

ECOLOGY AND POLLUTION BY MICROELEMENTS

**HISTOLOGICAL CHANGES INDUCED BY COPPER ION IN THE GILLS OF
Liza abu (Heckel, 1843).**

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ABSTRACT

Specimens of the fish *Liza abu* were exposed to different concentrations of copper. Gill damage resulted from exposure to sublethal concentrations. Histological changes found in the gills were represented by hyperplasia of the gill tissue, some engorgement with blood of the secondary lamellae, epithelial separation, necrosis, and fusion of adjacent secondary lamellae.

**MEASUREMENT OF RADIOACTIVITY IN WATERS AND SEDIMENTS OF
SELECTED AREAS IN SOUTHERN IRAQI MARSHES AND THE MAIN
DRAINAGE RIVER**

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ABSTRACT

Radioactivity was measured in the waters and sediments of selected areas of the southern Iraq marshes and the Main Drainage River. A chemiluminescence technique was used to calculate radiation dose. The solid-state track detectors method was employed using the detector CR-39. Track made was compared with control samples showing that radiation dose was 4.13 μ rad/h. It was found that the results of both methods seem to be similar. To measure the radioactivity of the sediments, a Gamma spectroscopy system with a sensitivity level of 0.5 Ba/Kg was used. The results showed that no radiation pollution was present in the samples detected, although the area contains some war machines destroyed by depleted uranium in the second Gulf War.

**SPECTROPHOTOMETRIC DETERMINATION OF NICKEL IN WATER
SAMPLES FROM THE SOUTHERN PART OF THE SHATT AL-ARAB RIVER
BY ADOPTING NICKEL-PORPHYRIN COMPLEX**

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ABSTRACT

In this study, levels of the ionic element nickel have been determined in water samples from selected stations along the southern part of the Shatt Al-Arab River that extended from: 1) Garmat Ali, 2) Mhelah in Abu Al-Khaseeb, 3) the discharge point of the Karun River into the Shatt Al-Arab River, 4) Al-Seebah in front of the Abadan refinery and 5) Al-Fao, the point between Al-Nagha'ah and the Costumer Station. A spectroscopic method was adopted for determination of nickel after the formation of a complex between nickel ions and porphyrin compound which was previously prepared from the reaction between pyrrol and benzaldehyde (0.8 moles each) by soxhlet in propionic acid for 30 minutes. Measurements were performed at a wavelength of 515 nm. For comparison and accuracy detection of this method another set of measurements was done with the atomic absorption technique. Values recorded spectrophotometrically for nickel were: 0.0860, 0.064, 0.063, 0.107 and 0.0865 mg/l for the stations 1-5 respectively compared with atomic absorption values 0.0865, 0.065, 0.065, 0.1085 and 0.0868 mg/l for the same stations respectively. As was expected, the highest level of nickel was recorded at station 4, which is affected by discharging effluent from the Abadan refinery. The study revealed that this complex is suitable for the determination of nickel in water samples.

**LEVELS OF POLLUTION BY TRACE METALS IN SHATT AL-ARAB
BRANCHES PENETRATING BASRAH CITY DURING SPRING AND
SUMMER 2006**

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ABSTRACT

The levels of pollution by trace metals in six branches of the Shatt Al-Arab River, which penetrating Basrah city were investigated during two seasons, spring and summer 2006. The trace metals investigated were Co, Cu, Ni and Zn in both dissolved and particulate phases of water. The technique adopted for trace metals analyses is Atomic Absorption Spectrophotometry. Levels recorded in $\mu\text{g/l}$ were high for Co (98-491), Ni (39.936 – 159.742) and Zn (47.589–396.578) in the dissolved phase during both seasons compared to the particulate phase in which levels recorded in $\mu\text{g/g}$ were Co (0.14–16.772), Ni (0.057–6.807) and Zn (0.744–11.417). For Cu most levels were under detection limit and the maximum value recorded was 57.364 $\mu\text{g/l}$ for the dissolved phase in Al-Khandak canal during spring 2006. All the studied canals were highly polluted and water appears highly turbid, viscous and greenish in color due to the expected abundance of phytoplankton.

