Nara, NARA	10 ～ 12	10810.0	0	±	0.00047	0	±	0.00029
Osaka, OSAKA	10 ～ 12	16786.0	0.0006	±	0.00039	0.00015	±	0.0002

Location	Sampling period	Absorption (m2)	90Sr (mBq/m3)			137Cs (mBq/m3)		
Tottori, TOTTORI	10 ～ 12	15114.0	0.00046	±	0.00033	0.00006	±	0.0002
Kobe, HYOUGO	10 ～ 12	10182.0	0.00055	±	0.0005	0.00028	±	0.00031
Wakayama, WAKAYAMA	10 ～ 12	10368.0	0	±	0.00051	0	±	0.00042
Okayama, OKAYAMA	10 ～ 12	11028.0	0.00016	±	0.00024	0	±	0.00028
Tokushima, TOKUSHIMA	10 ～ 12	10080.0	0.00096	±	0.00055	0.00015	±	0.0003
Takamatsu, KAGAWA	10 ～ 12	12150.0	0	±	0.00045	0	±	0.00024
Hiroshima, HIROSHIMA	10 ～ 12	10393.0	0.00058	±	0.00062	0.00071	±	0.0003
Yamaguchi, YAMAGUCHI	10 ～ 12	21600.0	0.00036	±	0.00029	0	±	0.00015
Ooita, OOITA	10 ～ 12	10540.0	0.00069	±	0.00076	0	±	0.00025
Saga, SAGA	10 ～ 12	12013.0	0	±	0.00039	0.00048	±	0.00039
Uto, KUMAMOTO	10 ～ 12	12334.0	0	±	0.00056	0.00023	±	0.00026
Miyazaki, MIYAZAKI	10 ～ 12	13075.0	0.00029	±	0.00025	0	±	0.0002
Nagasaki, NAGASAKI	10 ～ 12	10368.0	0.00034	±	0.00031	0.00016	±	0.0003
October～January, 1999								
Mito, IBARAKI	10 ～ 01	11639.0	0	±	0.00047	0	±	0.00026
January～March, 1999								
Morioka, IWATE	01 ～ 03	10378.0	0.0012	±	0.00032	0.00039	±	0.09004
Akita, AKITA	01 ～ 03	10800.0	0.0007	±	0.00029	0	±	0.00041
Yamagata, YAMAGATA	01 ～ 03	112960.0	0.0012	±	0.00048	0.00025	±	0.00034
Ookuma-machi, FUKUSHIMA	01 ～ 03	11925.0	0.0004	±	0.00032	0.0002	±	0.00025
Niigata, NIIGATA	01 ～ 03	10529.0	0	±	0.0005	0	±	0.00043
Kawachi-machi, TOCHIGI	01 ～ 03	14283.0	0.0002	±	0.00038	0.00005	±	0.00032
Ichihara, CHIBA	01 ～ 03	10152.0	0.00012	±	0.00058	0.00014	±	0.00044
Maebashi, GUNMA	01 ～ 03	11607.0	0.00057	±	0.00045	0.00025	±	0.00041
Nagano, NAGANO	01 ～ 03	12075.0	0.00049	±	0.00051	0.00032	±	0.00038
Yokohama, KANAGAWA	01 ～ 03	10085.0	0.00012	±	0.00029	0.00013	±	0.00048
Koufu, YAMANASHI	01 ～ 03	13447.0	0.0015	±	0.00028	0.00002	±	0.00036
Kosugi-machi, TOYAMA	01 ～ 03	13704.0	0.00015	±	0.00042	0.00068	±	0.00038

