Abstract

Mercury is an environmental contaminant that reaches aquatic environments through atmospheric deposition of inorganic mercury. A highly toxic form of mercury, methylmercury, occurs as a result of methylation by anaerobic bacteria. Methylmercury (MeHg) bioaccumulates through trophic levels in aquatic ecosystems, and it spreads to terrestrial food webs largely from insectivory. For this reason, it is highly important ecologically to look at the mercury and methylmercury contamination of aquatic insects. Deposition and methylation of mercury in an environment is related to several anthropogenic and natural factors. Agricultural land use, as well as gold mining, can aid in the process of transport of mercury through sediment into water bodies. The environmental factors that carry the strongest association with total and methyl mercury in aquatic food webs are low water pH, intermediate to high organic matter, low water retention time, and high rates of fluctuation in water level. These factors were considered when collecting samples and comparing data from insects and sediments at a stormwater catch basin and a vernal pool on the Wheaton College campus in southeastern Massachusetts, especially organic matter and residence time. Higher concentrations of total mercury were detected in sediment at the basin site (mean=128.3 ng/g s=67.9) compared to the vernal pool site (mean=61.4 ng/g, s=17.6); however, no significant difference in MeHg or %MeHg was observed between invertebrate samples at the two sites. Two sample collection methods, emergence traps and pitfall traps, were used to collect aquatic and terrestrial invertebrates, respectively. Significantly higher levels of MeHg were found in invertebrates from the emergence traps, regardless of site. This finding is consistent with MeHg production in aquatic sediments.