

SNAIL *MELANOIDES TUBERCULATA* AS BIOINDICATOR FOR SHATT AL ARAB RIVER POLLUTION BY SOME HEAVY METALS

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ABSTRACT

The gastropod (e.g. snails) has ability to bioaccumulation for heavy metals in the body more than surrounding media and worldwide, thus they are recognized as pollution bioindicators. *Melanoidea tuberculata* was exploit as bioindicator for pollution by six heavy metals (Fe, Co, pb, Cd, Cu and Ni) at five sites in shatt Al Arab river bank from winter 2008 to winter 2009. Present study includes measurements of some environmental factors such as air and water temperature, pH, DO and salinity.

Flame atomic absorption spectrophotometer was used to measure the concentration of the heavy metals. Bioaccumulation average of heavy metals was high reached 2740.360, 38.385, 21.791, 15.189, 95.279 and 121.257 µg/g dry wet respectively. While the concentration averages in water was 9274.556, 291.6933, 339.3408, 279.7521, 142.8338 and 85.39375 µg/l respectively and in sediment the concentration average was 4124.863, 38.61458, 43.65667, 5.820646, 31.90958 and 53.95658 µg/g dry wet respectively. An increase in average concentration of heavy metals in biomass due to increase heavy metals in water and sediment of Shatt Al Arab River was evident.

Biological sedimentation factor was investigated and it was high for Cd, Cu and Ni. Present study showed ability of *Melanoidea tuberculata* seems to be a good indicator for the bioavailability of some heavy metals in Shatt Al-Arab river.

Key Words: bioindicator, Heavy metals, *Melanoidea tuberculata*, Bioaccumulation, snail

Introduction

In recent years, technological advancement in various fields has led to increasing input of heavy metals into the environment, which in turn has inevitably caused water pollution (Shilla *et al.*, 2008). Natural environmental contamination by trace metals seems to be a worldwide problem (Nriagu and Pacyna, 1988). The cycling of heavy metals in aquatic ecosystems has been the subject of much investigation as levels of environmental contamination continually increase (Pip, 1992). Metals are mainly accumulated in sediments and bioaccumulated in aquatic biota through food chain (Schluderman *et al.*, 1999). Biomonitoring has been defined as species which accumulate trace metals in their tissues and may therefore be analysed to monitor the bioavailability of such contaminants in the ecosystems (Rainbow and Phillips, 1993). In Shatt Al Arab river, the mollusca has been evaluated for use as a bioindicator of heavy metals bioavailability in bank river (Al-Qarooni, 2011) as well in Iraqi marsh (Al-Haidarey, 2009 ; Qzar, 2009). In Basrah, the *Melanoidea tuberculata* is widespread throughout the bank waters growing on plant, broken rocks and sediments. Gastropod mollusca accumulate heavy metals in their tissues in proportion to the degree of environmental contamination and can be used as indicators of water metallic pollution (Piyatritvivorakul & Boonchamoi, 2008 ; Supanopas *et al.*, 2005). However, the concentration of metal in the mollusca depends not only on the level of the element in the environment but also on other factors like size, age, speed of growth, sex and reproductive conditions of the mollusca, season, salinity and interaction with other pollutants (Ravera, 2001; Ottolouj & Don-Pedro, 2006 ; Ocherre *et al.*, 2003). Swalleh *et al.* (1994) have reported that larger *M. tuberculata* snails contained generally higher levels of metals than the smaller ones from Azraq Oasis pools in the Jordanian desert. Numerous studies have quantified heavy metals concentrations in different gastropod species in different aquatic habitats for example (Supanopas *et al.*, 2005; Ezeemonye *et al.*, 2006; Karadede-Akin & Unlu, 2007 ; Clinton *et al.*, 2008). Little studies were conducted to measure the concentrations of heavy metals in gastropod from Shatt Al Arab river as in (Al-Qarooni, 2011). Thus The main objectives of this study were (1) determination the concentration of 6 heavy metals in 5 sites in Shatt Al Arab river (2) determination the ability of *M. tuberculata* as bioindicator for pollution by some heavy metals.