



Radium-226 accumulation in Florida freshwater mussels

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ABSTRACT: Selected lakes in Hillsborough County, Florida have been hydrologically augmented with groundwater to offset stage declines caused by excessive pumping of the Floridan Aquifer. Augmentation water can be relatively rich in ^{226}Ra (>5 decays per minute [dpm] L^{-1}). We measured ^{226}Ra activities in shells and soft tissues of adult bivalve molluscs (*Elliptio* cf. *buckleyi*) from groundwater-augmented and nonaugmented lakes to assess bioaccumulation of ^{226}Ra by mussels. Mussels from augmented lakes displayed higher ^{226}Ra in both shells and tissues than did mussels from nonaugmented lakes. Within a sample, ^{226}Ra activity in *Elliptio* tissues was higher than the value measured in shells. Highest activities were found in a composite mussel sample ($n = 6$) from an augmented lake; soft tissue activity was 619 ± 33 dpm g^{-1} dry weight and shell activity was 147 ± 7 dpm g^{-1} g dry weight. Large mussels displayed greater activities in soft tissues and shells than did small mussels. We transplanted animals from a nonaugmented lake into a groundwater-augmented water body. ^{226}Ra activity in dry tissue rose from 32 ± 1 to 196 ± 2 dpm g^{-1} within 2 months. When ^{226}Ra -rich mussels (232 ± 2 dpm g^{-1}) from the augmented lake were transferred to the nonaugmented lake, they showed no significant ^{226}Ra loss over the 69- d experiment. Large *Elliptio* mussels concentrated ^{226}Ra in their soft tissues to levels about 1,000 to 25,000 times concentrations in lake water. Pumping of groundwater in Florida for residential, agricultural, and industrial use contributes dissolved ^{226}Ra to some surface water bodies, where it can be bioaccumulated by bivalve molluscs.

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