Relationship of Genetics and Cs-137 in Asian Green Mussel (*Perna viridis*) from Nuclear Activities in Asia-Pacific Region

Wanwiwa Tumnoi[1*] and Yutthana Tumnoi[2]

[1]Faculty of Science, Silpakorn University, Nakhon Pathom 73000, Thailand
[2]Radiation Monitoring Group, Bureau of Technical Support for Safety Regulation, Office of Atoms for Peace, Bangkok 10900, Thailand

ARTICLE INFO

Received: 10 Jan 2017
Received in revised:
17 Mar 2017
Accepted: 17 Mar 2017
Published online:
23 Mar 2017
DOI: 10.14456/ennrj.2017.6

Keywords:
Cs-137/ *Perna viridis*/ Size class/ Comet assay/ Micronucleus/ Thailand

*** Corresponding author:**
E-mail:
tumnoi_w@silpakorn.edu

ABSTRACT

This study focuses on the relationship of genetics and Cs-137 radiation doses in Asian green mussel (*Perna viridis*) collected from Chonburi province, Thailand. They might accumulate the radiocaesium from the nuclear power plants in the Asia-Pacific region including the Fukushima-Daiichi nuclear power plant via their routine or accidental releases. The radiation doses, estimated using ERICA Tool in the bivalves categorized into 3 different size classes including 4-6, 6-8, and 8-10 cm, were below 0.02 nGy/h. In parallel, Micronucleus test and Comet assay were used to investigate genetic responses in the mussels. They revealed minimum micronucleus frequency (MNF) and %Tail DNA varying from 1.80-2.90% and 1.36-1.70%, respectively. The result indicates that neither particular accumulation of Cs-137 nor genetic responses among different size classes of the animals were observed. Furthermore, the radiation doses in the mussels were below the dose limit of 10 µGy/h. Therefore, no radiation effect caused by Cs-137 was found and it was also confirmed by minimal genetic damages. Data obtained can be used as site-specific data for radiological dose and impact assessment and as baseline data to establish the national radiation safety levels to protect Thai marine biota from any possible future nuclear accidents.

This is a selected paper presented at the 2nd Environment and Natural Resources International Conference (ENRIC 2016) in 16-17 November, 2016, Phra Nakhon Si Ayutthaya Province, Thailand