

BIOMONITORING OF METALS BY USING MUSSEL MYTILUS GALLOPROVINCIALIS IN REHABILITATED ESTUARY: GOLDEN HORN

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Introduction

The Golden Horn estuary exposed to chemical pollutant over 50 years mainly due to uncontrolled industrial discharges, badly managed estuarine system and domestic wastes of the metropolis of Istanbul. Large scale restoration launched in 1998 and some rehabilitation works were put into practice such as sludge dredging actions, establishing of new wastewater collectors and wastewater treatment facilities (Coleman et al., 2009). Mediterranean mussel *Mytilus galloprovincialis* is a sentinel organisms has been long used in metal biomonitoring studies not only in passive monitoring but also for transplantation campaign (Andral et al., 2011). In the current study the assessment of metal pollution was aimed in the Golden Horn by using well acknowledged bioindicator mussel *Mytilus galloprovincialis*.

Methods

Mussel samples (5-6 cm) were exploited seasonally at eight location in Golden Horn during two year (2013-2014). Correspondingly two mussel cage were employed at the Unkapanı Bridge which is located at the center of the study area. Following shell removal soft tissues of the mussels freeze-dried. The concentrations of essential and toxic metals (Ag, Al, As, Cd, Co, Cr, Cu, Fe, K, Mn, Ni, Pb, Sn, V and Zn) were measured by using ICP-MS (Inductively Coupled Plasma – Mass Spectrometer) after microwave digestion.

Results

The concentrations of Ag, As, Cd, Co, Cr, Cu, Ni and Sn concentrations found in mussel samples were shown in Fig.1 (Not all of the measured metal due to the constrain. All result will be released in the presentation). Metal concentrations were not higher than the Turkey average values (Belivermiş et al., 2016). All metals but not Sn enhanced during the transplantation period (12 month) although analogues gradient was not seen in the resident mussels.

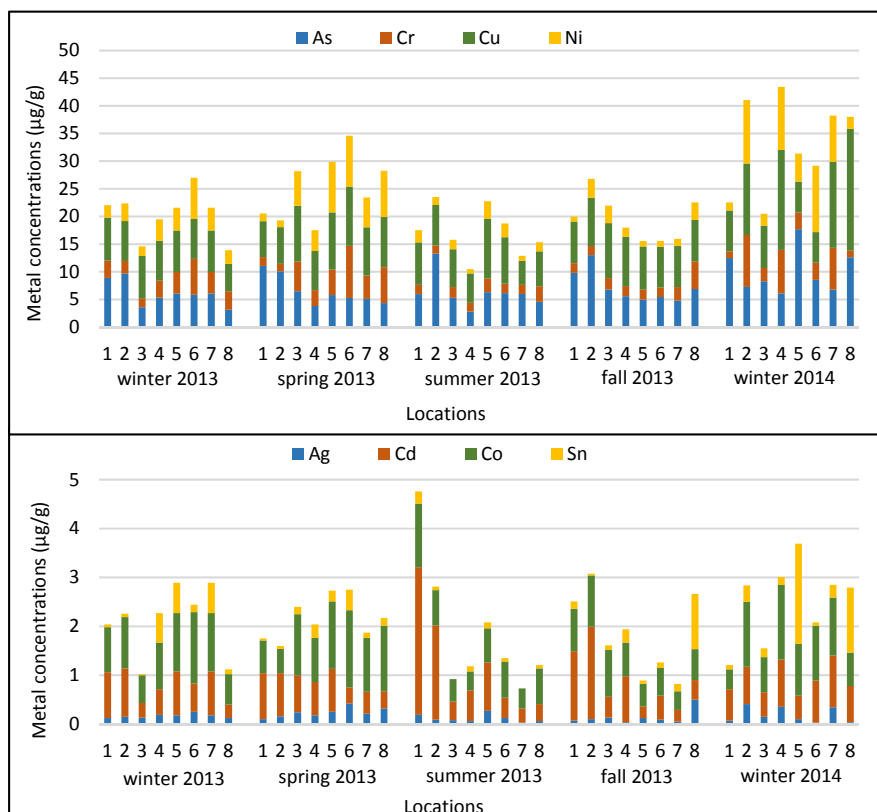


Figure 1. a) As, Cr, Cu and Ni concentrations in mussel b) Ag, Cd, Co and Sn concentrations in mussel

Conclusion

Comparatively higher seasonal variations were observed in transplanted mussel compared to resident mussels. Higher metal concentrations were also seen in transplanted mussels compared to both of t_0 values and resident mussel. Transplanted mussel attached in 30 meters at which abiotic factors such as current and temperature are partly different from coastal sampling locations. Most particularly current may be primer factor determining metal bioavailability in the estuaries like Golden Horn in which water body controlled by connected fresh water systems and Bosphorus.

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