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Determination of Cesium-137 and Cesium-134 radioactivity levels in fish consumed by Sri Lankans after the Nuclear Power Plant accident that occurred in Fukushima, Japan

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Release of radioactive isotopes to the environment by nuclear accidents such as at *Chernobyl*, *Three Miles Island* and *Windscale* has raised considerable environmental and safety concerns over the past several decades. The contamination of marine biota and subsequently seawater food sources with radioisotopes has caused considerable alarm within the scientific community and the general public as a whole after the Fukushima Nuclear Power Plant (FNPP) accident occurred in March 2011 in Japan. Radioisotopes such as Cs-137 can get bioaccumulated and biomagnified in fish due to its chemical nature and the longer half-life. This particular study was carried out to determine the activity levels of Cesium-137 and Cesium-134 in selected types of fish samples and to see whether there is any significant impact from the Fukushima NPP accident on the fish consumed by Sri Lankans at present. All samples were collected during the period September 2011- March 2012 and analyzed at the laboratories of the Atomic Energy Authority.

The radioactive isotopes of Cs-137 and Cs-134 were not found in detectable levels in all fresh water fish samples. The sea fish species collected from the local consumer market contained trace amounts of Cs-137 in dry weight (_{dw}) ranging from 0.27 ± 0.13 to 0.76 ± 0.34 Bq/kg. The Cs-137 and Cs-134 were detected in two imported canned fish samples indicating possible contamination due to the FNPP accident. The contaminated samples showed activities of 10.97 ± 0.99 Bq/kg _{dw} and 6.12 ± 0.62 Bq/kg _{dw} for Cs-137 and 8.37 ± 2.91 Bq/kg and 4.8 ± 1.75 Bq/kg _{dw} for Cs-134 respectively. The activity ratios of Cs-137 to Cs-134 for the above two samples were approximately 1.3. The Cs-137 and Cs-134 activities of the remaining five imported canned fish samples were less than the lower limit of detection.

The preliminary results of the study show that there is an impact on sea-fish due to radioactive releases from the FNPP accident. However, all the samples analyzed had radioactivity levels less than the stipulated levels by the regulations imposed in Sri Lanka. As there is a possibility for radioactivity in fish to be increased to harmful levels by the processes of bioaccumulation and biomagnifications, it is necessary for the study on sea food varieties generally consumed in Sri Lanka to be continued for an extended period of time.

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