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Total mercury and fractionation in benthic organisms from Isfjorden, Svalbard

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Polar regions are important in the mercury cycle. In these regions, mercury is readily deposited on the land and sea surface during a springtime Atmospheric Mercury Depletion Event (MADE). Svalbard is a system in transition, it is a region where the effects of global climate change are the most prominent. This area is also interesting because of possible mercury sources, e.g. a complex pattern of surface currents, varying geological bedrock, and recent glaciers melting. Benthic organisms, especially starfish, can be valuable bioindicators of heavy metal contamination. For that reason, in July 2018, selected benthic organisms: algae, brittle star, sea urchins, sea snails, and starfish were collected in Spitsbergen fjord. Two of the sampling stations were located in the Isfjorden, while one was outside the entrance to the fjord. Total mercury (Hg_{TOT}) was present in all organisms. The results showed that starfish are the most contaminated with mercury. Total mercury concentrations in these organisms were at least 10 times higher than in other organisms. However, they deal with harmful mercury by transporting it to the carapace. Of all the research material, starfish and sea urchins were the most effective at removing total mercury from their soft tissues (above 60% mercury in their carapace). The obtained results also show that the dominant fractions were the labile fractions that are bioavailable to organisms. The largest share of these forms occurred in predatory organisms.