Location	Sampling period	Absorption (m2)	90Sr (mBq/m3)			137Cs (mBq/m3)		
Hamaoka-machi, SHIZUOKA	01 ～ 03	10075.0	0.00066	±	0.0007	0.00024	±	0.00046
Fukui, FUKUI	01 ～ 03	13375.0	0.0006	±	0.0003	0.00017	±	0.00021
Gifu, GIFU	01 ～ 03	11296.0	0.00063	±	0.00057	0.0011	±	0.00043
Nagoya, AICHI	01 ～ 03	9553.0	0.0014	±	0.00074	0.0006	±	0.0005
Ootsu, SHIGA	01 ～ 03	10032.0	0	±	0.00035	0	±	0.00029
Kumanonada, MIE	01 ～ 03	13600.0	0.00058	±	0.00024	0.00044	±	0.00034
Kyoto, KYOTO	01 ～ 03	10090.0	0.00059	±	0.00031	0.00066	±	0.00049
Nara, NARA	01 ～ 03	10852.0	0.00046	±	0.00047	0.00059	±	0.00044
Osaka, OSAKA	01 ～ 03	16045.0	0.00017	±	0.00039	0	±	0.00017
Tottori, TOTTORI	01 ～ 03	15114.0	0.00056	±	0.00033	0.00006	±	0.00029
Kobe, HYOUGO	01 ～ 03	10213.0	0.00013	±	0.00047	0	±	0.00043
Wakayama, WAKAYAMA	01 ～ 03	15552.0	0	±	0.00036	0.00006	±	0.0003
Okayama, OKAYAMA	01 ～ 03	11261.0	0	±	0.00052	0.00002	±	0.00041
Tokushima, TOKUSHIMA	01 ～ 03	10080.0	0.00038	±	0.00077	0	±	0.00044
Takamatsu, KAGAWA	01 ～ 03	12166.0	0.00037	±	0.00036	0.00011	±	0.00026
Hiroshima, HIROSHIMA	01 ～ 03	9994.0	0.00029	±	0.00063	0.00029	±	0.00046
Yamaguchi, YAMAGUCHI	01 ～ 03	21600.0	0.00009	±	0.00031	0.00014	±	0.00022
Ooita, OOITA	01 ～ 03	10380.0	0.00027	±	0.00056	0.0006	±	0.0003
Saga, SAGA	01 ～ 03	13303.0	0.00046	±	0.00052	0.0014	±	0.00041
Uto, KUMAMOTO	01 ～ 03	11045.0	0	±	0.00045	0.00061	±	0.00046
Miyazaki, MIYAZAKI	01 ～ 03	13057.0	0.0014	±	0.00045	0.00036	±	0.00035
Nagasaki, NAGASAKI	01 ～ 03	10368.0	0	±	0.00042	0.00021	±	0.0003
January～April, 1999								
Mito, IBARAKI	01 ～ 04	9064.0	0.00024	±	0.0003	0	±	0.00049

(3) Strontuim-90 and Cesiumu-137 in Service Water
(form Oct.1998 to Mar.1999)

-continued from No. 126 for this publication-

Table (3) :Strontuim-90 and Cesiumu-137 in Service Water

Location	pH (pH)	90Sr (mBq/l)			137Cs (mBq/l)		
(Source Water)							
Dec,1998							
Kisarazu,CHIBA	7.4	2	±	0.15	0.14	±	0.048
Urawa,SAITAMA	7.3	0	±	0.2	0	±	0.044
Nagano,NAGANO	7.24	0.84	±	0.15	0.006	±	0.044
Tsukui-machi,KANAGAWA	7.8	0.43	±	0.084	0.032	±	0.038
Inuyama,AICHI	6.9	2.1	±	0.16	0.069	±	0.043
Moriguchi,OSAKA	7.4	2.8	±	0.23	0.16	±	0.049
Fukuoka,FUKUOKA	7.56	1.8	±	0.15	0.13	±	0.051
Jan,1999							
Gifu,GIFU	7.28	1.3	±	0.15	0.006	±	0.039
Kyoto,KYOTO	8.32	17	±	0.51	0.039	±	0.043
(Tap Water)							
Oct,1998							
Sendai,MIYAGI	0	1.2	±	0.16	0.055	±	0.05
Nov,1998							
Kawachi-machi,TOCHIGI	8.03	0.24	±	0.046	0	±	0.041
Nagano,NAGANO	6.58	0.63	±	0.11	0	±	0.041
Tokushima,TOKUSHIMA	7.19	1.9	±	0.18	0	±	0.041
Kagoshima,KAGOSHIMA	7.1	0.46	±	0.075	0.025	±	0.041
Dec,1998							
Wakkanai,HOKKAIDOU	6.8	1.1	±	0.7	0	±	0.041

