

A history of nuclear bomb testing and tsunami-related mass death recorded in shells of longest-living bivalve species in Japan

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Recent studies revealed that a cold-water bivalve, *Mercenaria stimpsoni*, found in the seafloor of the shallow ocean in North Japan has longevity of more than 100 years, which is the longest record in the bivalve species found in Japan. This presentation will show a general overview of growth pattern of *M. stimpsoni*, and then show findings, based on measurements of annual rings and radiocarbon in the shells, of past variation of seawater radiocarbon concentration in the high latitude NW Pacific ocean and mass death of *M. stimpsoni* living in Funakoshi bay, Iwate Prefecture, caused by huge tsunami in 11 March 2011. A synchronized variation of annual rings among individuals enabled us to establish robust calendar ages (sclerochronology). Based on results of radiocarbon analysis of multi-individuals' shells, we reconstructed seawater radiocarbon variation that includes a rapid increase during 1950–1960s due to nuclear bomb tests conducted in the atmosphere (Bomb-¹⁴C curve) for the first time in the high-latitude NW Pacific. The shape of the bomb-¹⁴C curve suggested a strong influence from Tsugaru Warm Current (Originated from Tsushima Current flowing through Sea of Japan) on a shallow water of Sanriku Coast, NE Japan. Moreover, by using the obtained bomb-¹⁴C curve as a precise dating tool of dead shells collected from the seafloor of Funakoshi bay, we revealed that a large disturbance on seafloor environment by 2011.3 Tsunami caused mass death of *M. stimpsoni*. We will show a direction of future research to prove that past huge tsunamis, such as those occurred in Showa era (AD 1933) and Meiji era (AD 1896), as well caused mass death of this animal.

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