



Radiological risk assessment in the Asian green mussel (*Perna viridis*) and the Thai seafood consumers

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ABSTRACT

There are several sources of radionuclides to be accidentally and routinely released into the marine ecosystem leading to bioaccumulation of such radionuclides in marine biota in Thailand. Radioactive contamination in local seafood can result in significant health effects via the human food chain. This study aims to estimate radiation doses received by the Asian green mussel (*Perna viridis*), and the Annual Committed Effective Doses (ACEDs) and Lifetime Cancer Risk (LCR) from ¹³⁷Cs, ²²⁶Ra, ²³²Th, and ⁴⁰K in the mussels via ingestion. The mussels were collected from the offshored shellfish farms in the Gulf of Thailand and the Andaman Sea during wet and dry seasons between 2020 and 2021 for radioactivity measurement using HPGe gamma spectrometry. The results showed that ¹³⁷Cs, ²²⁶Ra, ²³²Th, and ⁴⁰K concentrations in the green mussels ranged from 0.0049 to 0.0623 Bq/kg, 1.86 to 3.67 Bq/kg, 0.34 to 0.62 Bq/kg, and 3.80 to 30.74 Bq/kg, respectively. Radiation dose rates in the shellfish estimated using the ERICA Tool were found to be in a range of 0.50–0.76 μGy/h which were well below the screening value of 10 μGy/h. In addition, the ACEDs ranged between 6.41 and 72.78 μSv/yr which were lower than 300 μSv/yr. While the LCR values estimated in the present study ranging from 3.55×10^{-6} to 2.82×10^{-5} did not exceed the recommended value of 10^{-4} . It could be concluded here that eating the green mussels from the studied areas did not cause any radiological health risk in the Thai seafood consumers. However, future investigations are recommended to be conducted in the green mussels from other locations and in young consumers where higher ACEDs and LCR values were recorded.

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