Location	pH (pH)	90Sr (mBq/l)			137Cs (mBq/l)		
Aomori, AOMORI	8.1	0.8	±	0.11	0.088	±	0.048
Morioka, IWATE	7.3	0.87	±	0.11	0.038	±	0.043
Akita, AKITA	6.02	1.9	±	0.15	0.11	±	0.046
Yamagata, YAMAGATA	7.6	2	±	0.1	0.048	±	0.045
Niigata, NIIGATA	7.3	2	±	0.16	0	±	0.044
Mito, IBARAKI	7.97	1.4	±	0.14	0.087	±	0.045
Ichihara, CHIBA	7.6	1.3	±	0.13	0.034	±	0.04
Urawa, SAITAMA	6.8	0.82	±	0.22	0.035	±	0.042
Maebashi, GUNMA	7.2	1.1	±	0.13	0.082	±	0.048
Katsushika, TOKYO	6.9	0.9	±	0.15	0.03	±	0.051
Yokohama, KANAGAWA	7	0.53	±	0.093	0.062	±	0.041
Koufu, YAMANASHI	7.1	0.91	±	0.12	0.012	±	0.042
Kosugi-machi, TOYAMA	7.2	1.6	±	0.13	0.044	±	0.042
Kanazawa, ISHIKAWA	6.68	2.5	±	0.17	0.082	±	0.041
Fukui, FUKUI	6.36	0.56	±	0.093	0.044	±	0.042
Nagoya, AICHI	6.8	2.1	±	0.17	0.098	±	0.047
Ootsu, SHIGA	6.9	2.6	±	0.11	0.042	±	0.042
Tsu, MIE	7.1	1.8	±	0.14	0	±	0.041
Nara, NARA	7.2	2.3	±	0.17	0	±	0.037
Osaka, OSAKA	7.2	2.4	±	0.18	0.1	±	0.049
Tottori, TOTTORI	7.5	2	±	0.19	0	±	0.039
Tottori, TOTTORI	0	2.4	±	0.18	0	±	0.035
Kobe, HYOUGO	7.13	2.1	±	0.15	0	±	0.068
Shinguu, WAKAYAMA	6.9	1.6	±	0.17	0.038	±	0.049
Okayama, OKAYAMA	6.5	1.8	±	0.1	0	±	0.037
Takamatsu, KAGAWA	7.59	2.4	±	0.22	0.022	±	0.042

Location	pH (pH)	90Sr (mBq/l)			137Cs (mBq/l)		
Hiroshima, HIROSHIMA	6.94	1.7	±	0.11	0	±	0.042
Kochi, KOCHI	7.18	1.4	±	0.14	0.006	±	0.037
Ube, YAMAGUCHI	7.5	1.7	±	0.09	0.36	±	0.041
Ooita, OOITA	7.56	0.62	±	0.079	0.055	±	0.05
Fukuoka, FUKUOKA	7.08	1.9	±	0.15	0.029	±	0.041
Saga, SAGA	8	1	±	0.14	0	±	0.038
Uto, KUMAMOTO	7.16	0.02	±	0.1	0.014	±	0.048
Miyazaki, MIYAZAKI	7.08	1.3	±	0.12	0	±	0.041
Nagasaki, NAGASAKI	6.3	1.3	±	0.13	0	±	0.04
Naha, Okinawa	7.59	1.9	±	0.17	0.059	±	0.045
Jan, 1999							
Kyoto, KYOTO	8.04	2.7	±	0.19	0.058	±	0.041
Feb, 1999							
Fukushima, FUKUSHIMA	7.7	1.5	±	0.13	0.085	±	0.044

