A FOLLOW-UP ASSESSMENT OF HEAVY METAL POLLUTION RECORDED IN SCLERACTINIAN CORALS IN SOUTHERN RED SEA, HODEIDAH, YEMEN

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This is a continuing study, which provides a representative data on the pollution status of two important harbors in Hodeidah, Yemen, southern Red Sea Al-Luhaya and Al- Saleef. The aim of study was to assess the potential effects of the current war on the studies area, which had been investigated eight years ago before the war has been started. Five species of corals were collected from each harbor and transferred to FLNP at JINR for ICP-AES analysis. Measurements of twelve trace elements (Al, Ba, Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Zn, V) the major dominant element Sr and the nonmetal S were conducted. The Preliminary observations showed the order of the trace elements in the samples from Al-Luhaya harbor is Al> Fe > Ba> Mn> Zn> V> Cu> Ni> Cr> Cd> Pb> Co, whereas the order in Al-Saleef is Al> Fe> Ba> Mn> Zn> V> Ni> Cu> Cr> Pb> Co> Cd. The ICP-AES this time allowed to detect Pb and Cd which were not examined in the previous study by INAA. Pb and Cd average values were 0.22±0.07 and 0.45±0.24 µg/g in coral samples from Al- Luhaya and 0.53±0.49 and 0.21±0.27 µg/g in samples from Al- Saleef. Both elements can be derived from anthropogenic sources i.e. sewage input, municipal pipeline, and wastewater. In current study, Fe recorded significantly elevated value in both harbors (195±245 and 233±205 µg/g). These values are higher than values recorded for the same sites eight years ago also higher than values recorded in northern Red Sea and worldwide i.e., Japan, India, and Jordan. These high values may directly result from sunken boats and low surveillance on the old boats and their maintenance. Also, the (Co, Mn, and Zn) elements recorded increased values compared to the previous study (0.14±0.03, 6.8±2.35, 1.85±0.93 µg/g and 0.37±0.33, 11.31±4.56, 4.93±22.39 µg/g) for Al-Luhaya and Al-Saleef respectively. Statistical analyses outputs showed strong correlation between Al, Cr, Fe and V, indicating a sign of anthropogenic pollution level. The concentrations of those elements are higher than the levels of these heavy metals worldwide, i.e. Gulf of Aqaba, Jordan, India and Japan, although this level still lesser than other sites from northern Red Sea, Egypt. As conclusion there is upward increase pollution in the studied areas.

Key words: Red Sea, Yemen, scleractinian corals, Pollution ICP-AES