Geographical variation of total mercury level and its stable isotope composition in skipjack tuna (*Katsuwonus pelamis*) from western North Pacific Ocean

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Fish is the biggest source of methyl mercury (MeHg) exposure to humans. A good understanding of the factors controlling MeHg accumulation in fish is therefore primordial. Intra-species comparison studies near Hawaii suggested that species which migrate deeper have higher Hg concentration possibly due to high MeHg production below the ocean mixed layer [1] [2]. Geographical variations might be another factor infleuncing MeHg accumulation for certain fish species. In this study, we investigated total Hg (THg) variations in Skipjack tuna, archived in environmental specimen Bank in Japan, which cover a wide geographical distribution (n=126, 0-44°N and 137-175°E). Mercury stable isotope ratio was measured to constrain the source and ecological factors affecting Hg level in this species.

The THg concentration of skipjack tuna varied from 0.01 to 1.05 μg/g (wet wt.) depending on region and body size. Overall, samples from marginal ocean showed high THg, while those from open ocean were lower. Isotope analysis showed large variations in MDF and MIF among the samples. Foraging depth estimated from MIF values are consistent with the biologging studies. A decrease in the estimated foraging depth was observed from south to north, probably due to the change in water temperature. An increase in THg levels in skipjack tuna was observed with increasing foraging depth except for the samples near the equator. THg in samples from depths >200 m generally exceeded the Japanese Ministry of Health, Labour and Welfare guideline (0.4 μg/g). The geographical and seasonal variations will be further discussed.

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