(4) Strontuim-90 and Cesiumu-137 in Freshwater
(form Oct.1998 to Mar.1999)

-continued from No. 126 for this publication-

Table (4) :Strontuim-90 and Cesiumu-137 in Freshwater

Location	pH	90Sr			137Cs		
	(pH)	(mBq/l)			(mBq/l)		
(Fresh Water)							
Oct, 1998							
Shobara, HIROSHIMA	6.9	1.4	±	0.15	0.057	±	0.054
Dec, 1998							
Niigata, NIIGATA	7.38	2.6	±	0.19	0.35	±	0.065
Suwa, NAGANO	6.82	0.67	±	0.11	0.14	±	0.052
Uji, KYOTO	7.89	0.054	±	0.083	0.072	±	0.043

(5) Strontuim-90 and Cesiumu-137 in Soil
(form Oct.1998 to Mar.1999)

-continued from No. 126 for this publication-

Table (5) :Strontuim-90 and Cesiumu-137 in Soil

Location	Sampling period	90Sr (Bq/kg)	90Sr (MBq/km2)	137Cs (Bq/kg)	137Cs (MBq/km2)
December～, Saga, SAGA	5 ～ 20	0.1 ± 0.03	17 ± 5	0.24 ± 0.073	40 ± 12
December～December, 19 Saga, SAGA	0 ～ 5	0.19 ± 0.037	7 ± 1.4	0.96 ± 0.11	36 ± 4.3
October～, Shinguu, WAKAYAMA	0 ～ 5	0.34 ± 0.075	18 ± 4.1	1.5 ± 0.15	80 ± 7.9
Shinguu, WAKAYAMA	5 ～ 20	0.21 ± 0.065	31 ± 9.5	0.61 ± 0.11	90 ± 15

(6) Strontuim-90 and Cesiumu-137 in Seawater
(form Oct.1998 to Mar.1999)

-continued from No. 126 for this publication-

Table (6) :Strontuim-90 and Cesiumu-137 in Seawater

Location	Sample volume analyzed (l)	Cl (l)	90Sr (mBq/l)	137Cs (mBq/l)
Oct,1998				
White-beach,Okinawa	40	18.6	1.2 ± 0.18	1.9 ± 0.22

(7) Strontuim-90 and Cesiumu-137 in Sea Sediments
(form Oct.1998 to Mar.1999)

-continued from No. 126 for this publication-

Table (7) :Strontuim-90 and Cesiumu-137 in Sea Sediments

Location	(m)	90Sr (Bq/kg)		137Cs (Bq/kg)	
Oct,1998					
White-beach,Okinawa	14.3	0.18	0.061	0.3	0.075

* * Sampling Locations in Japan * *

1: Sapporo
2: Aomori
3: Morioka
4: Akita
5: Sendai
6: Yamagata
7: Fukushima
8: Niigata
9: Mito
10: Utsunomiya
11: Chiba
12: Urawa
13: Shinjuku
14: Maebashi
15: Nagano
16: Yokohama
17: Toyama
18: Kouhu
19: Kanazawa
20: Shizuoka
21: Gifu
22: Fukui
23: Nagoya
24: Tsu
25: Ootsu
26: Kyoto
27: Nara
28: Osaka
29: Tottori
30: Kobe
31: Wakayama
32: Okayama
33: Matsue
34: Tokushima
35: Takamatsu
36: Hiroshima
37: Kochi
38: Matsuyama
39: Yamaguchi
40: Ooita
41: Fukuoka
42: Saga
43: Kumamoto
44: Miyazaki
45: Nagasaki
46: Kagoshima
47: Naha