EVALUATION OF SOME PHYSICAL AND CHEMICAL PARAMETERS AND TRACE METALS IN WATERS OF SELECTED SITES ALONG THE TIGRIS RIVER AT MAYSAN GOVERNORATE, IRAQ

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ABSTRACT

The present study was concerned with an evaluation of some physical and chemical parameters and certain trace metals in waters of nine selected sites along the Tigris River at Maysan Governorate. Studied parameters included: pH, electrical conductivity (EC) and turbidity according to standard methods in addition to estimation of the trace metals Co, Cu, Ni and Zn by atomic absorption spectrophotometry. Results in this study showed little variation in the pH values within the range 7.4-7.6. The highest values for EC and turbidity were 1,860 mS/cm and 688 turbidity units respectively at site 7 downstream from Amarah city. For trace metals, Co and Zn showed the highest values, which were 0.1586 µg/ml for Zn at site 5 and 0.268 µg/ml for Co at sites 4 and 6. For Ni the highest value was 0.217 µg/ml at site 7, whereas for Cu, the concentrations were identical in most sites and ranged between Nd – 0.017 µg/ml. The rise in trace metal concentrations especially in sites 4-7 located downstream from Amarah city due to release of huge amounts of untreated sewage as domestic, industrial and agricultural waste into the Tigris River. Degradation of organic matter led to an increase of free carbon dioxide in water accompanied by decrease of pH. This effect in turn stimulated liberation and release of these metals from the organic matter to increase their dissolved concentrations in the river water.

LEVELS AND DISTRIBUTION OF TRACE METALS IN THE SOUTHERN WETLANDS OF IRAQ

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ABSTRACT

Levels of the trace metals Cd, Co, Cu, Fe, Mn, Ni, Pb and Zn were determined in water and sediments from southern Iraqi wetlands represented by the three main marshes, (Al-Haweizah, Central and Al-Hammar), the Shatt Al-Arab, Garmat Ali and the northern Arabian Gulf. Subsurface water samples and bottom sediments were collected from each site of sampling on a seasonal basis during the period July 2004 to July 2005. Trace metals were extracted from each sample by means of standard methods and determined by adopting of atomic absorption spectrophotometer. The highest mean concentrations for trace metals in water (in $\mu\text{g/l}$) were 85.97 (Cd), 407.98 (Co), 57.83 (Cu), 574.33 (Fe), 85.34 (Mn), 181.0 (Ni), 90.25 (Pb), and 702.34 (Zn) at Beesha, Qurna, Mashab, Khite, Seeba, Mashab, Beesha and Beesha respectively during different seasons of the study, while the highest mean concentrations of trace metals in sediments (in $\mu\text{g/g}$) were 35.92 (Cd), 836.46 (Co), 48.69 (Cu), 18,435.50 (Fe), 3,648.28 (Mn), 486.95 (Ni), 5435.5 (Pb) and 539.8 (Zn) at Central Marsh, Central Marsh, Central Marsh, Al-Haweizah, Qurna, Garmat Ali, Qurna and Qurna respectively. Certain sites along the Shatt Al-Arab River receive huge amounts of wastes from municipal, industrial and commercial facilities, which might increase the levels of pollutants in water and sediments, as it is found in Ras Al-Beesha at the top north of Arabian Gulf as pollutants in the particulate phase of water are separate and precipitate.

**ASSESSMENT OF RADIOACTIVITY IN THE FOOD CHAIN OF THE
DRAINAGE RIVER, BASRAH, IRAQ**

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ABSTRACT

The present study dealt with the measurements of environmental radiation levels in the main drainage at Basrah, in the south of Iraq, during July and August 2006. Gamma spectroscopy with a sensitivity level of 0.5 Bq/kg and the chemiluminescence technique were used. The results revealed no sign of radiation pollution in the main drainage at Basrah, in spite of the existence of war machines previously destroyed by depleted uranium in the area of the study.