

# THE EFFECT OF WEIGHT AND CONDITION INDEX IN MUSSEL ON HEAVY METAL CONCENTRATIONS IN IZMIT BAY

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## Abstract

The body weight and condition index (CI) effect on concentrations of Pb, Zn, Mn and Fe were investigated in *Mytilus galloprovincialis* soft tissue at two different locations in the Izmit Bay. A negative correlation between soft tissue dry weight and metal concentrations was clear in Mn and Fe. On the other hand, Zn and Pb levels decreased with increasing CI value.

**Keywords:** Metals, Bivalves, Marmara Sea

## Introduction

It is well known that mussels are good bioindicators for heavy metals. Several internal (e.g. body size, body weight, shell size, age, filtering capacity) and external factors (e.g. waves, tidal exposure, salinity, temperature) effect the metal accumulation in mussel tissues. Literature data shows a relation between body size and metal accumulation in mussel soft tissue [1]. In general metal accumulation is negatively correlated with body size but some studies reported that metal concentrations in molluscs can be independent of body size [2]. The objective of this study is to evaluate the some metal concentrations in different sizes of *Mytilus galloprovincialis* soft tissues at the two different locations from Izmit Bay (The Marmara Sea) (Fig. 1).

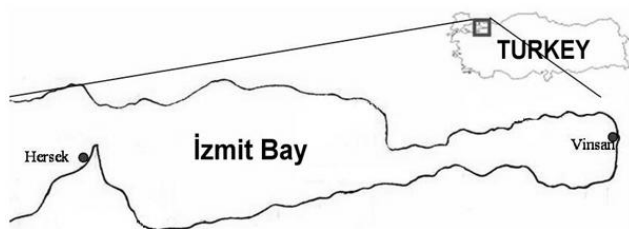


Fig. 1. Station locations in Izmit Bay (The Marmara Sea).

## Material and Methods

The mussels were collected on April 2009 from the coast line 100-200 m lengths from Vinsan, a stagnant area under the effect of untreated wastewater and from Hersék, a waving area located next to shipyards in the Izmit Bay (The Marmara Sea). At least 30 individual mussels in 5 different size (3, 4, 5, 6, 7cm ± 2mm) were measured with Wernier calipers with 0,1 mm sensitivity, dissected, dried and weighed same as the shells. Condition index (CI) was calculated by dry tissue and dry shell weight. For metal analyses whole soft parts were analyzed by flame atomic absorption used for Zn, Fe and Mn and graphite furnace for Pb. Detailed method is described previously [3]. Power function was used for plotting graphics for the effect of body size on metal concentrations.

## Results and Discussions

Pb, Mn and Fe levels were higher in Vinsan while Zn in Hersék station. A negative correlation between soft tissue dry weight and metal concentrations was clear in Mn and Fe at both stations, and for Pb at Hersék station. On the other hand, contrary to general literature, Zn levels increased with increasing body weights, same as Pb in Vinsan station. However comparison between condition index and metal levels for Zn and Pb showed that metal concentrations were inversely related to the condition index. A previous study has reported that for metals, tissue concentration is inversely proportional to the condition index [4]. For this reason correlation graphics were plotted CI versus concentrations for Zn and Pb and dry weight versus concentrations for Mn and Fe (Fig. 2). In general metal concentrations were higher than those observed in other locations of the Marmara Sea [3]. These results represent the first CI and metal concentration data from the region in the framework of a monitoring project in the Izmit Bay. Further researches are necessary to understand the relationship between metal accumulation and body size of mussels more clearly in the region.

## Acknowledgements

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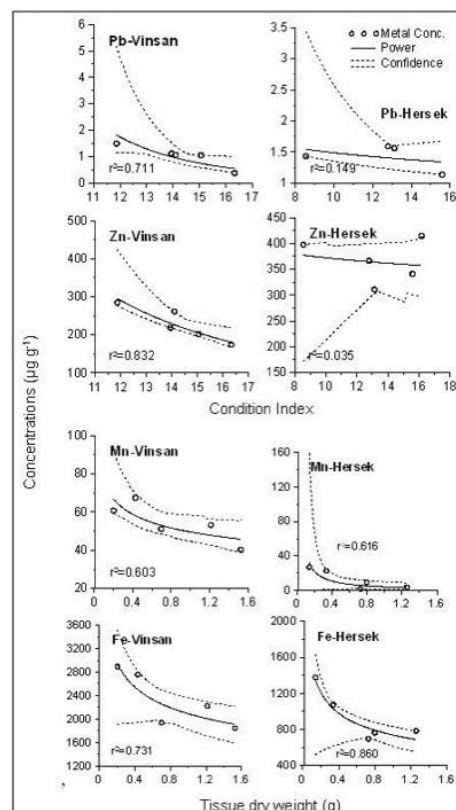


Fig. 2. Heavy metal concentration in mussels in Izmit Bay.

## References

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