

The Elemental Content of Seawater and Algae Collected from the Red Sea, the Arabian Gulf, and the Gulf of Oman: Preliminary Study

N. Nassar¹, M.M. Sherif¹, N. Yushin², I. Zinicovscaia^{2,3}

¹*Department of Physics, Faculty of Science, Cairo University, Giza, Egypt*

²*Joint Institute for Nuclear Research, IIO, Dubna*

³*Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering, Magurele, Romania*

The content of Na, Mg, Al, Ca, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Sr, Cd, Ba, and Pb in 24 samples of algae and 9 samples of water collected from 5 stations in the Red Sea, 2 stations in the Gulf of Oman and 2 stations in the Arabian Gulf were determined using ICP-OES. For all water samples, it was found that the concentrations of Cr, Co, Ni, Cd, and Pb were below the detection limits. Meanwhile, the predominant elements found in all water samples were Na, Mg, and Ca. Except for Ba, which attains its peak concentration at the Kalba station in the Gulf of Oman, the highest levels of all examined elements were detected in water samples from the Red Sea. Al, Ca, Mn, Fe, and Sr exhibit their maximum concentrations in water samples collected from the Al-Ain Al-Sukhna station in the Red Sea, demonstrating signatures indicative of geogenic origins in this area. On the contrary, the highest content of most of the elements was reflected in algae samples collected from the Gulf of Oman. The study revealed that different algae species collected from the same location exhibited a remarkable variance in elemental concentrations, which can be attributed to different accumulation capacities. Notably, the highest content of Pb was found in *Sargassum sp.* collected from Zaafrana station (The Red Sea) with a value of 19.4 mg/kg, which is 18 times higher than the average Pb content in all collected samples, revealing a possible Pb contamination in this area. The highest values of Fe, Co, Ni, and Cu were found in *Callithamnion corymbosum sp.* collected from Diba Fujairah station in the Gulf of Oman. While Cr and Mn showed their highest content in *Corallinalis sp.* collected from Kalba station in the Gulf of Oman.