**Physical, Chemical and Biological parameters in**

 **Arabian Gulf**

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**Abstract**

The aim of the present study is to investigate the hydrographic characteristics, nutrient salts and some heavy metals (Fe, Cu, Zn, Pb and Ni) as well as chemical oxygen demand (COD), biological oxygen demand (BOD) and chlorophyll-a (Chl-a) in six vertical profiles in the open Arabian Guf water about 20 Km from Khor Abdulla port (Iraq). Water samples were collected during April 2017. The results revealed that most of nutrients and heavy metals are concentrated in the surface layer and decreased with increasing the depth. N/P ratio and abundance of the N-ions revealed that the area is mostly Nlimiting.

Enrichment factor (EF) of the metals gives low values, less than 1 indicating to the enrichment and advection of heavy metals counted each other. The results indicated that the impact of

anthropogenic in puts was limited in the distribution of nutrient and heavy metals, the values of metals were similar or lower than that reported for water quality criteria (WQC) except that the Zn content was slightly higher. The relationships between the different heavy metal concentrations and the other

parameters (salinity, chlorophyll-a and suspended particulate matter) were discussed. The values of BOD/ COD ratio indicated that the water of the study area has a biodegradable nature. Relatively high levels of Chl-a concentrations was recorded in the surface layer during the period of study and negative

correlation was found between Chl-a and both NO3-N, PO4-P and SiO4 (r= -0.58, -0.38 and -0.58,respectively).

**Key words: Heavy metals, nutrient salts, hydrographic characteristics**