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Lithium isotope geochemistry in bivalves collected along the Korean coast

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As the production and demand of Li over the past decade increases, elevated Li level in the aquatic environment may exert a toxic for marine biota and therefore humans as well. Nonetheless, the study on this effect in the marine environment is at an incipient stage yet. Here we analyzed Li concentration and its isotopic compositions in the soft tissues of 38 mussels (*Mytilus edulis* and *Mytilus coruscus*) and 12 oysters (*Crassostrea gigas*) collected from the coastal areas of South Korea during 2021. Li contents in the mussels and oysters range from 0.88 to 1.35 ug/g (0.75±0.24, n=38, 1sd) and from 0.48 to 3.13 ug/g (1.36±0.97, n=12, 1sd), respectively, in which Li content in both *Mytilus coruscus* and *Mytilus edulis* is relatively constant. Given that seawater Li concentration is consistent with the mean global ocean Li concentration of 0.18 ug/mL, it indicates that bioaccumulation of Li is much more enhanced in oysters than mussels. Furthermore, Li isotopic compositions (δ^7Li) in the mussels and oysters vary from -10.3 to +24.6‰ (+9.5±6.8‰, n=38, 1sd) and from +5.9 to +36.0 (+26.5±8.3‰, n=12, 1sd), respectively, in which δ^7Li value in *Mytilus coruscus* is relatively higher than that in *Mytilus edulis*. Likewise, given that seawater δ^7Li value is consistent with the mean global ocean δ^7Li of 31.0±0.5‰, all samples are enriched in light Li isotope (^{6}Li), indicating that biological isotopic fractionations favor light isotopes due to kinetic effects during ionic transport. While recent experimental study by Thibon et al. (2021) showed preferential enrichment of heavy Li isotope (^{7}Li) in mussels, this study shows the opposite. Although this comparison needs more detailed investigations, this study suggests the ability of bivalves to biomonitor Li contamination in the marine environment.