Evaluating genetic responses in Asian green mussel (*Perna viridis*) following Cs-137 exposure

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Radiocaesium has contaminated marine environments as a result of historical nuclear testing, severe nuclear accidents, and routine discharges from operating nuclear power plants. Its ionizing radiation, persistence, and accumulation capacity could have a negative impact on aquatic species. This study aims to investigate potential effects of Cs-137 radiation doses on DNA strand breaks and chromosomal abnormalities in hemocytes of Asian green mussel (*Perna viridis*) after in vivo exposure using Comet and Micronucleus assay, respectively. Adult bivalves were exposed to Cs-137 for 48 hours to achieve expected dose rates of 0, 5, 10, and 15 µGy/h, calculated using the ERICA tool. The results revealed that the reached doses were 0, 5.83, 12.26, and 18.06 µGy/h, which caused a dose-dependent increase in both genotoxic biomarkers. The percentage of tail DNA representing DNA damage level in those exposed below 12.26 µGy/h was categorized as no to low (4.43±1.06 and 11.21±1.89-23.29±2.28%), while a moderate damage (31.03±1.68%) was observed at the highest dose rate. Micronucleus frequencies detected in those exposed by Cs-137 surpassing the screening levels of 10 µGy/h were 7.57±1.27 and 10.38±1.69 cells/1000 cells, which were greater than the background level of this species in Thai seas. It appears that a higher radiation dose of Cs-137 may enhance the risk of genotoxicity in tropical economic mussels. However, the latest study shown that the recommended value of 10 µGy/h can be used as a safety value for aquatic populations.