Using of Benthic Indices and GIS Maps to Determination of Biotic Health in Khure-Mussa

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Abstract

Without industrial and urban development and their effects on marine ecosystem, due to high biotic potential, Khure-Mussa would be one of the productive coastal areas. Because of sensitivity and vulnerability to environmental changes this area are classified in sensitive ecologic area. This study was conducted to evaluation ecological health status in Khure-Mussa in the Northwest of Persian Gulf by using benthic indices. Twenty creeks in Khure-Mussa area were set up for study and sampling in four seasons from winter 2008 to autumn 2009. Monthly water sampling for physico-chemical parameters was done by bottle sampler and seasonal samples of surface sediment were collected by Peterson grab sampler (0.125m2) .At each station three samples for macrobenthic study and one sample for grain size analysis and organic matter determination were obtain. Totally, 187589 macrobenthic individual were collected and separated. Among identified groups, Polychaets with total number108906, Crustacean with total number 46561, Bivalve with total number 14156 and seapen with total number 9841 were the dominant groups and were included 58, 25, 8 and 5 percentage of total number respectively. The highest abundance in the spring and the lowest abundance in the summer were observed. According to mean abundance, Somaily creek and Khure-mussa (3) station showed the highest and the lowest abundance respectively. Seapen is included more than 90 % of total biomass. The range of Shannon diversity index was (1.95-3.58) which the minimum and the maximum values were found in Shipping and Patil station respectively. Significance benthic biological parameters (abundance and richness) in different creeks explained the variation of benthic community structure in studied creeks. In addition, seasonal significant differences were found in these parameters due to seasonal changes in benthic animal's succession. The results of grain size analysis showed that the range of silt-clay was (63.6-95.59). According to AMBI index values, all of the studied creeks are classified in slightly pollution level and disturbed condition except for Petrochemical station that placed in moderate pollution level. The BOPA index values in all stations showed more than threshold level (0.19) that means bad and weak ecological condition. The highest and the lowest ITI index values were observed in Oil exporting port station (64.92) and Ghazaleh creek (29.53) respectively. The others were grouped in 30-60 range that means moderate pollution level and disturbed ecological status. The values of ABC (Abundance Biomass Curve) that explained the relation between macrobenthic biomass and abundance were calculated near zero from 0.1 to -0.1 in all studied creeks that show moderate condition for living animals. In general the studied creeks showed pollution potential and benthic biological parameters indicated downward trend in ecological quality and health status.

Key words: Khure- Mussa- Ecological health-Benthic animals-Biotic indices