Cesium-137 concentrations in freshwater fishes collected in Lake Inba

N. ISHII[1*], M. KAGAMI[2], T. FUROTA[2], K. TAGAMI[1] AND S. UCHIDA[1]

[1]National Institute of Radiological Sciences, Anagawa 4-9-1, Inage-ku, Chiba 263-8555, Japan (*correspondence: nobu@nirs.go.jp)

[2]Toho University, Miyama 2-1-1, Funabashi, Chiba 275-8510, Japan

A large amount of Cs-137 was released into the environments following the Fukushima Daiichi nuclear accident in 2011. Concequently, freshwater environments have also been contaminated with Cs-137. Most of Cs-137 is storongly assosicated with suspended matter in freshwater systems, and thus, it is easy to accumulate on the bottom of rivers and lakes. Aquatic organisms may accumulate Cs-137 into their bodies. We especially foucused on fish because the trophic level of fish is relatively high, and fish consume a large amount of foods contaminated with Cs-137. In addition, from the viewpoint of radiation dose for human, consumption of freshwater fish is one of pathways of internal dose. In this study, we determined the concentrations of Cs-137 in various parts of freshwater fishes in a lake to clarify major factors affect to Cs-137 concentration in fish.

We collected four fish species from Lake Inba (north basin) in 2015: *Channa argus* (n=1), *Ictalurus punctatus* (n=2), *Cyprinus carpio* (n=5), and *Carassius* sp. (n=3). Fish samples were separated into muscle, bone, and internal organs parts after the measurements of body length and fresh weight. Each separated part was freeze-dried and powdered, then the activity concentration of Cs-137 was measured with a Ge detector. The age of fish was detemined using otoliths.

From their age, all the collected fishe individuals had already been born when the nuclear accident was occurred. Therefore, exposing time should be the same for all samples. Among the fish body parts, the highest concentration was found in muscle for all species. Cs-137 concentrations in internal organs and born samples were less than 1/100 of the muscle. These results suggest that Cs-137 was highly accumulatied in muscle. The concentrations of Cs-137 in fish werehigher in the following order: *C. argus* > *I. punctatus* > *Cyprinus carpio* ≈ *Carassius* sp. *C. argus* and *I. punctatus* are carnivorous, and *Cyprinus carpio* and *Carassius* sp. are omnivorous. Such feeding habitat may be the majour factor of the Cs-137 differeces in freshwater fish species.